United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Grants Pass Field Office
2164 NE Spalding Avenue
Grants Pass, Oregon 97526
www.blm.gov/or/districts/medford

MAY 2 3 2017

1792 (ORM070)
DOI-BLM-ORWA-M070-2016-0006-EA

Dear Interested Party:

The Grants Pass Field Office has completed an Environmental Assessment and a Draft Finding of No Significant Impact for the Pickett West Forest Management Project. The Environmental Assessment analyzes the effects of a No Action Alternative and two Action Alternatives. Treatments are proposed in areas designated as Matrix, Matrix Adaptive Management Area, and Riparian Reserve Land Use Allocation as defined in the 1995 Record of Decision and Medford District's Resource Management Plan. Proposed treatments include density management, restoration thinning, understory reduction, and hazardous fuels reduction maintenance.

The planning area is located within the Hellgate-Rogue River, Deer Creek, and Lower Applegate River watersheds, in Josephine and Jackson Counties, Oregon. There is more location information on the attached map.

In 2015 forest restoration needs across Oregon were categorized and the three watersheds within the planning area were among those most in need of active restoration to promote forest resiliency. The Pickett West project is designed to meet multiple objectives including the Oregon and California Revested Lands Act of 1937. The proposed treatments would provide a sustainable supply of timber, improve forest resiliency, and enhance or maintain northern spotted owl habitat. Treatments are expected to reduce the long-term risk of disturbances such as disease outbreaks or potential catastrophic wildfire.

The following table provides a summary of the activities proposed under the two Action Alternatives:

Proposed Commercial Activities*	**Alternative 2**	**Alternative 3**
Restoration Thinning	3,025 acres	1,028 acres
Density Management	2,226 acres	3,185 acres
Total Commercial Treatments	**5,251 acres**	**4,213 acres**
Hazardous Fuels Reduction Maintenance	11,102 acres	11,102 acres

** The definition of treatment types is provided in the Environmental Assessment and the Reader's Guide on our website. The address is listed below.*

Public Involvement

The Pickett West Forest Management Environmental Assessment and Draft Finding of No Significant Impact are available for a 30-day public comment period, beginning May 30, 2017. The public comment period begins when a legal notice is published in the *Grants Pass Daily Courier* and the *Illinois Valley News.*

You can access project information at the BLM's ePlanning website at http://tinyurl.com/BLMePlanning-PickettWest. Hard copies are available at the Grants Pass Interagency Office at 2164 NE Spalding Ave, Grants Pass, OR 97526. The office is open Monday through Friday, 8:00 a.m. to 4:30 p.m., closed on holidays. Comments on the project must be received by close of business June 29, 2017 to be considered in the final decision making process. Please send comments to the address above or email to Don Ferguson, Public Information Specialist, at blm_or_pwest@blm.gov.

All comments will be made available for public review. If you would like your personal information withheld from public review or disclosure under the Freedom of Information Act, please state this clearly at the beginning of your written comment. All comments received from organizations or officials of organizations, businesses, or government agencies will be made available for public inspection in their entirety.

Field Tours

We will be hosting two public field tours on June 17, 2017. There will be an opportunity for a morning and an afternoon field tour at two locations.

The morning session will begin at 9 am. We will be meeting at the Speedy Mini Mart located at the intersection of the Rogue River Highway and Savage Creek Road. The address is 6415 Rogue River Hwy, Grants Pass, OR 97527. The field tour location is approximately 15 minutes up Savage Creek Road. You are welcome to drive your personal vehicle or ride in a BLM vehicle to the site. Once at the field tour site, BLM staff will give a short presentation, followed by an opportunity for open discussion. The morning session will conclude at 11:30 am.

The afternoon session will begin at 1 pm. We will be meeting at Robertson Bridge County Park at the intersection of Lower River Road and Pickett Creek Road. The address is 12171 Lower River Road, Grants Pass, OR 97526. The field tour location is approximately 10 minutes up Pickett Creek Road. You are welcome to drive your personal vehicle or ride in a BLM vehicle to the site. Once at the field tour site, BLM staff will give a short presentation, followed by an opportunity for open discussion. The afternoon session will conclude around 3:30 pm.

For more information about this project and the field tours, please visit the website above or contact Don Ferguson, at (541) 471-6520 or the email listed above.

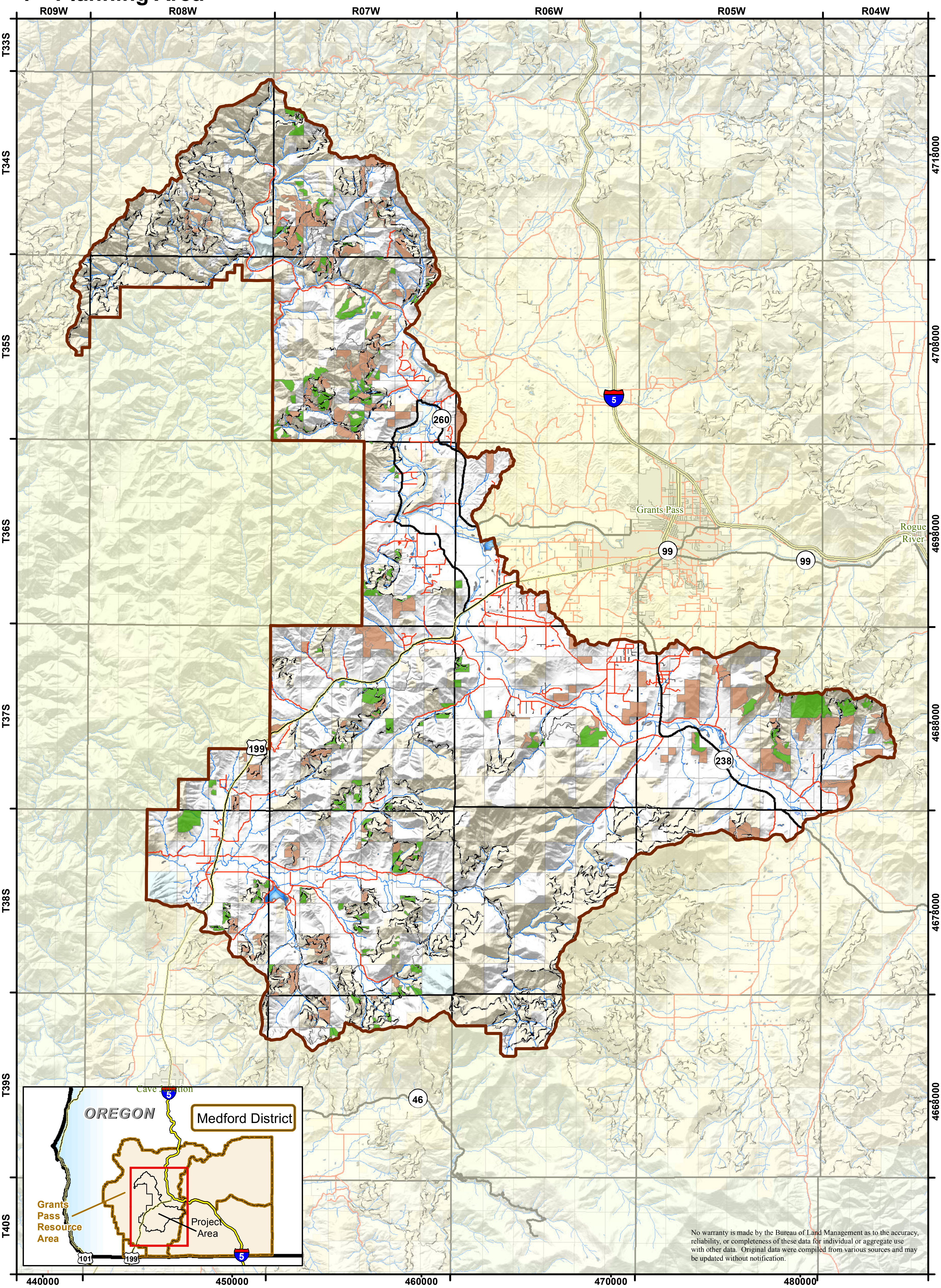
We appreciate your interest in the Pickett West Forest Management project.

Sincerely,

Allen Bollschweiler
Field Manager
Grants Pass Resource Area

Enclosure

Pickett West Forest Management Project Planning Area



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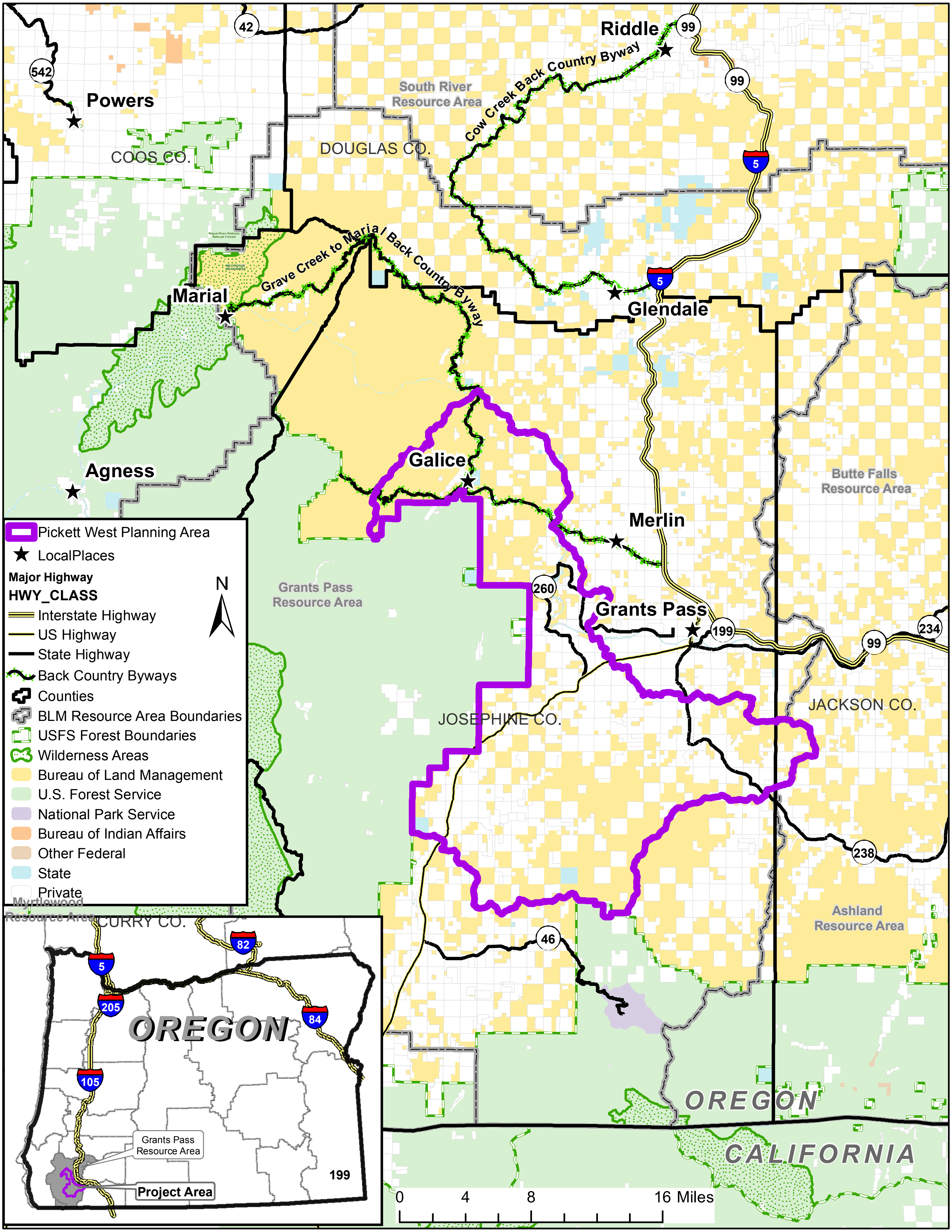
Pickett West Planning Area
Pickett West Planning Area Mask
Proposed Treatment Units
Proposed Hazardous Fuels Reduction (maintenance)

Bureau of Land Management
County route
Other state route
Municipal route (urban, residential, etc.)
Private road (no symbol)

Bureau of Land Management
U.S. Forest Service
Local Government
State
Private or Company



Riddle
Cow Creek Back Country Byway
South River Resource Area
Powers
COOS CO.
DOUGLAS CO.
Grave Creek to Marial / Back Country Byway
Marial
Glendale
Agness
Galice
Merlin
Butte Falls Resource Area
Grants Pass Resource Area
Grants Pass
JOSEPHINE CO.
JACKSON CO.
Ashland Resource Area
Myrtlewood Resource Area
CURRY CO.
OREGON
CALIFORNIA
Pickett West Planning Area
LocalPlaces
Major Highway
HWY_CLASS
Interstate Highway
US Highway
State Highway
Back Country Byways
Counties
BLM Resource Area Boundaries
USFS Forest Boundaries
Wilderness Areas
Bureau of Land Management
U.S. Forest Service
National Park Service
Bureau of Indian Affairs
Other Federal
State
Private
N
0 4 8 16 Miles
Grants Pass Resource Area
Project Area

DRAFT FINDING OF NO SIGNIFICANT IMPACT
FOR THE
PICKETT WEST FOREST MANAGEMENT PROJECT
DOI-BLM-ORWA-M070-2016-0006-EA

United States Department of the Interior
Bureau of Land Management
Medford District, Grants Pass Field Office

I. INTRODUCTION

The Grants Pass Field Office, Medford District Bureau of Land Management (BLM), Pickett West Forest Management Project Environmental Assessment was made available for public comment from May 30, 2017 to June 29, 2017. The BLM has a statutory obligation under the Federal Land Policy and Management Act which directs that "The Secretary shall manage the public lands…in accordance with land use plans developed by him under Section 202 of this Act…"

The BLM signed a Record of Decision approving the Southwestern Oregon Resource Management Plan (2016 ROD/RMP) on August 5, 2016. Revision of an RMP involves a transition from the application of the old RMP to the application of the new RMP. The planning and analysis of forest management projects require several years of preparation before the BLM can design a site-specific project and reach a Decision. Allowing for a transition from the old 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 (p. 10) allows the BLM to implement projects consistent with the management direction of either the 1995 ROD/RMP or the approved 2016 ROD/RMP, at the discretion of the decision maker so long as 1) a project-specific Decision was not signed prior to the effective date of the ROD, 2) preparation of NEPA documentation began prior to the effective date of the ROD, and 3) any project-specific Decisions are signed within two years of the effective date of the ROD.

The Grants Pass Field Office began preparation of this project on June 22, 2016 prior to the effective date of the 2016 ROD/RMP. This project was designed to conform to and be consistent with the Medford District's 1995 Record of Decision and Resource Management Plan (1995 ROD/RMP). For more information, see Chapter 1.5.1: Land Use Management Plans, within the Pickett West Forest Management Project Environmental Assessment (EA).

One of the primary objectives identified in the 1995 ROD/RMP is implementing the O&C Lands Act which requires the Secretary of the Interior to manage O&C lands for permanent forest production in accordance with sustained yield principles.

The purpose and need for the proposed treatments in the Pickett West project is to produce wood volume, improve stand resiliency, enhance or maintain northern spotted owl habitat, and reduce the long-term risk of catastrophic wildfire.

The No Action Alternative - Alternative 1, proposes no silviculture, forest management, wildlife habitat, or fuel maintenance activities. The No Action Alternative would not meet the purpose and need of the project.

The EA analyzes the effects of two Action Alternatives. Action Alternative 2 proposes the treatment of approximately 6,005 acres in the Matrix, Matrix Adaptive Management Area, and Riparian Reserve Land Use Allocations. Commercial treatments include Restoration Thinning (3,025 acres), Density Management (2,226 acres), and Understory Reduction (754 acres). Non-commercial treatments include approximately 11,102 acres of Hazardous Fuels Reduction maintenance.

Action Alternative 3 proposes the treatment of approximately 6,005 acres in the Matrix and Matrix Adaptive Management Area Land Use Allocations. There are no treatments proposed within the Riparian Reserve Land Use Allocation. Commercial treatments include Restoration Thinning (1,028 acres), Density Management (3,185 acres), and Understory Reduction (1,792 acres). Non-commercial treatments include approximately 11,102 acres of Hazardous Fuels Reduction maintenance.

II. DETERMINTION OF SIGNIFICANCE

The discussion of the following significant criteria applies to the intended actions and is within the context of local importance. Chapter 3 of the EA describes the effects of the Action Alternatives. None of the effects identified, including direct, indirect, and cumulative effects, are considered to be significant and do not exceed those effects described in the 1995 Medford District Resource Management Plan/Final Environmental Impact Statement or the Southwestern Oregon Resource Management Plan/Final Environmental Impact Statement. The environmental effects of the Action Alternatives do not meet the definition of significance in context and intensity as defined in 40 CFR § 1508.27. Therefore, an environmental impact statement is not necessary and will not be prepared.

Context. The Pickett West Forest Management project analyzes the treatment of approximately 6,005 acres in the Matrix, Matrix Adaptive Management Area, and Riparian Reserve Land Use Allocations. Treatments include Restoration Thinning, Density Management, Understory Reduction prescriptions, and 11,102 acres of Hazardous Fuels Reduction maintenance treatments. The planning area is located within the Hellgate-Rogue River, Deer Creek, and Lower Applegate watersheds in Josephine County including a small portion of Jackson County of Oregon. The Action Alternatives do not have international, national, region-wide, or state-wide importance.

Intensity. The following discussion is organized around the Ten Significance Criteria described in 40 CFR § 1508.27(b) as they pertain to the context of the Pickett West Forest Management project Action Alternatives.

1. **Impacts that may be both beneficial and adverse.** The most noteworthy predicated environmental effects of the Action Alternatives include:

    a) **Vegetation.** Restoration Thinning prescriptions have been developed with the Rogue Basin Cohesive Forest Restoration Strategy's "Ecosystem Resilience" and "Fuel Management" models in mind. Restoration Thinning and Understory Reduction prescriptions would reduce stand density, fuel loadings, increase vigor, and reduce insect and disease mortality similar to levels found in stands that have an intact fire regime. The desired condition is an open growing, structurally diverse stand with openings that allow the natural regeneration or planting of primarily early seral trees such as pines and oaks as well as retaining dense, shaded refugia for wildlife. Underburning would be considered after mechanical operations are completed to further reduce fuel loadings, recycle nutrients, and stimulate plant growth.

    Density Management and Understory Reduction treatments would control stand density, influence species dominance, maintain stand vigor, and place stands on developmental paths so that the desired stand characteristics would result in the future. These treatments break up the continuity of fuels, can slow or stop the spread of active crown fire across the mosaic, and can develop high-quality habitat conditions by keeping a cohort of large trees.

    The No Action Alternative would not promote the development of late-seral open or closed canopy forest, which is lacking at the landscape, BLM-administered lands, and proposed unit levels. No action is not expected to contribute to the recovery of the northern spotted owl as described in the Recovery Plan and Critical Habitat Rule, or to the resiliency of stands to environmental changes, including drought and catastrophic fire. There would be a cumulative adverse effect of not meeting improved conifer growth and habitat development objectives as described in the 2011 Revised Recovery Plan, the relevant Watershed Analysis, or the 1995 Medford District ROD/RMP, Chapter 3.1 Silviculture.

    b) **Fire and Fuels.** Alternative 2 and 3 would help restore, maintain, and enhance fire-adapted ecosystems by reducing fire hazard within the Pickett West planning area. Implementation of treatments would trend more towards the historical low to mixed severity fire regime enhancing fire-adapted ecosystems by reducing fire hazard. The proposed Hazardous Fuels Reduction maintenance treatments would re-evaluate past Hazardous Fuels Reduction acres within the planning area for potential maintenance treatments. Continuation of maintenance treatments would provide long-term benefits by maintaining and/or reducing fire hazard on 11,102 acres (EA, p. 141).

The implementation of forest thinning under Alternatives 2 and 3 involving thinning from below to remove suppressed and/or over crowded intermediate and co-dominant trees while retaining the larger co-dominant and dominant trees which would promote fire resilient forest stands. Forest structure alteration that would occur from the thinning prescriptions would result in a reduction in ladder fuels, an increased crown base height, and the reduction of crown bulk density. Treatments would reduce the likelihood of tree-to-tree crown fire; maintaining and promoting large diameter trees with thick fire resistant bark; and improving spatial heterogeneity. This would result in disrupting fuel continuity, uniformity and structure, a reduction to fire hazard, fire size, and potential loss of high value ecosystem components (EA, p. 142).

A short-term increase of fine fuels deposited on the forest floor would result in an immediate increase in fire hazard until activity fuels are treated. Activity fuels treatments are proposed that would reduce this immediate deposition of fuels as described in Chapter 2.4, Best Management Practices and Project Designs Features, and Chapter 3.2 Fire and Fuels Analysis (EA, p. 112).

Under the No Action Alternative, the current trend would continue for surface, ladder, and aerial fuels. Crown base height would decrease due to continued increases in understory density, increasing the potential for crown fire initiation. Crown bulk density and crown continuity would increase, as would the potential for active crown fire events. With the expected increase in flame length, significant torching, crown fire activity, and tree mortality would generally result in the extensive mixed conifer forest (EA, p. 136).

c) **Soil Compaction and Productivity.** Some units would have higher amounts of disturbance and loss of productivity, but the average amount across the planning area would be below the thresholds of 12% (compaction) and 5% (productivity loss). Pickett West projects would adhere to the aforementioned 12% and 5% thresholds, thus soil resources would not be directly, indirectly, or cumulatively impacted. By limiting soil disturbance to the threshold limit, the potential for accelerated erosion would also be limited. Similar to soil disturbance, loss of soil productivity would limited to 5% or less with installment of mitigation procedures. Soil disturbance is expected to remain consistent with current levels over the long-term, but may vary annually (EA, p.192).

Decompaction can be accomplished by the use of tool/machinery to reduce the soil bulk density and allow for water infiltration, aeration, and optimal seedling survival. After implementation of Best Management Practices and Project Design Features (Chapter 2.4), the detrimental effects of soil compaction and loss of soil productivity would be mitigated (EA, p.191).

d) **Soil Sedimentation and Erosion.** Inner and Outer Riparian Zone buffers are designed to be protective of the root network of typical trees in this area, mitigate potential impacts to hydric soils, and avoid sedimentation. In addition to the stabilizing effect of the root network, adjacent trees also dissipate stream energy during high or overbank flows, further reducing bank erosion (EA, p. 50). These buffers would be protective of bank erosion and avoid sedimentation (EA, p. 206). Inner Riparian Zone buffers adjacent to and below units would capture and filter sediment from reaching ditches and/or streams at a level that would be similar to that which would occur naturally (EA, p. 206).

   The main soil order that presented slope stability and erosion concerns was the Pearsoll-Rock outcrop complexes. Due to the high potential for fire related damage that could lead to soil erosion and loss of productivity, fuels treatment would be avoided on these soils (EA, p. 192 and Appendix XX).

   The proper implementation of Best Management Practices and Project Design Features would be protective of water quality by reducing erosion and sedimentation, protecting wood recruitment to streams, and protect riparian shading (EA, p. 195). Road maintenance activities associated with timber sales decrease the likelihood of road failures due to erosion (EA, p. 59). It is expected that the average amount of soil disturbance per unit would be consistent with the impact analysis and conclusions provided by the 1994 Medford RMP EIS (EA, p. 193).

e) **Hydrology.** The Pickett West analysis determined that little to no sedimentation would occur from individual units, landings, and crossings along haul routes. In other words, no measureable sedimentation would occur above natural background levels described for the No Action Alternative. Therefore, water quality measures would not be negatively affected. Some short-term direct and indirect effects to water quality were identified due to pulse increases in sediment and turbidity from road work, generally during the first significant storm event of the wet season. While these effects from sediment could potentially occur, it would still remain within acceptable water quality limits for turbidity, and sediment loads would be difficult to distinguish from background levels (EA, p. 212).

   No treatment buffers, Best Management Practices, and specific associated Project Design Features identified in Chapter 2.4, would result in no direct or long-term sediment input to streams and thus no cumulative effects to water quality. In addition to sediment filtering, the no treatment buffers would also retain trees that contribute to the primary shade zone for streams, and thus would maintain stream temperatures (EA, p. 213).

   The risk of negative effects to water quality from Alternative 2 is low. There would be no changes to current slope stability or risk of slope failure. The potential for periodic slope failures within the range of natural variability would still remain in association with areas exhibiting an historic disposition to soil movement, particularly in the event of a major storm (EA, p. 213).

Based on the data analyzed, the risk of peak flow enhancement from roads alone would be low. All roads in the PA currently occupy less than 5% of the land base. Statistically significant increases in peak flows have been shown to occur only when roads occupy at least 12% of the watershed, based on an extensive review of the literature of peak flows in western Oregon (Harr 1976). Alternative 2 would not increase road densities because all temporary routes would be fully decommissioned after use (EA, pp. 31 and 213).

Sediment from larger events would be typical of background conditions and is difficult to separate from natural sources of sedimentation and therefore not considered a pollutant for water quality. The proper application of Best Management Practices typically makes sedimentation downstream from proposed treatment units indistinguishable from background conditions (EA, p. 26)

Any increase in sedimentation associated with the actions described for Alternative 2 are unlikely to be detectable above effects described for the No Action Alternative (EA, p. 209). Any potential increase in sedimentation on a sub-watershed scale is expected to be indistinguishable from background conditions (EA, p. 210).

f) **Northern Spotted Owl.** See #9 below.

g) **Botany.** See Threatened and Endangered plants in #9 below.

There would be no direct or indirect effects that would jeopardize the presence or persistence of Bureau Special Status Species or Survey and Manage vascular and nonvascular plants because sites requiring protection within final planning units would receive protection buffers (EA, p. 255).

In the short-term (0-3 years), proposed management actions would result in soil displacement and erosion, potentially affecting fungi species recolonization efforts within treatment units and along roads. These effects are localized and not expected to remain in the long-term (3+) because mycelial networks are able to re-colonize areas of disturbance (EA, p. 256).

2. **The degree to which the selected alternative will affect public health or safety.** The Pickett West project is expected to maintain the health and safety of the public by utilizing signs during all forest operations as directed by federal and state Occupational Safety and Health Administration (EA, p. 291).

Public health and safety is expected to be maintained because of the use of water or approved road surface stabilizers to control dust during timber hauling to reduce surfacing material loss and buildup of fine sediment (EA, p. 67).

Roads used for hauling during timber sale activities are maintained by the purchaser of the timber sale. Road maintenance activities associated with timber sale decrease the likelihood of road failures due to erosion (EA, p. 59) and removes vegetation along roadsides to improve sight distance for travel (EA, p. 57). Proposed maintenance activities are anticipated to improve the roads within the PA making them safer for use by private entities and the public (EA, p. 31).

All prescribed burning activities on the Medford District BLM are required to be in compliance with the Clean Air Act and the Oregon Smoke Management Plan (OAR 629-048-0010). Prior to conducting prescribed burning activities, the BLM must register prescribed burn locations with Oregon Department of Forestry (ODF). 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. There would be negligible direct or indirect effects on air quality within the Pickett West planning area and the Smoke Sensitive Receptor Areas. Effects on air quality from slash burning would be short-term and localized (EA, pp. 32-33).

3. **Unique characteristic of the geographic area such as proximity to historic or cultural resources, park lands, prime farm lands, wetlands, wild and scenic rivers, or ecologically critical areas.** The BLM completed surveys for cultural resources in the proposed treatment units. Any sites eligible for protection have been buffered and would not be impacted by project activities. The process of surveying, buffering, and communicating project activities ensures that BLM activities would avoid, minimize, and mitigate impacts to cultural resources (EA, p. 19). Project Design Features ensure that the Action Alternatives would not have any direct or indirect effects on cultural resources. There are no eligible properties located within the Area of Potential Effect as defined by Section 106 of the National Historic Preservation Act (EA, p. 235).

   There are no park lands or prime farmlands that would be effected by the Pickett West proposal (EA, p. 19).

   There are no known wetlands that would be effected by proposed treatment units. Any wetlands that are discovered would be buffered with a 25-foot no treatment buffer (EA, p. 79). Also, there are nineteen Best Management Practices and Project Design Features which are incorporated into the analysis to ensure the protection of wetlands (EA, Chapter 2.4).

   To protect river values, there are no treatments proposed within the ¼ mile Rogue River Recreation Corridor. To ensure proposed treatments would not negatively impact the hydrology of the river, units found to be hydrologically connected to the river were dropped or had their boundaries modified (EA, p. 18). Based on the evaluation described in the EA, there are no anticipated effects to natural scenery, recreation, or fisheries contained within the Rogue River Corridor (EA, pp. 25 - 27).

The Pickett West planning area encompasses a Fritillaria Management Area, 6 Areas of Critical Environmental Concern (ACECs), and a Research Natural Area (RNAs), including the Brewer Spruce RNA, Crooks Creek ACEC Deer Creek ACEC, Eight Dollar Mountain ACEC, Iron Creek ACEC, and Pickett Creek ACEC. With the exception of the Pickett Creek ACEC and the Fritillaria Management Area, there are no proposed commercial or fuels treatments within ACECs and RNAs listed above (EA, p. 19 and 236).

Unit 32-1 totals approximately 10 acres of which approximately 3 acres are within the Pickett Creek ACEC and Fritillaria Management Area. The 2016 ROD/RMP does not preclude timber harvest in these areas so long as the treatments are intended to increase fire resilience and improve and maintain habitat for Gentner's fritillary (EA, p. 236).

The planning area also includes a segment of the Illinois Valley Botanical Area (1995 ROD/RMP) (EA, p. 236). The 1995 ROD/RMP directs the Illinois Valley Botanical Area to be managed as a botanical emphasis area due to the preponderance of special status plants. Actions including timber harvest are allowed if they do not conflict with the habitat needs of the plants (1995 ROD/RMP p. 56) (EA, p. 27).

4. **The degree to which the effects on the quality of the human environment are likely to be highly controversial.** The effects of the Action Alternatives on the quality of the human environment were adequately understood by the interdisciplinary team to provide analysis in the EA.

   Public comments and input have been considered and incorporated throughout the analysis for this project (Chapter 1.6.1 Scoping). Public comments were parsed into substantive and non-substantive comments. Those comments found be substantive had four outcomes: 1) they were incorporated into the analysis, 2) they were mitigated through the utilization of project design features, 3) they are responded to in Appendix B of the Pickett West EA, or 4) there is an explanation for why they were not incorporated into the Action Alternatives and became Issues and Alternatives Considered but Not Analyzed in Detail (EA, p. 22).

   The Action Alternatives analyzed in the Pickett West Forest Management project are within the scope of effects identified in the 1995 Medford District Resource Management Plan and the 2016 Southwest Oregon Resource Management Plan (Chapter 1.5.1: Land Use Management Plans). The interdisciplinary team utilized the best available science to determine the effects of the activities analyzed in the Action Alternatives as disclosed in Chapter 5 References. None of the comments were considered controversial in respect to their context and intensity in determining significance.

5. **The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risk.** The effects of the Action Alternatives are not unique or unusual. The BLM has experience with similar forest management projects and have found the effects to be reasonably predictable. The environmental effects to the human environment are fully analyzed in Chapter 3 of the EA. Public concerns and input have been considered throughout the analysis, see Chapter 1.6 Public Involvement and Appendix B of the EA. The activities analyzed in the Action Alternatives are routine in nature, which includes Best Management Practices, Project Design Features, and seasonal restrictions. These effects are well known and do not involve unique or unknown risk to the human environment.

6. **The degree to which the actions may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.** The Action Alternatives do not set precedent for future actions that might have significant effects nor do they represent a decision about future considerations. The Action Alternatives adhere to the direction provided in the 1995 Medford District Resource Management Plan.

   The Pickett West project is a transitional project between the 1995 Medford District Resource Management Plan and the 2016 Southwest Oregon Resource Management Plan. The BLM must sign a project-specific Decision Record within two years of the effective date of the ROD (August 5, 2016). Any future planning efforts within the Grants Pass Field Office management area would adhere to the direction provided in the 2016 Southwest Oregon Resource Management Plan (Chapter 1.5.1: Land Use Management Plans).

7. **Whether the action is related to other actions with individually insignificant but cumulatively significant impacts.** The Interdisciplinary team evaluated the Action Alternatives in context of past, present, and reasonably foreseeable actions. Significant cumulative effects outside of those already disclosed in the 1995 Medford District Resource Management Plan and the 2016 Southwest Oregon Resource Management Plan are not predicted. Complete disclosure of the effects of the Action Alternatives are disclosed in Chapter 3 of the Pickett West environmental assessment.

8. **The degree to which the action may affect districts, sites, highways, structures, or other objects listed in or eligible for listing in the Nation Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historic resources.** There are no eligible properties located within the Area of Potential Effect as defined by Section 106 of the National Historic Preservation Act (EA, p. 235). To ensure the protection of possibly undetected sites during project implementation, the interdisciplinary team designed a Project Design Feature that directs operators to cease operations immediately and contact the project archaeologist if unidentified cultural or paleontological resources are encountered. If cultural resources are discovered during project implementation, the project would be redesigned to protect the cultural resource values present, or evaluation or mitigation procedures would be implemented based on

recommendations from the Resource Area Archaeologist with input from federally recognized Tribes, approval from the Field Manager, and concurrence from the State Historic Preservation Office (EA, p. 87).

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.**

   a) **Fish.** Stand treatments, yarding, landing construction and rehabilitation, temporary route construction and reconstruction (including route decommissioning), road maintenance, hauling, and activity fuel treatments would have no effect on Southern Oregon Northern California Coast Coho Salmon (ESA-Threatened) and their Critical Habitat. For the Pickett West project, the closest Critical Habitat (Crooks Creek, Stratton Creek, Hog Creek, Pickett Creek, Panther Gulch, Dutcher Creek, Slate Creek, and Jackson Creek) is approximately 120 feet from the closest treatment units (3-6, 5-1, 5-2, 5-3, 11-5, 27-3, 28-2, 28-4, 28-5, 27-3, 33-3, 23-1, 9-4, 21-6, and 21-7). These treatment units would have Riparian Reserves of 190 feet for non-fish bearing and 380 feet for fish bearing streams (EA, p. 223).

      Sediment would not be expected to enter Critical Habitat as a result of haul or maintenance of haul roads, with dry condition haul, properly functioning cross drains, and sediment barriers installed, where needed, to prevent sediment delivery into Critical Habitat. Project activities would follow all provisions of the Clean Water Act (40 CFR Subchapter D) and Department of Environmental Quality's (DEQ's) provisions for maintenance of water quality standards (EA, p. 223).

      With the implementation of the Best Management Practices, Project Design Features, stream buffers, and seasonality of ground disturbance; there would be no direct or indirect effects from Alternative 2. Therefore, this project is not anticipated to cumulatively effect fish species and habitat within the Pickett West planning area (EA, p. 227).

   b) **Plants.** There are four federally listed plants on the Medford District. The Pickett West planning area contains two federally listed plant species, Cook's lomatium (*Lomatium cookii*) and Gentner's fritillary (*Fritillaria gentneri*) (EA, p. 237). Vascular plant surveys were conducted in the spring of 2016 and 2017. As of the release of the Pickett West EA, no new Threatened and Endangered plant sites were found. There would be no anticipated adverse effect from Action Alternatives 2 or 3 on any federally listed plant (EA, p. 238).

      Unit 32-1 totals approximately 10 acres of which approximately 3 acres are within the Fritillaria Management Area. The 2016 ROD/RMP does not preclude timber harvest in these areas so long as the treatments are intended to increase fire resilience and improve and maintain habitat for Gentner's fritillary (EA, p. 236) The EA concluded that there may be beneficial effects to Gentner's fritillary via habitat modification (canopy reduction and prescribed burning) in some areas within the Fritillary Management Area (EA, pp. 238 and 255).

c) Northern Spotted Owl.

Northern Spotted Owl (NSO)

Alternatives 2 and 3 are designed to achieve multiple objectives, including: a reduction of vegetation density, reduced risk of high-severity fire, increased growth and vigor of residual trees, and increased heterogeneity in terms of stand and species composition across the landscape (EA, p. 154).

Alternative 2 would result in the downgrade or removal of 151 acres of NRF habitat found within the six high value northern spotted owl sites. Alternative 3 would implement a lighter prescription (i.e. Treat & Maintain) on these same acres and only seven acres of NRF would be removed under Alternative 3 within these six high value northern spotted owl sites. Ultimately, this project must avoid the incidental take of northern spotted owl, and any decision issued from this EA would have a valid Biological Opinion that would support the BLM's determination that the project would not cause incidental take of NSO pairs or resident singles. Consultation with the USFWS is on-going and the determinations contained within the forthcoming Biological Opinions for this project would have major relevance to which Action Alternative or blend of Alternatives is selected (EA, p. 165).

Effects to spotted owl prey species – All of the treatments proposed under the Action Alternatives were designed to help reduce any negative effects to northern spotted owl prey species by incorporating untreated pockets (leave "islands" or "skips") throughout the treatment areas. This strategy is expected to provide unaltered portions of the stand throughout the PA that have the potential to serve as refugia for northern spotted owl prey species during project implementation. Residual trees, snags, and down wood retained in the thinned stands would provide some cover for prey species over time and would help further reduce any negative effects to spotted owl prey species (EA, p. 159).

Northern Spotted Owl Critical Habitat (CHU)

Alternative 2 would negligibly affect the intended conservation function of the critical habitat subunits in which they occur because at most (under Alternative 2), the proposed treatments would only result in a reduction of 1.4% and 0.7% of the available nesting, roosting and foraging (NRF) and dispersal habitat within the critical habitat sub-unit KLW 1, respectively (EA, p. 170).

Neither of the Action Alternatives would appreciably reduce the capacity of any of the critical habitat sub-units to facilitate northern spotted owl dispersal. At most, under Alternative 2, the total amount of all Klamath West Habitat Unit 1 dispersal habitat (NRF + dispersal-only) would be reduced by an estimated 0.7%. This small loss of dispersal habitat across the critical habitat Subunit would not noticeably reduce the ability of the Klamath West Habitat Unit 1 Subunit to facilitate the dispersal of northern spotted owls across and between other critical habitat subunits or units. Northern spotted owls are able to disperse through a fragmented mosaic of roads, clear-cuts, non-forest areas, and a variety of forest age classes (Forsman et al. 2002) (EA, p. 170).

Compliance with Northern Spotted Owl Recovery Plan

During the project planning and development of Pickett West, the interdisciplinary team followed principles in the Recovery Plan Implementation Guidance: Interim Recovery Action 10 Medford Bureau of Land Management/Rogue River-Siskiyou National Forest/U.S. Fish and Wildlife Service Roseburg Field Office (USDA/USDI 2013) while designing the location and intensity of the proposed treatments included in each Action Alternative. Factors that influence this process include: occupancy rates across all known northern spotted owl sites within the planning area, existing habitat types, percentages within the 0.5 mile cores and home ranges of known owl sites, and abiotic factors such as topography, slope position and the Relative Habitat Suitability (MaxEnt) model described in the 2011 Revised Recovery Plan for the Northern Spotted Owl (USDI 2011a) (EA, p. 42 and 151).

Both Action Alternatives address the need to restore, conserve, and enhance NSO habitat as recommended in the 2011 Revised Recovery Plan. However, Alternative 2 was developed to strategically determine objectives in each unit, while Alternative 3 was not developed with a site specific strategy. BLM staff followed the RA-10 process that deferred forested areas already meeting high quality NSO habitat while minimizing impacts to any single NSO homerange (EA, p. 111).

The 2011 Revised Recovery Plan for the Northern Spotted Owl, “Restoring Dry Forest Ecosystems” (USDI 2011, Section III, pp. 32-38). Specifically, the following recommendations were used to reduce and minimize impacts to NSO in the PA: 1) no commercial treatments would occur within the Nest Patch area of any NSO site; 2) no habitat downgrade would occur within any high value owl sites; 3) limit the total amount of commercial treatments to <30% of the available NRF in any 0.5 mile core area; and 4) where habitat downgrade or removal is proposed, it is proposed to occur only in “low value” owl sites and the treatment is designed to emphasize dry forest habitat restoration, consistent with "Restoring Dry Forest Ecosystems" section of the Revised Recovery Plan for the Northern Spotted Owl (USDI 2011a, pp. III-32-38), and direction included in the 2012 NSO Critical Habitat Rule (USDI 2012) (EA, p. 158).

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 violate any known federal, state, or local law or requirement imposed for the protection of the environment. Furthermore, the Action Alternatives are consistent with the two applicable land management plans, policies, and programs.

III. FINDING

I have determined that the Action Alternatives do not constitute a major federal action having a significant effect on the human environment. An environmental impact statement is not necessary and will not be prepared. This conclusion is based on my consideration of the Council on Environmental Quality's criteria for significance (40 CFR §1508.27), the context and the intensity of the impacts described in the Pickett West environmental assessment, my understanding of the project, review of the project analysis, and review of public comments. As previously noted, the analysis of effects has been completed within the context of the 1995 Medford District's Resource Management Plan and 2016 Southwest Oregon Resource Management Plan. This conclusion is consistent with those plans. The anticipated effects are within the scope, type, and magnitude of effects anticipated and analyzed in those plans. The analysis of project effects has also occurred in the context of multiple spatial and temporal scales as appropriate for different types of impacts. These effects were determined to be insignificant.

Pickett West Forest Management Project
DOI-BLM-ORWA-M070-2016-0006-EA

BLM
Grants Pass Resource Area

May 2017

Prepared by:
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Contents

Acronyms

ACS	Aquatic Conservation Strategy
AREMP	Aquatic and Riparian Effectiveness Monitoring Program
ARPA	Archaeological Resources Protection Act of 1979
ASQ	Annual Sale Quantity
ASR	Annual Species Review
BA	Biological Assessment
BLM	Bureau of Land Management
BMP	Best Management Practice
BO	Biological Opinion
BSS	Bureau Special Status
CCA	Clean Air Act of 1990
CCH	Coho Critical Habitat
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CHU	Critical Habitat Unit
CWA	Clean Water Act
CWD	Coarse Woody Debris
CX	Categorical Exclusion
DBH	Diameter at Breast Height
DEQ	Department of Environmental Quality
DM	Density Management
EA	Environmental Assessment
ECA	Equivalent Clearcut Area
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
EPZ	Environmental Protection Zone
ESA	Endangered Species Act of 1973
ESU	Evolutionarily Significant Unit
FEIS	Final Environmental Impact Statement
FGR	Fragile Gradient Restricted Soils
FLPMA	Federal Land Policy and Management Act of 1969
FNR	Fragile Nutrient Restricted Soils
FOI	Forest Operational Inventory
FRCC	Fire Regime Condition Class
FSEIS	Final Supplemental Environmental Impact Statement
FWR	Fragile Groundwater Restricted
GIS	Geographic Information Systems
GPFO	Grants Pass Field Office
GPS	Global Positioning Systems
HUC	Hydrological Unit Code

IDT	Interdisciplinary Team
IM	Instruction Memorandum
ISSSSP	Interagency Special Status / Sensitive Species Program
KLE	Klamath East Critical Habitat Unit
KSA	Klamath Study Area
LSR	Late Successional Reserve
LSRA	Late Successional Reserve Assessment
LTC	legacy tree culturing
LUA	Land Use Allocation
LWD	Large Woody Debris
MCWA	Middle Cow Creek Watershed Analysis
MOU	Memorandum of Understanding
NAGPRA	Native American Graves Protection and Repatriation Act of 1990
NAIP	National Agriculture Imagery Program
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act of 1966
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
NRF	Nesting, Roosting, and Foraging
NSO	Northern Spotted Owl
NWFP	Northwest Forest Plan
O&C	Oregon and California Railroad Revested Lands
ODF	Oregon Department of Forestry
ODFW	Oregon Department of Fish and Wildlife
OHV	Off-highway Vehicle
OSHA	Occupational Safety and Health Administration
PA	Planning Area
PDF	Project Design Feature
PRPA	The Paleontological Resources Protection Act
RA-10	Recovery Action 10
RA-32	Recovery Action 32
RD	Relative Density
REO	Regional Ecosystem Office
RMP	Resource Management Plan
RMR	Reforestation Moisture Restricted Soils
RNV	Range of Natural Variability
ROD	Record of Decision
ROW	Right-of-Way
RR	Riparian Reserve
RROW	Reciprocal Right-of-Way
RSMR	Reforestation Surface Rock Moisture Restricted Soils
RSTR	Reforestation Surface Rock Temperature Restricted Soils
RSW	Reforestation Surface Rock Withdrawn Soils

RT	Restoration Thin
RTR	Reforestation Temperature Restricted Soils
RTV	Red Tree Vole
S&M	Survey and Manage
SDWA	Safe Drinking Water Act of 1974
SEIS	Supplemental Environmental Impact Statement
SHPO	State Historic Preservation Office
SSS	Special Status Species
SYU	Sustained Yield Unit
T&E	Threatened and Endangered
TMDL	Total Maximum Daily Load
TPCC	Timber Production Capacity Classification
TRS	Township, Range, and Section
WA	Watershed Analysis
UR	Understory Reduction
USDA	United States Department of Agriculture
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WQMP	Water Quality Management Plan
WQRP	Water Quality Restoration Plan
WUI	Wildland Urban Interface

Chapter 1 Introduction

1.1 Document Structure

The Grants Pass Field Office has prepared an Environmental Assessment (EA) to analyze the Pickett West Forest Management Project in compliance with the National Environmental Policy Act (NEPA) and other relevant federal and state laws and regulations. This EA discloses the direct, indirect, and cumulative impacts that may result from the Alternatives. The EA provides the decision maker, the Grants Pass Field Manager, with information to aid in the decision making process. The document is organized into four chapters and appendices:

Chapter 1, Purpose and Need: This section includes information on the location of the project, the purpose and need for the project, and the BLM's proposal for achieving the purpose and need. This section includes details on how the BLM informed the public of the proposal and provides a synopsis of the issues raised.

Chapter 2, Alternatives: This section provides a description of the Alternatives for achieving the stated purpose and need. Alternatives were developed in light of substantive issues raised by the GPFO interdisciplinary team, the public, other agencies, and organizations. Incorporated in this section are best management practices (BMPs) and project design features (PDFs) that avoid or reduce impacts to resources. Alternatives considered but not analyzed in detail are also presented in this section.

Chapter 3, Affected Environment and Environmental Effects: This section describes the environmental effects of implementing any of the Alternatives. A description of the existing conditions for resources is provided in the beginning of Chapter 3. Effects of the Alternatives are then described based on what is proposed in the No Action Alternative, Action Alternative 2 and Action Alternative 3.

Chapter 4, Prepares, Consultation, and Coordination: This section provides a list of the resource specialists that comprised the interdisciplinary team which prepared the EA analysis, and information on consultation efforts with Tribal governments and regulatory agencies.

Appendices: The appendices provide information in support of the analysis presented in this EA.

1.2 Planning Area Vicinity

The planning area (PA) is mostly located within Josephine County; a small portion is within Jackson County. See Figure 1-1, Vicinity Map. The Pickett West Forest Management project units are found within the following legal descriptions:

Table 1-1 Planning Area Location*

Township	Range	Sections
34 South	7 West	7, 15, 19, 20, 21, 22, 23, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36
34 South	8 West	10, 11, 24, 25, 26, 27, 34, 36
35 South	7 West	1, 2, 3, 4, 5, 6, 9, 10, 11, 12, 15, 16, 20, 21, 22, 27, 28, 29, 30, 32, 31, 32, 33, 34
36 South	6 West	5, 8, 30
36 South	7 West	3, 11, 23, 27, 33, 34, 35
37South	4 West	17, 18, 19, 20, 21, 30, 31
37 South	5 West	3, 4, 5, 7, 8, 9, 10, 11, 13, 14, 15, 16, 17, 18, 19, 20, 23, 24, 25, 26, 27, 28, 29, 31, 36
37 South	6 West	7, 10, 11, 12, 13, 17, 20, 21, 23, 24, 26, 29
37 South	7 West	3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 15, 20, 21, 22, 23, 25, 27, 28, 29, 33, 34, 35, 36
37 South	8 West	25, 35, 36
38 South	5 West	3, 4, 5, 7, 8
38 South	6 West	1, 7, 8, 11, 13, 14, 15, 17, 19, 20, 22, 23, 26, 27, 34
38 South	7 West	1, 3, 7, 11, 13, 14, 17, 20, 21, 22, 23, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35
38 South	8 West	3, 13, 23, 25, 26
39 South	6 West	3, 4, 6, 10
39 South	7 West	3, 4, 5, 9, 10

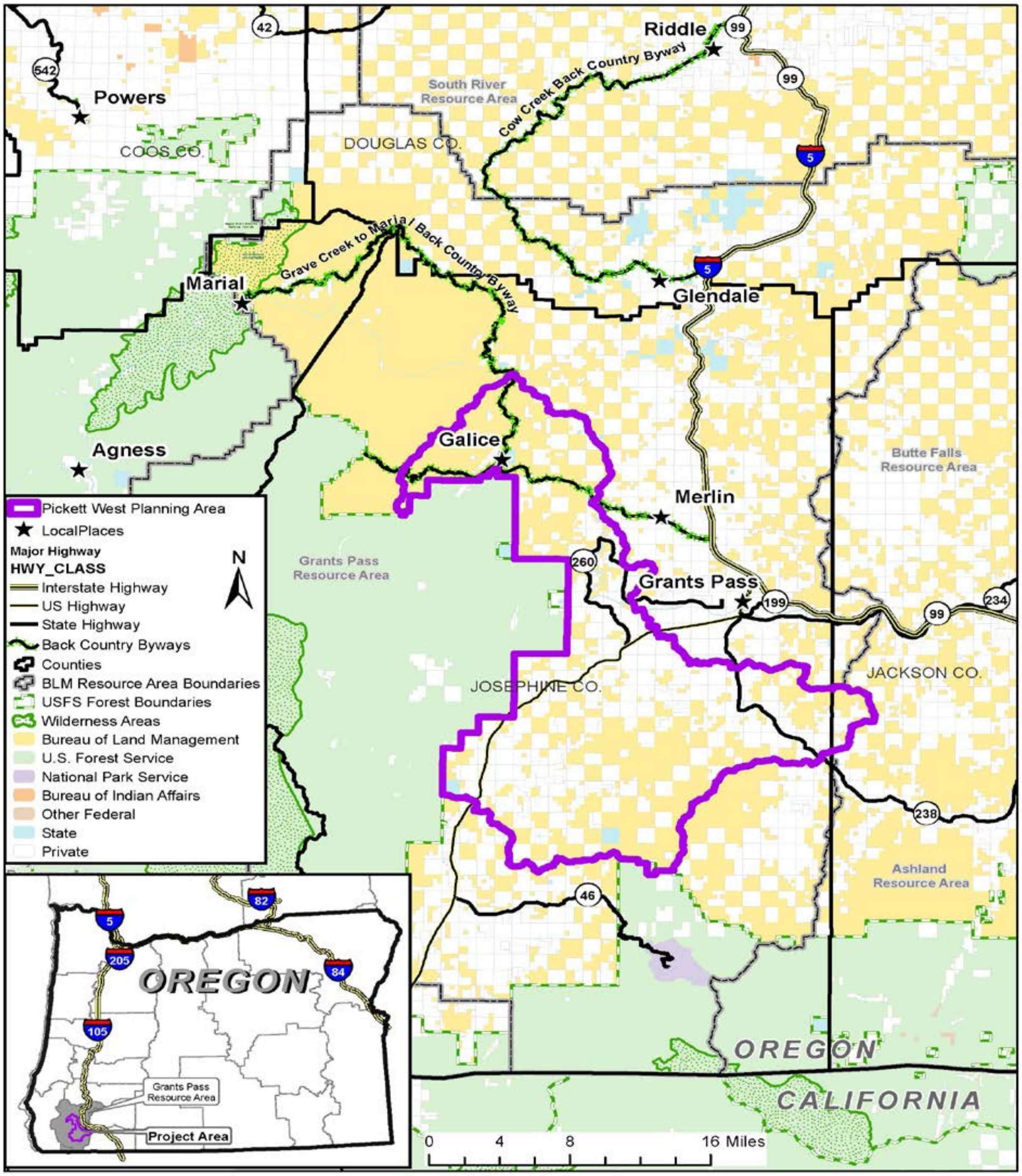
**All locations are based off of the Willamette Meridian.*

The PA is located within the Hellgate-Rogue River, Deer Creek, and Lower Applegate Hydrologic Unit Code (HUC) 10-digit watershed (5^{th} field). The total area is approximately 203,458 acres. All proposed project units are located on BLM-administered land within the Matrix, Matrix Adaptive Management Area, and Riparian Reserve Land Use Allocations (LUA). These LUAs are defined in the 1994 RMP/1995 ROD. BLM-administered lands within the PA are intermixed with private and state lands, creating a mosaic of ownership patterns often referred to as a “checker board”.

The planning area or PA refers to the purple boundary as seen in Figure 1-1 below. Any proposed activities described in this document would occur entirely within the PA boundary. This project does not propose forest management activities on lands that are not administered by the BLM. No forest management treatments are proposed on private, state, or county lands. This proposal does include landings, temporary routes, and haul routes on private industrial lands, state lands, or county lands with the proper reciprocal right-of-way agreements or license agreements.

For a description of the current conditions found within the PA see Chapter 3 and Appendix D.

Figure 1-1 Pickett West Project Vicinity Map



The PA boundary defines the area where the environmental effects analysis conducted in Chapter 3 would occur. The PA is defined by the boundaries of the 3 watersheds listed above with the lands administered by the United States Forest Service on the west side of the PA removed. The use of watershed boundaries ensures the effects to the hydrologic resources can be adequately analyzed and are restricted to the interior of the PA boundary.

Background and Existing Conditions

The Pickett West planning area totals just over 200,000 acres, of which approximately half is administered by the BLM. These forests are made up primarily of the Douglas-fir - Dry Potential Vegetation Types, which support diverse stand compositions of conifers such as ponderosa pine, sugar pine, incense cedar, and Douglas-fir as well as hardwoods such as black oak and Pacific madrone. Before the fire suppression and intensive management practices of the twentieth century, this area was characterized by high frequency, low severity fires that reduced fuel loadings and maintained a mosaic of open stand conditions which is different from what is seen today (LANDFIRE, 2012). Under such an active disturbance regime, stands at these lower elevations were dominated by drought-tolerant pines and oaks, as well as Douglas-fir that developed fire resistant, complex forms in open growing conditions. After missing several fire return cycles, the likelihood of uncharacteristic fire behavior and high severity fire has increased due to the buildup of fuels. Brown et al. 2004, Kauffman 2004, Reinhardt et al. 2008, Ryan et al. 2013 Haugo et al. 2015 categorized the forest restoration needs across Oregon and Washington. They found that not only does southwest Oregon demonstrate the highest need for active forest restoration in the region, but the three watersheds in the planning area are among the most in need of active management to promote forest resiliency.

While there has been a noticeable spike in mortality of Douglas-fir trees from 2015-2016 in the Rogue Basin due to flathead borer activity, aerial insect and disease surveys from 2005-2015 also show that a disproportionate amount of tree mortality is occurring in pine trees in the Pickett West PA (USDA and ODF, 2016). This is an undesirable shift as ponderosa pine-dominated forests have been described as among the rarest type of old growth in the region, and should be a high priority for fuels reduction and restoration (Hessburg et al. 2005).

Stands proposed for treatment exhibit a range of conditions due to the variety of past management activities or lack of disturbance. However, they can be categorized broadly as overly dense stands of Douglas-fir dominated, dry mixed conifer, often with residual large diameter ponderosa pine and hardwoods. Extremely high canopy cover across entire stands has reduced understory complexity and within-stand heterogeneity. This lack of light beneath the canopy has left little room for understory shrubs to grow and has also resulted in scarce tree regeneration. Where saplings are able to establish they are primarily Douglas-fir, with few pines to be found. Without active management or natural disturbance such as periodic wildfire, these stands are on a trajectory that would result in reduced species diversity, diminishing structural complexity, and an increasing risk for high severity fire.

1.3 Purpose and Need for the Action

The BLM has a statutory obligation under the Federal Land Policy Management Act of 1976 which directs that "[t]he Secretary shall manage the public lands…in accordance with the land use plans developed by him under section 202 of this Act when they are available…" The Medford District's Record of Decision and Resource Management Plan (1995 ROD/RMP) guides and directs management on Medford District BLM-administered lands. For more discussion see Chapter 1.5, Conformance with Law, Regulation & Policy.

One of the primary objectives identified in the 1995 ROD/RMP is implementing the Oregon and California Railroad Revested Lands Act (O&C Act) that requires the Secretary of the Interior to manage O&C lands for permanent forest production in accordance with sustained yield principles.

Existing forest stand conditions demonstrate there is a need for active management to meet objectives under the 1995 ROD/RMP and other regulatory directives. The proposed treatments are designed to provide a sustainable supply of timber, improve stand resiliency, and enhance or maintain northern spotted owl habitat. There is a need to apply silvicultural treatments that reduce the long-term risk of disturbances such as catastrophic wildfire or unacceptable mortality from moisture stress, insects, and disease.

Any alternatives that are to be given serious consideration as viable must meet the objectives provided for in the 1995 ROD/RMP. The 1995 ROD/RMP and statutes specify the following objectives that are to be accomplished in managing the various land use allocations (LUAs) for this project on the Medford District:

Within the Matrix LUA project objectives include but are not limited to:

- The production of a sustainable supply of timber and other forest commodities to provide jobs and contribute to economic sustainability in the Matrix LUA (1995 ROD/RMP, p. 38);
- Contributing to local, state, national, and international economies through sustainable use of BLM-administered lands and resources and use of innovative contracting and other implementation strategies (1995 ROD/RMP, p. 80);
- Preserving or retaining the existing character of landscapes on BLM-administered lands allocated for visual resource management (VRM) Class I and II management (1995 ROD/RMP, p. 240). Class I is the congressionally-designated Rogue River Wild and Scenic River Corridor; Class II is "the seen area" from the Rogue National Wild and Scenic River (wild section) (1995 ROD/RMP, p.69).

Within the Dry Riparian Reserves, objectives include:

- Restore and maintain the ecological health of watersheds and aquatic ecosystems as directed under the Aquatic Conservation Strategy (1995 ROD/RMP, p. 22);
- Contribute to the conservation and recovery of Endangered Species Act listed fish and their habitats and provide for conservation of Bureau Special Status fish and other bureau Special Status riparian-associated species (2016 ROD/RMP, p. 75);
- Maintain water quality and streamflows within the range of natural variability, to protect aquatic biodiversity, provide quality water for contact recreation and drinking water (2016 ROD/RMP, p. 75);

- Meet Oregon Department of Environmental Quality (ODEQ) water quality criteria (2016 ROD/RMP, p. 75);
- Maintain high quality water and contribute to the restoration of degraded water quality for 303(d)-listed streams (2016 ROD/RMP, p. 75).

Within the Adaptive Management Area, objectives include:

- Developing and testing new management approaches to integrate and achieve ecological and economic health and other social objectives. Specific emphasis for the Applegate Adaptive Management Area includes “development and testing of forest management practices including partial cutting, prescribed burning, and low impact approaches to forest harvest that provide for a broad range of forest values, including late-successional forest and high quality riparian habitat” (1995 ROD/RMP, p. 36);

Objectives common to all LUAs include:

- Improving the health of the forest and associated habitats to reduce tree mortality, and restore the vigor, resiliency, and stability of forest stands that are necessary to meet LUA objectives (1995 ROD/RMP, p. 62);
- Managing timber stands to reduce the risk of stand loss from wildfires, animals, insects, and diseases (1995 ROD/RMP, p. 72);
- Managing and maintaining road systems that reduce hazards to public health and safety, fire risks, and vandalism to public and private property (1995 ROD/RMP, p. 88) in an environmentally sound manner (1995 ROD/RMP, p. 84);
- Minimizing negative effects to Threatened and Endangered species within the planning area; endeavor to contribute to the recovery of federally listed and proposed plant and animal species and their habitat (1995 ROD/RMP, p.52).
- Maintaining or restoring components of the Aquatic Conservation Strategy (ACS) in Riparian Reserves (1995 ROD/RMP, p. 22);
- Maintaining haul roads to accommodate the safe movement of vehicles and machines (Oregon OSHA Chapter 437, Division 7, Section F);
- Maintaining or improving habitat conditions for *Fritillaria gentneri* within the Fritillaria Management Area (Conservation Agreement for Gentner’s Fritillary in Southwestern Oregon);

The inability to proceed with a given sale in the Medford District Sale plan for any particular fiscal year has the potential to prevent the Medford District from meeting Allowable Sale Quantity targets, as directed in the O&C Act and the 2016 ROD/RMP.

2016 ROD/RMP Allowable Sale Quantity of Timber

- Sustainably contribute to the variable annual Medford District sustained-yield unit target of 37 MMbf (million board feet) within the harvest land base (2016 ROD/RMP, p. 5), and
- Contribute to the 1,700 acre non-allowable sale quantity target.

1.4 Decision Framework

The Grants Pass Field Manager is the responsible official for deciding whether or not, and in what manner, to implement any of the alternatives analyzed in this EA. Actions in this decision could include:

- Commercial and non-commercial vegetation treatments,
- Temporary route construction to accommodate harvest operations and upgrading/maintaining system roads for forest products hauling,
- The combination of harvest systems to accommodate harvest operations, and
- Use of Best Management Practices and Project Design Features to avoid or reduce impacts to resources.

The decision will be based on a consideration of the environmental effects of implementing any of the Alternatives and how well the selected alternative meets the Purpose and Need for the project. The selected alternative would make a substantial contribution to the Medford Districts Allowable Sale Quantity Target and the Non-allowable Sale Quantity Target. The Field Manager may select any alternative analyzed in detail, a modified alternative, or the No Action Alternative. If the Field Manager determines that the proposal would result in significant effects, additional analysis may occur through the development of an Environmental Impact Statement (EIS).

1.5 Conformance with Law, Regulation, & Policy

1.5.1 Land Use Management Plans

The BLM signed a Record of Decision approving the Southwestern 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 actions such as forest management projects require several years of preparation before the BLM can design a site-specific project and reach a decision. Allowing for a transition from the old 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 (p. 10) allows the BLM to implement projects consistent with the management direction of either the 1995 ROD/RMP or the approved 2016 ROD/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 Grants Pass Field Office began preparation of this project on June 22, 2016, prior to the effective date of the 2016 ROD/RMP. This project was designed to conform to and be consistent with the Medford District's 1995 Record of Decision and Resource Management Plan (1995 ROD/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 ROD/RMP, with the exception of five categories of prohibited carry-over actions (2016 ROD, pp.10-11). The Pickett West Forest Management Project does not include any actions that are exempted and therefore precluded from the 2-year transition period under the 2016 ROD/RMP. The following are the five categories of prohibited carry over actions:

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 2016 ROD/RMP.

   This project does not propose 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 approved 2016 ROD/RMP.

   This project does not propose to issue any right-of-way grants within the Late-Successional Reserve or any other land use allocation.

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 2016 ROD/RMP.

   This project utilizes the management objectives for Riparian Reserves – Dry (2016 ROD/RMP, pp. 82-84). For perennial fish bearing and non-fish bearing streams, there are no commercial thinning treatments proposed to occur within a 120 foot no-entry buffer. For intermittent streams there are no commercial thinning treatments proposed to occur within a 50 foot no-entry buffer. For a detailed explanation of the stream buffers utilized in this project see pages 51-55.

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

the District-Designated Reserve-Lands Managed for their Wilderness Characteristics contained within the approved 2016 ROD/RMP.

The project does not propose any treatments within District-Designated Reserve-Lands Managed for their Wilderness Characteristics. Interdisciplinary team (IDT) members performed a GIS exercise to compare all of the proposed treatment units with the 2016 ROD/RMP District-Designated Reserve-Lands Managed for their Wilderness Characteristics Geographic Information System (GIS) layers. There are no Lands Managed for their Wilderness Characteristics as shown in the 2016 ROD GIS data that intersect with any proposed treatment units, either commercial timber sale units or hazardous fuels reduction units.

5. Timber harvest that would cause the incidental take of northern spotted owl (NSO) territorial pairs of resident singles and does not have a signed Biological Opinion from the U S Fish and Wildlife Service and Incidental Take Statement that predates the effective date of the Biological Opinion for the approved 2016 ROD/RMP.

   This project is designed to avoid the incidental take of NSO. Any decision issued from this EA would have a valid Biological Opinion that would support the BLM's determination that the project would not cause incidental take of NSO pairs or resident singles. If this determination is not supported by the Biological Opinion, the project would be altered to remain consistent with this exemption.

The 2016 Southwest Oregon ROD/RMP is the Medford District BLM's RMP of record as of August 5, 2016. Therefore, all projects including transition projects such as Pickett West must conform to the 2016 ROD/RMP.

The Grants Pass Field Manger has elected to implement this transition project consistent with the management direction in the 1995 ROD/RMP (which does not involve any of the five exceptions described above); such projects may include features not consistent with the management direction in the approved RMP attached to the 2016 ROD. However, any differences in the specific effects resulting from implementation of timber sales not consistent with the management direction in the approved RMP would not alter the analysis of effects in the Preliminary Resource Management Plan/Final Environmental Impact Statement (PRMP/FEIS) because of the limited geographic extent of such projects. Additionally, implementation of such projects would not alter the analysis effects in the PRMP/FEIS because of the limited difference between projects prepared in conformance with the 1995 RMPs and projects prepared in conformance with the approved RMP (2016 SO ROD/RMP, pp. 11-12).

Given that vegetation modeling conducted for the 2016 PRMP/FEIS provided outputs based on 10-year increments, and given the likely year-to-year variability in timber harvest acreages, this difference is expected to be less than one percent of average timber harvest acreage over this 2-year transition period and would not result in any measureable or meaningful difference in the effects described in the PRMP/FEIS (2016 SO ROD/RMP, p. 11).

Tiering is a form of incorporating by reference that refers to previous EAs or EISs. Tiering allows the BLM to narrow the scope of the subsequent analysis, and focus on issues that are ripe for decision-making. Tiering is appropriate when the analysis for the Action Alternative would be a more site specific or project specific refinement or extension of the existing NEPA document. The BLM may tier to a NEPA document for a broader action when the narrower action is clearly consistent with the decision associated with the broader action (2008 BLM NEPA Handbook 1709-1, pp. 25-27. Any tiering contained in this EA tiers to the analysis in the 2016 PRMP/FIES.

Table 1-2 Comparison of the 1995 ROD/ROM and the 2016 ROD/RMP Land Use Allocations in the Pickett West planning area.

Land Use Allocation	Planning Area Acres	
	1995 ROD/RMP	2016 ROD/RMP
Matrix/Adaptive Management Area	5,1347	--
Late Successional Reserve/Adaptive Management Reserve	4,2790	46,592
Congressionally Reserved	951	4,945
District-Designated Reserve	--	15,214
Riparian Reserve	--	21,205
Harvest Land Base – Uneven-aged Timber Area	--	7,037
Harvest Land Base – Moderate Intensity Timber Area	--	95
Total BLM-administered acres within the planning area	**95,088**	**95,088**

Other Plan Conformances

- Final Supplemental Environmental Impact Statement: Management of Port-Orford Cedar in Southwest Oregon (FSEIS, 2004 and ROD, 2004)

- Medford District Integrated Weed Management Plan Environmental Assessment (1998) and tiered to the Northwest Area Noxious Weed Control Program (EIS, 1985)

1.5.2 Relevant Statutes/Authorities

This section is a summary of the relevant statutes/authorities that apply to this project. The Action Alternatives are designed in conformance with the direction given for the management of public lands in the Medford District and the following:

- Federal Land Policy and Management Act of 1976 (FLPMA). Defines the BLM's organization and provides the basic policy guidance for the BLM's management of public lands. Section 302 directs the Secretary of the Interior to manage public lands under the principle of multiple-use.

The treatments proposed under the Pickett West project would only preclude multiple-use during short durations of active operations and only on small portions of BLM-administered lands where active management is proposed. The Pickett West PA is approximately 203,459 acres, of which the BLM manages approximately 95,088 acres or 47 percent of the PA. Of the BLM-administered acres within the PA the Pickett West project proposes to commercially treat 6,005 acres or 6 percent of the PA, leaving the remaining 89,085 BLM-administered acres or 94 percent of the PA available for multiple-uses which may include but are not limited to recreation opportunities, spiritual ventures, special forest products collection, and mining.

The proposed 11,102 acres of fuels hazard reduction maintenance treatments would only treat understory material, which is less than 8 inches in diameter. These treatments would preclude multiple-use during short duration but would not limited multiple-use activities following treatments.

- National Environmental Policy Act of 1969 (NEPA). Ensures that information on the environmental impacts of any federal action is available to public officials and citizens before decisions are made and actions are taken.

  For a detailed description of the public involvement strategy employed for this project see Section 1.6 below. Information about this project was posted on the BLM's ePlanning website, 3,850 notification postcards, 4,300 scoping letters, and 185 EA release letters were mailed to the public during project planning activities. The BLM hosted an open house public meeting which was attended by 86 members of the public and during the EA release period the BLM intends to conducted 2 field tours. Local county commissioners, the USFWS, and local federally recognized Tribes were also informed about this project prior to any decisions being made.

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

  The BLM consulted with the USFWS regarding effects of the Action Alternative 2 on the northern spotted owls and their critical habitat. This project is designed to meet the exemption criteria #5 listed above, which precludes projects that cause incidental take to northern spotted owls.

  The BLM is not consulting with the USFWS regarding Fritillaria gentneri and Lomatium cookii, the two federally endangered plants that occur within the Pickett West PA.

Consultation is not needed for these species because suitable habitat within proposed treatments units, harvest operation areas, and temporary routes will be surveyed prior to implementation. Any individuals and populations would be appropriately buffered before project implementation.

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

  All prescribed burning activities are required to be incompliance with the Oregon Smoke Management Plan, which designates Smoke Sensitive Receptor Areas. The objective of the Smoke Management Plan is to prevent smoke from prescribed fire from entering the Smoke Sensitive Receptor Areas. In addition to the Oregon Smoke Management Plan, the BLM is required to comply with the Oregon Visibility Protection Plan which protects visibility in Class I areas. All BLM prescribed burning activities are registered with the Oregon Department of Forestry, where the location, size, fuels, ignition source, time, and duration of prescribed burns are reported.

  The Oregon Department of Forestry Smoke Management Plan addresses the issue of using polyethylene sheeting to cover piles, and has concluded that polyethylene sheeting may be used and that all other plastics are prohibited.

  By complying with the Oregon Smoke Management Plan and the Oregon Visibility Protection Plan the BLM is meeting its obligation to protect air quality under the Clean Air Act. For more information see Chapter 1.7 Issues and Alternatives Considered but not Analyzed in Detail; Prescribed Burning Issues-Air Quality, and the Use of Polyethylene Sheeting.

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

  The SDWA was originally passed by Congress in 1974 and amended in 1986 and 1996 to require actions to protect rivers, lakes, reservoirs, springs, and groundwater wells used as public water supplies. In February 1998, the President issued the "Clean Water Action Plan: Restoring and Protecting America's Waters". The Clean Water Action Plan calls for federal agencies to engage in watershed management as a core guiding principle for water quality management.

- Clean Water Act (CWA) of 1972 as amended. Establishes objectives to restore and maintain the chemical, physical, and biological integrity of the nation's water.

  Road building, road maintenance, timber harvest and other actions taken on Federal lands that are considered in this project must take into account how these actions may impact water quality. Water quality is classified by Oregon Department of Environmental Quality

(ODEQ) to meet beneficial uses such as sustaining anadromous fish. Best Management Practices (BMPs) as specified in standards, guidelines, design features, and mitigation are utilized by BLM to minimize and reduce potential water quality impacts. BLM reviews and revises BMPs as necessary, if post-implementation monitoring indicates the BMPs are not effective. Waters that do not meet ODEQ water quality standards are considered impaired (for more information see the water quality Chapter 3.5). The BLM signed a Memorandum of Understanding (MOU) with the State of Oregon Department of Environmental Quality (BLM 2011) that specified BLM responsibilities during project planning for managing lands to protect water quality.

- <u>National Historic Preservation Act (NHPA), 1966 as amended.</u> Consideration of the effects of federally funded undertakings on cultural resources is governed by the NHPA. Regulations in 36 CFR 800 outline the process through which historic preservation is administered toward to the goal of avoiding, minimizing or mitigating impacts to historic properties that are eligible for the National Register of Historic Places.

  The BLM completed surveys for cultural resources in the proposed treatment units. Any sites eligible for protection have been buffered and would not be impacted by project activities. The BLM is not required to consult with the Oregon State Historic Preservation Office for Pickett West project activities. The process of surveying, buffering, and communicating project activities, ensures that BLM activities would avoid, minimize, and mitigate impacts to cultural resources.

- <u>Magnuson-Stevens Act Provisions: Essential Fish Habitat, 2002.</u> Specifies that essential fish habitat (EFH) be identified and described for the fishery, adverse fishing impacts on EFH should be minimized to the extent practicable, and other actions to conserve and enhance EFH be identified.

  Treatments occurring within the Outer Riparian Zones were identified through field surveys. Treatments are designed to develop multiple canopy layers, increase species diversity, and increase the vigor of conifers and hardwoods. Treatments are not proposed in areas with multiple canopy layers and high species diversity. Outer Riparian Zone thinning is expected to benefit fish habitat by promoting species diversity and resilience to disturbance. With the use of Inner Riparian Zone no-treatment buffers and targeted thinning in the Outer Riparian Zone, essential fish habitat features such as shade and wood recruitment would be conserved. For more information see Chapter 2; Description of Riparian Reserve Thinning Treatments.

- <u>Environmental Justice, 1994.</u> The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

The Pickett West project encouraged and facilitated public involvement. The interdisciplinary team employed a public information specialist, ensuring that interested members of the public were engaged timely. External scoping included multiple public notifications, a public meeting, and two environmental assessment field tours.

The analysis found that Josephine County is considered to be an environmental justice population due to its low-income status because it has a high proportion of residents living below the poverty level. The main way the proposed project could affect this low-income population is the number and type of jobs created. In the Final EIS for the Western Oregon RMPs, the BLM concluded that employment effects would not be disproportionately negative for Josephine County under the Proposed RMP, and in fact employment was estimated to increase from 2012 levels[1]. Because the Pickett West project would involve some type of commercial treatment on only 6,005 of the 89,085 BLM-administered acres in the PA, far lower than the broader, log-term scale analyzed in the FEIS, its effects on low-income populations would be reduced.

- <u>Wild and Scenic Rivers Act, as amended.</u> To protect and enhance river values, free-flowing condition, and water quality.

  To protect river values there are no treatments proposed within the ¼ mile Rogue River Recreation Corridor. To ensure proposed treatments would not negatively impact the hydrology of the river, units found to be hydrologically connected to the river were dropped or had their boundaries modified. For more information see Chapter 1.7 Issues and Alternatives Considered but not Analyzed in Detail; Rogue River Corridor.

Supplemental Guidelines

- <u>Areas of Critical Environmental Concern.</u> Areas where special management attention is needed to protect, and prevent irreparable damage to important historical, cultural, and scenic values, fish, or wildlife resources or other natural systems or processes; or to protect human life and safety from natural hazards.

  There are five Areas of Critical of Environmental Concern (ACEC) within the Pickett West PA: Crooks Creek ACEC, Deer Creek ACEC, Eight Dollar Mountain ACEC, Iron Creek ACEC, and the Pickett Creek ACEC. There are approximately 3 acres of commercial treatment proposed within the Pickett Creek ACEC. The 2016 ROD/RMP does not preclude timber harvest in this area so long as the treatments are intended to increase fire resilience and improve and maintain habitat for Gentner's fritillary. Under either Action Alternative canopy cover post treatment is expected to be between 30 percent and 60 percent and would

[1] Coos and Curry Counties (both identified as low-income communities for the purpose of environmental justice) were expected to be disproportionately negatively affected under the Proposed RMP.

include post-harvest fuels treatments. Gentner's fritillary show positive responses to decreases in canopy cover and fire activity. For more information see Chapter 3.8, Botany.

- Research Natural Areas. A nationwide network of ecological areas set aside for both research and education.

  The Pickett West project does not propose any treatments within the Brewer Spruce Research Natural Area (RNA). This is the only RNA within the PA and it would not be impacted because there are no proposed treatments within its boundary.

- Hazardous or Solid Waste. To protect human health and the environment from the potential hazards of waste disposal, conserve energy and natural resources, reduce the amount of waste generated, and ensure that wastes are managed in an environmentally sound manner.

  Contractors must prepare a Spill Prevention, Control, and Countermeasure Plan for all hazardous substances to be used in the contract area. Such plans must comply with the State of Oregon DEQ OAR 340-142, Oil and Hazardous Materials Emergency Response Requirements. The proper implementation of Best Management Practices and Project Design Features such as locating waste disposal areas outside of waters of the state, requiring spill prevention kits to be on-site, not allowing re-fueling within 150 feet of streams, and ensuring hydraulic fluid and fuels lines be in properly function condition, ensures that the Action Alternatives would protect human health and the environment.

- Prime or Unique Farmlands. Farmlands that are of statewide and local importance for producing crops need to be protected.

  There are no park lands or prime farmlands that would be effected by the Pickett West proposal.

1.6 Public Involvement

The Council on Environmental Quality (CEQ) directs the BLM to encourage and facilitate public involvement in the NEPA process to the fullest extent possible (40 CFR 1500.2(d), 40 CFR 1506.6). For this project public involvement has included external scoping, multiple public notifications before and during the preparation of the EA, a public meeting and a scheduled field tour, public review and two formal public comment periods.

1.6.1 Scoping

Scoping is the process by which the BLM solicits internal and external input on the issues, impacts, and potential Alternatives that will be addressed in the EA. Scoping occurs early in the NEPA process and extends through the development of the EA.

To ensure a robust scoping experience a public information specialist was utilized. The use of a public information specialist ensured that interested members of the public were engaged timely. The public information specialist responded to emails, phone calls, and letters; promptly allowing for responsive and open communication. All letters, emails, postcards, and articles received are cataloged and contained within the Administrative Project Record.

The International Association for Public Participation describes the public's role in the public participation process as occurring on a spectrum (http://bit.ly/2qVWTyk), from *informing* - providing the public with balanced information to aid in the understanding of the alternatives, to *empowerment* - which places the final decision making in the hands of the public. The Pickett West project employed a public *involvement* strategy, which means that the BLM worked directly with the public throughout the EA process to ensure public concerns were considered and understood. There were members of the public who expressed an interest in *collaboration* which is defined as a partnership with the public in each aspect of the decision making process, including the development of the alternatives and the identification of a preferred solution. It is important to highlight that the final decision-making authority rests with the Grants Pass Field Manager. The BLM considered public comments and developed alternatives based on information and interactions with the public during the planning process for this EA.

Internal Scoping

Internal scoping is the use of BLM and consulting agency staff to help determine what needs to be analyzed in the NEPA document. Internal scoping involves an interdisciplinary team (IDT) of BLM resource specialists with various disciplines. The IDT consists of wildlife biologists, fisheries biologists, hydrologists, foresters, botanists, fuels specialists, silviculturists, archaeologists, engineers, recreation specialists, soil scientist, NEPA planners, a public information specialist and the field manager. The IDT conducted internal scoping through the project planning process. Internal scoping included record searches, field surveys, review of current literature, and discussions by the IDT members. During the planning process the IDT considered elements of the environment that are specific to this project.

External Scoping

External scoping involves notification and opportunities for feedback from non-cooperating agencies, organizations, Tribes, local governments, and the public.

On June 22, 2016 a scoping postcard was sent to approximately 3,850 members of the public within and adjacent to the Pickett West PA. The postcards did not contain detailed information about the development of the project but rather acted as a greeting to neighbors informing them that BLM employees would be working in the area. The postcards invited interested members of the public to learn more about the project by visiting the project website or contacting the BLM via email or telephone. Those that received the postcards were included in the subsequent scoping mailing discussed below.

On October 31, 2016 a Legal Notice was published in the Grants Pass Daily Courier which initiated the formal scoping period for the Pickett West project. In addition to the Legal Notice, approximately 4,300 letters were sent to members of the public within and adjacent to the Pickett West PA.

Public Meeting

The scoping letter invited the public to attend an open house meeting on November 19, 2016. The meeting was held at the Grants Pass Interagency Office from 3-7 pm. The team of BLM interdisciplinary specialists, the Pickett West public information specialist, and the Grants Pass Field Manager were present. There were approximately 86 members of the pubic in attendance throughout the duration of the meeting.

Each of the BLM specialists in attendance hosted a station with a visual aid. There were maps, poster boards, photos, and videos which illustrated elements of the proposal development. The BLM provided two interactive stations with live GIS on the main projector and allowed people who were concerned about activities occurring in close proximity to their property to actively view treatment units. For those concerned about the visual impact of the proposed activities from their properties the BLM provided an interactive computer station accessing Google Earth imagery. This allowed unique views of potential treatments from residences and helped frame the proximity of the BLM-administered areas to private properties.

Scoping Comments

The formal scoping period for forest management projects is approximately 30-days. The formal scoping period for the Pickett West project began on October 30, 2016 and ended on November 30, 2016. Scoping comments were accepted throughout this 30-day period to ensure that the proposal development is responsive to the comments received. Scoping comments were accepted through the Environmental Assessment (EA) release but consideration and application to the proposal may be less responsive because the details of the project are well defined by the EA release date.

The BLM received approximately 629 comments from organizations and individuals, of these comments approximately 472 were form letters or identical emails. Each form letter or identical email was documented and accounted for separately but the content of the duplicate letters and emails was compiled into single topics or issues. The remaining letters were received from neighbors or organizations and contained individually unique topics. Below is an explanation of how the content of all scoping comment letters were considered or why the comments were not considered in the proposal development.

Substantive versus Non-Substantive Comments

The National Environmental Policy Act Handbook (section 6.9.2.1, p. 66) describes substantive comments as doing one or more of the following: 1) question, with reasonable basis, the accuracy of the information contained within the EA, 2) question the adequacy of the methodology for, or assumptions used in the analysis, 3) present new information relevant to the analysis, 4) present reasonable alternatives other than those described in the EA, or 5) cause changes or revisions in one or more of the alternatives.

Comments are considered non-substantive if they 1) express favor for or against the Action Alternative without reasoning, 2) agree or disagree with BLM policy or resource decisions without justification or supporting data, 3) don't pertain to the planning area or the Action Alternatives, or 4) take the form of vague, open-ended questions.

All comments received during the scoping process were read in their entirety and carefully considered. Substantive comments were parsed from the letters and are organized in a comment spreadsheet contained within the Administrative Record. If comments were found to be non-substantive they may not appear in the comment spreadsheet. Non-substantive comments are not required to be responded to as those comments merely express approval or disapproval to the Action Alternative without reason. The description below explains how substantive comments were used in the development of the Pickett West proposal.

Substantive comments were organized in one of the following four ways: 1) incorporated into the analysis, 2) mitigated through the utilization of project design features, 3) responded to in Appendix B of this EA, or 4) explained why they were not incorporated into the Action Alternatives and became Issues and Alternatives Considered but Not Analyzed in Detail.

There was a subset of comments received which supported 2 different community alternatives; the Natural Selection Alternative which is supported by members of the Deer Creek Association and the Community Alternative which is supported by members of the Applegate Neighborhood Network. The validity of these two alternatives was explored by the IDT and discussed in terms of how well they responded to the purpose and need for the Pickett West project (Chapter 1.3).

Below is a discussion of how these alternatives and the other comments were considered in the development of the project.

Incorporated Comments

Comments were incorporated into the analysis for the Pickett West project if they provided broad direction for the overall planning of resources contained within the PA, as opposed to site specific comments, which may have been mitigated as described below. The BLM received scoping comments from organizations and individuals which contained discussions of trade-offs of unresolved conflicts concerning alternative uses of resources. It was appropriate to analyze specific elements of the scoping comments, for example no commercial treatments in Riparian Reserves and the maintenance of all northern spotted owl habitat within the PA. Elements of comment letters were considered within a second Action Alternative, to the degree that those elements met the purpose and need for the project. Action Alternative 3 was designed to be selectable in its entirety, or selected in part, by the Grants Pass Field Manager. For further details see Chapter 1.4 Decision Framework and Chapter 2.3 Action Alternative 3.

Mitigated Issues
There was a subset of comments that were site specific and did not contain broad direction for overall resource management within the PA. These comments were analyzed by the IDT through the design of Project Design Features (PDFs). PDFs are measures incorporated into the site specific design of the project to eliminate or minimize adverse impacts to the human environment. Specific PDFs include the following and are reiterated in Chapter 2.4:

- Controlling the establishment and spread of noxious weeds by vehicle washing, the use of weed free straw, and monitoring.
- Implementing actions such as fully decommissioning all temporary routes which includes blocking and placing material at the entrance of skid trails and temporary routes to discourage the development of OHV routes.

Appendix Responses
Comments that were not incorporated into the analysis or mitigated during planning may have been responded to in Appendix B of this document. These elements from the comment letters did not warrant incorporation into the analysis because they didn't meet the purpose and need for the project, were technically or economically infeasible, were inconsistent with policy or objectives, or had already been decided upon, making them beyond the scope of this analysis.

Issues and Alternatives Not Analyzed in Detail
Similar to the situation described above, comments that were responded to as Issues and Alternatives Not Analyzed in Detail are technically or economically infeasible, are inconsistent with policy or objectives, or have already been decided upon, making them beyond the scope of this analysis. A subset of comments that were not analyzed in detail have been considered under the No Action Alternative and are discussed in Chapter 1.7 Issues and Alternatives Not Analyzed in Detail include:

- The Natural Selection Alternative
- Late-Successional Reserve/Adaptive Management Reserve
- Regeneration Harvest
- Permanent Road Construction

As described above, the BLM has encouraged and facilitated public involvement during the NEPA process for this project. The BLM solicited comments through the external scoping process, hosted an informational public meeting and scheduled field tours, and employed a public information specialist to ensure the public was engaged timely. Public comment letters and supporting literature were cataloged, parsed, and considered in the development of this project.

1.7 Issues and Alternatives Considered but not Analyzed in Detail

This EA explored and objectively evaluated a range of reasonable alternatives within laws, regulations and policy. Through the planning process several issues and alternatives were explored but eliminated from detailed analysis for various reasons. The Action Alternatives analyzed for an economically viable proposal with consideration to environmental effects that meets the purpose and need for the project. An issues or alternative would not be considered if:

- It would not meet the purpose and need;
- It would be technically or economically infeasible; or
- It would be inconsistent with the basic policy or objectives for the management of the area.

The following issues and alternatives were considered by the IDT, but not analyzed in detail.

Natural Selection Alternative (NSA)

The Deer Creek Association submitted the Natural Selection Alternative for consideration within the Pickett West project EA. The NSA was supported by public comments through the submission of unique letters and form letters. The Natural Selection Alternative has been previously submitted for consideration under the South Deer Landscape Management Project (EA# OR 110-05-10), the Deer North Vegetation Management Project (DOI-BLM-OR-M070-2009-0010-EA), and the 2016 Proposed Resource Management Plan/Final Environmental Impact Statement (PRMP/FEIS).

The South Deer Landscape Management Project considered the Natural Selection Alternative as Alternative 4. The South Deer Landscape Management Project EA analyzed the NSA and determined that the level of commercial timber removal for Alternative 4 was minute and the cumulative impacts to vegetation would be the same as those described for the No Action Alternative. Further, the NSA has been described as an opportunity to demonstrate the effectiveness of this approach in young stand development. The Pickett West project does not propose a demonstration of young stand development.

The NSA was subsequently submitted for consideration within the Deer North Landscape Management Project. The NSA is not compatible with projects when the primary purpose and need is to produce a sustainable supply of timber from lands allocated for timber production, such as the Pickett West project proposes. The Deer North Landscape Management Project did not select the NSA, and the decision was appealed to the Interior Board of Land Appeals (IBLA). The BLM prevailed with the IBLA, arguing that the extent of timber harvest under the NSA was inconsequential, and that the alternative was virtually the equivalent of the No Action Alternative. (*Deer Creek Valley Natural Resources Conservation Association, et al.*, IBLA 2012-131, 2012-164, & 2012-173). A lawsuit was filed and the BLM, likewise prevailed in court (*Deer Creek Valley Natural Resources Conservation Association v. BLM*, 1:12-cv-1596-CL). That decisions was appealed to the 9th Circuit Court, but the appeal was voluntarily dismissed.

Most recently, the NSA was submitted for consideration during the planning efforts for the 2016 Proposed Resource Management Plan/Final Environmental Impact Statement. In that EIS the NSA was an Alternative Considered but not Analyzed in Detail. The EIS concluded that the NSA does not meet the purpose and need and basic policy objectives described for developing the Alternatives because it would not make a substantial and meaningful contribution to providing a sustained yield of timber. Limiting harvest to dead and dying trees would not reflect the annual productive capacity for O&C Lands. Additionally, volume from dead and dying trees from year to year is inherently unpredictable, thus would not support sustained-yield timber production due to the fluctuation and unpredictability of supply which would vary based on annual conditions. Limiting the harvest of timber to dead and dying trees would not be consistent with the requirements of the O&C Act and would not respond to the purpose for the action (PRMP/FEIS, p. 103).

In summary, the NSA was considered but not analyzed in detail for the Pickett West project because 1) it is substantially similar to the No Action Alternative, 2) it proposes young stand management development, which is not one of the purposes of the Pickett West project and 3) it does not meet the purpose and need to produce a sustainable supply of timber from O&C Lands.

Rogue River Corridor

The northern portion of the Pickett West PA is bisected by the Rogue River Recreational Section Corridor. Approximately 8,688 acres within the PA contain the Rogue River Recreation Corridor which extends for ¼ mile on each side of the river. For disclosure purposes, within the PA boundary there are approximately 0.3 miles of Rogue River Wild and Scenic River Corridor which totals approximately 2.8 acres. No treatments are being considered in this area.

Treatments within the Rogue River Recreation Corridor were considered but not analyzed in detail. The BLM is directed to manage National Wild and Scenic River Systems in such a manner as to protect and enhance the values for which the river was designated. The outstanding remarkable values for the Rogue River are defined in the 1972 Comprehensive River Management Plan and the Wild and Scenic Rivers Act. Those values are defined as natural scenery, recreation, and fisheries.

To ensure that river values are protected the BLM performed GIS exercises and field verified the results. To reduce effects to the outstanding remarkable values the BLM removed from consideration the 8,688 acres contained within the river corridor, performed a viewshed analysis on proposed treatments units that were in close proximity to the river but outside of the corridor, evaluated the hydrologic connectivity of all proposed units that are adjacent to the river corridor, and removed these areas from consideration and detailed analysis.

To eliminate effects to the outstanding remarkable values contained within the river corridor the IDT performed GIS exercises and on the ground reconnaissance. The first screen conducted to protect the natural scenery entailed elimination of any proposed treatments within the ¼ mile river corridor. Eliminating any proposed treatments from the ¼ mile river corridor ensured that the immediate visual resources within the area would not be altered by the Pickett West proposal.

To further reduce affects to the visual characteristics of the river corridor on areas not within the ¼ mile area the IDT preformed a viewshed analysis. This was conducted using Light Detection and Ranging or LiDar highest point raster data set, which shows the height of tree crowns from the water level of the river. During the viewshed analysis, the IDT made assumptions about the visual effects within the river corridor when units were 2-6 miles from the river corridor but contained a small number of trees which were visible from the river corridor. There were approximately four instances where the IDT either dropped portions of units that were visible or retained the units assuming that the treatments proposed in the units would not cut the tallest trees. Since all proposed treatments would retain 30-60 percent canopy cover, the IDT assumed that the largest trees within the units would be retained, thus proposed units that occur 2-6 miles from the river corridor would not alter the visual characteristics of the landscape for the casual river user. A detailed map of the Rogue River Viewshed Analysis is in the Administrative Project Record.

The viewshed analysis resulted in the removal of 61 units or parts of units, totaling 989 acres.

To protect the outstanding remarkable value of fisheries within the Rogue River Corridor the IDT hydrologist performed an analysis to determine which units were hydrologically connected to the Rogue River. "Hydrologically connected" means that there is a potential to transport sediment caused by surface disturbance to enter perennial surface waters. The hydrologist considered a 1-2 year peak flow event or normal winter rain storm. The analysis considered access roads, landings, and ground-based timber units as mechanisms of surface disturbance that have the potential to transport sediment to surface waters. Sediment from larger events would be typical of background conditions and is difficult to separate from natural sources of sedimentation and therefore not considered a pollutant for water quality. The proper application of Best Management Practices typically makes sedimentation downstream from proposed treatment units indistinguishable from background conditions.

Because all treatment units within the ¼ mile Rogue River Corridor were removed it is assumed that there would be no direct impacts to the Rogue River from the proposed treatment units. Following the visual assessment described above the hydrologist used GIS to "clip" the units within the Hellgate-Rogue Hydrologic Unit Code, which allowed individual evaluation. This evaluation considered field surveys and LiDar to determine if there is a likely transportation pathway to the Rogue River.

Based on the evaluation described above units that were found to be hydrologically connected had their boundaries modified to avoid potential impacts. Thinning within these units after the application of buffers is not expected to adversely impact water quality or increase peak flows. There were 2 units that were dropped from consideration because they were too small to be adequately buffered, had complex access issues, and were not located near other proposed treatment units.

Recreational activities relating to the river were assumed to be restricted to the ¼ mile river corridor. By removing all treatment units within the corridor the IDT determined that recreational activities associated with the river were protected and would not be affected by this project.

Based on the evaluation described above there are no anticipated effects to natural scenery, recreation, or fisheries contained within the Rogue River Corridor. Impacts to the outstanding remarkable river values are not analyzed further in this document.

Oregon and California Land Grant Act of 2015

The Oregon and California Land Grant Act (O&C Act) of 2015 is a congressional bill which was introduced to the 114th Congress by Oregon Senator Ron Wyden and Jeff Merkley on January 8, 2015. The proposal would amend the O&C Act of 1937 and establish uses and management requirements for BLM-administered O&C lands. This bill was read twice to the Senate and was referred to the Committee on Energy and Natural Resources. As of May 2017 the bill had not been approved.

The O&C Act of 2015 was not approved, thus remains a speculative action. The BLM is not required to manage lands based on speculative or indefinite proposals. The BLM is required to manage lands as designated under the 2016 ROD/RMP and the 1995 ROD/RMP, during this 2 year transition period, ending in August of 2018. The Pickett West project is a transition project and adheres to the land use allocations within the 1995 ROD/RM and follows exemption criteria #3 listed above in Chapter 1.5.1 Land Use Management Plans.

The O&C Act of 2015 proposed the designation of the Illinois Valley Salmon and Botanical Area, which comprises approximately 15,000 acres of BLM-administered lands. The proposed Illinois Valley Salmon and Botanical Area lies within and adjacent to the Pickett West PA. The 1995 ROD/RMP Map 8: Special Areas, documents a Special Emphasis Area called the Illinois Valley Botanical Area totaling 10,613 acres and is similar in scale and location to the proposed Illinois Valley Salmon and Botanical Area. The 1995 ROD/RMP directs the Illinois Valley Botanical Area to be managed as a botanical emphasis area due to the preponderance of special status plants. Actions including timber harvest are allowed if they do not conflict with the habitat needs of the plants (1995 ROD/RMP p. 56). There are approximately 49 acres of commercial treatments proposed within this area and approximately 3 acres of Fuels Hazard Reduction maintenance treatments. This area also overlaps Cook's Desert Parsley Critical Habitat and a very small portion of the Fritillaria Management Area. All proposed project activities conform to Project Design Criteria set forth in the *Programmatic Biological Assessment: Assessment of activities that may affect the federally listed plant species, Gentner's Fritillary, Cook's Lomatium, and Large-flowered Woolly Meadowfoam, of Bureau of Land Management, Medford District and Cascade Siskiyou National Monument* (USDI, 2014) which are listed on page 244 of this document.

With the implementation of the project design features listed on pages 81-85 of this EA, the proposed commercial and non-commercial activities do not conflict with the special status plants and their habitat needs. This project does not conform to the speculative and indefinite proposed O&C Act of 2015. The Pickett West project does adhere to the direction in the 1995 ROD/RMP for allowable timber harvest in the Illinois Valley Botanical Area because the implementation of project design features and the protection of known sites and new plant sites discovered during project clearance surveys would ensure that the proposed activities do not conflict with the special status plants or their habitat.

The O&C Act of 2015 also proposed the Rogue Canyon National Recreation Area which is approximately 94,700 acres of BLM-administered lands adjacent to the Rogue River Wild and Scenic River Corridor and a portion of the Rogue River Recreation Section Corridor. The Pickett West PA and the Rogue Canyon National Recreation Area proposal overlap in the northern portion of the PA from Galice to Grave Creek, where the river transitions from the recreation section to the wild and scenic section. As discussed above, the BLM is not required to manage lands based on speculative or indefinite proposals. Also discussed above is the methodology the Pickett West IDT utilized to protect the outstanding remarkable values of the Rogue River Corridor. Because the IDT removed all proposed treatments within ¼ mile river corridor, dropped the visible units from the river, and dropped or modified the hydrologically connected units, there are no anticipated effects to natural scenery, recreation, and fisheries within the Rogue River Corridor. Although the BLM does not mange lands based on speculative proposals, the Pickett West project proposed activities would not preclude the designation of the Rogue Canyon National Recreation Area.

Applegate Ridge Trail (ART)

The Applegate Ridge Trail is a proposed system of trails, which may one day connect Jacksonville Forest Park Trail system to the Grants Pass Cathedral Hills Trail system. The ART system is a project that is supported by community members across the Rogue Valley. Phase I of the ART system is the East ART and is under construction on the Medford District's Ashland Resource Area. The portions of the ART system that are proposed on the Grants Pass Resource Area have not been formally submitted to the Grants Pass Field Manager for consideration.

During the scoping period for this project the IDT received letters informing the BLM about the ART system. While the stated purpose and need for the Pickett West project does not include the development of recreation opportunities, the IDT discussed how project activities may affect the future establishment of the portion of the ART system that traverses adjacent to and through the Pickett West PA. Below, Figure 1-2 shows a digitized image of the ART system in relation to the PA boundary and proposed treatments units. Table 1-2 below lists the commercial and fuels units that are in proximity to the ART system.

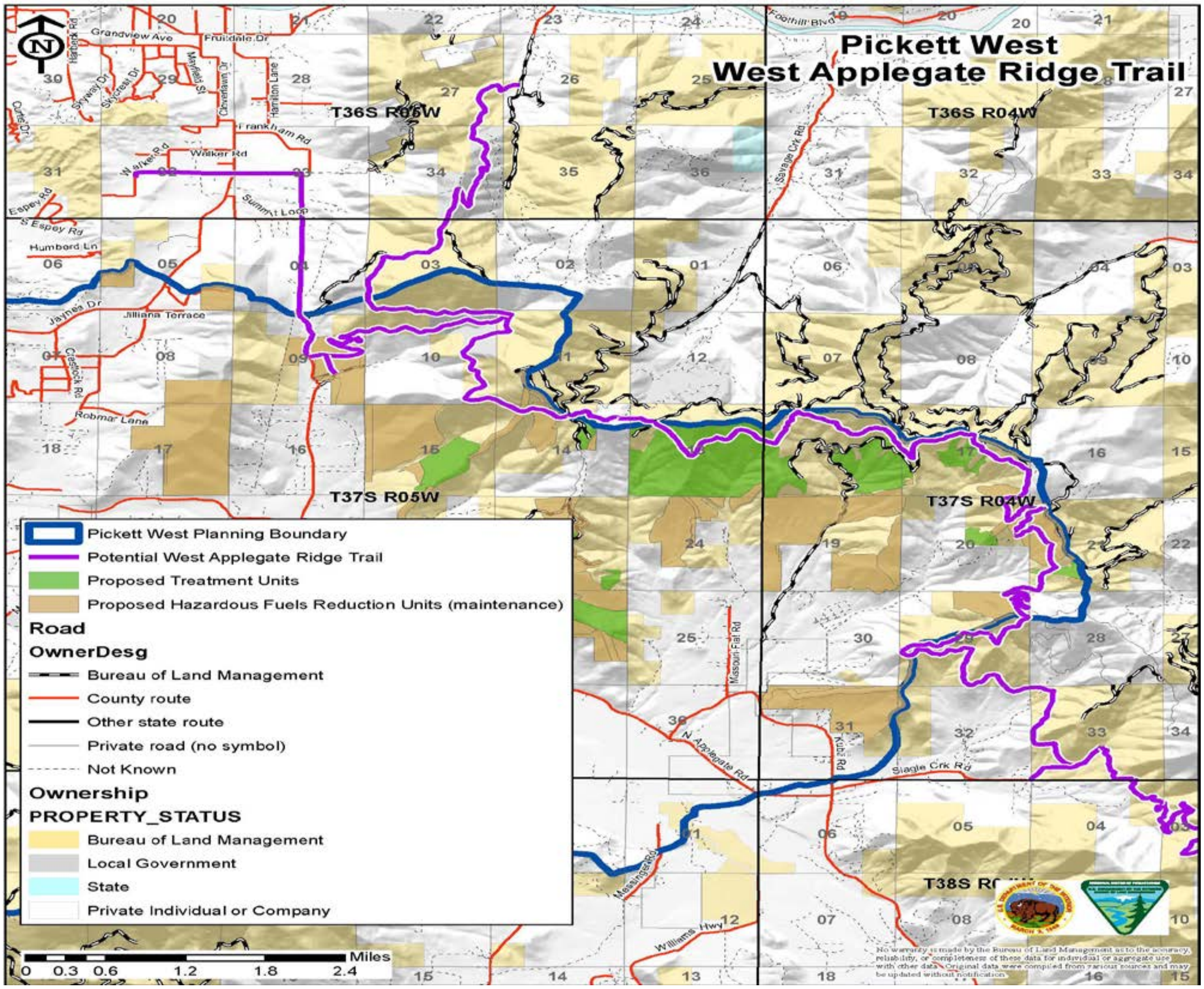
Table 1-3 Proposed Treatment Units in Proximity to Applegate Ridge Trail System

Township Range Section	Unit Number	Alternative 2 Treatment*	Alternative 3 Treatment*	Acres
37-4-17	17-5	DM	DM	50

Township Range Section	Unit Number	Alternative 2 Treatment*	Alternative 3 Treatment*	Acres
	17.029	HFRm	HFRm	31
37-4-18	18-1	DM	DM	153
	18-2	RT	RT	7
	13-9	DM	DM	83
37-4-20	20-5	DM	DM	24
	20	HFRm	HFRm	15
37-4-21	21-13	DM	DM	25
	21	HFRm	HFRm	12
	21A	HFRm	HFRm	104
37-4-29	29-31	HFRm	HFRm	54
	29A	HFRm	HFRm	84
37-5-09	9	HFRm	HFRm	40
	FMZ1	HFRm	HFRm	3
	FMZ2	HFRm	HFRm	10
	9-1A	HFRm	HFRm	55
	9-1B	HFRm	HFRm	59
37-5-11	11.14.15	HFRm	HFRm	45
	11+14	HFRm	HFRm	15
37-5-13	13-7	RT	RT	6
	13-8	DM	DM	470
37-5-14	14-5	DM	DM	24
	14	HFRm	HFRm	5
	14A	HFRm	HFRm	56

**DM=Density Management, RT=Restoration Thinning, HFRm=Hazardous Fuels Reduction maintenance*

Figure 1-2 Applegate Ridge Trail in relation to the Pickett West PA



As seen in Figure 1-2, the ART system traverses near the eastern edge of the PA. The ART system is adjacent to proposed commercial treatment units in T37S-R4W-Sections 17, 18, 20, and 21 and T37S-R5W-Section 13 and 14. The ART system is adjacent to proposed fuels reduction maintenance units in T37S-R4W-Sections 17, 20, 21, and 29 and T37S-R5W-Sections 09, 11, and 14.

Approximately 21 miles of the ART system traverses through the Pickett West PA. Most of the proposed commercial treatment units are positioned adjacent to the trail. The trail passes through the edge of some of the proposed commercial units. The ART system traverses through the northern portion of the largest unit in T37S-R5W-Section 13 unit 13-8. As seen in Appendix L Alternative 2 Map, there is a temporary route proposed along a portion of the ART system that traverses the left side of unit 13-8. In Appendix L, Alternative 3 Map, there is a proposed tractor swing route in this same location. The proposed use of a new temporary route or a tractor swing route would not preclude future establishment of the trail and could become a portion of the trail in the future. All temporary routes would be fully decommissioned after use to reduce sedimentation and reestablish vegetation. The treatment proposed in unit 13-8 is density management and would retain canopy cover between 40 percent and 60 percent. The density management prescription is designed to enhance forest health, stand structure, and function, protecting older trees and promoting a multi-layered complex stand. This treatment is expected to benefit the landscape in the long-term and would not impede the future establishment of the ART system.

The ART system traverses adjacent to or through approximately 15 proposed hazardous fuels reduction maintenance units. All of the units proposed for fuels reduction maintenance have been fuels treated in the past. These treatments are expected to improve stand-level residual tree growth/vigor, reduce the fire hazard, and potentially decrease the risk of wildfire climbing into the crowns of trees. Because these stands have been treated in the past and the ART system was envisioned to traverse through these previously treated stands, follow-up treatments would not preclude the future establishment of the ART system.

Proposed haul routes in this area may be considered for road maintenance activities that may include the reshaping of road surfaces, spot rocking, ditch clearing, and vegetation removal. Proposed maintenance activities are anticipated to improve the roads within the PA making them safer for use by private entities and the public. The implementation of activities proposed under the Pickett West project may cause intermittent access delays but these delays would be of a short duration and would likely only occur during the operating season.

The proposed ART system was discussed during the development of this project but the construction and establishment of the ART system was not considered within the Action Alternatives for the Pickett West project. The main purpose and need for the Pickett West project is the production of a sustainable supply of timber, thus a proposal to establish recreational opportunities is beyond the scope of the Pickett West project. There are no activities proposed that would preclude future establishment of this trail. The ART systems was considered during project development but not analyzed in detail.

Prescribed Burning Issues-Air Quality, and the Use of Polyethylene Sheeting

Air Quality

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

Medford District BLM is also required to be in compliance with the Oregon Visibility Protection Plan (OAR 340-200-0040, Section 5.2) which mandates that prescribed burning does not affect the visibility of Class I areas. Class I areas are defined in the Clean Air Act as Forest Service wildernesses and national memorial parks over 5,000 acres, National Parks over 6,000 acres, and international parks. Local Class I areas include Crater Lake National Park, the Kalmiopsis Wilderness, and the Rogue Wilderness. The PA 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 (ODF). The specific location, size of the burn, fuel loadings, ignition source, time, and duration of ignition are reported prior to ignition. Smoke management advisories or restrictions are generated on a daily basis by the State Meteorologist. This information is used to determine the appropriate time to conduct the planned prescribed burn. Most prescribed burning on the Medford District is accomplished by hand-pile burning. Hand-pile burning generally occurs throughout the winter months during storm events when unstable atmospheric conditions are present in order to maximize mixing and lessen smoke impacts to localized areas. All piles would be covered with four mil polyethylene plastic sheeting to keep fuels dry to facilitate rapid and efficient ignition and consumption of fuels to minimize residual smoke (Aurell et al. 2016).

The issue of degraded air quality resulting from prescribed burning was considered but eliminated from further analysis because there would be negligible direct or indirect effects on air quality within the PA and the SSRA. Effects on air quality from 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 is dissipated 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 PA 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 Grants Pass SSRA. In addition, the BLM does not expect prescribed burning to affect visibility within Crater Lake National Park, Kalmiopsis or Rogue Wilderness Areas due to the distance from the PA and implementation of smoke management guidelines. Therefore, this issue was not analyzed further.

<u>Polyethylene (PE) Sheeting - Burning of PE Sheeting</u>

For all prescribed burning activities, the Medford District BLM is required to be in compliance with the Clean Air Act and the Oregon Smoke Management Plan (OAR 629-048-0010). The Oregon Department of Forestry Smoke Management Plan addresses the issue of using PE to cover piles. OAR 629-048-0210(2), Best Burn Practices; Emission Reduction Techniques, states, "…best burn practices involve methods that ensure the most rapid and complete combustion of forest fuels…" Covering of hand piles is a "Best Burn Practice." OAR 629-048-0210(4) states, "When covers will not be removed and thus will be burned along with the piled forest fuels, the covers must not consist of materials prohibited under OAR 340-264-0060(3), except that polyethylene sheeting that complies with the following may be used: 1) Only polyethylene may be used. All other plastics are prohibited."

Air quality concerns have led to prohibitions on the open burning of household plastics in many areas of the country. “Inasmuch as regions in Oregon where silvicultural burning occurs are exposed to significant amounts of precipitation, there is an overall emissions reduction benefit from covering silvicultural piles. Polyethylene does not include chlorinated compounds or significant amounts of other chemicals likely to form uniquely toxic emissions, nor have these been demonstrated in the literature” (Wrobel and Reinhart 2003). Emissions comparison of burning post-harvest timber slash piles suggest that dry piles covered with polyethylene (PE) sheets significant lower emissions than uncovered wet piles (Aurell et al. 2016).

An addendum to the original Wrobel and Reinhart literature review (2003) on the use of polyethylene sheeting to enhance combustion efficiency discusses the rules affecting PE burning. Oregon has addressed the issue based on the findings reported by Wrobel and Reinhart (2003). “The available literature does not support the contention that burning PE sheeting would produce unique chemicals or classes of chemicals that are not also found in emissions from burning wood debris” (Wrobel and Reinhart 2003).

The Oregon Department of Environmental Quality and the Oregon Department of Forestry developed a Memorandum of Understanding (MOU) for PE, adopted in 2005. The MOU suggests the plastic material should be removed prior to burning when practicable. Adequate debris or slash is placed over the PE sheeting to ensure the plastic remains covering the piles until the piles are burned. Due to the difficulty of removing the PE cover from below the debris, especially after long-term exposure to the elements, it would be operationally impractical to remove the PE prior to burning for the Action Alternative. Burning of PE sheeting showed no statistical significant difference in emissions of measurable pollutants when burned with timber slash (Aurell et al. 2016). Therefore, the PE would be left in place and burned in the pile.

Alternative coverings, such as Kraft paper, are used in other parts of the country to cover burn piles in place of PE. Combustion studies involving lignocellulosic materials suggest that uncoated Kraft paper may produce some of the same substances as polyethylene (Garcia et al. 2003). The study also states that from an operational standpoint, Kraft paper is a more expensive, less durable, and less effective means of minimizing moisture intrusion into the pile because of its tendency to degrade more rapidly than PE. In turn, fuel moisture is increased, combustion efficiency is reduced, and more accelerants may be needed for pile ignition. Additionally, the weight and means of packaging Kraft paper contributes to decreased production and increased per unit cost of covering piles.

Pollutant concentrations are reduced by atmospheric mixing, which depends on weather conditions such as temperature, wind speed, amount of sunlight, and the movement of high and low pressure systems and their interaction with the local topography. The BLM would schedule hand pile burning primarily from October to May during unstable atmospheric conditions (e.g., rain, snow, or storm events) when atmospheric mixing is occurring. Wet season conditions minimize the amount of smoke emissions by burning when duff and dead woody fuel have the highest moisture content, which reduces the amount of material outside of the piled fuel that is actually burned. All piles would be covered with 4 millimeter polyethylene plastic sheeting to facilitate rapid ignition and consumption of fuels to minimize residual smoke.

Timing of all prescribed burning would be dependent on weather and wind conditions to help reduce the amount of residual smoke to the local communities. If residual smoke impacts exceed limits set by the Oregon Smoke Management Plan, additional burning would be suspended until given the notice to proceed by the ODF Forester.

The issue of degraded air quality resulting from the burning of PE sheeting was considered but eliminated from further analysis because there would be negligible direct or indirect effects on air quality within the PA. The use of PE sheeting would follow guidance from DEQ and Oregon Department of Forestry Smoke Management Plan. Oregon Smoke Management Plan regulations (OAR 629-048-0210) state that, (1) "Only polyethylene may be used. All other plastics are prohibited; (2) the size of each polyethylene cover must not exceed 100 square feet. For small piles, covering only an area necessary to achieve rapid ignition and combustion, instead of the entire pile, is encouraged; (3) the thickness of the polyethylene cover must not exceed 4 millimeters". On hand pile units the 4 millimeter PE sheeting typically covers 90 percent of the surface of the pile, with a maximum of 100 square feet of coverage.

Burning would occur after coordination with ODF on the smoke management forecast and instructions to minimize the likelihood of public health effects and visibility impairment. The literature suggests that the emissions to the atmosphere contributed by the sheet of PE covering are chemically similar to the emissions from the underlying pile of silvicultural debris. For many of these emissions, such as CO, CO2 and particulate matter, the amount emitted from the woody debris will of course overwhelm the contribution from the PE. The available literature does not support a contention that burning PE sheeting would produce unique chemicals or classes of chemicals that are not also found in emissions from burning wood debris (Worbel and Reinhardt 2003, Aurell et al. 2016).

Carbon and Green House Gases

On August 5, 2016 the BLM issued the Southwestern Oregon Record of Decision and Resource Management Plan (2016 ROD/RMP) revising the 1995 RMP for the Medford District. The ROD was based on the analysis conducted in the Proposed Resource Management Plan/Final Environmental Impact Statement: Western Oregon (BLM 2016). The 2016 Final Environmental Impact Statement (FEIS) analyzed the effects of timber harvesting, prescribed burning, and livestock grazing on greenhouse gas emissions and carbon storage, and the potential impacts of climate change on major plan objectives. Analysis contained within the FEIS represents current understanding of the relationships between proposed management activities, climate change, carbon storage, and greenhouse gas emissions. The 2016 ROD/RMP contained direction on transition projects, projects that had begun previous to the signing of the 2016 ROD. Pickett West is one of those transition projects. For more information on the transition between the 1995 ROD/RMP and the 2016 ROD/RMP see Chapter 1.5 of this EA.

The effects of the Action Alternatives contained within the Pickett West Forest Management project on carbon storage and greenhouse gas emissions tiers to the analysis in the FEIS. As described below, the Action Alternatives are consistent with the Southwestern ROD. The Action Alternatives are not expected to have significant effects beyond those already analyzed in the FEIS. While analysis of the project-specific and site-specific conditions could give greater specificity to the analysis in the FEIS, there is no potential for reasonably foreseeable significant effects of the Action Alternatives beyond those disclosed in the FEIS. The analysis in the FEIS addressed the effects on carbon storage and greenhouse gas emissions of implementing the entire program of work associated with forest management and other activities based on high quality and detailed information (FEIS, pp. 165-180; 1295-1304). While designed under the 1995 RMP, outputs and resultant stand conditions from the Pickett West project satisfy part of the program of work that was analyzed in the FEIS. The information available on project-specific and site-specific conditions, while more specific, is not fundamentally different from the information used in the FEIS analysis of effects on carbon storage and greenhouse gas emissions, and thus cannot reveal any fundamentally different effects than that broader analysis.

The FEIS upon which the 2016 ROD/RMP was based examined the most recent science regarding climate change, carbon storage, and greenhouse gas emissions. The analysis in Volume 1 on Pages 165-211 are relevant to this project and are incorporated by reference.

The key points from 2016 FEIS analyses include (FEIS, p. 165):

- Net carbon storage would increase.
- Annual greenhouse gas emissions would increase although annual emissions would remain less than one percent of the 2010 statewide greenhouse gas emissions.
- Climate change increases the uncertainty that reserves will function as intended and that planned timber harvest levels can be attained, with the uncertainty increasing over time.
- Active management provides opportunities to implement climate change adaptive strategies and potentially reduce social and ecological disruptions arising from warming and drying conditions.

The FEIS concluded that the approved RMPs support the state of Oregon’s interim strategy for reducing greenhouse gas emissions (FEIS, p. 173). Both the state of Oregon’s strategy and Federal climate change strategies have goals to increase carbon storage on forest lands to partially mitigate greenhouse gas emissions from other sectors of the economy. Neither the state of Oregon nor the federal government have established specific carbon storage goals so quantifying BLM’s contribution to that goal is not possible. Assuming no changes in disturbance regimes such as fire and insects (acres affected and severity of impact) from the recent past, timber harvesting is the primary activity affecting carbon storage (FEIS, p.169).

The FEIS estimated the effects of implementing actions consistent with the Northwestern and Coastal Oregon and the Southwestern Oregon RMPs as follows:

Table 1-4 2016 Final Environmental Impact Statement Estimation of Carbon and Greenhouse Gas Emissions

	Current	2033	2063
Carbon Storage	336 Tg C	404 Tg C	482 Tg C
Greenhouse Gas Emissions	123,032 Mg CO_2e/yr	256,643 Mg CO_2e/yr	230,759 Mg CO_2e/yr

Tg – Teragram. One million metric tons.
Mg – Megagram. Metric ton. Approximately 2,205 pounds
CO_2e – carbon dioxide equivalent

The carbon storage and greenhouse gas emissions analysis was based on assumptions concerning the level of management activity:

- The FEIS assumed an average annual harvest level of 278 MMbf (MMbf = 1 million board feet) per year (205 MMbf from the Harvest Land Base and 73 MMbf from non-ASQ related harvest) over the entire decision area (FEIS, p. 307). The expected annual harvest for the Medford District is 51 MMbf (37 MMbf from the Harvest Land Base and 14 MMbf from non-ASQ related harvest). Projected harvest levels from the Pickett West project when added to projected harvest levels from other projects on the Medford District fall within the FEIS analysis.

- Activity fuels treatments are aligned with the harvest program with estimated acres of prescribed fire treatment type provided by the Woodstock model (FEIS, p. 1300). The decadal average of activity fuels prescribed burning for the first 20 years of the 2016 RMP would be an estimated 64,806 acres over the entire decision area (FEIS, p. 362). Slash and scatter treatments are estimated to be an additional 28,109 acres. Proposed treatment of harvest related activity fuels within the Pickett West project falls within FEIS analysis.

- The FEIS assumed that the non-commercial hazardous fuels (natural fuels) treatment levels would not differ from the 2003-2012 period although there is substantial year-to-year variability in the size of the program over the PA and within any one District (FEIS, p. 270). Approximately 173,300 acres of natural fuels treatment is expected to occur on average each decade across the PA (FEIS, p. 167). The expected natural fuels treatment program for the Medford District is approximately 104,000 acres per decade or a little over 10,000 acres per year. Pickett West proposes to treat natural fuels on less than 11,500 acres. Treatments proposed are maintenance treatments (HFRm) that would occur on previously treated acres. The bulk of vegetation to be removed from these sites has already been removed. HFRm treatments would also occur over a period of several years, dependent on available funding, staffing, and other factors. Greenhouse gases produced would be from regrowth, would be distributed over time, and would be less than amounts analyzed in the FEIS.

- The FEIS assumed 22,396 permitted Animal Unit Months (AUMs) of livestock grazing per year across the entire decision area (FEIS, P. 479). The Medford District expects to have 9,197 AUMs allocated for livestock grazing. Grazing is not proposed within the Pickett West project.

The amount of activity fuels prescribed burning is the primary driver of greenhouse gas emissions (FEIS, p. 178). Greenhouse gas emissions would increase substantially, largely due to the projected increases in activity fuels prescribed burning. The FEIS assumed no change in the natural fuels prescribed burning program from the recent past. Greenhouse gas emissions analyzed included those from grazing, prescribed burning, and harvest operations (FEIS, p. 174).

There is no new information or changed circumstances that would substantially change the effects anticipated in the 2016 FEIS. This is because:

1. The harvest levels remain within the range of that analyzed in the FEIS.
2. The acres of activity fuels prescribed burning and expected tonnage consumed remains within the range analyzed in the FEIS
3. The acres of natural fuels prescribed burning and expected tonnage consumed does not exceed the levels analyzed in the FEIS.
4. The number of permitted Animal Unit Months (AUMs) does not exceed the levels analyzed in the FEIS.

Regeneration Harvest

Regeneration harvests prescriptions were initially proposed for this project. During project development, regeneration harvest prescriptions were dropped from consideration. Regeneration harvesting is considered when stands have reached 150 years of age and their rate of annual growth is declining (culmination of mean annual increment). The stands previously proposed for regeneration harvests met the age requirements described above. Due to administrative issues and funding deficits the project silviculturist was unable to collect enough data to establish that these stands had reached the culmination of mean annual increment. Without data confirming that these stands were declining in growth rates it was not appropriate to propose regeneration harvest. These stands have high densities and warrant treatment so they are currently proposed as restoration thinning units. Regeneration harvesting prescriptions are not analyzed further in this document.

Late Successional Reserve/Adaptive Management Reserve

The Late Successional Reserve, which in this area includes the Adaptive Management Reserves was initially proposed for treatment. The Late Successional Reserve/Adaptive Management Reserve discussed here is defined in the 1995 ROD/RMP. During project development this portion of the project was deferred from consideration because it was technically infeasible to complete the needed field review prior to the analysis which occurred for this EA. Additionally, many of the timber stands within the Late Successional Reserve were 180 years or older and it was economically infeasible to conduct the necessary botanical surveys. While this portion of the PA was deferred it is important that the reader understand this area may be considered in the future and deferring this area does not set precedent for future actions occurring within the same Late Successional Reserve.

Approximately 95,088 acres of BLM-administered lands are contained within the Pickett West PA. Approximately 42,880 acres within the Late Successional Reserve and the Adaptive Management Reserve were deferred from this project. The Late Successional Reserve which includes the Adaptive Management Reserve is not analyzed further in this document.

Economically Infeasible Units

Many stands were considered for treatments but were subsequently dropped from analysis due to the economic infeasibility of access and/or survey costs. As stated at the beginning of this Chapter 1.7, issues and alternatives which were considered economically infeasible were not considered. For an operation to be economically feasible the economic value of the material leaving the stand must be greater than the cost of route construction, either permanent or temporary, harvest operations, and other factors. Many of these stands were dropped from the proposal entirely because they contained low merchantable volume which neither supported route building nor helicopter yarding. Conventional ground based yarding systems may have been economical but without a route to reach the area, the units were dropped from consideration due to access issues.

Approximately 95,088 acres of BLM-administered lands are contained within the Pickett West PA. Approximately 3,749 acres were dropped because the potential volume leaving the stand could not support route construction or helicopter yarding or were otherwise not economically feasible.

There is a subset of stands that were dropped from consideration due to the cost of surveys. Stands that are180 years of age or greater require 2 years of fungi surveys. Stands that are 80 years of age or greater require protocol surveys for red tree voles. There were numerous stands within the PA that met the age requirements that trigger surveys. Surveys were prioritized for stands that were deemed to be economically feasible. Low volume stands were not economically feasible because the cost of surveys would have been greater than the revenue generated.

Approximately 95,088 acres of BLM-administered lands are contained within the Pickett West PA. Approximately 4,960 acres were dropped due to prohibitive survey costs with the available budget. Low volume stands and stands requiring extensive surveys were dropped from the proposal and are not considered further in the analysis.

No Active Management Treatments

During the public scoping period the BLM received comments that requested no active management. Foregoing any active management treatments does not meet the purpose and need for this project. The No Action Alternative is the equivalent of not engaging in any management activities so requests to forego all active management are analyzed under the No Action Alternative.

During the unit selection process the IDT visited stands to assess the need for active management treatments. There were approximately 28,586 acres that did not warrant treatment to achieve resource objectives. These acres were dropped from consideration and are not analyzed further in this document.

Permanent Road Construction

Permanent road construction was considered for this project. Due to the checkerboard ownership pattern and the urban nature of the PA, not contributing to the open road network with permanent road features was a project sideboard. Forgoing permanent road construction would not increase the open road network within the PA thus ensuring that peak hydrologic flows are not negatively impacted. Additionally, constructing roads that are considered permanent is costly due to the requirements of culvert installation and road surfacing. The construction of permanents roads is not considered further in this analysis.

No Temporary Routes

An Action Alternative that analyzed no temporary routes (new temporary routes, existing reconstructed routes, and existing renovated routes) was not considered because not considering temporary routes is neither technically or economically feasible. In response to public comments, the IDT designed Alternative 3 to eliminate the construction of new temporary routes. Instead, Alternative 3 proposes only reconstruction and renovation of existing temporary routes. Not engaging in temporary route construction is analyzed under the No Action Alternative, therefore, this issue was considered but not analyzed in detail.

Road Decommissioning

Road decommissioning was considered but not analyzed in detail. The existing roads in the Pickett West PA provide access for future forest management activities such as young stand management treatments and fire suppression activities. Roads are made up of segments and many of these road segments are encumbered under reciprocal right-of-way agreements, which precludes the BLM from road decommissioning; to decommission road segments which are encumbered the BLM must obtain permission from the right-of-way holder. The procedural requirements for road decommissioning include gaining the permission of both reciprocal right-of-way holders and Josephine County Commissioners, and was beyond the timeframe needed to complete this EA. Additionally, the BLM has a current NEPA document which analyzes road decommissioning. Road decommissioning was considered during the development of this project but not analyzed in detail.

Northern Spotted Owl: Recovery Action 32 (RA 32)

The NSO Recovery Plan contains specific "Recovery Actions" which are near-term recommendations to guide the activities needed to accomplish recovery objectives. The Revised Recovery Plan presents 33 actions that address overall recovery through maintenance and restoration of NSO habitat, monitoring of avian disease, development and implementation of a delisting monitoring plan, and management of barred owls.

Recovery Action 32 (RA 32) aims to retain high-quality owl habitat stands characterized as having large diameter trees, high amounts of canopy cover, and decadence components such as broken-topped live trees, mistletoe, cavities, large snags and fallen trees. Stands that were considered high-quality spotted owl habitat were deferred from treatment to reduce effects to owls because owls require well distributed, older and more structurally complex multi-layered conifer forests.

The initial RA 32 screening did not yield a high amount of structurally complex habitat within the potential treatment pool of stands because the majority of older and more complex stands were already dropped from consideration due to the RA10 screening process described in more detail below.

RA 32 stands are not considered for treatment within this project and not analyzed in further detail. See Chapter 3.3, Wildlife, for further consistency with NSO Recovery Plan Recommendations, especially Recovery Actions 10 and 32.

Chapter 2 Alternatives

Pursuant to Section 102 (2) (E) of the National Environmental Policy Act (NEPA) 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."

This EA analyzes 3 Alternatives. The No Action Alternative is described first and establishes the baseline for analysis. Alternatives 2 is described second and was designed by the Interdisciplinary Team of BLM resource specialists to achieve all aspects of the Purpose and Need for the project. Alternative 3 was developed in response to the public comments received during the scoping period. While Alternative 3 can achieve aspects of the Purpose and Need. The Field Manager may choose any of the Alternatives in their entirety or may choose to blend aspects of any of the three Alternatives. Environmental effects from the Alternatives will be disclosed in Chapter 3 of the EA.

Quality Control Measures

The Medford District BLM utilizes a Guide for Planning and Implementing Vegetation Management Projects (September 2015). The Implementation Guide is meant to ensure that BLM vegetation management projects are consistent with law, policy, and consultation. The Implementation Guide outlines 6 steps which are to occur during vegetation management projects. The steps span from out-year planning to post-implementation monitoring. The Pickett West IDT utilized the Pre-decision Record checklist (Medford District Implementation Guide, 2015, pp. 14-16). The check-list has many items and tasks which are to be completed prior to the signing of the Decision Record for a project, one example includes a field review of the silvicultural prescription and marking guidelines for each unit. Some of the items on the Implementation Guide checklist are not completed before the Decision Record for a project because the tasks are considered post-decisional. The Administrative Record for this project contains the Implementation Guide check-list, not all items and tasks are pertinent to every project (Medford District Implementation Guide, 2016, p. 14).

The discussion below explains how the IDT ensured that canopy cover targets would be achieved in stands proposed for commercial treatment.

Proposed commercial treatments within the PA were designed to meet target canopy cover and tree retention requirements, described as basal area. Basal area is the common forestry term used to describe the average amount of area (usually an acre) occupied by tree stems. It is defined as the total cross-sectional area of all stems in a stand measured at 4 ½ feet from the ground (dimeter at breast height or DBH) on the uphill side of a tree, and is expressed per unit of land area (typically square feet per acre). These targets are based on the type of NSO habitat present prior to the treatment proposal. To ensure that these targets are achieved the Pickett West IDT silviculturist and wildlife biologist field verified the accuracy of the retention marking and tree removal for each unit and where needed, modified the tree marking to improve structural characteristics of habitat quality and stand variability. To ensure that canopy cover targets are achieved, most silvicultural prescriptions included an additional percentage of canopy cover to mitigate potential impacts from harvest operations such as yarding corridors, landings, and skid trails. These Quality Control Measures apply to all Action Alternatives.

2.1 Alternative 1 - No Action Alternative

The No Action Alternative serves as a baseline to compare the effects of the actions between the Alternatives and describes the existing condition and continuing trends within the PA. Under the No Action Alternative, silvicultural treatments would not be applied within the PA. No forest management or fuels maintenance activities would be implemented to accomplish project goals in the foreseeable future. The No Action Alternative would not meet the purpose and need of the project.

Future active management treatments in this area would not be precluded and would be analyzed under a subsequent environmental analysis. Maintenance of BLM controlled roads is dependent on BLM funding or requests from right-of-way (ROW) holders.

2.2 Action Alternative 2

Alternative 2 is proposed to meet the purpose and need of the project within the multiple use objectives and resource protection measures established by the 1994 Northwest Forest Plan, 1994 FEIS, and the 1995 ROD/RMP for each LUA within the PA. The RMP directs the BLM to implement the O&C Act. Lands administered under the O&C Act must be administered in accordance with environmental laws such as the ESA and the CWA. Table 2-2 below summarizes Alternative 2.

Northern Spotted Owl: Recovery Action 10 (RA 10) Application and Critical Habitat

During the project planning and development of Pickett West, the IDT followed principles in the Recovery Plan Implementation Guidance: Interim Recovery Action 10 Medford Bureau of Land Management/Rogue River-Siskiyou National Forest/*USFWS* Roseburg Field Office (USDA/USDI 2013) while designing the location and intensity of the proposed treatments included in each Action Alternative. Factors that influence this process include occupancy rates across all known northern spotted owl sites within the PA, existing habitat types and percentages within the 0.5 mile cores and home ranges of known owl sites, and abiotic factors such as topography, slope position and the Relative Habitat Suitability (MaxEnt) model described in the 2011 Revised Recovery Plan for the Northern Spotted Owl (USFWS 2011a).

Northern spotted owl (NSO) sites within the PA were analyzed using historic pair occupancy and reproductive success derived from protocol surveys. The historic NSO sites in the Pickett West PA have received various degrees of survey effort, with some sites receiving relatively few and sporadic surveys, while others have had more routine and recent surveys. Because of the inconsistent survey effort between each NSO site, it was difficult to evaluate the true value of each site in comparison to others, without having the benefit of equivalent survey effort across all sites. Due to this uncertainty within the NSO demographic data set, two Action Alternatives were developed with consideration of RA 10 principles, emphasizing two differing approaches.

Alternative 2 conformed to the RA 10 principles, but emphasized the “enhance” strategy described in the RA 10 document (USDA/USDI 2013). Under alternative 2, all NSO sites without recent NSO occupancy (≤ 2 years) where considered low value sites. Any proposed treatments that fell within the home range of these low value NSO sites under Alternative 2 were then designed following the RA 10 guidance for habitat enhancement, with consideration of landscape position and topography, current habitat condition, and Relative Habitat Suitability (USFWS 2011a). The Decision Framework for Alternative 2, Figure 2-1, was designed to incorporate these considerations and help create a consistent approach across the PA by Action Alternative. Additional project design components of Alternative 2 include: No habitat removal in any 0.5 mile core of any NSO site, downgrade or removal of habitat at the home range scale would only occur in areas modeled as low Relative Habitat Suitability (USFWS 2011a), and all nesting habitat would be minimally treated (Treat & Maintain) regardless of the Relative Habitat Suitability.

The “conserve” strategy described in the RA10 document (USFS/BLM/USFWS 2013) was applied to the over-arching “framework” of Alternative 3. As such, all treatments proposed within any NSO homerange was designed to “Treat & Maintain” the habitat type where the activity is proposed (no change in the overall habitat category).

Common to the design of both Action Alternatives was the total acres of treat and maintain prescriptions within the 0.5 mile core area of high priority owl sites were reduced and in some cases eliminated in order to reduce the effects to NSOs at those sites. Silvicultural prescriptions that have adverse impacts to NSO habitat were considered in areas outside of high value owl sites. The IDT focused on reducing the amount of timber harvest within the 0.5 mile core area because it is the area that provides the important habitat elements of nest sites, roost sites, and access to prey that benefit NSO survival and reproduction (Bingham and Noon 1997). Approximately 5,017 acres were dropped from the original 95,088 acre proposal in early RA10 evaluations and RA 32 stands. These acres were deferred from treatment to reduce effects to NSO and their habitat.

The 2012 Final Critical Habitat Rule and principles in the 2011 Recovery Plan were used to inform specific prescriptions when treatment units are located within the 2012 designated critical habitat. Adverse effects were avoided in occupied sites within critical habitat. Adverse effects in critical habitat located outside of the home ranges of known sites were only proposed in areas where the habitat could be improved in the long-term (i.e. proposed treatments in capable, dispersal, or roosting/foraging habitat within high habitat suitability according to the relative habitat suitability model); treatments would improve stand resiliency; or where the ecological needs of the stand outweighed the owl habitat needs (i.e. pine restoration on a ridge that is in low habitat suitability according to the relative habitat suitability model). For more information see the Wildlife write-up in Chapter 3.3.

Deferred Watershed

White Creek

The White Creek watershed was deferred in the 1995 ROD/RMP. Deferred watersheds are identified as areas having high watershed cumulative effects from management activities. The 1995 ROD/RMP allows for management activities of a limited nature to occur in this area so long as the effects would not increase the cumulative impacts (pp. 42-43). Under Alternative 2 there are no treatment units proposed within this watershed. Under Alternative 2 the reconstruction of approximately 1,084 feet of ridge top routes are proposed and approximately 193 feet of new routes, these routes are located on the ridge that separates White Creek watershed from the adjacent Cedar Creek watershed. These routes would be decommissioned after use which follows RMP direction to implement management activities within deferred watersheds so long as the activities are of a limited nature. Hauling is proposed on rocked and surfaced roads and includes specific improvements such as improving the road surfacing and drainage features on BLM Road 38-6-18 (see PDF section). This is discussed further in the Chapter 3 Hydrology effects analysis write-up.

Key Watershed

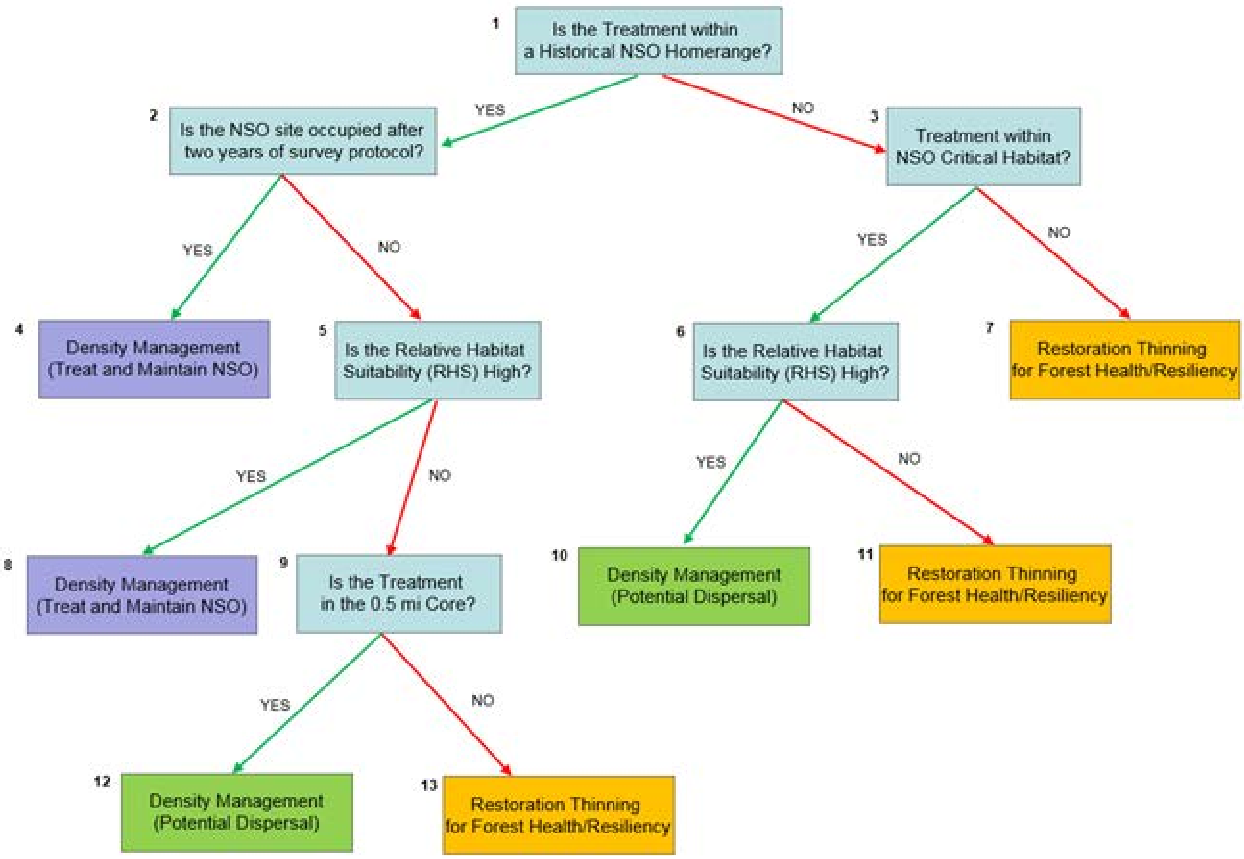
Taylor Creek

The Taylor Creek watershed is listed as a key watershed in the 1995 ROD/RMP. Key watersheds serve as refugia for maintaining and recovering habitat for anadromous salmon and resident fish species. Thinning treatments are proposed within this watershed. There are proposed temporary reconstructed and new routes proposed within this watershed. This would include about 1,500 feet of reconstruction, 450 feet of operator spur routes, and about 700 feet of new construction. These temporary routes would be decommissioned after use and therefore there should be no net increase in the amount of roads in this watershed. There are 2.5 miles of haul routes mostly along the ridgetop between Taylor Creek and Pickett Creek under both Action Alternatives. As mentioned above, this is discussed further in the Chapter 3 Hydrology effects analysis write-up.

Forest Management Activities

Alternative 2 was designed to meet the needs of stands identified for treatment, while at the same time balancing the needs of the threatened NSO. The flow chart below illustrates how consideration for the northern spotted owl and its habitat influences where treatments may occur on the landscape. Alternative 2 emphasizes forest health and restoration.

Figure 2-1 Decision Framework for Alternative 2, Forest Health and Restoration Emphasis



Silvicultural activities are being proposed to harvest timber, develop forest structure, and/or move stands towards desired conditions for multiple objectives. Treatments would reduce stand densities and may include the creation of small openings within stands and around large legacy trees and less prominent species, see Figures 3.1-2, 3.1-6, 3.1-9 and 3.1-12 in Chapter 3.1. These treatments may also include the retention of untreated areas. Prescriptions would promote vertical and horizontal heterogeneity in stands, generally utilizing a thin from below strategy to maintain larger tree structure. Objectives would:

- Provide viable commercial products (volume);
- Enhance residual tree vigor and promote stand resiliency;
- Develop within-stand species diversity and structural complexity;
- Shift forest composition towards more drought and fire tolerant tree species
- Protect large older trees with complex forms that are important for wildlife; and
- Reduce fuel loadings that exacerbate high severity fire risk.

Activity fuels, which can also be called slash, would be assessed following treatment. Slash may be treated using one or more of the following actions: lop and scatter, hand pile and burn, chipping, biomass utilization for electric power generation, and maintenance underburning.

The Action Alternatives propose vegetation treatments that may produce woody biomass and special forest products that could be removed through stewardship contracts, and timber sale contracts. Understory reduction treatments may be implemented through service contracts.

Description of Forest Management Treatments

Restoration Thinning (RT):

This silvicultural approach will be used where the purpose is to reduce stand density and fuel loadings, increase vigor, and reduce insect and disease mortality similar to levels found in stands that have an intact fire regime which can also be described as a historically typical pattern of fire intensity and frequency. The desired condition is an open growing, structurally diverse stand with openings that allow the natural regeneration or low density planting of early seral trees such as pines and oaks as well as dense, shaded refugia for wildlife. Underburning (low intensity prescribed burning beneath the forest canopy) would be considered after mechanical operations have been completed to further reduce fuel loadings, recycle nutrients and stimulate plant growth. A restoration thinning allows for the protection and development of important NSO habitat features over the long-term, such as large diameter, open grown trees with large lower limbs. Restoration thinning also can help reduce wildfire impacts. Restoration Thinning could result in minimum canopy covers of 30 percent averaged over the treatment area of the units.

Density Management (DM):

Where NSO habitat maintenance is the short-term objective and habitat improvement is the longer term objective of treatment, a density management strategy will be used. Stands will be thinned or partially harvested to enhance forest health, stand structure, or function. The desired condition is one that maintains at least 40 percent canopy cover for NSO dispersal, or 60 percent canopy cover for NSO nesting, roosting and foraging functions while protecting old growth trees and promoting a multi-layered complex stand. Underburning would be considered after mechanical operations have been completed to further reduce fuel loadings, recycle nutrients, and stimulate plant growth. The term “treat and maintain (TM)” indicates that the habitat function that currently exists would continue to function after the treatment is completed. A habitat “downgrade” (DG) indicates that a minimum of dispersal function would be maintained after the treatment are completed.

Mortality Salvage (MS):

Mortality salvage is listed here to inform the reader of its definition. MS is not proposed as a primary treatment that would be applied to an entire stand. Rather, MS may occur incidentally within the PA as warranted by the occurrences listed below. In the event that stands are impacted by self-thinning or disturbances such as windstorms, fire, or insect and disease mortality, salvage may be warranted to reduce fuel loadings and capture economic value. Only mortality exceeding the level needed to meet snag retention and other habitat goals and provide desired levels of coarse woody debris (CWD) would be harvested.

Understory Reduction (UR):

Small dimeter understory reduction (material less than 8 inches in diameter) may be coupled with restoration thinning and density management harvest treatments. This type of treatment focuses on thinning understory vegetation. Generally, the treatment is focused on cutting vegetation that is 8 inches in diameter or less and is often performed on regular spacing interspersed with clumps of treated and untreated areas. Material that is less than 8 inch would remain on site and be dispersed, or hand piled and burned. Small diameter UR treatments may occur within red tree vole buffers and in Riparian Reserves, because this treatment only alters the understory and is expected to have no effect on the retention of overall unit canopy cover.

Understory reduction, associated with Special Forest Products (material between 8 and 14 inches in dimeter), would not be removed from areas where restoration thinning and density management treatments occur. Any Special Forest Products that are removed would be less than 14 inches in diameter and would be located outside of resource buffers such as red tree vole areas, botany buffers, the Inner Riparian Zone, and northern spotted owl sites. Any Special Forest Products would be removed with OHVs and trailers and would adhere to Best Management Practices and Project Design Features.

Hazardous Fuels Reduction Maintenance (HFRm)

Hazardous fuels reduction maintenance (HFRm) treatments would be designed to reduce and maintain tree and brush densities in previously treated stands. These treatments would improve stand-level residual tree growth and vigor, and reduce the fire hazard (reduction in surface fuels and ladder fuels), potentially decreasing the risk of wildfire climbing into the crowns of trees. HFRm treatments are being considered for managed and naturally developed stands to improve and/or maintain existing desired conditions.

Treatments could include slashing, hand piling, hand pile burning, chipping, lop and scatter, biomass removal, and/or understory burning. Conifers would likely be spaced 16-20 feet apart while hardwoods would be spaced 25-45 feet apart. No trees greater than 8 inches in diameter at breast height (DBH) would be cut unless joined with another silvicultural prescription. Within the Riparian Reserve, material to be hand piled would be limited to six inches on the large end of the log to provide for soil protection and small wood recruitment.

Activity Fuels Treatments

Activity fuels treatments differ from HFRm treatments because activity fuels treatments refer to the treatment of slash following silvicultural activities. Stands receiving activity fuels treatments may or may not have been treated in the past, while stands receiving HFRm treatments have been treated in the past.

Trees to be removed for commercial harvest would be whole-tree yarded or yarded with tops attached to minimize activity slash remaining within the harvest units. It is anticipated that the majority of the activity slash would be extracted from each unit by this process and piled at the landing sites. In areas utilizing ground-based harvest equipment, processing of tops within skid trails may occur and the resulting slash would be driven over by the ground-based equipment. Merchantable sawlogs would be removed from yarded material, and any remaining debris at the landing sites would be machine and/or hand piled and burned at approved locations, chipped, or removed for biomass utilization. Machine piling may occur on landings and within units that are adjacent to roads.

Activity slash within ground-based units, that occurs adjacent to roads and on landings, may be machine or hand pile/burned, chipped, lopped and scattered, retained as CWD or underburned. Activity slash within the remainder of ground-based units may be hand pile/burned, lopped and scattered, retained as CWD, or underburned. Activity slash within cable and helicopter units may be hand pile/burned, chipped, lopped and scattered, retained as CWD, or underburned. All post implementation activity slash treatments are based upon a post-harvest assessment of fuel loading.

The purpose of a lop-and-scatter treatment is to break up concentrations of material so that the slash does not increase the fire hazard. The lop portion of "lop-and-scatter" would cut slash so it would not exceed 18 inches in height from the ground and material less than 6 inches in diameter would be cut into pieces so it would not exceed 8 feet in length. Scattering would arrange slash in a discontinuous pattern across the forest floor, thus reducing postharvest fire hazard.

If the amount of slash remaining in units results in excessive quantities of fuel loading which would appear as a lack of open space to scatter the slash, treatment by chipping or machine/hand pile and burn may be recommended.

Underburning (UB)

BLM fire and fuels management personnel would conduct pre- and post-treatment evaluations to determine the need for maintenance underburning for all proposed treatments. Maintenance underburning would involve the controlled application of fire to understory vegetation and downed woody material when fuel moisture, soil moisture, and weather and atmospheric conditions allow for the fire to be confined to a predetermined area at a prescribed intensity to achieve the planned resource objectives. Underburning provides a low cost method to maintain desired condition class and reduced activity fuel. Maintenance underburning would occur within 15 years from the initial or follow-up maintenance fuels reduction treatments.

Coarse Woody Debris (CWD)

A renewable supply of large down logs is critical for maintaining populations of fungi, arthropods, bryophytes, and various other organisms that use this habitat structure. Specific measures for CWD are intended to be applied in Matrix and Matrix Adaptive Management Areas. All proposed treatments are thinning treatments and would retain adequate numbers of trees in relevant sizes classes to contribute to future CWD recruitment. A minimum of 120 linear feet of logs per acre greater than or equal to 16 inches in dimeter and 16 feet long would be retained. Logs already in place that are mostly decomposed would not contribute to the total. Down logs would reflect the species mix of the original stand. As stated in the North West Forest Plan Standards and Guides. Partial harvest treatments such as thinning units, should apply the same basic guidelines but should be modified to reflect the timing of stand development cycles. CWD already on the ground would be retained and protected to the greatest extent possible from disturbance during treatment.

The marking guidelines located in Appendix F require snags greater than 20 inches in diameter to be retained. Any snags that need to be removed for safety reasons would be marked and only felled following approval from the Authorized Officer. Snags are expected to become future sources CWD. Additionally, the marking guide directs the retention of trees which show signs of conk or damage and these trees would also contribute to snag recruitment and future CWD.

Stewardship Proposal

A subsection of the units proposed for treatment within the PA may use stewardship contracting authority to accomplish the active management proposal. Stewardship contracting provides the flexibility of a service contract with a product removal contract. The primary objective of stewardship contracting is to achieve the land management goals described above in the Purpose and Need section. Goals identified in the legislation authorizing stewardship contracting include removing vegetation or other activities to promote healthy forest stands, reduce wildfire hazards, or achieve other land management goals (http://www.fs.fed.us/restoration/Stewardship_Contracting/faqs.shtml). The areas selected for stewardship would utilize the silviculture prescription listed above and employ yarding systems described below. Examples of woody biomass and special forest products that may be removed under a stewardship contract are firewood, chips/hog fuel, and small diameter poles. The proposed treatment units are analyzed within this EA.

Description of Riparian Reserve (RR) Thinning Treatments

Field surveys revealed that RRs within the proposed treatment units are also in need of treatment in order to better achieve ACS objectives. This project is proposing 1,040 acres of riparian thinning under Alternative 2 and no commercial riparian thinning under Alternative 3. RR widths are based on a typical site potential tree height (190 feet for the Pickett West project) in the PA. Each 5th field watershed has a site potential tree which reflects the site productivity; it is not an exact measurement at each site. The largest site potential tree buffers are 190 feet for the Lower Applegate and Deer Creek watersheds and 185 feet for the Hellgate Canyon - Rogue River watershed. To be consistent, the site potential tree height for the PA was selected to be 190 feet. Based on this site potential tree height, intermittent and non-fish bearing perennial streams are assigned a 190 foot RR buffer on both sides of the channel. Perennial fish bearing streams are assigned a 380 foot RR buffer on both sides of the stream.

The proposed treatments in the RRs are based on field surveys and silvicultural review. Proposed treatments are designed to help accelerate the development of multiple canopy layers, increased species diversity, and increased conifer and hardwood vigor. No treatments are proposed in riparian stands that have multiple canopy layers and high levels of species diversity or in wetlands, unstable soil areas, springs, or seeps. Stands that exhibit conditions such as overstocking, minimal canopy layers, low species diversity, or low conifer and hardwood vigor were selected for potential treatment. Within these stands riparian thinning is expected to benefit perennial and intermittent streams, fish habitat, and habitat for other aquatic species by promoting species diversity and resiliency to disturbance in the riparian forest stands.

Outer Riparian Zone treatments are designed to enhance resiliency and sustainability to obtain ACS objectives. ACS objectives address the physical integrity of the aquatic system, including shorelines, banks, and bottom configuration of streams. ACS objectives also address sediment and in-stream flow including the timing, volume, rate, input, storage, transport and spatial distribution of peak, high and low flows. Floodplain characteristics and health of wetland and riparian features must be considered for ACS objectives as well as the role and function of CWD in maintaining healthy productive, complex and resilient aquatic and riparian systems. Treatment may help riparian stands better recover from or withstand disturbances by promoting species diversity and forest health.

The objectives of riparian thinning treatments are to expedite the development of late successional, multi-story habitat conditions (RMP, p. 22) and “restore the species composition and structural diversity of the plant communities” needed to achieve ACS and RR objectives (RMP p. 26); accelerate the development of late-successional stand conditions such as older forest stand characteristics; increase conifer growth rates; and encourage larger remnant conifers and hardwoods. Activities that are intended to enhance RR characteristics and attain ACS objectives are authorized under the NWFP following the completion of a Watershed Analysis (USFS/BLM 1994, pp. C-31-32). The Deer Creek, Lower Applegate and Hellgate-Rogue Watershed Analyses were used in the analysis of the PA. These documents are available for review on the Medford BLM website at http://www.blm.gov/or/districts/medford/plans/inventas.php.

Inner Riparian Zones

Treatments within the Inner Riparian Zone would employ no-treatment buffers to ensure protection of water quality during and after treatments. The following paragraphs describe the application of these protection zones within the RR to maintain ACS objectives such as reducing erosion, promoting wood recruitment, and maintaining stream temperatures.

Commercial treatments would not occur within the 50 foot no treatment buffer for intermittent streams and for perennial fish bearing and non-fish bearing streams no treatment would occur within the 120 foot no treatment buffer. To protect riparian characteristics commercial treatments would not occur within the 25 foot no treatment buffer for wetland areas, unstable soils, springs and seeps.

To protect riparian characteristics hazardous fuel reduction treatments and understory reduction treatments would not occur within the 25 foot no treatment buffer for intermittent streams. Hazardous fuels reduction treatments and understory reduction treatments would not occur within the 50 foot no treatment buffer for all perennial streams.

These buffers are designed to be protective of the root network of typical trees in this area, mitigate potential impacts to hydric soils, and avoid sedimentation. One study found that 95 percent of the erosion features from timber harvest 32.8 feet from streams delivered no sediment to stream channels (Rashin et.al. 2006). In addition to the stabilizing effect of the root network, adjacent trees also dissipate stream energy during high or overbank flows, further reducing bank erosion (FEMAT 1993). Studies have shown that "vegetation immediately adjacent to the stream channel is most important in maintaining bank integrity" (FEMAT 1993). No treatment buffers can be extended to protect unstable slopes that have been identified to be at risk of landslides, mass-wasting or slumping.

Each proposed treatment unit has been visited at least once by field crews looking specifically at the soil and water resources. Field surveys occurred primarily in the period from June 2016 to March 2017. Typical field crews consist of three people with extensive field experience directed and supervised by a BLM hydrologist and soils specialist. Field verification of information has occurred in most units in the field by a hydrologist and soils specialist.

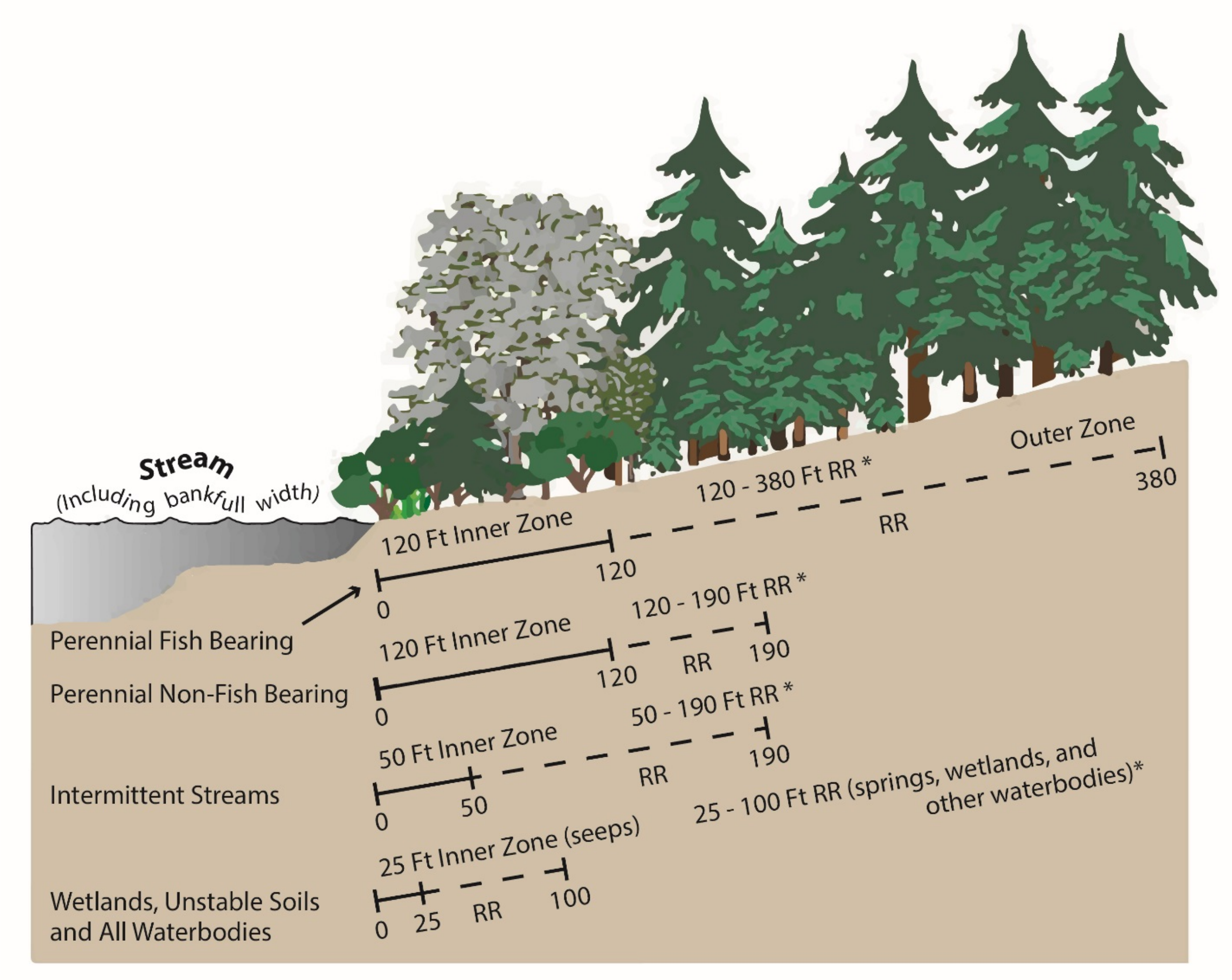
The 120 foot no commercial treatment buffer for perennial streams is set for the protection of the primary shade zone, as described in the NWFP Temperature Total Maximum Daily Load (TMDL) Implementation Strategies (USDA/USDI 2012a, Table 4). Based on a study conducted on the Rogue River Siskiyou National Forest in 2006 a no-cut buffer of 60 feet was found to be effective in maintaining the Angular Canopy Density and therefore the effective stream shade (USDA/USDI 2012a). Research indicates that microclimate gradients are important for maintaining stream temperature and are the strongest near streams and diminish rapidly moving upslope. Near-stream microclimate gradients appear to be topographically controlled. Density management or thinning beyond 15 meters (50 feet) does not measurably affect microclimate (USDA/USDI 2012a).

Empirical and modeling studies suggest that stream wood input rates decline with distance from the stream and the majority of in-channel wood recruitment comes from within 120 feet of the stream channel (ICS 2013: Appendix 3: Item I). Density management, or thinning, of riparian stands to benefit the aquatic and riparian environment is therefore tied to attainment of the ACS objectives when used with a no treatment buffer.

Canopy cover in the RR would remain above 40 percent or 60 percent depending on the silvicultural prescription. Activities in the RR would be designed to improve habitat conditions in the long-term for the wildlife and plant species that use this zone.

Below is an illustration of stream buffer distances per stream type.

Figure 2-2 Commercial Treatments: Riparian Reserves and No Treatment Buffer Distances



**All distances are measured on slope distance not horizontal distance.*

Description of Yarding Systems

Harvest operation systems are comprised of pairing different harvesting mechanisms with various yarding mechanisms. Harvesting mechanisms are comprised of mechanical and manual harvesting methods. Mechanical methods include the use of harvesters or feller-bunchers which cut, fall and/or process logs prior to removal from the treatment unit. Manual harvesting methods include the use of chainsaws in which trees are felled, limbed and bucked within the treatment unit. Mechanical harvesting is generally limited to slopes of 35 percent, unless tethered via a synchronized winch system (see below), in which case they are limited to 70 percent for safety purposes. Manual harvesting is utilized on slopes over 35 percent and generally paired with skyline yarding (see below). Most resource concerns stem from the yarding system due to effects of removing cut timber from treatment units.

The descriptions below detail the yarding systems proposed for this project. Harvest operation systems are assigned to commercial treatment units based upon methodologies and assumption defined in BLM manual H-5420-1 Timber Sale Handbook. The handbook directs the BLM to explore the lowest cost methods to accomplish the yarding of commercial products while providing for, but not exceeding, the necessary or required level of environmental protection. The average cost of the different types of yarding systems may influence the final decision for this project.

Most often, slope determines whether ground-based or skyline yarding systems would be utilized. Ground-based systems are generally limited to slopes less than 35 percent, and skyline systems are generally used on slopes greater than 35 percent. However, resource buffers, temporary route feasibility, and harvesting feasibility would determine the final yarding systems. Yarding systems may include the use of skyline cable yarding, conventional ground-based yarding, tethered assist cut-to-length systems, and helicopter yarding.

The yarding systems listed below may utilize whole tree yarding or yarding with tops attached to minimize impacts to retained trees and soils. This means that the trees may be yarded to the landings with tops and limbs attached or with the limbs removed but with the tops attached. The remaining processing of the logs would occur at the landing. Tops and limbs would be removed and logs would be cut into desired lengths.

Skyline Yarding

Skyline cable yarding systems are in a fixed position, usually attached to a yarder or a tower from which cables, carriages, and winches originate. The yarder, tower, and cables utilized in this system may require the use of tail hold and/or guylines to remain erect. The carriage is a load-carrying device from which logs are suspended and rides into the interior of the unit and returns back to the landing along the skyline cable. The tail end of the cable yarding corridors will be at least 150 feet apart; cable yarding corridors may converge near the landing. Landings are generally ¼ acre in size when multiple yarding corridors converge, but can be smaller in size if servicing only one yarding corridor. Landings would be located outside of the Inner Zone of Riparian Reserves when possible. Often no additional disturbance is created if the landing is located on an existing road and services one or two corridors.

Some areas will require full suspension yarding across streams, depending on the alternative selected. Under these circumstances, cable yarding corridors would be previously approved to ensure limited impacts to Inner Riparian Zones including shade requirements. Full suspension yarding would require the entire tree to be lifted in complete suspension across the Inner Riparian Zones. All trees within the Inner Riparian Zones required to be cut for yarding operations would be left on site as course woody debris and not yarded to the landing.

The cost of utilizing skyline cable yarding systems averages to approximately $150 to $250 per acre. Costs are dependent upon the external and average yarding distance, the volume of timber being removed per acre, the size of the material being yarded from the unit, and the operator and the equipment which is utilized.

Conventional Ground Based Yarding

Ground-based yarding systems utilize tracked or wheeled tractors to transport logs from the interior of units to landing areas. Trees are either manually or mechanically felled and processed, depending on resource protection concerns. Landing areas are generally ¼ acre in size and are located outside of the Inner Riparian Zone with the exception of three units 7-3, 13-2, and 35-11. The landings in these three units may still be located outside of the Inner Riparian Zone during implementation. The equipment utilized with this system operates on designated skid trails or existing skid trails when possible which are required to be located 150 feet apart at the back end of the unit. Operations would generally occur on ground that is less than 35 percent slope. Ground-based yarding equipment is required to utilize an integral arch which is able to suspend logs on one end. This minimizes soil disturbance and compaction.

Tractor swing routes enable yarders to "walk" up designated skid trails in which the yarder is set up along the skid trail where corridors are needed to facilitate cable yarding operations. From the location of the yarder along the tractor swing route, a skidder as described in the above paragraph would skid logs using one end suspension to a landing on an existing road in which logs are loaded onto a log truck and hauled to the mill. Tractor swing routes provide for access to cable yarding areas where building a temporary road would be infeasible or full bench construction would be needed. Tractor swing routes are generally located on ridgetops with slopes less than 35 percent or midslope through units on slopes less than 35 percent to access steeper slopes for cable yarding operations. Tractor swing routes would be fully decommissioned similar to skid trails. Generally, due to the number of passes required to be made during tractor swing operations, these see more disturbance than a skid trail. Dry condition operations limit the impacts of these tractor swing routes and proper decommissioning measures ensure mitigation of excess impacts.

The cost of utilizing ground based yarding systems averages to approximately $130 per acre. As discussed above, costs are dependent upon the external and average yarding distance, the volume of timber being removed per acre, the size of the material being yarded from the unit, and the operator and the equipment which is utilized.

Tethered Assist Yarding

Within the Adaptive Management Area, a tethered assist cut-to-length system may be used. This system utilizes a harvester and forwarder paired together in which the harvester processes logs in the woods and the forwarder fully suspends them over the ground for transport to the landing. A synchronized winch system allows the equipment to travel over harvest slash mats on steep terrain with greatly reduced soil impacts. Tethered Assist systems generally exert 5 pounds per square inch of ground pressure when operating without tire chains, and 4 pounds per square inch (PSI) when operating with tire chains. This is important because it is assumed that when these machines operate on a slash mat with PSIs as described above soil compaction and productivity loss remains below the thresholds described in PDF Chapter 2.4. This system can reduce road construction needs due to longer allowable travel distances to and from landings. Processing logs in the woods maximizes payloads per turn. Use of the tethering system (winch) on this equipment is required on slopes over 50 percent by Oregon Occupational Safety and Health Administration. Tethered assist systems are generally limited to 70 percent slopes due to operator safety and comfort levels.

Helicopter Yarding

Helicopter yarding uses a helicopter to transport logs from the interior of a unit to a landing. Trees are cut and usually limbed within the interior of the unit. A mechanized harvester may be used on slopes less than 35 percent to process and pre-bunch logs prior to yarding. A person within the unit attaches a cable to a group of trees which are then lifted and transported to a nearby landing location.

The cost of utilizing helicopter yarding systems are generally the most expensive, averaging approximately $350 to $500 per acre. Yarding costs are dependent upon the external and average yarding distance, the volume of timber being removed per acre, the size of the material being yarded from the unit, and the operator and the equipment which is utilized. Because the BLM is directed to explore the lowest cost methods to accomplish yarding, the helicopter method is often not economically feasible.

Landings

All of the yarding systems described above require some form of landing. The landing is the area where trees are processed into logs and loaded onto log trucks. For skyline systems, conventional ground based systems, and tethered assist systems landings would generally be ¼ acre in size and placed within the boundary of proposed treatment units. These areas would be winterized if they are needed for multiple operating season and fully decommissioned once operations, including the burning of landing piles, is conducted. Landings would be located outside of the Inner Riparian Zone, with the exception of three units 7-3, 13-2, and 35-11. It is possible these landings may still be located outside of the Inner Riparian Zone during implementation.

Helicopter landings are generally 1 acre in size. Existing landings are used where possible but new landings may be needed. Existing disturbance areas would be utilized as the first choice when possible. Selected helicopter landings would generally be within ½ mile of treatment units, would be placed where the vegetation is mainly in shrub form or where vegetation is lacking entirely, placed on or near ridge tops, and at large road junctions. Because helicopter landings are expected to be located near ridges and where vegetation is lacking they would be located outside of the Inner and Outer Riparian Zones. These areas would be winterized if they are needed for multiple operating season and fully decommissioned once operations, including the burning of landing piles, is conducted.

Road Management

Road management categories define the intended use of roads by the public and for BLM administrative purposes. Many of the roads on BLM-administered lands provide access to public or private lands for fire or silvicultural treatments, are encumbered under reciprocal right-of-way (ROW) agreements, or provide access to private lands; and therefore will remain open or be decommissioned at the end of the project.

Efforts made to fully decommission or obliterate existing roads require the BLM to coordinate with local governments and property owners. Medford BLM has the following road management categories that will be determined for each road used by the project (not all categories will be utilized during this project):

- Open, No-Restrictions – These roads should be left in a well maintained condition appropriate for the future use. In most cases, this would require maintenance, leaving all drainage features in place and improving aggregate surfacing to achieve the same or better road condition as when the project began. Roads may still have seasonal restrictions for activities, and use is predicated on good maintenance conditions.

- Open with Administrative Conditions – These are typically resource roads, closed with a gate or barrier. The road will be closed to public vehicular traffic but may be open for BLM/Permittee commercial activities. The road may or may not be closed to BLM administrative uses on a seasonal basis depending upon impacts to the resources. Drainage structures will be left in place.

- Decommissioned – The road segment will be closed to vehicles on a long-term basis, but may be used again in the future. Prior to closure the road will be left in an erosion-resistant condition or “storm-proofed” by removing culverts, eliminating diversion potential at stream channels, stabilizing or removing fills on unstable areas, installation of rolling dips and/or outsloping and stabilizing the road prism. Exposed soils will be treated to reduce sediment delivery to streams. The road will be closed with an earthen barrier or its equivalent. This category can include roads that have been or will be closed due to a natural process (abandonment) and may be opened and maintained for future use.

- Fully Decommissioned – Permanent closure of roads determined to have no immediate need such as temporary roads. These roads would be decommissioned as described above. These roads would be decompacted, seeded, mulched, physically blocked, and/or planted to reestablish vegetation.

- Obliteration (full site restoration/permanent) – Roads receiving this level of treatment have no future need and would be returned to the original contours or a stable condition that approximates the original topography.

All temporary routes constructed or reconstructed/renovated for timber harvest would be fully decommissioned after use. No increase in the open road network is proposed for this project.

Road Work

For Alternative 2, proposed road work associated with active forest management includes 14 miles of new temporary route construction and 9 miles of existing route renovation/reconstruction. Approximately 231 miles of road maintenance on existing haul routes would be conducted. All road use would be consistent with existing ROW agreements.

For Alternative 3, proposed road work associated with active forest management includes no new temporary route construction and 7 miles of existing route renovation/reconstruction.

Approximately 218 miles of road maintenance on existing haul routes would be conducted. All road use would be consistent with existing ROW agreements.

<u>Description of Road Work Activities</u>

Road Maintenance

Road maintenance restores a road to its original design standard. Typical maintenance may include, but is not limited to: road blading and reshaping; spot rocking and surface replacement; ditch cleaning; cut-bank sluff removal; culvert inlet and outlet clearing; catch basin cleaning; culvert replacement; and removing vegetation along roadsides to improve sight distance for travel. Vegetation naturally re-establishes itself on road surfaces over time if not removed by maintenance activities. Revegetation generally starts with non-vascular plants, followed by herbaceous plants, then brush and trees. Road maintenance activities may remove all types of vegetation that are within 5-8 feet from either edge of the road prism. PDFs direct vegetation to be cut rather uprooted.

Temporary Routes

Immediately following the treatment of activities fuels, all temporary routes would be fully decommissioned. Route decommissioning would include blocking routes, decompacting to allow for water infiltration, installing water bars, and applying seed and mulch. Water bars filter water runoff and direct drainage off the road surface and away from streams and into vegetation that is adequate to slow surface water and allow for the deposition of detached soil particles. Mulching helps minimize surface erosion and seeding aids in re-establishing vegetation.

- New Temporary Route Construction – This action includes short-term overland routes authorized for the development, construction, or staging of a project that has a finite lifespan.

Temporary routes are not intended to be part of the permanent or designated transportation network system.

- Existing Temporary Route Renovation/Reconstruction – Renovation restores an existing unmaintained route to its original or modified design standard. Reconstruction restores a badly damaged or deteriorated route to a useable condition and design standard. Activities may include realignment, slide and slope failure repair, structure upgrades, and removal of existing stumps from the subgrade. Renovated/reconstructed routes would be decommissioned after use, which may include decompacting installing water bars (where needed), applying seed and mulch, and blocking routes.

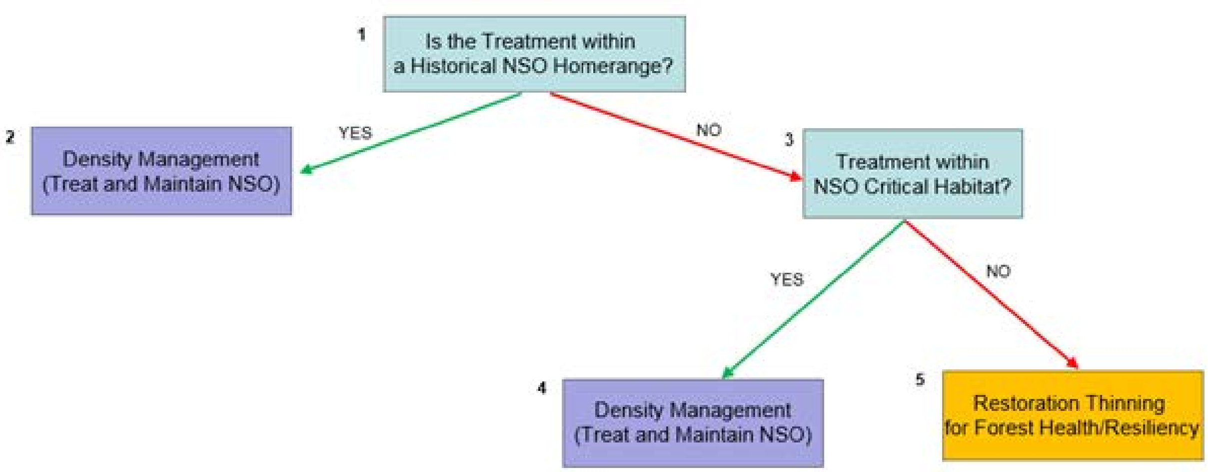
- Tractor Swing Routes – These routes provide temporary access to the interior of units for yarders and log skidders. These routes are not capable of accommodating log trucks. Tractor swing routes would be fully decommissioned after use, which would include subsoiling, installing water bars (where needed), applying seed and mulch, and blocking routes.

- Operator Spurs – These spurs provide temporary access for short distances which would not exceed 200 feet. They are not designed to accommodate log trucks. They are designed to accommodate a yarder or a tractor. These spurs would be fully decommissioned after use.

2.3 Action Alternative 3

Alternative 3 was developed in response to public comments received during the scoping period. Specific elements include no new temporary route construction, no commercial treatments within Riparian Reserves, and northern spotted owl treat and maintain prescriptions within their critical habitat. The flow chart below illustrates how the maintenance of all spotted owl habitat types influences treatments options. Limiting treatments to those that only retain spotted owl habitat may not consider the needs of that specific stand, such as sites that were historically pine and oak and could benefit from a treatment that downgrades northern spotted owl habitat.

Figure 2-3 Decision Framework for Alternative 3, Northern Spotted Owl Habitat Maintenance Emphasis



Within the Matrix LUA Alternative 3 would contribute to the purpose and need for the production of a sustainable supply of timber but to a lesser degree than Alternative 2. A reduction in the number of proposed new temporary routes may limit the economic viability of a timber sale because instead of utilizing conventional extraction methods (cable/tractor), helicopter yarding may be required, which is costlier. The BLM is required to pursue a cost effective method to remove commercial forest products which why there is an increased number of tractor swing routes in Alternative 3 when compared to Alternative 2. While tractor swing routes have a smaller footprint on the landscape than newly constructed temporary routes soil within these tractor swing routes may experience greater displacement due to the dragging of a single end of a log or group of logs. Project design features such as securing exposed soil prior to rain events would prevent sediment from mobilizing offsite. Tractor swing routes would be fully decommissioned following use and are expected to leave a smaller footprint on the landscape. The goals of the ACS would not be achieved because no commercial treatments would occur in Riparian Reserves.

Alternative 3 would meet the purpose and need as described in Chapter 1.3 but to a lesser degree than Alternative 2. There is a possibility that the Field Manager may choose portions of any of the 3 Alternatives.

Deferred Watershed

White Creek

As discussed above under Alternative 2, White Creek is a deferred watershed located within the Pickett West PA. Under Alternative 3 no ridgeline routes would be constructed or reconstructed for use. There would be no hauling proposed on rocked or surfaced roads within the watershed, thus the road maintenance that would have occurred under Alternative 2 would not be implemented under this project. Under this Alternative the no road improvements would be conducted, so the watershed would not benefit from lowered sediment production. Road maintenance activities are dependent upon available funding, which limits that amount and extent that occur outside of roads needed for timber sale hauling activities. Roads used for hauling during timber sale activities are maintained by the purchaser of the timber sale and are included in the cost of the timber sale. Road maintenance activities associated with timber sales decrease the likelihood of road failures due to erosion. Under Alternative 3 there would be benefit of road improvements within the White Creek deferred watershed. This is discussed further in the Chapter 3 Hydrology effects analysis write-up.

Key Watershed

Taylor Creek

Under Alternative 3 there would be no construction of new temporary routes within this watershed. There are two temporary routes that would be reconstructed (1,500 feet), these routes are on ridgetops and have clear existing footprints on the ground. There would be 1,118 feet of tractor swing routes in the watershed. Tractor swing routes do not require road surface construction and are not used for hauling. These temporary routes would be decommissioned after use and therefore there should be no net increase in the amount of roads in this watershed. There are 2.5 miles of haul routes mostly along the ridgetop of this watershed are proposed under both Action Alternatives. As mentioned above, this is discussed further in the Chapter 3 Hydrology effects analysis write-up.

Common to Both Action Alternatives 2 and 3

During the public scoping process the BLM received comments which included specific elements such a no regeneration harvest and no treatments within the late successional reserve land use allocation. As described above in chapter 1.7, the regeneration harvest units were dropped because of funding deficits which made it infeasible to gather the necessary data to confirm that regeneration harvest prescriptions were warranted. Although it is not displayed in Table 2-1 below, public comments contributed to removing regeneration harvest prescriptions from both alternatives, no regeneration harvest prescriptions became part of the overall project proposal.

Public comments also requested no treatments within the Late Successional Reserve land use allocation. As described above in the Chapter 1.7, treatments within the Late Successional Reserve were deferred due to technical and economic infeasibilities of completing needed surveys and field work. Although it is not displayed in Table 2-1 below, public comments contributed to removing treatments within the Late Successional Reserve from both alternatives, the deferral of treatments within the Late Successional Reserve became part of the overall project proposal.

Below is a description of the differences between Action Alternatives 2 and 3.

Table 2-1 Action Alternatives 2 and 3 Comparison

Alternative 2	Alternative 3
No diameter restriction in the Matrix and Matrix Adaptive Management Land Use Allocations.	21 inch diameter restriction within the Matrix and Matrix Adaptive Management Land Use Allocations.
New temporary routes – New temporary routes, reconstructed routes, and renovated routes are proposed.	No new temporary routes. Only reconstructed and renovated routes are proposed.
Commercial and non-commercial treatments may occur within Riparian Reserves.	No commercial treatments are proposed within Riparian Reserves.
Proposed treatments may downgrade habitat within northern spotted owl Critical Habitat and northern spotted owl home ranges.	Proposed treatments would treat and maintain habitat within northern spotted owl Critical Habitat and northern spotted owl home ranges.

Table 2-2 Action Alternative Totals

Number of units	147		147	
	Alternative 2		*Alternative 3*	
Commercial Treatments				
	Upland	Outer Riparian Zone	Upland	Outer Riparian Zone
Commercial Restoration Thinning (RT)	2,394	631	1,028	0
Commercial Density Management (DM)	1,819	407	3,185	0
Non-commercial Treatments				
Non-commercial Inner Riparian Zone Understory Reduction	754		754	
Non-commercial Outer Riparian Zone Understory Reduction		1,038		1,038
Non-commercial Upland Understory Reduction	4,213		4,213	
Total Commercial and Non-commercial Treatment Acres	**6,005**		**6,005**	
Hazardous Fuels Reduction maintenance (HFRm)	11,102		11,102	
Harvest Type (acres)	**Alternative 2**		**Alternative 3**	
Conventional Ground-based harvesting	1,292		909	
Tether Assist yarding	1,166		335	
Cable yarding	1,987		1,264	
Helicopter yarding	806		1,705	
Total Acres	5,251		4,213	
	Alternative 2		**Alternative 3**	
Road Work Summary	**Approximate Amount (miles)**			
New Temporary Route Construction	14		0	
Existing Temporary Route Renovation/Reconstruction	9		7	
Tractor Swing Routes	5		11	
Road Maintenance	231		218	

**Non-commercial Understory Reduction treatments may occur in the upland and the Inner and Outer Riparian Zone regardless of Alternative. The 1,038 acres of Non-commercial Outer Riparian Zone Understory Reduction treatments are not additional to the commercial treatments proposed within the Riparian area, both commercial and non-commercial treatments may occur on the same acres.*

2.4 Best Management Practices and Project Design Features

2.4.1 Best Management Practices (BMPs)

BMPs are methods, measures or practices incorporated into the project to meet the requirements of the Clean Water Act (CWA) of 1972 as amended, to reduce nonpoint source pollution to the maximum extent practicable. A BMP is a practice or combination of practices that are effective and practicable in preventing or reducing the amount of pollution generated by diffuse sources to a level compatible with water quality goals (40 CFR 130.2 (m)). BMPs reduce sediment delivery from BLM roads and are incorporated into the 1995 RMP through an RMP plan maintenance action in July of 2012. The purpose of applying project BMPs is to minimize or prevent sediment delivery to the waters of the United States.

The Action Alternative assumes the proper application of BMPs for roads to protect soil and water resources. Proper application of these BMPs constitute BLM's compliance with the CWA of 1972, as amended to reduce nonpoint source pollution, state of Oregon water quality legislation (chapter 340), and the O&C Act which sets land ownership boundaries for the Revested Oregon and California Railroad and Reconveyed Coos Bay Wagon Road grant lands.

The strategy for managing and controlling nonpoint source water pollution from BLM-administered lands in the State of Oregon is outlined in the 2001 Memorandum of Understanding (MOU) between the State of Oregon DEQ and BLM. BMPs are the primary methods for achieving Oregon's water quality standards for non-point pollution sources, such as those that may occur on public lands. Oregon's MOU for water quality standards, including numeric standards, are designed to protect designated beneficial uses (such as salmonid spawning and rearing, resident fish and aquatic life, domestic water supplies, and water-contact recreation). The MOU specifies that the BLM would implement site-specific BMPs as specified in Management Objectives, standards, guidelines, design features, and mitigation developed in either: RMPs, RMP amendments, project level plans, and Water Quality Restoration Plans (WQRP) to meet applicable water quality standards.

BMPs are methods, measures, or practices shown to be an effective and practical means of preventing or reducing nonpoint source pollution (USDI 2011c). Although normally preventative, BMPs can be applied before, during, and after pollution-producing activities to reduce or eliminate the introduction of pollutants into receiving waters (40 CFR 130.2, EPA Water Quality Standards Regulation).

The BMPs selected from the amended Medford RMP list demonstrate which are relevant to this project, may have already been included in project planning, in some cases have been modified to only include actions described in the proposed alternatives, and would be implemented in this project level plan and resulting Decision Record.

The incorporation of BMPs happens during project planning as the Action Alternatives are developed, BMPs are refined through the planning process, included as stipulations in the timber project, and are guidance when actions occur on public land.

Road Location

1. Locate temporary routes and landings on stable locations, e.g., ridge tops, stable benches or flats, and gentle-to-moderate side slopes. Minimize construction on steep slopes, slide areas and high landslide hazard locations. [R001 - modified]

2. Avoid locating roads and landings in wetlands, riparian management areas, floodplains and waters of the state. Avoid locating landings in areas that can contribute to dry draws and swales. [R003]

3. Locate roads and landings to minimize total transportation system mileage. Renovate or improve existing roads or landings when it would cause less adverse environmental impact. Where roads traverse land in another ownership, investigate options for using those roads before constructing new roads. [R004]

Road Design

4. Design road cut and fill slopes with stable angles, to minimize erosion and prevent slope failure. [R006]

Road Prism

5. End-haul material excavated during construction, renovation, and/or maintenance where side slopes generally exceed 60 percent, and regardless of slope where side-cast material may enter wetlands, floodplains and waters of the state. [R008]

6. Construct road fills to prevent fill failure using inorganic material, compaction, buttressing and sub-surface drainage, rock facing or other effective means. [R009]

Stream Crossing Structures

7. Minimize fill volumes at temporary stream crossings by restricting width and height of fill to amounts needed for safe travel and adequate cover for culverts. For deep fills (generally greater than 15 feet deep) incorporate additional design criteria (e.g., rock blankets, buttressing, bioengineering techniques) to reduce the susceptibility of fill failures. [R012 - modified]

8. Locate stream crossing culverts on well defined, unobstructed, and straight reaches of stream. Locate these crossings as close to perpendicular to the streamflow as stream allows. When structure cannot be aligned perpendicular, provide inlet and outlet structures that protect fill and minimize bank erosion. Choose crossings that have well defined stream channels with erosion resistant bed and banks. [R013]

9. On new construction, install culverts at the natural stream grade. [R014]

10. Use stream crossing protection techniques to allow flood water and debris to flow over the top of the road prism without the loss of the fill or diversion of streamflow. This protection could include hardening crossings, armoring fills, dipping grades, oversizing culverts, hardening inlets and outlets, and lowering the fill height. [R015]

11. When installing temporary culverts, use washed rock as a backfill material. Use geotextile fabric as necessary where washed rock will spread with traffic and cannot be practicably retrieved. [R018]

12. Design roads crossing low-lying areas so that water does not pond on the upslope side of the road. Provide cross drains at short intervals to ensure free drainage. [R020]

<u>Drainage</u>

13. Install underdrain structures when roads cross or expose springs, seeps, or wet areas rather than allowing intercepted water to flow downgradient in ditchlines. [R022]

14. Effectively drain the road surface by using crowning, insloping or outsloping, grade reversals (rolling dips) and waterbars or a combination of these methods. Avoid concentrated discharge onto fill slopes unless the fill slopes are stable and erosion proofed. [R023]

15. Outslope temporary routes to provide surface drainage on road gradients up to six percent unless there is a traffic hazard from the road shape. [R024 – modified]

16. Consider using broadbased drainage dips and/or leadoff ditches in lieu of cross drains for low volume roads. Locate these surface water drainage measures where they won't drain into wetlands, floodplains and waters of the state. [R025]

17. Avoid use of outside road berms unless designed to protect road fills. If road berms are used, breach to accommodate drainage where fill slopes are stable. [R026]

18. Divert road and landing runoff water away from headwalls, slide areas, high landslide hazard locations or steep erodible fill slopes. [R028]

19. Design landings to disperse surface water to vegetated stable areas. [R029]

20. Design stream crossings to prevent diversion of water from streams into downgrade road ditches or down road surfaces. [R030]

21. Disconnect the road runoff to the stream channel by outsloping the road approach. If outsloping is not possible, use runoff control, erosion control and sediment containment measures. These may include using additional cross drain culverts, ditch lining, and catchment basins. Minimize ditch flow conveyance to stream through cross drain placement above stream crossing. [R031]

22. Locate cross drains to prevent or minimize runoff and sediment conveyance to wetlands, riparian management areas, floodplains and waters of the state. Implement sediment reduction techniques such as settling basins, brush filters, sediment fences and check dams to prevent or minimize sediment conveyance. [R032]

23. Space cross drain culverts at intervals sufficient to prevent water volume concentration and accelerated ditch erosion. At a minimum, space cross drains at intervals referred to in the BLM Road Design Handbook 9113-1, Illustration 11 -"Spacing for Drainage Laterals". Increase cross drain frequency through erodible soils, steep grades, and unstable areas. [R033]

24. Choose cross drain culvert diameter and type according to predicted ditch flow, debris and bedload passage expected from the ditch. Minimum diameter is 18 inches. [R034]

25. Locate surface water drainage measures (e.g., cross drain culverts, rolling dips, water bars) where water flow will be released on convex slopes or other stable and non-erosive areas that will absorb road drainage and prevent sediment flows from reaching wetlands, floodplains and waters of the state. Where possible locate surface water drainage structures above road segments with steeper downhill grade. [R035]

26. Armor surface drainage structures (e.g., broad based dips, leadoff ditches) to maintain functionality in areas of erosive and low strength soils. [R036]

27. Discharge cross drain culverts at ground level on non-erodible material. Install downspout structures and/or energy dissipaters at cross drain outlets or drivable dips where water is discharged onto loose material, erodible soils, fills, or steep slopes. [R037]

28. Cut protruding "shotgun" culverts at the fill surface or existing ground. Install downspout and/or energy dissipaters to prevent erosion. [R038]

29. Skew cross drain culverts 45 to 60 degrees from the ditchline as referenced in BLM Road Design Handbook 9113-1 and provide pipe gradient slightly greater than ditch gradient to reduce erosion at cross drain inlet. [R039]

30. Use slotted risers, over-sized culverts or build catch basins where floatable debris or sediments may plug cross drain culverts. [R040]

31. Clean ditch lines to provide for unobstructed flow at culvert inlets and within ditch lines during and upon completion of road construction prior to the wet season. [R044 modified]

Waste Disposal Areas

32. Locate waste disposal areas outside wetlands, riparian management areas, floodplains and unstable areas to minimize risk of sediment delivery to waters of the state. Apply surface erosion control prior to the wet season. Prevent overloading areas which may become unstable. [041]

Stream Protection

33. Use temporary sediment control measures (e.g., check dams, silt fencing, bark bags, filter strips and mulch) to slow runoff and contain sediment from road construction areas. Remove any accumulated sediment and the control measures when work or haul is complete. When long-term structural sediment control measures are incorporated into the final erosion control plan, remove any accumulated sediment to retain capacity of the control measure. [045]

34. Conduct all nonemergency in-water work during the ODFW instream work window. [046]

35. Utilize stream diversion and isolation techniques when installing stream crossings. Evaluate the physical characteristics of the site, volume of water flowing through the PA and the risk of erosion and sedimentation when selecting the proper techniques. [047]

36. Limit activities and access points of mechanized equipment to streambank areas or temporary platforms when installing or removing structures. Keep equipment activity in the stream channel to an absolute minimum. [048]

37. Install stream crossing structures before heavy equipment moves beyond the crossing area. [049]

38. Remove temporary crossing structures promptly after use. Follow practices under the Closure/Decommissioning section for removing stream crossing drainage structures and reestablishing the natural drainage. [050]

39. Locate equipment washing sites in areas with no potential for runoff into wetlands, riparian management areas, floodplains and waters of the state. Do not use solvents or detergents to clean equipment on site. [R053]

40. Limit disturbance to vegetation and modification of streambanks when locating road approaches to in-stream water source developments. Surface these approaches with durable material. Employ erosion and runoff control measures. [054]

41. Direct pass-through flow and/or overflow from in-channel and any connected off-channel water developments back into the stream. [055]

42. During roadside brushing remove vegetation by cutting rather than uprooting. [R060]

Stabilization

43. Limit road and landing construction, reconstruction, or renovation activities to the dry season or dry conditions in the wet season. Keep erosion control measures concurrent with ground disturbance to allow immediate stormproofing. [R061, modified]

44. Apply native seed and certified weed free mulch to cut and fill slopes, ditchlines, and waste disposal sites with the potential for sediment delivery to wetlands, riparian management areas, floodplains and waters of the state. Apply upon completion of construction and as early as possible to increase germination and growth. Reseed if necessary to accomplish erosion control. Select seed species that are BLM approved, fast growing, provide adequate ground cover, and soil-binding properties. Apply mulch that will stay in place and at site specific rates to prevent erosion. [062 – modified]

45. Suspend ground-disturbing activity if projected forecasted rain will saturate soils to the extent that there is potential for movement of sediment from the road to wetlands, floodplains and waters of the state. Cover or temporarily stabilize exposed soils during work suspension. Upon completion of ground disturbing activities, immediately stabilize fill material over stream crossing structures. Measures could include but not limited to erosion control blankets and mats, soil binders, soil tackifiers, slash placement. [065]

Road Maintenance

46. As necessary and approved by the Authorized Officer, apply water or approved road surface stabilizers/dust control additives during timber hauling to reduce surfacing material loss and buildup of fine sediment that can enter into wetlands, floodplains and waters of the state. Prevent entry of road surface stabilizers/dust control additives into waters of the state during application. [R070, modified]

47. Prior to the wet season, provide effective road surface drainage through practices such as machine cleaning of ditches, surface blading including berm removal, constructing sediment barriers, cleaning inlets and outlets. [R071]

48. Avoid undercutting of cut-slopes when cleaning ditchlines. Seed with native species and use weed free mulch on bare soils including cleaned ditchlines that drain directly to wetlands, floodplains and waters of the state. [R072]

49. Remove and dispose of slide material when it is obstructing road surface and ditchline drainage. Place material on stable ground outside of wetlands, riparian management areas, floodplains and waters of the state. [R073]

50. Do not sidecast loose ditch or surface material where it can enter wetlands, riparian management areas, floodplains and waters of the state. [R074]

51. Inspect and maintain culvert inlets and outlets, drainage structures and ditches before and during the wet season to diminish the likelihood of plugged culverts and the possibility of washouts. [075]

52. Repair damaged culvert inlets and downspouts to maintain drainage design capacity. [076]

53. Blade and shape roads to conserve existing aggregate surface material retain or restore the original cross section, remove berms and other irregularities that impede effective runoff or cause erosion, and ensure that surface runoff is directed into vegetated, stable areas. [R077]

54. Retain ground cover in ditchlines, except where sediment deposition or obstructions require maintenance. [078]

55. Retain low-growing vegetation on cut-and-fill slopes. [079]

56. Stormproof open resource roads receiving infrequent maintenance to reduce road erosion and reduce the risk of washouts by concentrated water flows. Stormproof temporary roads if retained overwinter. [R080]

57. Suspend stormproofing/decommissioning operations and cover or otherwise temporarily stabilize all exposed soil if conditions develop that cause a potential for sediment laden runoff to enter a wetland, floodplain or waters of the state. Resume operations when conditions allow turbidity standards to be met. [081]

<u>Vacating Forest Roads</u>

58. Fully decommission or obliterate temporary roads upon completion of use. [R083]

59. Prevent use of vehicular traffic using methods such as gates, guard rails, earth/log barricades, to reduce or eliminate erosion and sedimentation due to traffic on roads. [R085]

60. Convert existing drainage structures such as ditches and cross drain culverts to a long-term maintenance free drainage configuration such as outsloped road surface and drainage dips and runout ditches for roads that are fully decommissioned. [R086 modified]

61. Remove stream crossing culverts and entire in-channel fill material during ODFW instream work period. [R087]

62. Place excavated material from removed stream crossings on stable ground outside of wetlands, riparian management areas, floodplains and waters of the state. In some cases material could be used for recontouring old road cuts or be spread across roadbed and treated to prevent erosion. [R088]

63. Reestablish stream crossings to the natural stream gradient. Excavate sideslopes back to the natural bank profile. Reestablish natural channel width and floodplain. [R089]

64. On each side of a stream crossing, construct waterbars or cross ditches that will remain maintenance free. [R090]

65. Following culvert removal and prior to the wet season, apply erosion control and sediment trapping measures (e.g., seeding, mulching, straw bales, jute netting, and native vegetative cuttings) where sediment can be delivered into wetlands, riparian management areas, floodplains and waters of the state. [R091]

66. Implement decompaction measures, including ripping or disking to an effective depth. Treat compacted areas including the roadbed, landings, construction areas, and spoils sites. [R092 modified]

67. After decompacting the road surface, pull back unstable road fill and either end-haul or recontour to the natural slopes. [R093]

<u>Wet Weather Road Use</u>

68. On active haul roads, during the wet season, use durable rock surfacing and sufficient surface depth to resist rutting or development of sediment on road surfaces that drain directly to wetlands, floodplains and waters of the state. [R094]

69. Prior to winter hauling activities, implement structural road treatments such as: increasing the frequency of cross drains, installing sediment barriers or catch basins, applying gravel lifts or

asphalt road surfacing at stream crossing approaches, and cleaning and armoring ditchlines. [R095]

70. Suspend commercial use where the road surface is deeply rutted or covered by a layer of mud or when runoff from the road surface is causing a visible increase in stream turbidity in the receiving stream. [R096]

71. Remove snow on haul roads in a manner that will protect roads and adjacent resources. Retain a minimum layer (2-4 inches) of compacted snow on the road surface. Provide drainage through the snow bank at periodic intervals to allow for snow melt to drain off the road surface. [R097]

72. Do not allow wet season haul on natural surface roads or high sediment producing surfaced roads without practicable and effective mitigation. [R098]

73. Maintain road surface by applying appropriate gradation of aggregate and suitable particle hardness to protect road surfaces from rutting and erosion under active haul where runoff drains to wetlands, riparian management areas, floodplains and waters of the state. [R099]

74. To reduce sediment tracking from natural surface roads during active haul provide gravel approach before entrance onto surfaced roads. [R100]

75. Install temporary culverts and washed rock on top of low water ford to reduce vehicle contact with water during active haul. Remove culverts promptly after use. [R101]

2.4.2 Project Design Features (PDFs)

Soil Productivity, Soil Compaction, Residual Trees, and Coarse Woody Debris

<u>Harvest Operations</u>

- Existing skid trails would be utilized whenever practical. New skid trails would be placed approximately 150 feet apart and be pre-designated and approved by the Authorized Officer.

- Conventional ground based yarding and harvesting would generally be limited to slopes of less than 35 percent. Existing skid trails with a grade of 35 percent slope or less may generally be utilized. This is not applicable to tethered-assist harvest systems.

- Tethered-assist yarding and harvesting would generally be limited to slopes of less than 70 percent. Designated forwarder trails would generally be limited to side slopes of less than 12 percent. Tethering would generally be used on slopes over 35 percent, where rutting or slippage causes resource damage. If these criteria are exceeded, the Authorized Officer would be the approving official.

- Following approval by the Authorized Officer, ground-based harvesting would not occur when soil moisture at a depth of 4-6 inches is wet enough to maintain form when compressed, or when soil at the surface would readily displace, causing ribbons and ruts along equipment tracks. These conditions are generally found when soil moisture at a depth of 4-10 inches is between 15-25 percent, depending on soil type.

- Tractors would be equipped with an integral arch to minimize soils disturbance and compaction.

- Skid trails including turning points would be 12 feet wide on average unless the Purchaser proposes an alternate harvest plan that limits soil compaction to 12 percent and soil productivity loss to 5 percent. When practical as decided by the Authorized Officer, the harvest equipment must walk on a mat of existing or created slash, have an arm capable of reaching at least 20 feet and minimize turning.

- To minimize soil disturbance and to keep soil organics on site, the use of blades while tractor yarding would not occur. Equipment would walk over as much ground litter as possible to reduce compaction.

- Harvest equipment used off of designated skid trails would operate on existing skid trails and/or ground less than 35 percent slope, have an arm capable of reaching at least 20 feet and minimize turning. When practical, the harvest equipment must walk on a mat of existing or created slash. Equipment use may be restricted depending on soil type, soil moisture, ground pressure of the equipment, and presences of slash to operate on.

- When using conventional ground based yarding systems, whole tree yarding with tops attached is the preferred harvest method as long as the contractor can operate without causing bark slippage, girdling, broken tops, or damage to live crowns. If it is determined by the Authorized Officer that unacceptable amounts of damage is occurring, tree bucking and limbing would be required as directed by the Authorized Officer. Delivered log length would not exceed 41 feet. Equipment use may be restricted depending on soil type, soil moisture, ground pressure of the equipment, and presences of slash to operate on.

- When using cut to length systems (tethered-assist), log length yarding is the preferred harvest method. If it is determined by the Authorized Officer that unacceptable amounts of slash is accumulating, outside of designated forwarder trails (typically greater than 18 inches of continuous slash), hand piling and hand pile burning of slash would be required as directed by the Authorized Officer. Equipment use may be restricted depending on soil type, soil moisture, ground pressure of the equipment, and presences of slash to operate on.

- Lateral yarding would be required on all cable yarding units to protect residual leave trees and existing conifer regeneration. Yarding carriages would be required to maintain a fixed position during lateral yarding to reduce damage to the residual stand.

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

- At a minimum, partial suspension would be required on all units to minimize soil disturbance.

- Units 15-3 and 35-11 have skyline cable corridors purposed that may cross perennial streams. When this occurs, logs will be fully suspended and the skyline cable will be attached to trees outside of the Inner Riparian Zone to establish lift above the trees that are not harvested. Corridors will not be cut through the Inner Riparian Zone, but there may be some mortality or individual trees that may be a safety hazard. If any trees need to be removed for safety in the Inner Riparian Zone, downed material would be left for potential wood recruitment to the channel.

- Prior to October 15 of the same operating season, winterization would occur on landings, skid trails, and hydrologically-connected cable yarding corridors. This is specific to units3-5, 5-1, 7-3, 9-5, 11-1, 11-3, 11-5, 11-6, 13-2, 15-3, 15-11, 17-2, 21-6, 21-7, 21-9, 22-3, 23-6, 31-1, 31-2, 33-5, 33-8, 34-2, 35-10, and 35-11.

- Underburning and pile burning will not occur on the Pearsoll-rock outcrop complex soils series, which are Category 1 soils, when loss of site productivity would exceed 5 percent. Specific identification of these soils would be coordinated between the fuels specialist and soils scientist. Commercial units include: 27-1 (1 acre), 28-5 (2 acres), 29-4 (1 acre), 29-5 (10 acres), 35-3 (2 acres), and 35-4 (3 acres). For a list of the fuels unit which contain Category 1 soils, see Appendix I.

- If approved by the Authorized Officer, machine piling may be allowed on designated skid and forwarder trails within ground based units.

- At the discretion of the Authorized Officer, yarding of un-merchantable material may be required.

- Existing coarse woody debris should be retained and protected to the maximum extent practicable. The Authorized Officer may direct large cull material that is yarded to the landing be redistributed back into the unit.

Activity Fuels and Prescribed Fire

- Landing piles and hand piles located along haul routes, temporary routes, skid trails, forwarder trails, or landings would be burned, chipped, or otherwise removed from these sites within 24 months of unit harvest completion.

- Merchantable sawlogs (including pole decks) would be removed from yarded material, and may be hauled off site for processing. Debris at the landing sites would be piled and burned on the immediate downhill side of existing roads, chipped, or removed for biomass utilization.

- The Authorized Officer will determine the location of pole/hardwood decks.

- Activity slash remaining in units could be lopped-and-scattered, chipped, or hand piled and burned to prevent an increase in fire hazard.

- To reduce the risk of escaped fire, mechanical blading may occur around landing piles.

- For underburing operations firelines would be constructed by hand.

- Activity slash within twenty (20) feet of each finished landing pile will be added to the pile. Construct a fireline approximately eighteen (18) inches wide and down to mineral soil within twenty (20) feet of each finished landing pile to prevent escaped fire. Each landing pile would be covered with a large enough piece of four millimeter thick black plastic to ensure a dry ignition spot (generally 10 feet x 10 feet or large enough to cover 80 percent of the pile).

- Landing piles would not be placed adjacent to or within 15 feet of leave trees to minimize scorch and mortality. Landing piles would be as free of dirt as reasonably possible to facilitate desired consumption.

- Hand piles would not be allowed on roadways, turnouts, shoulders, or on the cut bank, unless authorized by the Authorized Officer.

- Landing and hand piles would be burned in the fall to spring season after 1 or more inches of precipitation have occurred. Patrol and mop-up of burning piles would occur when needed to prevent treated areas from re-burning or becoming an escaped fire.

- Prescribed fire burn plans would be completed before ignition, as would smoke clearance to minimize impacts on air quality.

- Each hand pile would be covered with a large enough piece of 4 millimeter thick black plastic to ensure a dry ignition spot (generally 5 feet x 5 feet or large enough to cover 80 percent of the pile). Hand piles would not be placed adjacent to or within 10 feet of leave trees or large woody debris to minimize scorch and mortality.

Temporary Route Construction and Re-Construction

- Temporary routes would not be located on or directly above a headwall or on slopes in excess of 70 percent. During construction, rehabilitation, and winterization of roads, temporary routes, skid trails, and landings, runoff water would be diverted away from headwalls, slide areas, high landslide hazard locations or steep erodible fill slopes.

- New temporary routes would be located on the upper slope or ridge when possible, and would not cross through the Inner Zone of Riparian Reserves.

- All temporary routes constructed or reconstructed on BLM-administered lands would be fully decommissioned after use. Routes would be ripped, water bared, decompacted, seeded, mulched, physically blocked, and/or planted to reestablish vegetation before the beginning of the next wet season (typically October 15th), after landing and hand pile burning is complete.

- Temporary route construction and temporary route re-construction (including associated decommissioning) would not occur when soil moisture, at a depth of 4-6 inches, is wet enough to maintain form when compressed; or when soil moisture at the surface would readily displace, causing ribbons and ruts along equipment tracks. These conditions are generally found when soil moisture at a depth of 4-10 inches is between 15-25 percent depending on soil type.

- All temporary route segments constructed with full bench prisms would be obliterated following use, before the beginning of the next wet season (typically October 15th), after landing and hand pile burning is complete.

- The Purchaser shall, prior to October 15 of the same operating season, winterize temporary routes, landings, hydrologically connected corridors/skid trails and other areas of exposed soils that are not already reclaimed or fully decommissioned. Winterization would be done by properly installing and/or using water bars, berms, sediment basins, gravel pads, hay bales, straw waddles, small dense woody debris, seeding and/or mulching, to reduce sediment runoff and divert runoff water away from stream channels, headwalls, slide areas, high landslide hazard locations or steep erodible fill slopes as directed by the Authorized Officer.

- Any temporary routes that are less than ¼ mile would be fully decommissioned immediately after use.

Stream Protection

<u>Harvest Operations</u>

- The purchaser shall not locate new landings in areas that contribute eroded fines to streams, wet areas, dry draws and swales. If these landing locations cannot be avoided, ensure that properly installed sediment control measures are placed and maintained, as needed, to keep eroded material onsite.

- Landings and landing piles would be placed outside of the Inner Riparian Zone with the exception of units 7-3, 13-2, and 35-11. It is possible landings in these units may still be located outside of the Inner Riparian Zone during implementation.

- Any project related activities would be suspended if conditions develop that cause a potential for sediment laden runoff to enter a wetland, floodplain or waters of the state. Operations resume when sediment control devices are in place and conditions allow turbidity standards to be met.

- Sediment trapping devices would be properly installed and maintained to hydrologically disconnect sites from perennial stream channels.

- In general, cable and ground based landings size shall not exceed 1/4 acre; helicopter landings shall not exceed 1 acre and all landings shall be located along existing roads, temporary routes, and/or cable-tractor swing routes or within unit boundaries where possible. Landing locations would be approved by the Authorized Officer. Any ground disturbance should be included in the size of the landing.

- Landings used during dry conditions within the wet season (generally Oct 15 - May 15) that have the potential to release sedimentation into a stream or wet area via ditchlines or other means, would have silt fencing or other sediment control measures in place during periods of non-use if they are hydrologically connected to streams in units 3-5, 5-1, 7-3, 9-5, 11-1, 11-3, 11-5, 11-6, 13-2, 15-3, 15-11, 17-2, 21-6, 21-7, 21-9, 22-3, 23-6, 31-1, 31-2, 33-5, 33-8, 34-2, 35-10, and 35-11..

- Prior to winter rains, cable yarding corridors that are above or nearly perpendicular (approximately 60-90 degrees) to stream channels within Riparian Reserves, or hydrologically connected to ditchlines, would be water-barred and have slash placed over them to protect water quality and minimize soil erosion.

- Existing skid roads shall be used when possible. New skid trails shall be placed at least 150 feet apart where topography will allow. New skid trails will be located on ground generally less than 35 percent slope.

- Where hydrologically connected, place sediment-trapping materials or structures such as straw bales, jute netting, or sediment basins at the base of newly constructed fill or side slopes where sediment could be transported to waters of the state. Keep materials away from culvert outlets.

- Where hydrologically connected, use biotechnical stabilization and soil bioengineering techniques to control bank erosion (e.g., commercially produced matting and blankets, live plants or cuttings, dead plant material, rock or other inert structure).

<u>Road Maintenance and Haul</u>

- No haul on natural surface and rocked roads that do not have an all-weather surface (i.e. are rocked or aggregate roads with good drainage features) shall be conducted on the Contract Area between October 15 of one calendar year and May 15 of the following calendar year, both days inclusive. The Purchaser may request in writing, a conditional waiver of this restriction. If the Authorized Officer determines that hauling would not result in road damage or the transport of sediment to nearby stream channels based on soil moisture conditions or rain events, the Authorized Officer may approve a conditional waiver for hauling. If soil moisture conditions or rain events are anticipated to cause impacts to roads or stream water quality resulting from said conditional waiver are not acceptable as determined by the Authorized Officer, the waiver will be revoked.

- Haul would not occur on hydrologically connected roads (34-7-7.1, 25-7-11.0, 35-7-11.1, 34-7-27.0, 34-7-28.0, 34-7-33.1, 35-7-5.1, 35-7-29.0, 35-7-27.0, 35-7-27.1, 35-7-27.3, 35-7-33.1, 36-7-4.2, 37-7-10, 37-7-15.4, 36-7-22.0, 37-5-25.0, 37-7-13.0, 37-7-15.0, 38-7-3.2, 37-7-33.0, 37-7-34.1, 38-7-11.0, 38-7-11.4, 38-7-16.0, 38-7-17.1, 38-7-21.2, 38-8-27.0, 38-7-31, and 39-7-3.0) when water is flowing in the ditchlines due to precipitation or during any conditions that would result in any of the following: surface displacement such as rutting or ribbons, continuous mud splash or tire slide, fines being pumped through road surfacing from the subgrade, resulting in a layer of surface sludge.

- Hauling on natural surface or rocked roads would not resume for a minimum of 48 hours following any storm event that results in ½ inch or more precipitation within a 24 hour period, and until road surface is sufficiently dry to prevent any of the above conditions from occurring, and as approved by the Authorized Officer.

- Non-emergency road maintenance work would occur during the dry season (generally between May 15 and Oct 15). Certain activities (blading of aggregate roads, rocking, cross drain installation) would be permitted during the wet season (generally between Oct 15 - May 15) when conditions are dry. If these activities occur within 200 feet of perennial streams, sediment control devices would be placed and maintained as necessary to prevent action-related stream sedimentation.

- No ditch maintenance would occur during the wet season unless for safety or resource protection. Work would be suspended during precipitation events or when observations indicate that saturated soils exist that includes visible runoff or might cause elevated stream turbidity and sedimentation.

- Blading and vegetation removal would be avoided unless deemed necessary to remove drainage impediments when maintaining inboard ditches. Sediment control measures would be evaluated and implemented if necessary where ditchline blading is required within 200 feet of perennial streams.

- Waste material from road maintenance activities would be placed in stable disposal areas a minimum of 200 feet from any perennial stream and in a location where sediment laden runoff can be confined. Where necessary, erosion control measures would be installed to minimize sediment delivery to streams.

- Dewater streams during culvert removal, replacement, and installation to minimize the movement of sediment downstream.

- Install downspout structures and/or energy dissipaters (e.g., rock material) at newly installed cross drain outlets or drain dips where water is discharged on unprotected fill-slopes to reduce potential for soil erosion.

- All soil disturbances associated with road drainage improvement and culvert installation / replacement shall be within the existing road prism except for splash pads at the end of downspouts.

- All ground disturbance outside of the road running surface, other than ditchline cleaning, within 200 feet of any perennial streams shall be mulched with weed free straw or native materials. A minimum of 80 percent ground cover shall be maintained following such activities. Native seed and mulch would be applied to all soils that are disturbed or exposed during stream culvert removal, replacement, and installation in the same operational season the work is completed.

- Blade and shape roads to conserve existing aggregate surface material, retain or restore the original cross section, remove berms and other irregularities that impede effective runoff or cause erosion, and ensure that surface runoff is directed into vegetated, stable areas.

- When cleaning ditchlines, do not undercut cut-slopes and retain low-growing vegetation on cut-and-fill slopes.

- Prior to winter hauling activities, implement any of the following structural road treatments as needed: examples include increasing the frequency of cross drains, installing sediment barriers or catch basins, applying gravel lifts, and cleaning ditchlines.

- Inspect and maintain culvert inlets and outlets, drainage structures, and ditches before and during the wet season to diminish the likelihood of plugged culverts.

- Flowing water would be diverted around each culvert or cross drain installation site. Diverted water would be returned to the channel immediately downstream of the work site. At all times during installation, effective erosion control measures would be in place, and would be removed from the channel prior to October 15th of the same calendar year. Seepage water from the de-watered work area would be pumped to a temporary storage and treatment site or into upland areas and allowed to filter through vegetation prior to reentering the stream channel.

- Sediment reduction techniques would be implemented to reduce sedimentation into Oregon Coast Coho Salmon critical habitat. Sediment reduction techniques include settling basins, brush filters, sediment fences and/or check dams to prevent or minimize sediment conveyance to streams. Specifically these sediment barriers would be installed at perennial stream crossings on BLM roads 38-7-3.0, 35-7-33.1, 35-7-27.1, 34-7-3.0, 36-7-22.0, 37-7-10.0, 37-4-4.1, 37-7-13.0, 35-7-4.2, 35-7-11.1, and 35-7-4.2.

- Stored sediment behind erosion control devices would be removed from ditchlines and disposed of in a stable location outside the Riparian Reserves.

- Prior to a ½ inch rain event, sediment barriers would be placed by the purchaser according to specifications and locations outlined by the BLM fish biologist, hydrologist, engineer, and Authorized Officer. These barriers would be maintained and monitored (in accordance with the Oregon Department of Environmental Quality (ODEQ) Erosion and Sediment Control Manual) by the purchaser and Authorized Officer during haul route usage.

- During roadside brushing, vegetation could be removed from the site, lopped and scattered or hand pile and hand pile burned. If uprooting is necessary within 200 feet of a perennial stream crossings then sediment control devices will be installed and properly maintained, and removed when the site stabilizes.

- Where necessary, downspouts and/or energy dissipaters would be installed at drainage outlets.

- To caution forest road users of potential hauling and operational activities, warning signs would be placed where appropriate to satisfy Oregon Safety and Health Administration (OSHA) standards. The proper use and maintenance of the signs will be monitored using Oregon OSHA regulations.

Riparian Reserve Treatment Zones

The Inner and Outer Zone buffers that would be utilized within the riparian areas are dependent on the type of treatment proposed and the type of stream present within the unit. Non-commercial treatments such as understory reduction and fuels maintenance would utilize a minimum 25 foot Inner Zone buffer on intermittent streams, and a minimum 60 foot Inner Zone buffer for all perennial streams. Proposed commercial treatments such as Restoration Thinning and Density Management would utilize a minimum 50 foot Inner Zone buffer for intermittent streams and a minimum 120 foot Inner Zone buffer for perennial fish bearing, and non-fish bearing streams. Wetlands, unstable soils, seeps, springs and other waterbodies would utilize a minimum 25 foot Inner Zone buffer. For more information see Chapter 2; Description of Riparian Reserve Thinning Treatments and Figure 2-2.

Harvest Operations

- On all units with Understory Reduction and fuel maintenance, a minimum 25 feet from bankfull width of intermittent streams and 60 feet for perennial streams to protect streambank stability and riparian vegetation.

- Underburning may occur within the treatment buffer but the point of ignition should not occur within 25 feet of intermittent streams and within 60 feet of perennial streams.

- On all units, commercial extraction would not occur within the Inner Zone buffer which is a minimum of 50 feet from bankfull width on all intermittent streams.

- On all units, commercial extraction would not occur within the Inner Zone buffer which is a minimum of 120 feet from bankfull width on all perennial streams.

- Slumps, intermittent seeps, wetlands, and other unstable areas would be buffered (no treatment) by leaving one row of overstory trees or a 25 foot diameter buffer (whichever is greatest), from the outer edge of instability, around these areas for soil stabilization.

- Trees within the Inner Zone of Riparian Reserves knocked over during falling and yarding would be retained on site for fish/wildlife habitat.

- Cleaning culvert inlets and replacing culverts within stream channels would occur during the low flow period (generally July 1 to September 15) in accordance with Oregon Department of Fish and Wildlife (ODFW) in-stream work period guidelines.

- Upon completion of harvest, all existing skid trails and landings utilized during this harvest activity within Riparian Reserves would be discontinuously decompacted, seeded, water-barred, mulched, and blocked, (as described above for upland skid trails).

- When utilizing existing landings that have the potential to release eroded fines into a stream or wet areas directly or via draws or ditchlines, silt fencing or other sediment control measures would be properly placed and maintained during use and periods of non-use, to keep eroded material onsite. Silt fencing and/or other sediment control measures would be removed after rehabilitation activities are accomplished.

- Upon completion of harvest, all existing skid trails utilized during harvest activities that are within RRs and hydrologically connected to perennial streams would be scarified, seeded, water-barred, mulched, and blocked (Units 3-5, 7-3, 11-1, 11-3, 11-6, 17-2, 21-7, 22-3, 23-6, 33-5, 33-8, 34-2, and 35-10).

Botany and Noxious Weeds

The following are Project Design Features (PDFs) for federally endangered plant species Gentner's fritillary and Cook's desert parsley. These PDFs originated from the *Medford District Consultation Biological Assessment - Assessment of activities that may affect the federally listed plant species, Gentner's Fritillary, Cook's Lomatium, and Large-flowered Woolly Meadowfoam, on Bureau of Land Management, Medford District and Cascade Siskiyou National Monument*.

<u>Prescribed burning</u>

- Restrict underburning within plant sites to the dormant season.

- Conduct one-year surveys for pile burning. If there is a documented Gentner's fritillary occurrence within 1,500 feet or indeterminate fritillary leaves within the pile burn area, then an additional year of surveys would be performed.

- Pile material at least 25 feet away from plant sites.

- Rehabilitate pile burn scars with native seed and mulch when adjacent to listed plant sites or in critical habitat. Coordination will occur between the fuels specialist and the botanist.

<u>Manual fuel reduction</u>

- Conduct one-year surveys for manual thinning; however, if thinning would be followed by pile burning in Gentner's fritillary habitat, then follow survey requirement for pile burning under "prescribed burning" above.

- Maintain 25 foot no-treatment buffers around plant sites during the growing season. Treatment inside of buffers is allowed in the dormant season.

- For Gentner's fritillary, retain 40 percent combined canopy coverage of trees and shrubs within 25 foot plant site buffers.

Route construction

- Conduct one-year surveys along the proposed corridor. If there is a documented Gentner's fritillary occurrence within 1500 feet of the corridor or indeterminate leaves are located, an additional year of surveys will be performed.

- New route construction is not allowed within Cook's desert parsley critical habitat.

- Follow general PDFs for Use of Heavy Equipment (below).

- Protect known plant sites by aligning road prisms to maintain 100-foot buffers.

- Protect all plant occurrences with site-specific PDFs prescribed by the project botanist in cooperation with the project leader.

Tree Harvesting

- For Gentner's fritillary, retain 40 percent combined canopy coverage of trees and shrubs within 25-foot plant site buffers.

- Do not locate anchor trees within plant sites.

- Do not burn landing slash within 100 feet of plant sites.

- Construct landings at least 300 feet from plant sites. Permit use of previously existing landings when more than 100 feet away from plant sites.

- Realign new proposed route corridors, truck turn-arounds, and staging areas to maintain 100 foot buffers. Permit use of existing roads, even when located less than 100 feet from plant sites.

Project Activities During Dormancy

- Certain activities that are excluded from critical habitat or plant sites during the growing season may be allowed during the dormancy period for the affected species, if the resulting activity is deemed neutral or beneficial to the species. Use of heavy equipment will not be allowed within plant sites, regardless of season. Relevant PDFs will still apply as deemed necessary by the project botanist.

Use of Heavy Equipment

- For all projects involving the use of heavy equipment, plant sites must be protected by a 100 foot radius buffer. The use of heavy equipment is not permitted within this buffer. Heavy equipment includes tractors, dozers, loaders, graders, excavators, cranes, skid steers, and similar equipment. Pick-up trucks, ATVs, UTVs, and similar soft-wheeled vehicles may be permitted within a plant site on a limited basis in dry conditions in the dormant season, if authorized by the project botanist.

- All projects involving heavy equipment use near plant sites require pre-disturbance surveys for non-native invasive plants. Project botanists will prescribe appropriate invasive plant treatments.

- All heavy equipment used within Cook's desert parsley critical habitat or near listed plant sites will be cleaned prior to entering BLM-administered lands. All dirt and vegetation must be washed from the equipment exterior, including any unattached accessory equipment, such as augers, scoops, and blades.

- Projects involving heavy equipment (landing and route construction) in Cook's desert parsley critical habitat must be evaluated by a hydrologist prior to implementation. The hydrologist will evaluate potential effects of the Actions Alternative on site hydrology and prescribe appropriate PDFs, which may include (1) seasonal entry restrictions, (2) limiting the extent of disturbance, (3) temporary engineered solutions to reduce compaction and erosion, and (4) restoration of vegetation and hydrologic function.

Bureau Special Status and Survey and Manage Plant Species

Activity Fuels and Prescribed Fire

- Buffer sizes for understory reduction would be a minimum of 5 feet from the occurrence boundary.

- Manual slashing (chainsaws) and brushing through buffered sites could occur during the dormancy period (July through January). No mechanical equipment in buffers.

- In coordination with project botanist, cut material would be lopped and scattered or piled and burned outside of buffers where beneficial to species.

- Mechanical thinning/brushing (e.g. tracked vehicles) would occur 100 feet from buffers and no vehicles or heavy equipment would occur within buffers. Hand treatment could occur within buffers, as previously described.

- Bureau Sensitive and Survey and Manage botanical species would be protected by the no treatment buffers to minimize adverse impacts from project activities. Site management requirements are provided in the Botany Species Survey and Site Management section. Minimum buffer size is determined by habitat requirements and existing habitat conditions on a case-by-case basis.

- Trees would be directionally felled away from all no disturbance buffers.

- For units which contain Special Status Species (See Table 3.8-1 and Appendix I and J for specific units), prescribed burning (including underburning and handpile burning) would occur during September - January; prescribed burning may occur later into the spring depending on the species and existing habitat conditions, as determined by the project botanist.

- For Bureau Sensitive and Survey and Manage plant species within final units, no harvest activity would occur within a minimum of 25 feet from the population boundary (a site, or the outer edge of a polygon encompassing the population).

- No tree falling or yarding would occur in buffered sites.

- Anchor trees would not be located within known sites.

- Construction of new landings would be at least 100 feet from known sites. Use of an existing landing could occur if the location of the plant(s) is more than 100 feet away. Use of existing landings within 100 feet of a plant would not occur unless approved by the botanist.

- Proposed harvest route locations, including temporary routes, would be surveyed. A minimum 100 feet buffer would protect populations, unless otherwise approved by the project botanist. Use of existing roads within 100 feet of a plant could occur.

Noxious Weeds

Harvest Operations

- To prevent the potential spread of noxious weeds into the Medford District BLM, the operator would be required to clean all harvesting, construction, chipping, grinding, shredding, rock crushing, and transportation equipment prior to entry on BLM-administered lands. Cleaning shall be defined as removal of dirt, grease, plant parts, and material that may carry noxious weed seeds into BLM-administered lands. Cleaning prior to entry onto BLM-administered lands may be accomplished by using a pressure hose.

- Only equipment inspected by the BLM would be allowed to operate within BLM-administered lands. All subsequent move-ins of equipment as described above shall be treated the same as the initial move-in.

- Prior to initial move-in of any equipment, and all subsequent move-ins, the operator would make the equipment available for BLM inspection at an agreed upon location off of federally administered lands.

- To prevent establishment of new noxious weed populations within the planning area, all material utilized in the building, reconstruction, or maintenance of roads (temp, permanent, etc.) must be free of noxious weed seeds and originate from a quarry approved by the project botanist.

<u>All Project Actions</u>

- To prevent the further spread of noxious weeds and reduce soil erosion, native seed and certified weed-free straw would be used for post-treatment restoration where project activities such as temporary route decommissioning, landing construction and decommissioning and other such activities result in bare soil.

Wildlife

<u>All Project Actions</u>

- All existing snags would be retained from cutting unless they pose a safety hazard, in which case they would be left on the ground as coarse woody debris (CWD) in the unit.

- CWD would be retained and protected from disturbance to the greatest extent possible during harvest operations, burning and other project activities.

- Leave cull material from harvest activities on site when possible.

- Retain and protect, where possible (if not jeopardizing public or worker safety), large, broken-top trees and large snags with loose bark.

- All trees damaged during felling operations that were not originally marked for removal will be retained for future snag and cavity recruitment.

<u>Raptors</u>

- Protect any raptor nests or centers of activity as necessary to maintain the integrity of the site. Activities that produce noise above ambient levels that may disturb or interfere with nesting would be prohibited within one-quarter mile of active nesting areas between approximately March 1 and July 15.

All Project Actions

- Activities that produce noise above ambient levels would not take place within ¼ mile of active raptor nests/roosts where there is no line-of-sight or within ½ mile where there is line-of-sight between February 1 and August 15.

Northern Spotted Owl

The Project Design Features listed below would be applied and incorporated into the design of the Pickett West project.

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

All Project Actions

- No treatments would occur within any northern spotted owl nest patch.

- Activities (such as tree felling, yarding, temporary route construction and re-construction, hauling on roads not generally used by the public, prescribed fire, and muffled blasting) that produce loud noises above ambient levels would not occur within specified distances (Table 2-5) of any documented or projected owl site between March 1 and June 30 (or until two weeks after the fledging period) – unless protocol surveys have determined the activity center to be not occupied, non-nesting, or failed in their nesting attempt. The distances may be shortened if significant topographical breaks or blast blankets (or other devices) muffle sound traveling between the work location and nest sites.

- The action agency has the option to extend the restricted season until September 30 during the year of harvest, based on site-specific knowledge (such as a late or recycle nesting attempt) if the project would cause a nesting NSO to flush (See Table 2-5 for disturbance distance).

- The buffer distance to the prescribed area may be modified by the action agency biologist using topographic features or other site-specific information. Buffer distance for prescribed fire may be reduced if substantial smoke from prescribed fire would not enter the nest stand March 1 - June 30. The restricted area is calculated as a radius from the assumed nest site (tree).

Table 2-3 Disturbance Distances from Various Activities for Spotted Owls

Activity	Buffer Distance around Owl Sites
Heavy Equipment (including non-blasting quarry operations)	105 feet

Activity	Buffer Distance around Owl Sites
Chain saws	195 feet
Commercial Timber Harvest	0.25 miles
Prescribed fire/Activity fuels burning	0.25 miles

- This NSO PDF applies to commercial harvest units: 13-1, 13-2, 13-8, 13-9, 18-1, 20-5, 21-6, 21-9, 29-1, 35-9, and 3-6; and to HFRM units: North Murphy 29A, Tall Timber 11-6, Round Bull 21-2 and Dry White 15-1.

Bald Eagle

- Work activities that cause disturbance above ambient noise levels (hauling, chainsaws, and helicopters) would not take place within ¼ mile (1/2 mile line-of-site) from an active bald eagle nest between January 1 and August 31 (1995 ROD/RMP, p. 55). This applies to commercial harvest units: 13-3, 13-4, 17-2, 27-8, 27-9, 30-3, 31-1, 31-2, 35-1, and 35-2; and to HFRM units: Maple Syrup 30.3, Maple Syrup 31-009, Maple Syrup 31-30, Maple Syrup 31.003, Maple Syrup 31.3, North Murphy 29-31, North Murphy 29A, Round Bull 35-134A, Williams 3-3, and Williams 3-4.

- The following measures could be waived in a particular year if surveys indicate the site is unoccupied or nesting attempts failed or until 2 weeks after the young have fledged. Waivers would only be valid until January 1 of the following year.

Great Gray Owl

- Manage all known Great Gray Owl (GGO) nests and/or pairs within the Pickett West PA in accordance with current GGO management recommendations as described in the Conservation Assessment for the GGO (USDA/USDI 2012).

All Project Actions

- Establish a 30 acre GGO management area around known GGO nest sites or pair activity centers. Within these 30 acres, management treatments are limited to the protection or improvement of GGO nesting habitat. In addition, establish a ¼ mile protection zone around each nest site or pair activity center. Within this protection zone, establish a 300 foot buffer around meadows and natural openings greater than 10 acres. Within these buffers, treatments are limited to protection or improvement of GGO nesting habitat.

- Work activities that cause disturbance above ambient noise levels (hauling, chainsaws, and helicopters) would not take place within ¼ mile from an active GGO nest between from March 1 to July 31, or until fledging, whichever is later.

Peregrine Falcon

- Minimize human disturbance with the potential to disturb nesting falcons within one mile of active peregrine falcon nest sites between January 1 and July 15.

- The core area within one-half mile of active peregrine nest sites would receive additional protection. In addition to the measures used in the one-mile radius within the protected core area, there would be no scheduled timber harvest, no aerial application of herbicides or pesticides. There will be no new road construction unless the activity would not adversely affect the integrity of the site. (1995 ROD/RMP, p. 55). This applies to commercial harvest units: 9-1 and 9-2.

Red Tree Vole

- Manage all RTV populations within the Pickett West PA in accordance with current RTV management recommendations (USFS/BLM 2000). Protect all active and associated inactive RTV nests by delineating a Habitat Area with a minimum of 10 acres of suitable RTV habitat around each RTV site. A RTV site is defined as any individual active RTV nest tree or a collection of RTV nest trees within a local area (all nest trees in a stand and adjacent stands that are not isolated from other clumps of nest trees by more than 100 meter [330 feet]). While past surveys have occurred in the planning area, recent surveys were used to establish the sites that are managed under the Pickett West project.

All Project Actions

- Establish RTV Habitat Areas around all RTV sites within the Pickett West Planning Area. Include a minimum of 10 acres of suitable RTV Habitat and ensure a one site potential tree buffer around all RTV nests located in each RTV Habitat Area (USFS/BLM 2000).

- Protect the physical integrity of all RTV nests in RTV Habitat Areas from both management activities and natural disturbances such as windthrow. Any management that occurs within a Habitat Area should not remove or modify nest trees, the canopy structure of the stand, or remove any of the dominant, codominant, or intermediate (Daniel et al. 1979) crowns (USFS/BLM 2000). To meet these standards, limit treatments to only Understory Reduction (UR) or Hazardous Fuels Reduction Maintenance (HFRM) in all RTV Habitat Areas in the Pickett West PA.

Air Quality / Smoke Management

Activity Fuels and Prescribed Fire

- Local residents would be advised of prescribed burning through news releases.

- Prescribed burning would occur under atmospheric conditions that allow for the mixing of air to lessen the impact on air quality. All prescribed burning would be administered in a manner consistent with the requirements of the Oregon Smoke Management Plan administered by the

Oregon Department of Forestry and the regulations established by the Air Quality Division of the Oregon Department of Environmental Quality.

- Burning of slash piles would occur after a sufficient period of curing (generally over a year) and adequate seasonal moisture to ensure desired consumption of material and to minimize risk of fire escape. Smoke clearance(s) would be obtained prior to ignition to minimize impacts on air quality.

Cultural Sites

<u>All Project Actions</u>

- If cultural resources are discovered during project implementation, the project would be redesigned to protect the cultural resource values present, or evaluation or mitigation procedures would be implemented based on recommendations from the Resource Area Archaeologist with input from federally recognized Tribes, approval from the Field Manager, and concurrence from the State Historic Preservation Office.

<u>Harvest Operations Contour Ditches</u>

- In the event that historic mining ditches need to be crossed for harvest operations, keep tractors or other equipment out of the ditch to prevent damage. There should be as few crossings of the ditch as is reasonably possible. When crossing the ditch, only cross perpendicular and in places where the ditch is in the poorest condition. To protect the ditch, logs should be placed length-wise in the ditch to help protect the integrity of the ditch walls. After timber harvest the crossing point needs to be reconstructed. A Grants Pass Field Office Archaeologist will review the ditch crossing locations selected and the reconstruction following harvest operations.

Port-Orford cedar (POC) Root Disease Management

<u>All Activities</u>

- The Action Alternatives would be consistent with management direction in the Port-Orford cedar EIS (See POC Risk Key in Appendix G).

- The HFRm units listed below would require project scheduling to reduce the risk of infestation by Port-Orford-cedar root disease. Units: 19-1A, 27-10, 27-11, 27-18, 27-19, 27-19A, 27-3A (Rich and Rocky), 27-3B (Rich and Rocky), 34-14, 34-1A, 34-3A, 34-3B, and 34-3D. No POC root disease mitigation measures are required for harvest units.

Off-Highway Vehicles

Harvest Operations

- If unauthorized OHV use is identified within harvest units vegetation would be pulled back over skid trails upon project completion, when possible, to minimize OHV use of the area.

Hazmat

- The Purchaser shall not refuel equipment, store, or cause to have stored, any fuel or other petroleum products within 150 feet of streams, springs or wetlands. All petroleum products shall be stored in durable containers and located so that any accidental releases will be contained and not drain into any stream system. Hydraulic fluid and fuel lines on heavy mechanized equipment would be in proper working condition in order to minimize potential for leakage into streams. Absorbent materials shall be onsite to allow for immediate containment of any accidental spills. Spilled fuel or oil and any contaminated soil shall be cleaned up and disposed of at an approved disposal site.

Table 2-3 Summary of Seasonal Restrictions and Operational Periods

Restriction	Resource Concern	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Activities that produce loud noises above ambient levels within 0.25 miles of NSO site.	NSO critical nesting time March 1st through June 30th												
Timber harvesting or yarding	FRGE and LOCO												
Activities that produce loud noises-fine tune	Bald eagles												
Activities that produce loud noises-fine tune	Peregrine falcon												
Activities that produce loud noises-fine tune	Great grey owls												
Road building, maintenance, or renovation including culverts	Water quality and sedimentation – dry condition only												
Landing construction & rehabilitation	Water quality and sedimentation – dry condition only												
Ground based yarding	Water quality and sedimentation – dry condition only												
Hauling	Water quality and sedimentation – dry condition only												
Harvest operations	Fire season, ODF regulated use												

Key Operations generally allowed. Operations restricted, modified or allowed depending on conditions. Operations generally restricted

Chapter 3 Affected Environment and Environmental Effects

In accordance with law, regulation, executive order, policy, and direction, an interdisciplinary team (IDT) reviewed the elements of the human environment to determine if they would be affected by the Alternatives described in Chapter 2.0. Those elements of the human environment that were determined not to be affected are disclosed in the Issues and Alternatives Considered but not Analyzed in Detail.

Affected Environment

The Affected Environment portion of this chapter describes the current conditions in the Pickett West project PA. The relevant resources that could potentially be impacted are vegetation resources, noxious weeds/sensitive plants, fire and fuels, wildlife, soils, hydrology, fisheries and cultural resources.

Environmental Effects

The Environmental Effects portion of this chapter provides the analytical basis for the comparison of the Alternatives (40 CFR § 1502.16) and the reasonably foreseeable environmental consequences to the human environment that each Alternative considered in detail. This analysis considers the direct impacts (effects caused by the action and occurring at the same place and time), indirect impacts (effects caused by the action but occurring later in time and farther removed in distance but are reasonably foreseeable) and cumulative impacts (effects caused by the action when added to other past, present and reasonably foreseeable future actions on all land ownerships). The temporal and spatial scales used in this analysis may vary depending on the resource being affected.

Cumulative Effects

Council on Environmental Quality (CEQ) guidance issued on June 24, 2005, points out that the "Environmental Analysis required under NEPA is forward-looking." Review of past actions is required only "to the extent that this review informs agency decision-making regarding the Proposed Action." A description of current conditions includes the effects of past actions and serves as a more accurate and useful starting point for a Cumulative Effects analysis than by "adding up" the effects of individual past actions. "Generally, agencies can conduct an adequate Cumulative Effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions" (CEQ Memorandum "Guidance on the Consideration of Past Actions in Cumulative Effects Analysis," June 24, 2005). The use of information regarding the effects of past actions may be useful in two ways according to CEQ guidance: 1) consideration of the Action Alternatives' Cumulative Effects and 2) as the basis for identifying the Action Alternatives' direct and indirect effects.

When encountering a gap in information, the question implicit in the CEQ regulations on incomplete and unavailable information was posed: is this information "essential to a reasoned choice among the Alternatives?" (40 CFR §1502.22(a)). While additional information would often add precision to estimates or better specify a relationship, the basic data and central relationships are sufficiently well-established that any new information would not likely reverse or nullify understood relationships.

Although new information would be welcome, no missing information was determined as essential for the decision maker to make a reasoned choice among Alternatives.

The IDT weighed the scientific evidence offered through public comments, as well as that gathered individually. Scoping for this project did not identify any need to exhaustively list individual past actions or analyze, compare, or describe their environmental effects in order to complete a useful analysis for illuminating or predicting the effects of the Action Alternatives. The following projects are described because they were needed for resource specialists to perform a complete analysis.

For a comprehensive list of all project available for consideration see Appendix D; Past, Present, and Foreseeable Projects.

Past Actions

The following past actions define the present conditions or the baseline for the effects analysis within the PA. For the purpose of analysis past projects are defined as those that have already been implemented by the time of EA release. Past actions are summarized in aggregate and not listed individually. Past actions describe the present conditions that occur within the Pickett West PA.

Josephine County was the first place in the state where gold was extracted. These activities have been occurring in the Rogue Valley for approximately a third of a century. The County has many useful and valuable metals, ores, and rock, most notably gold, copper, and marble. Due to the concentration of valuable minerals many of the drainages in the Rogue Valley have been placer mined and are in various states of health.

Wildfires and wildfire suppression has greatly influenced the vegetation within the PA. During the early and mid-1900s the PA experienced over 22,000 acres of low intensity fires which were not suppressed with modern fire suppression tactics. From the mid-1950s to the 1980s the PA experienced few fires, ~ 2,000 acres, due to aggressive fire suppression. The past wildfire and suppression efforts have resulted in the current fire regime which is characterized by high intensity fire.

Timber harvest has been occurring within Josephine County since its organization in the mid-1850s. Past timber harvest activities and wildfire suppression have influence the vegetation currently seen within the PA. Many of the forest stands within the PA can be characterized as mid-seral, closed canopy forests which is a departure from what would be expected within the historical range of variation for dry Douglas-fir forest types. Forest types historically expected to occur within the PA would be of the late seral open variety opposed to the mid-seral closed canopy forest which dominate the PA. For more information on the existing vegetation within the PA see the Vegetation and Fire and Fuels sections below.

Present Actions

Present actions within the geographical scope of the Pickett West PA are described below, they are ongoing actions that may occur during the time of this analysis. The IDT considers present BLM actions as those having valid Decision Records which have not been implemented or are in the process of being implemented.

Cheney Slate Timber Sale

The Cheney Slate timber sale occurred in T37S-R5W-Sections 14 and 23 and T37S-R7W-Sections 5, 13, and 19. This timber sale thinned approximately 140 acres within the Pickett West PA. As of May 2017 all harvesting activities have been completed. There are approximately 2 miles of road maintenance work which have yet to occur. Specific activities include clearing material from ditches and disposing of any remaining slash.

Section 13 Mining Plan of Operation Project

The Section 13 Mining Plan of Operation project is located in T37S-R6W-Section 13. The proposed action is to expand the existing Copeland Quarry on to 18 acres of adjacent BLM-administered lands. The quarrying operations would take place on approximately 7 acres of BLM administered lands with an 11 acre buffer which would contain a 1 acre area for an access route. Through the proper design of the route, including the installation of a culvert, and the presences of settling ponds within the existing quarry footprint, sediment is not anticipated to be mobilized off-site. A final decision for this project is expected in the summer of 2017.

Stray Dog Mining Plan of Operation Project

The Stray Dog Mining Plan of Operation is located in T35S-R8W-Section 03. The proposed action is to mine and excavate for gold in alluvium deposits on approximately 3.4 acres of BLM-administered land. This project was designed to reduce effects on the landscape through the use of vegetative buffers and a reclamation plan. A Decision Record for this project would not be issued until consultation for fisheries is competed with the National Marine Fisheries Service.

California Oregon Broadcasting Inc., Right-of-Way

This right-of-way is located in T36S-R5W-Section 27 at the peak of Mount Baldy. The proposal is for the expansion of the existing communication site. The existing tour would be removed and a new 120 foot tower would be installed. There is approximately less than 0.5 acres of new disturbance proposed, most activities would occur within the existing communication site footprint. This project would apply appropriate best management practices and project design features.

Medford District Insect and Disease Mortality Salvage for Safety Categorical Exclusion

The implementation of the activities authorized under this categorical exclusion may occur on BLM-administered land within the Pickett West PA. The proposed action may include hazard tree felling and removal associated with insect and disease mortality. Depending on the Land

Use Allocation, trees would either be left on site as coarse woody material or removed; removed trees would be used for habitat restoration projects such as large woody debris placement in streams, improvement of recreational areas, bridge or trail construction, or sold as firewood or commercial timber. Action implemented under this categorical exclusion are expected to increase safety within the Pickett West PA.

Medford District Road and Pump Chance Routine Maintenance Categorical Exclusion
The Medford District manages approximately 5,000 miles of roads which may require some form of maintenance. This categorical exclusion does not authorize road or pump chance maintenance within fish-bearing streams.

Routine road maintenance may include: 1) maintenance and improvement of the road surface to minimize off-site sedimentation; 2) repair and maintenance of drainage structures to prevent road damage; and 3) road repair to prevent large-scale road damage from storm events.

Routine Pump Chance maintenance may include: 1) sediment deposited in the water impoundments reduces storage capacity; 2) growth of brush impedes access by fire engines, water tenders and helicopter buckets; and 3) growth of trees and brush on water impoundment retaining walls/dikes may cause a breach with resultant loss of waterholding capacity.

Activities preformed under this categorical exclusion are expected benefit the Pickett West PA by improving roads which decreases possible sedimentation and increasing access and feasible use of pump chances which can aid in fire suppression activities.

Reasonably Foreseeable Future Actions

Reasonably foreseeable future actions are described as actions for which there are existing Decision Records, funding, formal proposals, or which are highly probable, based on known opportunities or trends. While this is true, foreseeable actions should not be limited to actions that are approved or funded, conversely speculation about future actions is not required.

Applegate Ridge Trail System
The Applegate Ridge Trail System occurs across the Medford District BLM. The proposed trail system would connect Jacksonville Forest Park Trails with Grants Pass Cathedral Hills Trail Systems. The Pickett West analysis considers 17 miles of trail contained within the PA. The Pickett West project does not propose to construct the trail but the IDT acknowledges that there is support for the trail and a portion of the trail has been constructed on lands administered by the Ashland Field Office. Due to community support and active construction, the Applegate Ridge Trail System is a foreseeable action which is likely to occur within the Pickett West PA.

Private Industrial Forest Lands

There are approximately 10 private industrial land owners (including Josephine County and the State of Oregon) within the Pickett West PA who collectively manage approximately 32,276 acres. Within the PA there may be approximately 4,002 acres of private industrial forest land assumed to be harvested between 2018 and 2019. These acres are anticipated to be 40-80 years old when harvested and are not assumed to contribute to spotted owl habitat. Activities on private land would be conducted under the Oregon Forest Practices Act.

Waters Creek In-stream Restoration Project

The Waters Creek In-stream Restoration Project is located in T37S-R7W-Section 08. This project proposes to place log structures in a ¼ mile stretch of Waters Creek. The placement of large log structures improves aquatic and riparian habitat. This project is expected to benefit riparian health within the Pickett West PA.

East West Junction Timber Sale

East West Junction Timber Sale is located in T39S-R7W-Sections 08, 20, 21, T39S-R8W-Section 34, and T40S-R8W-Sections 03, 05, and 09. This timber sale is currently under an Administrative Protest, however, upon completion of the Administrative Remedies process it is anticipated that the East West Junction timber sale would implement 86 acres of Variable Density thinning with a retention of 40-60 percent canopy cover and 20 acres of Variable Retention Harvest with a retention of 25-30 percent canopy cover. The activities within the East West Junction timber sale are not expected to alter the hydrology within the Pickett West PA. This project has valid consultation with the *USFWS* for northern spotted owls and their critical habitat.

Reciprocal Right-of-Way (RROW) Permits

Much of the PA is encumbered under reciprocal right-of-way (RROW) permits. These permits allow RROW holders to use, maintain, and construct roads, landings, yarding wedges, and secure tail holds for the purpose of forest management on lands administered by the Medford District BLM. Once an area is encumbered under a RROW permit the actions that are carried out are considered non-discretionary and are not federal actions. The BLM may only object to the request if there is a legitimate reason to object and that reason is listed in the permit. Each permit is unique and contains a specific set of objections. These types of requests are common throughout the PA but the exact locations of the activities are unknown until a request is received.

General Affected Environment

The Pickett West PA lies almost entirely within Josephine County; a small portion on the eastern edge of the PA is within Jackson County. Josephine County is approximately 1,642 square miles, the Pickett West PA totals approximately 313 square miles. General descriptions for the average climate and land use within the county are used as a proxy for the Pickett West General Affected Environment.

The Pickett West PA contains 1 incorporated city; Cave Junction. Grants Pass is the county seat and lies to the east of the Pickett West PA. Unincorporated cities within the PA include Galice, Murphy, and Selma, Oregon.

The Pickett West PA lies within the Rogue Valley. The Rogue Valley is a relatively isolated area framed by the Southern Oregon Coast Range on the west side, the Cascade Range on the eastside and the Siskiyou Range on the south side. The climate is described as being Mediterranean with hot dry summers and mild rainy winters. The average high temperature in the summer is approximately 80 degrees with peak highs above 100 degrees. Average low temperatures range from 35 to 50 degrees depending on the season.

The precipitation averages within the PA varies widely. This is due to the topographically complex nature of the Rogue Valley which is characterized by many small drainages with localized unique climates. In general the PA receives the most precipitation from November to December with an average of 6 inches per month. During the summer months, average precipitation ranges from 0 to ¼ inch. The Rouge Valley receives relatively little snow with a yearly average of less than 1 inch. As stated above, these averages are dependent upon elevation and location and vary widely across the valley.

The general affected environment described here is meant to be an overview of the baseline conditions that typify the valley. Site specific descriptions are contained within the individual Chapter 3 Effects Analysis sections below.

Resource Specialist Analyses

Chapter 3 describes the environmental effects to resources from implementation of the Alternatives. Methodologies, assumptions, and the scale of analysis for resources are disclosed. A description of existing conditions is provided. Effects of the Alternatives are described based on the proposal contained within the No Action Alternative, Alternative 2, and Alternative 3. Projects considered for the Cumulative Effects analysis for each resource can be found at the beginning of Chapter 3 and in Appendix D.

The analysis contained within Chapter 3 has been incorporated by reference from the specialist reports contained within the Administrative Record for this project.

3.1 Silviculture

Methodology and Assumptions

Methods for this analysis included planning area reconnaissance, stand exams, and multiple Geographic Information System (GIS) datasets including: US Forest Service Region 6 insect and disease aerial surveys, aerial photos, Medford District Forest Operations Inventory (FOI) and BLM MicroStorms (activity tracking databases), Gradient Nearest Neighbor (GNN) data from the Southern Oregon Forest Restoration Collaborative (SOFRC), and Rogue Basin 2012 Light Detection and

Ranging (LiDAR) data products. Stand trajectories were modeled using the Forest Vegetation Simulator (FVS), the Southwest Oregon "Organon" FVS variant was used over a 50 year time horizon starting in 2017 to model anticipated treatment outcomes. The historical range of variation (or natural range of variability) was analyzed using data published by Haugo et al. (2015) and the Rogue Basin Cohesive Forest Restoration Strategy: A Collaborative Vision for Resilient Landscapes and Fire Adapted Communities v.1, (Metlen et al. 2015).

Direct/Indirect Effects and Cumulative Effects Boundaries

The spatial extent for the silviculture direct and indirect effects analysis to forested vegetation is the treated area proposed in this project. The cumulative effects are described by the past actions in the proposed treatment units which have resulted in the current condition of these stands, as well as the reasonably foreseeable actions in these stands. The timeframe considered for short-term direct and indirect impacts to stand structure, composition, forest health risk, and appearance is the time needed to complete the proposed silvicultural treatments, approximately three to ten years. The timeframe for long-term direct and indirect impacts to forested vegetation is 50 years in order to better model long-term growth and change in species composition.

3.1.1 Affected Environment

The Pickett West planning area (PA) is made up of the Hellgate Canyon-Rogue River, Lower Applegate and Deer Creek watersheds, totaling just over 200,000 acres, of which approximately half is administered by the BLM. As shown on Figure 3.1-1 and Table 3.1-1, these forests are made up primarily of the Douglas-fir-Dry Potential Vegetation Types (PVT), that support diverse stand compositions of conifers such as Douglas-fir, Ponderosa Pine, Sugar Pine, and Incense Cedar, as well as hardwoods such as Black Oak and Pacific Madrone. These PVTs exhibit a wide variety of conditions, differing by slope, aspect, elevation and soil transitions. South and west aspects exhibit more cover in Sugar pine, Ponderosa pine, California black oak, and seldom white oak, while northern and eastern slopes, as well as more productive soil types display more Douglas-fir, tanoak, and golden chinquapin. The vegetation, fire regimes and historical conditions are described in detail in the relevant watershed analyses.[2] Before the fire suppression and intensive management practices of the twentieth century, this area was characterized by high frequency, low severity fires that would have reduced fuel loadings and maintained a mosaic of open stand conditions different from what is seen today (LANDFIRE, 2012; RGPWA pg. 9-11, SOCBAS pg. 21, DCWA pg. 6). Under the active disturbance regime described, stands would have been dominated by drought-tolerant pines and oaks, as well as Douglas-fir that develop fire resistant, complex forms in open growing conditions following these frequent low to mixed severity fires. After missing several fire return cycles, the likelihood of uncharacteristic fire behavior and high severity fire increases due to the buildup of fuels (Brown et al. 2004, Hessberg et al. 2005, Kauffman 2004, Reinhardt et al. 2008, Ryan et al. 2013). Haugo et al. (2015) categorized the forest restoration needs across Oregon and Washington, and found that not only does southwest Oregon demonstrate the highest need for active forest restoration

[2] Rogue-Grants Pass Watershed Analysis, 1998 (RGPWA); Water Quality Restoration Plan: Southern Oregon Coastal Basin, Applegate Subbasin, 2005 (SOCBAS); Cheney/Slate Watershed Analysis, 1996 (CSWA); Deer Creek Watershed Analysis, 1997 (DCWA);

in the region, but the three watersheds in Picket West are among the most in need of active management to promote forest resiliency. While there has been some debate about the efficacy and need for restoration in forests such as those proposed for treatment in Pickett West, the overwhelming majority of scientists who study ecological processes in the inland Pacific Northwest support the need for active management (Hessberg et al. 2016, pg. 227-228)

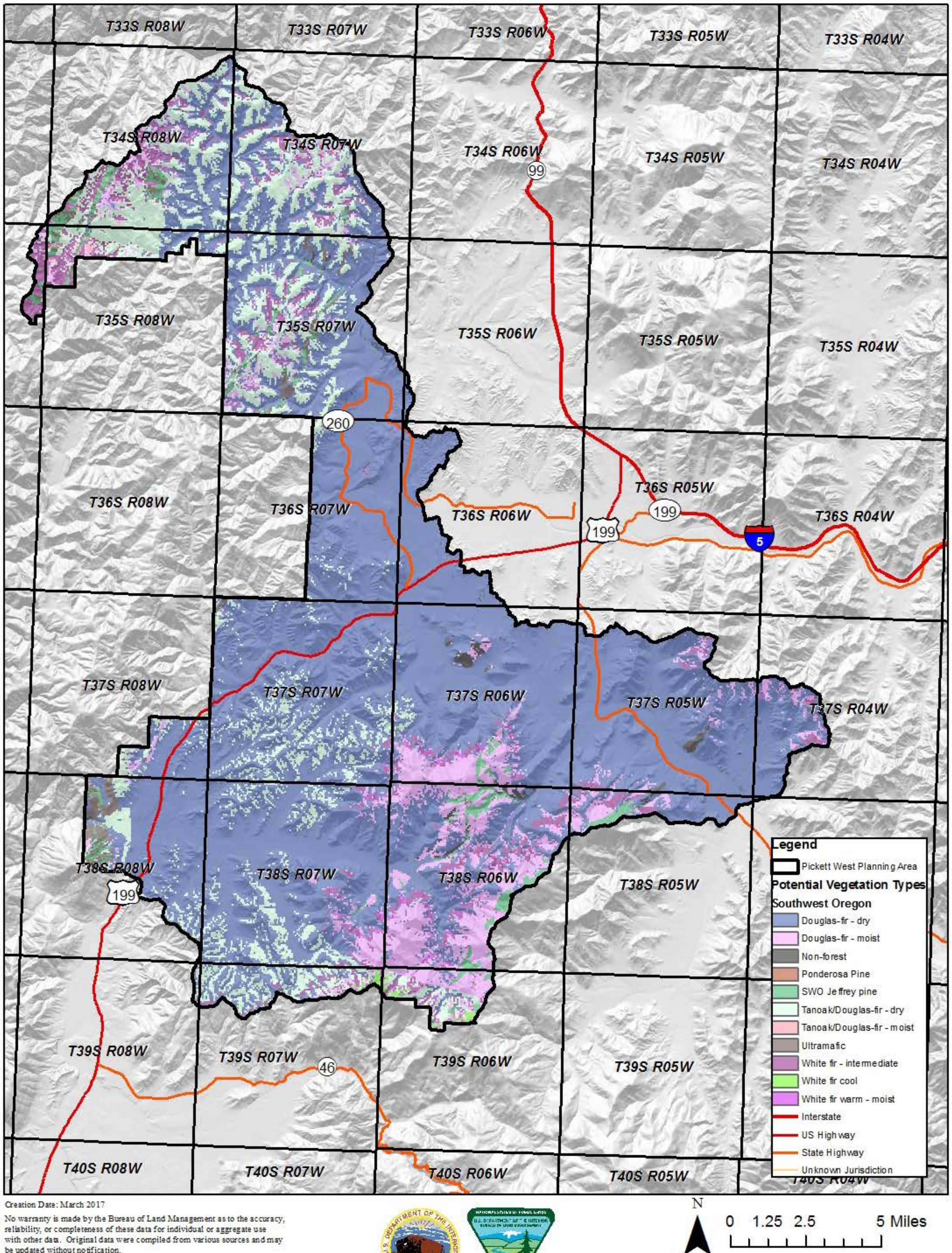
The Revised Recovery Plan for the Northern Spotted Owl (NSO) (2011) states that dry forests that support NSO "should be actively managed in a way that reconciles the overlapping goals of spotted owl conservation, responding to climate change and restoring dry forest ecological structure, composition and processes, including wildfire and other disturbances" (USDI 2011a, p. III-20). Furthermore, "short-term decisions to increase forest ecosystem adaptations to climate-driven drought stresses may include vegetation management around older individual trees to reduce competition for moisture" and "longer-term strategies may include protecting or restoring multiple examples of ecosystems and promoting heterogeneity among and within forest stands with the potential for natural adaptation to future (and unpredictable) climate changes" (USDI 2011a, p. III-21). The plan concludes that "given the complexity of the disturbance regimes in dry forest systems, response of NSO to these disturbances, and the projected influence that climate change may play on these regimes, this Revised Recovery Plan recognizes that active management of vegetation within the dry forest landscape is needed to restore ecosystem resiliency consistent with spotted owl conservation objectives" which are listed on page III-34-35 (USDI 2011a, III-38). In the Critical Habitat Rule (2012) the *USFWS* encourages land managers "to restore natural ecological processes where they have been disrupted or suppressed" (USDI 2012, p. 7-8, 29). They also note that the conversion of early successional shrub-hardwood communities into closed forests in the absence of fire significantly impacts landscape diversity, and that restoration of appropriate fire regimes and use of targeted silvicultural intervention could be effective if the goal is to restore or maintain diversity (USDI 2012, p. 151).

Table 3.1-1 Potential Vegetation Types in the Pickett West Planning Area, BLM-administered Lands, and Proposed Commercial Treatment Units (Atzet et al. 1996)

Plant Association Group	**Dry Forest**	**Approximate BLM and Private Acres** *(Percent of Total Area)*	**Approximate BLM Only Acres** *(Percent of Total BLM)*	**Approximate Acres in Proposed Units** *(Percent of Commercial Units)*
Douglas-fir-Canyon Live Oak/Poison Oak *PSME-QUCH2/RHDI6*	Yes	104,023 *(51.1%)*	40,603 *(42.7%)*	3,758 *(62.6%)*
Douglas-fir-California Black Oak/Poison Oak *PSME-QUKE/RHDI6*	Yes	35,335 *(17.4%)*	8,938*(9.4%)*	368 *(6.1%)*
Tanoak-Douglas-fir-Live Oak/Oregon grape *LIDE3-PSME-QUCH2/BENE2*	Yes	28,021 *(13.8%)*	18,637 *(19.6%)*	1309 *(21.8%)*

Plant Association Group	**Dry Forest**	**Approximate BLM and Private Acres** *(Percent of Total Area)*	**Approximate BLM Only Acres** *(Percent of Total BLM)*	**Approximate Acres in Proposed Units** *(Percent of Commercial Units)*
Douglas-fir/Whipplevine-Western Sword-Fern *PSME/WHMO-POMU*	Yes	17,302 *(8.5%)*	12,457 *(13.1%)*	291 *(4.8%)*
White Fir-Douglas-fir/Creeping Snowberry-Baldhip Rose/Western Starflower *ABCO-PSME/SYMO-ROGY/TRLA6*	Yes	3,585 *(1.8%)*	2,377 *(2.5%)*	81 *(1.3%)*
Jeffrey Pine-Douglas-fir-Incense Cedar *PIJE-PSME-CADE27*	Yes	3,457 *(1.7%)*	3,043 *(3.2%)*	16 *(0.3%)*
Western Hemlock-Port-Orford Cedar/Pacific Rhododendron *TSHE-CHLA/RHMA3*	No	3,057 *(1.5%)*	2,567 *(2.7%)*	55 *(0.9%)*
Douglas-fir-Ultramafic *PSME-ULTRAMAFIC*	Yes	2,068 *(1.0%)*	1,426 *(1.5%)*	20 *(0.3%)*
Other (individual Plant Associations 1percent or less)	---	6,611 *(3.2%)*	5,040 *(5.3%)*	107 *(1.7%)*
TOTAL		**203,458 *(100%)***	**95,088 *(100%)***	**6,005 *(100%)***

Figure 3.1-1 Map of Potential Vegetation Types (PVT) in the Pickett West Planning Area



As shown below in Table 3.1-2, approximately half of the BLM-administered lands contained in the Pickett West PA have had some form of commercial timber management in the last eight decades. Only 10 percent of the BLM-administered acreage was clearcut, mostly in areas now designated as Late Successional Reserve (LSR) under the Northwest Forest Plan. This practice was most prominent in the 1960s, and then again in the 1980s. Regeneration harvest also took place on about 10 percent of BLM stands, and this practice retained some legacy old growth trees for shade. Selection harvest has been the most prominent management approach observed in the PA, accounting for about one third of the BLM-administered lands, and while this approach can take on a variety of forms, generally it refers to the overstory removal of some of the dominant trees in a stand to release the understory trees. In Pickett West this practice, along with fire suppression, effectively shifted the tree species diversity towards more dominance of shade tolerant Douglas-fir over pine species. This change, converted late seral open and closed canopy forests into mid seral closed canopy forest, as average tree diameters decreased, and the lack of regular disturbance allowed dense regeneration to persist in light limited settings.

Figure 3.1-2 Dense Douglas-fir Stand with Oak Mortality

A stand in Pickett West, showing dense small diameter Douglas-fir, the absence of light in the stands has led to excessive oak mortality. The Douglas-fir has self-pruned, resulting in low live canopy ratios and vigor.

Table 3.1-2 Past Commercial Timber Sales and Prescription Types by Decade

	Silvicultural Management						
Decade	**Clearcut** [3]	**Regeneration** [4]	**Selective Cut** [5]	**Thinning** [6]	**Salvage** [7]	**Other** [8]	**Total**
1940-1949	0	515	957	0	0	0	1472
1950-1959	812	620	1,312	0	50	0	2794
1960-1969	3,530	1,011	3,964	0	0	195	8700
1970-1979	493	1,970	16,852	147	0	53	19515
1980-1989	3,697	4,075	3,470	19	136	0	11397
1990-1999	1,366	1,282	1,431	1,143	0	0	5222
2000-2009	0	0	0	1,415	0	0	1415
2010-Present	0	0	0	244	11	0	22
Total by Type	***9,901***	***9,473***	***27,986***	***2,968***	***197***	***248***	***50773***
Percent of Planning Area	***4.9%***	***4.7%***	***13.8%***	***1.5%***	***0.1%***	***0.1%***	***25.0%***
Percent BLM-administered Lands	***10.4%***	***10.0%***	***29.4%***	***3.1%***	***0.2%***	***0.3%***	***53.4%***

[3] Clearcut refers to the removal of all trees on a site, and is followed up by planting a new cohort, leading to an even aged stand

[4] Regeneration refers to a timber harvest resulting in a new cohort of trees, often overstory trees are left on site to act as a seed source and provide shade as the new stand develops. These overstory trees may or may not be removed once a new cohort is established leading to an even aged or two aged stand.

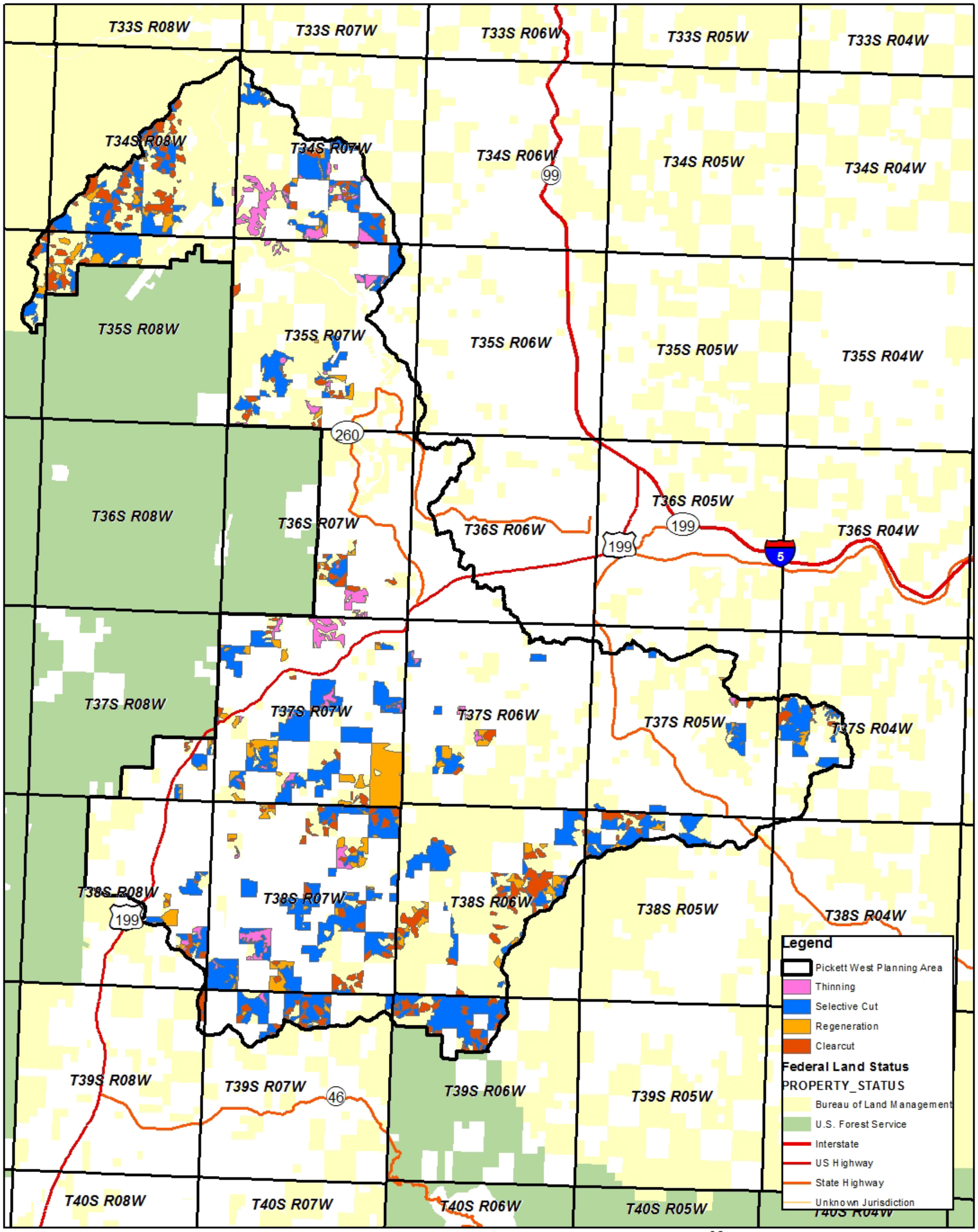
[5] Selective cut refers to the removal of only some trees, generally the largest in a stand or the dead and dying to redistribute resources and stimulate growth in the remaining trees

[6] Thinning refers to the partial harvest of a stand, intending to redistribute resources to residual trees.

[7] Salvage refers to the removal of dead and dying trees to recover economic value, and is usually followed up by planting a new cohort of trees.

[8] A small amount of past harvest activities were not defined in available data sources

Figure 3.1-3 Map of Past Commercial Timber Harvest in the Pickett West Planning Area



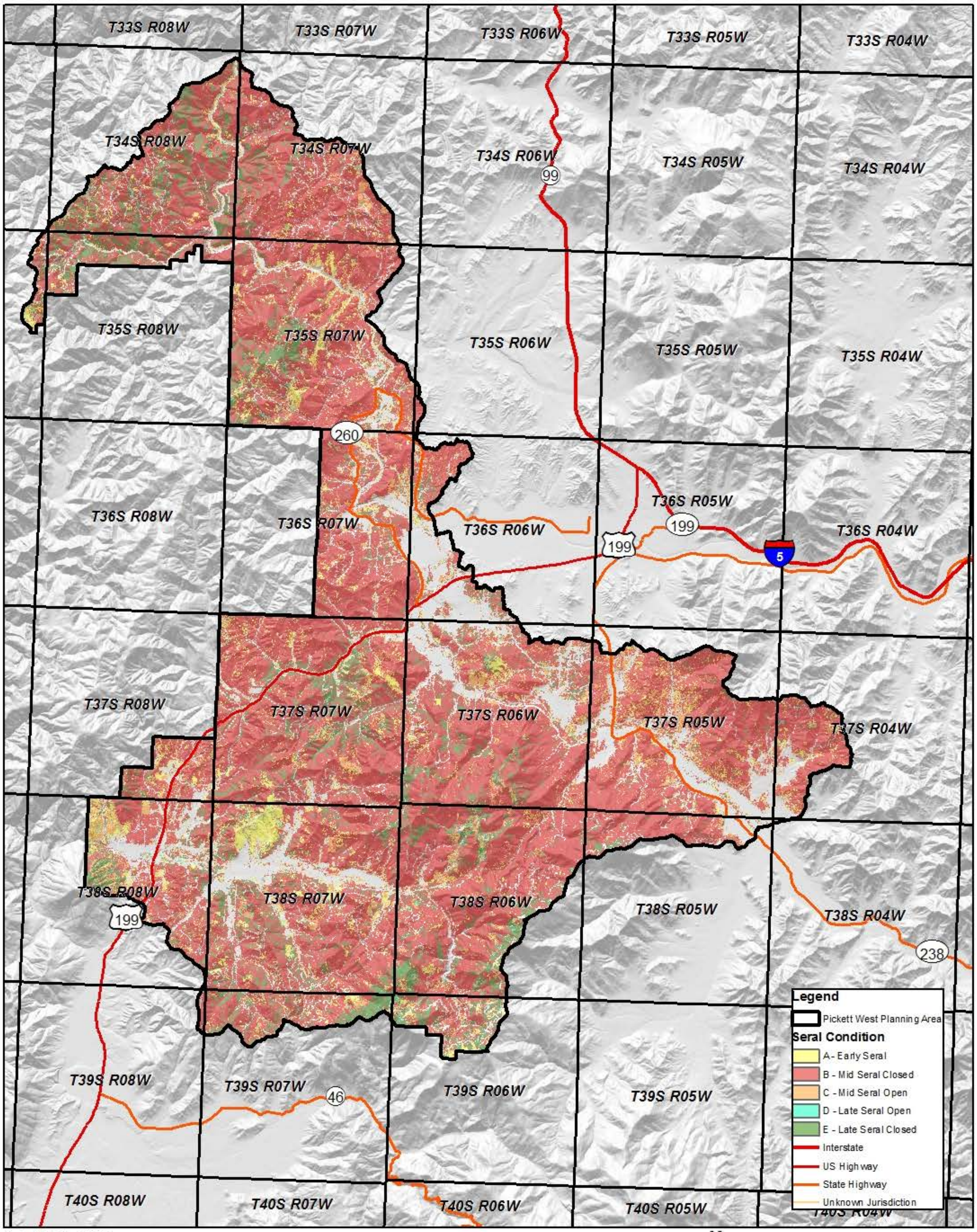
Creation Date: March 2017

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

N

0 1.25 2.5 5 Miles

Figure 3.1-4 Current Seral State of Forested Lands in the Pickett West Planning Area



Creation Date: March 2017

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

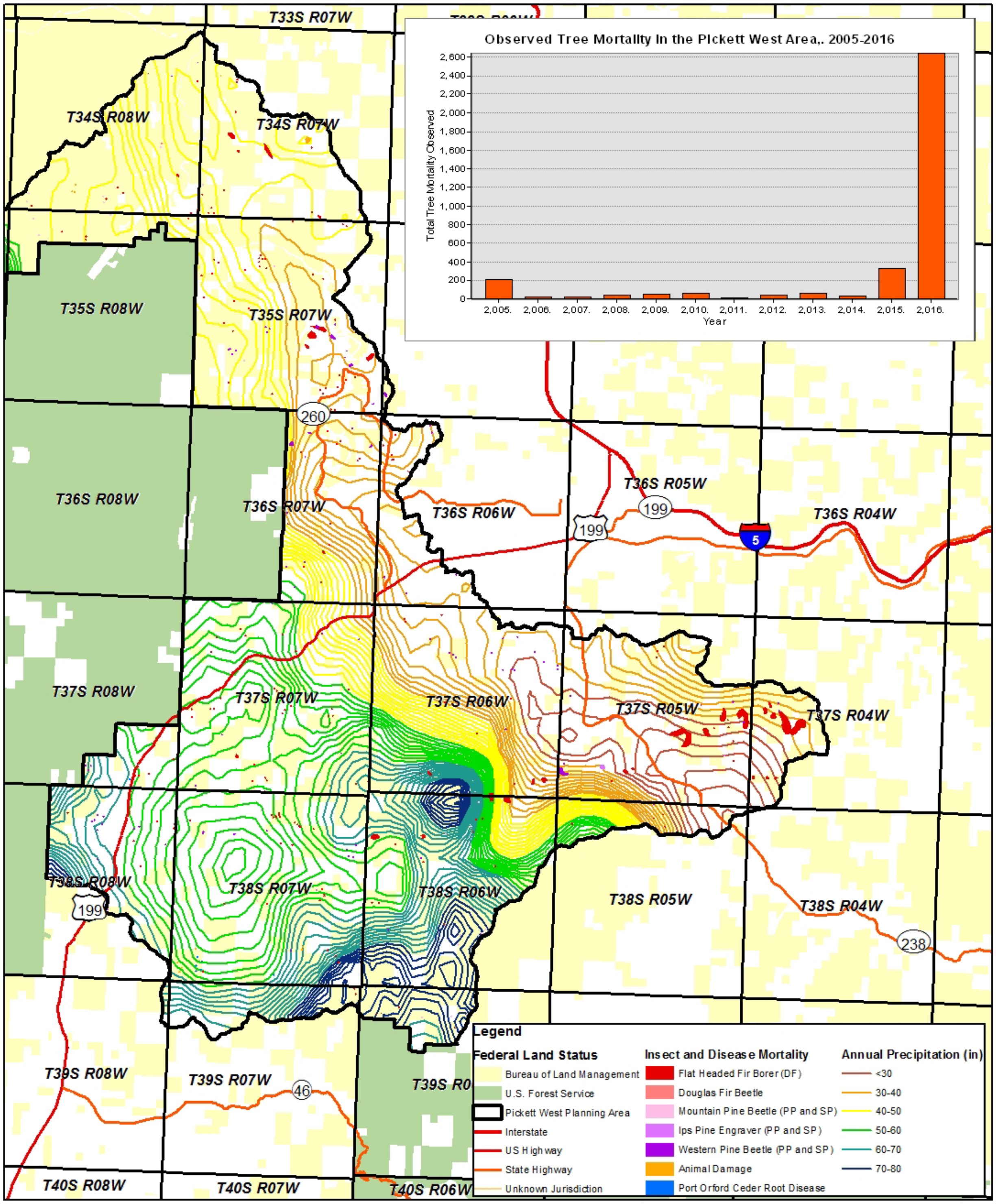
Table 3.1-3 Current Seral State of Forested Lands in the Pickett West Planning Area, BLM-administrated Lands, and Proposed Commercial Treatment Units

Seral Condition	**Historical Range of Variation (HRV) for Douglas-fir-Dry: SW Oregon** [9]	**Approximate BLM and Private Acres** *(Percent of Total Area)*	**Approximate BLM Only Acres** *(Percent of Total BLM)*	**Approximate Acres in Proposed Units** *(Percent of Commercial Units)*
A: Early Seral	7-11%	10,211 *(5.0%)*	4,412 *(4.6%)*	72 *(1.2%)*
B: Mid Seral Closed Canopy	5-8%	125,608 *(61.7%)*	69,851*(73.5%)*	4,999 *(83.3%)*
C: Mid Seral Open Canopy	18-22%	15,810 *(7.8%)*	5,815 *(6.1%)*	139 *(2.3%)*
D: Late Seral Open Canopy	40-45%	1,644 *(0.8%)*	740 *(0.8%)*	15 *(0.3%)*
E: Late Seral Closed Canopy	20-25%	20,538 *(10.1%)*	13,936 *(14.7%)*	780 *(13.0%)*
Non Forested (i.e. urban areas, open water)	--	29,647 (14.6%)	334 (0.4%)	--
TOTAL		**203,458** ***(100%)***	**95,088** ***(100%)***	**6,005** ***(100%)***

While Douglas-fir trees have experienced a noticeable spike in mortality from 2015-2016 in the Rogue Basin due to Flathead Fir Borer activity, aerial insect and disease surveys from 2005 to present also show that a disproportionate amount of tree mortality has been occurring in pine trees in the Pickett West PA prior to 2016 (USDA and ODF 2016). Densely stocked stands develop in the absence of disturbance, which has also increased the overall cover of Douglas-fir in all stand layers (top, middle, and bottom). Douglas-fir tends to produce conditions that favor fire because it is self-pruning, often sheds its needles, and tends to increase the rate of fuel buildup and drying (Atzet and Wheeler 1982, pp. 8-9). Subsequently, this substantial shift in species composition has heightened the competitive advantage of shade tolerant trees, increasing its absolute cover and relative density (USDI 1996, p.36), thereby increasing the overall fire hazard. Refer to the Fuels Report for additional information on fire risks. The now minor conifer species, such as Ponderosa and Sugar pine appear most frequently in the top layer, making up a very small legacy component of stands. This conversion and simplification of stands into closed canopy, mid seral conditions is an undesirable shift for many wildlife species, including the northern spotted owl.

[9] Historical Range of Variation (HRV) is derived for the Douglas-fir-Dry vegetation type, the dominant classification in the Planning Area, from Haugo et al. (2015) Appendix A. The dataset used to calculate current seral classification was provided by The Nature Conservancy (TNC) and was used in the planning of the Rogue Basin Cohesive Forest Restoration Strategy (2015) from Gradient Nearest Neighbor (GNN) data.

Figure 3.1-5 Insect and Disease Induced Mortality 2005-Present and Average Annual Precipitation



0 1.25 2.5 5 Miles

N

Creation Date: March 2017

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

Source: USDA Forest Service, Forest Health Protection; Washington Department of Natural Resources, Resource Protection Division, Forest Health; and Oregon Department of Forestry, Forest Health Management

Disclaimer: The insect and disease data should be used only as an indicator of insect and disease activity, Polygons indicate areas of tree mortality and/or defoliation; intensity of damage is variable and not all trees indicated by polygons are dead or defoliated.

3.1.2 Environmental Effects

Stand exams were conducted in 2017 for this analysis and under several past projects within the Pickett West PA, including North Murphy, Deer North, South Deer, and Cheney Slate. These exams were used to model treatment outcomes in the Forest Vegetation Simulator (FVS), Southwest ORGANON variant. Maximum stand density indexes (SDI) and target SDI values were sourced from the Rogue Basin Cohesive Forest Restoration Strategy v.1 Appendix 3 (SOFRC, 2015), resulting in the ranges provided in the following Table 3.1-4. Overall objectives for the proposed treatment types are described in more detail below.

Table 3.1-4 Approximate basal area and canopy cover retention targets under the proposed activities

Prescription Objective	Target Canopy Cover	Target Stand Density Index*	Target Basal Area (ft^2/ac)
Restoration Thinning	Variable, 30-50%	150-210	70-140 ^{2}/ac
Density Management: NSO Dispersal	> 40%	NA	100-140 ft^2/ac
Density Management: NSO NRF	> 60%	NA	150-240 ^{ft2}/ac

** Stand Density Index – a measure of the stocking of a stand of trees based on the number of trees per unit area and diameter at breast height of the tree of average basal area.*

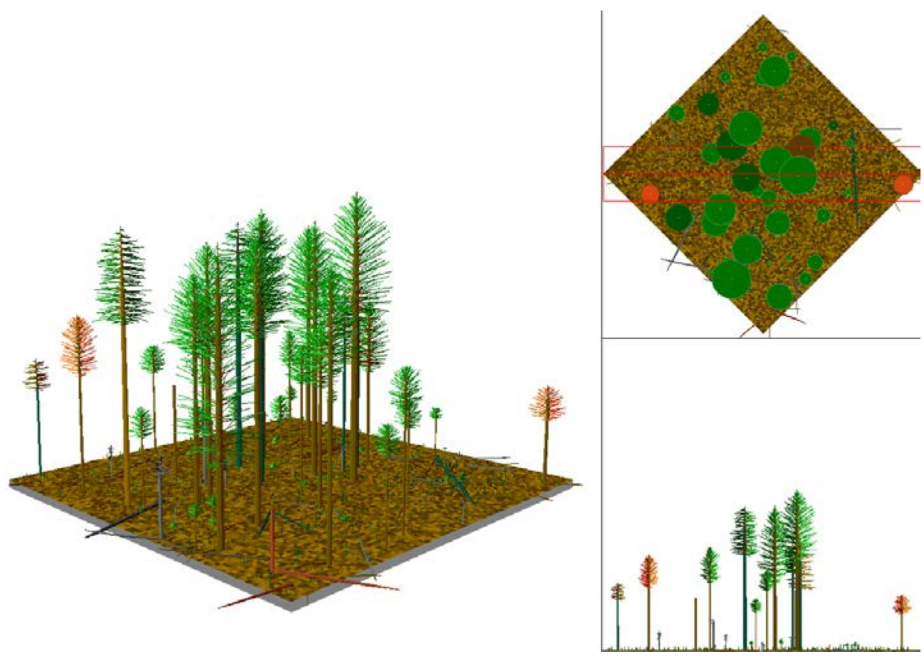
Figure 3.1-6 Legacy Ponderosa Pine

A surviving ponderosa pine with basal scars on the uphill side indicates that the tree has survived past frequent fires. These legacy structures are to be preserved and enhanced, primarily under restoration thinning which allows more light for pine recruitment and establishment. Excessive stand densities predispose trees like this to bark beetles and drought stress in the absence of any management action.

Restoration Thinning and Understory Reduction: Dry Forest Restoration Objectives

As shown in Figures 3.1-4 and 3.3-2, outside of all historical NSO homeranges and within unoccupied homeranges where the Relative Habitat Suitability (RHS) is very poor, an ecological restoration approach is being proposed under Alternative 2. Under Alternative 3, this approach is only proposed outside of all historical NSO homeranges and outside of the NSO 2012 Critical Habitat Designations. Described in the 1995 RMP (p. 186), the purposes of Restoration Thinning and Understory Reduction are to reduce stand density and fuel loadings, increase vigor, and reduce insect and disease mortality similar to levels found in stands that have an intact fire regime in place. Restoration Thinning prescriptions have been developed with the more recent Rogue Basin Cohesive Forest Restoration Strategy's "Ecosystem Resilience" and "Fuel Management" models in mind (SOFRC 2015, pp. 26-30, 45). The desired condition is an open growing, structurally diverse stand with openings that allow the natural regeneration or planting of primarily early seral trees such as pines and oaks where appropriate as well as dense, shaded refugia for wildlife. Underburning would be considered after mechanical operations are completed to further reduce fuel loadings, recycle nutrients and stimulate plant growth. A restoration thinning allows for the protection and development of important NSO habitat features over the long-term such as large diameter, open grown trees with large lower limbs, as well as reducing wildfire impacts. The treatment's effect would bring the stand to 30-50 percent maximum Stand Density Index, and the residual growth increase would generally last for 25 years or longer.

Figure 3.1-7 Example Restoration Thinning Prescription

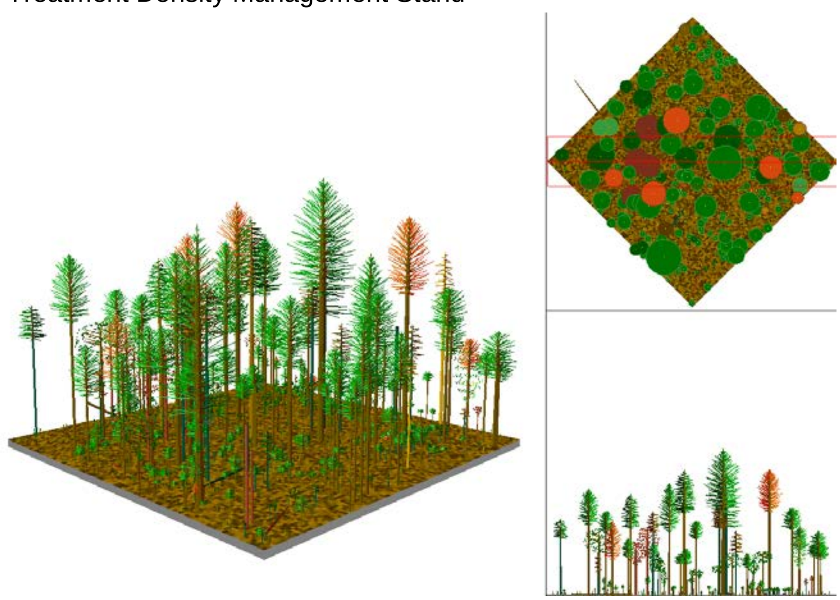


Example of a Restoration Thinning Prescription, including a post treatment underburn. Residual Basal Area in this example stand is 112ft^2/ac, SDI = 197. The onset of competition is at 25 percent of SDImax, 35 percent of SDImax is the lower limit of full site occupancy, and 60 percent SDImax is associated with the lower limit of self-thinning (Long and Daniel, 1990). At 39 percent SDimax this stand is now in a stable condition, Pine and other early seral trees will likely persist and thrive in the more open conditions. Adequate canopy remains for suppression of understory shrubs.

Density Management and Understory Reduction: Dispersal Objectives

This approach is described in the RMP as release treatments designed to control stand density, influence species dominance, maintain stand vigor and place stands on developmental paths so that the desired stand characteristics result in the future (p. 185). Several definitions have been suggested for dispersal habitat, Buchanan (2004) provides a long list of these definitions and the Recovery Plan suggests that owls are able to disperse through highly fragmented landscapes, generally dispersal function exists when a stand consists of 11" DBH trees or greater, contains opportunities for some foraging as well as some roosting structures, and a minimum of 40 percent canopy cover (USDI 2011a, p.vi). These types of treatments are more characteristic of a Habitat Capable-Long approach in that they "break up the continuity of fuels and can slow or stop the spread of active crown fire across the mosaic [and by keeping a cohort of large trees], can develop high-quality habitat conditions" in the similar fire regimes of the Cascades (USDA 2016, p. 90). Additionally, treatments of this type are consistent with the objectives described in the Recovery Plan to reduce stress through vegetation management around older individual trees in the short-term, and longer term strategies of actively restoring multiple examples of ecosystems and promoting heterogeneity among and within forest stands (USDI 2011a, p. III-21). The treatment's effect would bring the stand to within 30-50 percent Maximum Stand Density Index, however the residual growth increase would generally last for less than 25 years because higher stocking levels would be retained post treatment.

Figure 3.1-8 Post Treatment Density Management Stand



Post treatment Density Management to a minimum 40 percent canopy cover retention. Residual Basal Area in this example stand is 122ft2/ac, SDI = 251. The onset of competition is at 25 percent of SDImax, 35 percent of SDImax is the lower limit of full site occupancy, and 60 percent SDImax is associated with the lower limit of self-thinning (Long and Daniel, 1990). At 51 percent SDImax the stand in the upper limits of the management zone. An early second entry would be needed to maintain the stand in a resilient condition.

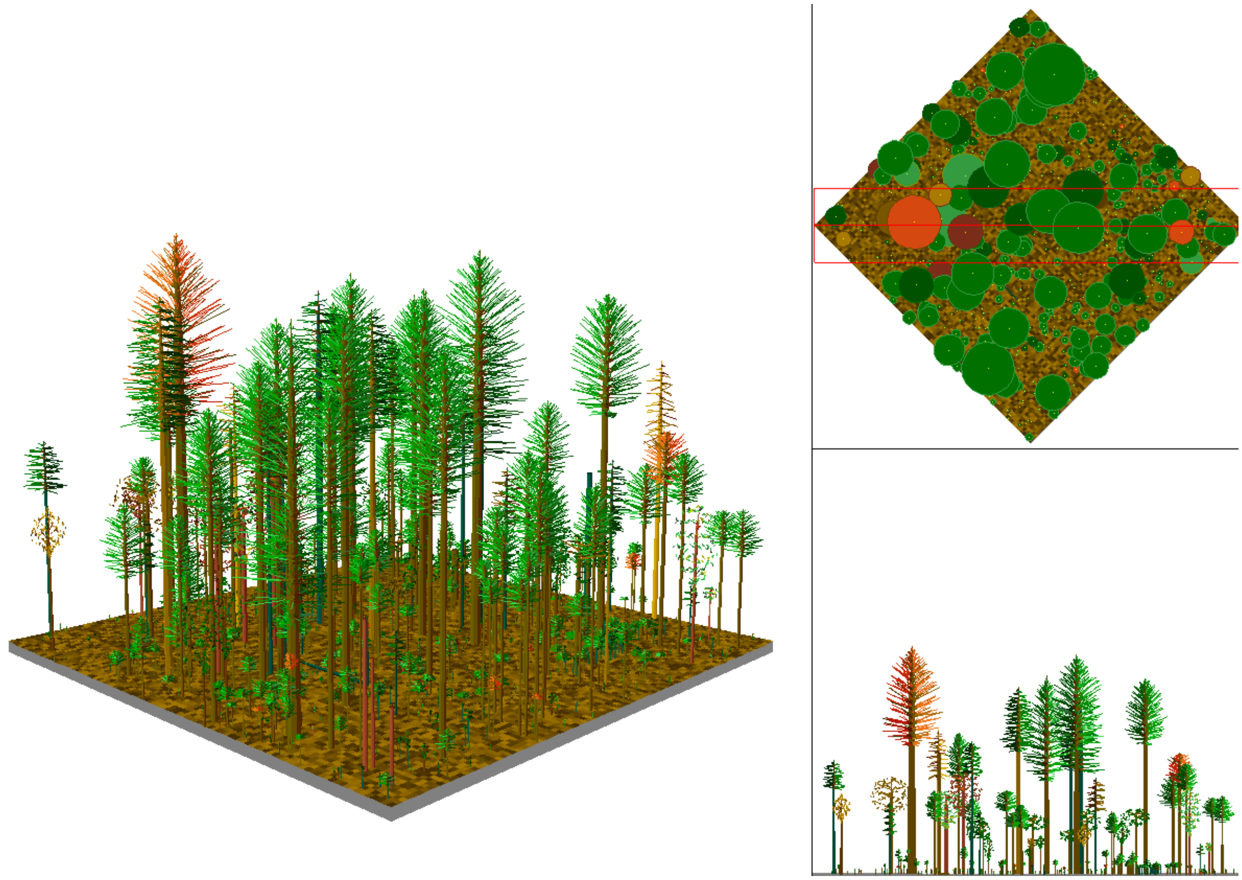
Density Management and Understory Reduction: Nesting, and Roosting-Foraging Objectives

The main objective is to provide nesting habitat and food resources for owls, however foraging habitat features are extremely variable across the range and therefore stand level treatments should consider the primary prey species in the immediate area. NSO in the Pickett West PA appear most likely to forage on woodrats. Studies in the Klamath Province suggest that “a mosaic of late-successional habitat interspersed with other seral conditions may benefit spotted owls more than large, homogeneous expanses of older forests in areas where woodrats are a major component of spotted owl diets” (USDI, 2011a, p. A-10). “Compared to other zones, additional foraging habitat for this zone showed greater divergence from nesting habitat, with much lower canopy cover and tree size. Low to intermediate slope positions were strongly favored (USDI 2012, p. 121).” To improve habitat for these populations, desired features would be large snags, mistletoe infested trees (particularly Douglas-fir), and complex forest structures with a variety of shrubby openings, multiple layers and dense pockets, and overall canopy cover greater than 60 percent at the stand level. This is a Habitat Capable-Short approach where stands “can be made somewhat resistant to wildfire and contain a sufficient number of large trees and medium-size trees to grow into nesting and roosting habitat (may still provide foraging potential (productivity), [and] local NSO habitat needs (e.g., for dispersal)” in the similarly fire adapted Cascade region (USDA 2016, p. 90). This was also studied and quantified by Irwin et al. (2015) in south-central Oregon and north-eastern California finding that stands managed with this approach showed an increase in use by NSO post-treatment (for stands nearest nest sites and near streams) and that commercial thinning can improve the values of low-quality foraging habitat in the short run in stands where woodrats are important food source and where uncharacteristic wildfires may threaten habitat sustainability. As above in dispersal management, treatments of this type are consistent with the objectives described in the Recovery Plan to reduce stress through vegetation management around older individual trees in the short-term, and longer term strategies of actively restoring multiple examples of ecosystems and promoting heterogeneity among and within forest stands (USDI 2011a, p. III-21). The treatment would leave the stand above 50 percent Maximum SDI, however a localized stress reduction to individual trees would occur.

Figure 3.1-9 Pine mortality

Pine mortality in shaded conditions allowing small diameter Douglas-fir to develop with poor height to diameter and crown ratios.

Figure 3.1-10 Post Treatment Density Management 60 Percent Canopy Retention



Post treatment Density Management 60 percent Canopy Retention. Residual Basal Area in this example stand is 175ft2/ac, SDI = 345. The onset of competition is at 25 percent of SDImax, 35 percent of SDImax is the lower limit of full site occupancy, and 60 percent SDImax is associated with the lower limit of self-thinning (Long and Daniel, 1990). At 69 percent SDImax the stand is still well into mortality stage and continued pine and Douglas-fir mortality is expected to occur though some risk reduction has taken place.

<u>Alternative 1 – No Action</u>

Direct, Indirect, and Cumulative Effects

The cumulative effect of past management practices including timber harvest and fire suppression at the project boundary, BLM-administered, and proposed treatment unit scales is an over representation of closed canopy, mid seral stand conditions as discussed above in Table 3.1-3. Because trees growing in dense conditions grow in height, but very little in diameter (Oliver and Larson 1996, pg. 75), the No Action Alternative scenario would not result in late seral open or closed canopy conditions and the current over representation of mid-seral, closed canopy forests would continue. Overall stand growth would remain stagnant as stands would be left in overly dense conditions (Tappeiner et al. 2007, p.124). Alternative 1 ensures the direct and indirect effect of declining individual tree and stand vigor because if a stand is allowed to grow for many years within the zone of imminent competition mortality, mortality would occur (Drew and Flewelling 1979). In dense stands, non-vigorous large trees would likely not persist and a non-vigorous stands would likely not develop large woody structure. The Alternative 1 would prevent stands from attaining vigorous conifer growth. Forest floors would continue accumulating fuel from branches and limbs as trees continue to self-prune. Current densities threaten the persistence of minor species composition both directly by fire risk and indirectly by the effects of competition mortality from Douglas-fir as shade intolerant pine and oak species continue to decline.

Young stand management in the PA, such as tree planting, brush cutting, pre-commercial thinning, plantation maintenance and protection treatments would continue. Reduced biological and structural diversity is expected in private industrial forestland which can continue long-term if planted with single crop tree species. Forest operations on private land were anticipated in the development of the BLM Resource Management Plan (USDI 1995), the landscape planning of the project itself, through the application of the Recovery Action-10 process, as well as in the development of criteria for appropriate silvicultural treatments (USDI 2011a, III-11 to III-38). Fire suppression activities would continue on federal and non-federally administered lands in accordance with the fire protection contract the BLM holds with the Oregon Department of Forestry (ODF).

In summary, the No Action Alternative would not promote the development of late-seral open or closed canopy forest, which is lacking at the landscape, BLM-administered lands and proposed unit levels. No action is not expected to contribute to the recovery of the NSO as described in the Recovery Plan and Critical Habitat Rule, or to the resiliency of stands to environmental changes, including drought and catastrophic fire. There would be a cumulative adverse effect of not meeting improved conifer growth and habitat development objectives as described in the 2011 Revised Recovery Plan, the relevant Watershed Analysis listed above, or the 1995 Medford District RMP.

Action Alternatives 2 and 3

Direct and Indirect Effects

The Record of Decision/Medford District Resource Management Plan (USDI 1995) defines silviculture as “the art and science of managing forest stands to provide or maintain structures, species composition, and growth rates that contribute to forest management goals.” Matrix objectives for silviculture include: production of commercial yields of wood, retention of moderate levels of ecologically valuable old-growth components such as snags, logs, and relatively large green trees, and increasing ecological diversity by providing early successional habitat. The units proposed for treatment under both Alternative 2 and 3 are situated on Matrix lands, approximately 65 percent of the units are in designated NSO Critical Habitat. This does not change land use allocations or Standards and Guidelines for management under the Northwest Forest Plan, nor does it establish any management direction or prescriptions for critical habitat. However, the Fish and Wildlife Service encourages land managers “to restore natural ecological processes where they have been disrupted or suppressed” (USDI 2012, p. 7-8, 29). They also note that the conversion of early successional shrub-

hardwood communities into closed forests in the absence of fire significantly impacts landscape diversity, and that restoration of appropriate fire regimes and use of targeted silvicultural intervention could be effective if the goal is to restore or maintain diversity (USDI 2012, p. 151).
The effects of active management, as opposed to the No Action Alternative are:

- A reduction in stand densities that promote growth and vigor; living vegetation must expand in size and a tree cannot grow larger unless its growing space is increased; residual trees are expected to increase in diameter growth, including the diameter of the largest trees (Oliver and Larson 1996, pg. 36, Tappeiner et al. 2007, p.127).

- Tree species diversity would be increased, ensuring that NSO and 1995 ROD/RMP species diversity goals could be met (USDI 2011a, p.III-20); (USDI 1995, p.191). This diversity in tree species and sizes is important for ecosystem function (Franklin et al. 2002).

- A short-term increase of fine fuels deposited on the forest floor would result in an immediate increase in fire hazard until activity fuels are treated. Activity fuels treatments are proposed that would reduce this immediate deposition of fuels as described in Chapter 2.4, PDFs and BMPs and the Fire and Fuels Specialist Report.

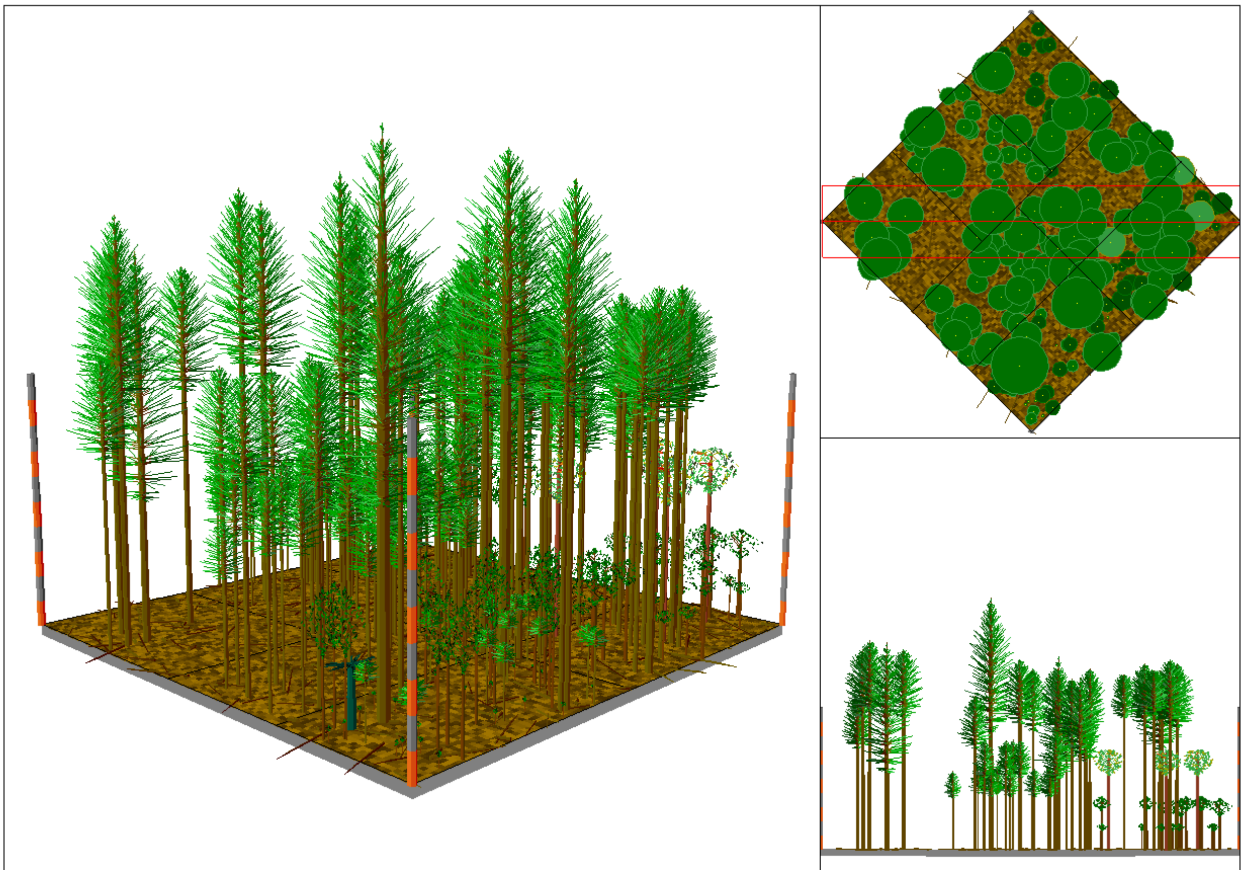
- Risk of windthrow could be increased, however windthrow occurs in both managed and unmanaged stands and low levels of windthrow are desirable for wildlife habitat and stand complexity. Proposed silvicultural prescriptions are designed to remove trees that are most susceptible such as those with low vigor, poor crown ratios and those with high height : diameter ratios (Worthington and Staebler, 1962, pg. 21, Moore et al. 2003, Wonn and O'Hara, pg. 92, Tappeiner et al. 2007, pg. 129-130)

Direct/Indirect and Cumulative Effects differences between Alternative 2 and Alternative 3

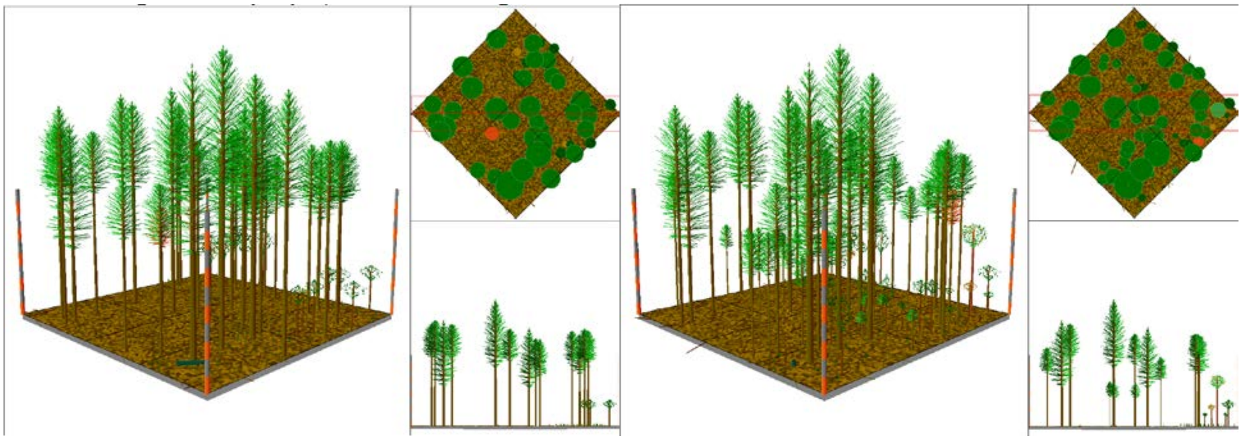
The two suites of silvicultural treatment types proposed under Alternatives 2 and 3 are similar in objectives, however there are key differences between them and the spatial location where the treatments would be applied, as seen on the following page in Tables 3.1-5. Both Action Alternatives address the need to restore, conserve, and enhance NSO habitat as recommended in the 2011 Revised Recovery Plan, however Alternative 2 was developed to strategically determine objectives in each unit, while Alternative 3 was not developed with a site specific strategy. BLM staff followed the RA-10 process that deferred forested areas already meeting high quality NSO habitat while minimizing impacts to any single NSO homerange, (refer to Wildlife Specialist Report, and the Biological Assessment for more information on effects to owls). Under Alternative 2, there is no specific upper limit tree diameter that could be harvested as long as the objectives described are being met, and thinning in Riparian Reserves could occur to accelerate the development of large diameter trees and reduce overall risk, thus contributing to Aquatic Conservation Strategy objectives (refer to the Hydrology Report for more information).

Alternative 2 was developed to allow for more flexibility in promoting dry forest restoration while considering the long-term potential for improved habitat development. This was done in a similar fashion as described by the Southern Oregon Forest Restoration Collaborative (Metlen et al. 2015) - primarily using the Relative Habitat Suitability (RHS) model developed by the USFWS, as well as records of site occupancy, site specific information such as soil conditions, topography and current condition. Additionally, in order to minimize the potential impacts to owls, no NSO nesting habitat (which is distinct from roosting-foraging habitat) would be downgraded or removed, regardless of site suitability. Under Alternative 3 an upper diameter limit of 21 inches DBH was applied, no commercial treatments within Riparian Reserves would occur. NSO habitat would be maintained in all historical NSO homeranges and Critical Habitat, regardless of occupancy or site suitability. Based on modelling in FVS, generally the overall stocking targets can be attained when the diameter limit of 21” DBH is applied. The major impact of diameter restrictions applied regardless of current condition is that the ability to influence species diversity is reduced, the economic viability is reduced and the stand complexity in terms of canopy layers and structures is reduced by removing only small trees. An example is provided in the figures below.

Figure 3.1-11 Example stand in Pickett West prior to treatment



Above, an example stand in Pickett West prior to treatment. Below left, the stand has been treated to within 30-50 percent Maximum SDI with a diameter limit of 21” and on the right, the same treatment without a Diameter limit. Without a 21 inch diameter limit, greater structural complexity is retained and more options are available in future treatments.



The summation of effects under Alternatives 1, 2, and 3 is below in Table 3.5-1. For Alternative 2, all Inner Riparian Zones were removed from commercial treatment, all NSO nesting habitat was identified as “Treat and Maintain,” and NSO Dispersal and Foraging habitat under the Treat and Maintain and Downgrade scenarios were identified within the broader unit classifications. For Alternative 3 all riparian Inner and Outer Zones were removed from commercial treatment, all NSO nesting habitat was identified as “Treat and Maintain,” as was all NSO habitat within historical homeranges and all CHU designations. The onset of competition is at 25 percent of SDImax, 35 percent of SDImax is the lower limit of full site occupancy, and 60 percent SDImax is associated with the lower limit of self-thinning, tree mortality (Long and Daniel, 1990). For the purposes of this analysis, 30-50 percent SDImax is considered desirable in that trees would occupy the site, and self-thinning would not yet have occurred at the stand level. After modelling the effects of the proposed treatment types in FVS, it was determined that Restoration Thinning would bring treated areas to within 30-50 percent of SDImax, at the stand level and the duration of the effect from the initial treatment to residual trees would last over 25 years on average.

Density Management: Dispersal would bring treated stands to within 30-50 percent of SDImax, and the duration of the effect from the initial treatment to residual trees would last less than 25 years on average. Density Management: Nesting/Roosting-Foraging would not generally bring treated stands to within 30-50 percent of SDImax, however there would be a reduced risk to individual trees in treated stands.

In summary, under Alternative 2, approximately 75 percent of the proposed units would be in resilient growing conditions, 12 percent would have a risk reduction to some individual trees, and 12percent would be untreated. Under Alternative 3, only 42 percent of the proposed units would be in resilient growing conditions, and 28 percent would have a risk reduction while 30 percent would be untreated. Additionally the 21 inch diameter limit under Alternative 3 reduces the economic feasibility of all treatments and would likely come into conflict with the desire to leave multi-layered, multi-cohort stands.

Table 3.1-5 Comparison of Alternatives, Effects on Forested Vegetation[10]

Treatment Type	Silvicultural Effect	Alternative 1 No Action	Alternative 2 Restoration Emphasis	Alternative 3 Assumed NSO Occupancy
Restoration Thinning	Stands 30-50% Max SDI Expected Duration >25Years	0	3,043 acres (50%)	1,170 acres (20%)
Density Management: Dispersal	Stands 30-50%Max SDI Expected Duration <25 Years	0	1,494 acres (25%)	1,360 acres (23%)
Density Management: NRF	Stands with Risk Reduction, levels above 50%Max SDI	0	714 acres (12%)	1,683 acres (28%)
No Treatment (Riparian Buffers)	No Risk Reduction	6,005 acres (100%)	754 acres (13%)	1,792 acres (30%)

The cumulative effect of past management practices including timber harvest and fire suppression at the project boundary, BLM-administered, and proposed treatment unit scales is an over representation of closed canopy, mid seral stand conditions as discussed above in Table 3.1-2. Under Alternative 2, approximately 4,545 acres of forestland, approximately 4.8 percent of BLM-administered lands in the PA, would be brought from mid-seral closed growing conditions into mid-seral open growing conditions, thus allowing the long-term growth trajectory to trend towards late seral open and closed canopy conditions. Under Alternative 3 this number is reduced to 2.7 percent of BLM-administered lands that would be set on a trajectory towards late seral open and closed growing conditions.

[10] Acres and percentages are approximate, based on Geographic Information Systems (GIS) analysis

Figure 3.1-12 Legacy old growth trees in Pickett West

Legacy old growth trees in Pickett West show signs of establishing and growing under open growing conditions. On the left, an old growth Douglas-fir developed thick, fire resistant bark and thick lower limbs when they were exposed to light, providing a benefit to wildlife that does not develop in shaded conditions. As this stand closed in, it developed from Late Seral Open Canopy into Late Seral Closed Canopy forest. On the right, an old growth sugar pine exhibiting fire scars on the uphill side provide evidence that the tree has survived multiple low intensity fires that would have maintained the stand in Late Seral Open Canopy forest.

3.2 Fire and Fuels

Methodology

- Fuels Models (Scott and Burgan 2005) and photo series were used to estimate and predict surface fuel loading and flame lengths.

- Conditional Flame Length, Annual Burn Probability and Natural Range of Variability were derived from Rogue Basin Cohesive Forest Restoration Strategy: A Collaborative Vision for Resilient Landscapes and Fire Adapted Communities (Metlen et al. 2015).

- Fire Regimes data was derived from LANDFIRE Refresh 2014 http://landfire.cr.usgs.gov/viewer/.

- Fire Behavior Fuel Models data was derived from LANDFIRE Refresh 2014 http://landfire.cr.usgs.gov/viewer/.

Assumptions

Hazardous Fuels Reduction Maintenance (HFRm) acres would be prioritized based on Natural Range of Variability (surplus seral closed), Burn Probability, Conditional Flame Length, fire suppression objectives, public safety, improving/maintaining desired condition, maintaining previous investments and funding allocations.

All merchantable saw logs (> 8 inch diameter at breast height - DBH) would be whole tree yarded with tops attached in cable yarding systems. Tether assist harvest systems activity slash would be placed on the forest floor and used as a slash mat for equipment travel. In ground-based harvest systems, slashing, hand piling, hand pile burning, lopping and scattering, machine piling, machine pile burning, and underburning would be evaluated pre and post-harvest for slash disposal. Helicopter harvest units would be evaluated post-harvest based on fuel loading, fuel continuity, aspect, slope, and fire hazard for slash mitigation.

3.2.1 Affected Environment

After Euro-American settlement, several factors including fire exclusion, forest management activities, and climatic events have greatly altered historical vegetation patterns. This trend is being readily observed across the entire country and catastrophic fires are becoming more common. This section describes the current condition of the landscape and discloses the effects of forest management activities on fire hazards.

Fire History

Prior to the twentieth century, low to mixed-severity fires burned regularly in most dry forest ecosystems, with ignitions caused by both lightning and humans. Frequent low severity fire influenced and controlled regeneration of fire intolerant species, promoted fire tolerant species, such as ponderosa pine and Douglas-fir, and maintained an open forest structure with mosaics of frequent, low severity burn areas. This resulted in the reduction of forest biomass, decreased the impacts of insects and diseases, and maintained wildlife habitats for many species that utilize open stand structures (Graham et al. 2004).

The Pickett West Forest Management Project is within the Klamath Siskiyou province forests in southwestern Oregon where fire is recognized as the primary natural disturbance agent, influencing vegetation structure, species composition, soil properties, nutrient cycling, hydrology and other ecosystem processes (Agee 1993). Fire has played an important role in influencing successional processes and creating diverse forest conditions, creating a landscape of patchy mixed seral states of shrubland, woodland and forests in both open and closed conditions (Perry et al. 2011, Taylor and Skinner 1998). Frequent, low intensity fires served as a thinning mechanism, thereby naturally regulating the density of the forests. A more open crown structure would have allowed fire to burn at lower intensities, move more rapidly across the landscape for shorter resident time. The light flashy surface fuels (grasses, shrubs, and conifer/hardwood litter), burned on a regular fire interval, thus maintaining historical fuel loading. Repeated reduction in surface fuels due to frequent fires would have reduced the post-fire effects (fire severity). Open crown canopies would also provide means for ventilation of fire intensity, thus reducing potential scorch and mortality. Historically large old growth trees are naturally fire-tolerant, but current conditions are often threatened by dense understory brush and cohorts (poles to small-sized trees), creating ladder fuels thus increase vulnerability to wildfire and climatic stressors (Hessburg et al. 2015).

Fire risk is the probability of a fire occurring within a given area. Historical records show that lightning and human caused fires are common in the Pickett West planning area (PA). Information from the Oregon Department of Forestry database (Table 3.2-1) shows 1,637 fires occurred in the Pickett West PA between 1967 and 2014. Three hundred and sixty-four (364) fires out of the 1,637 wildfires occurred on BLM-administered lands, 1,273 fires (78 percent) occurred on private lands (other ownership). Ninety-nine percent of the fires were held to 10 acres or less.

Table 3.2-1 Fire History in the Pickett West Project Planning Area 1967 – 2014*

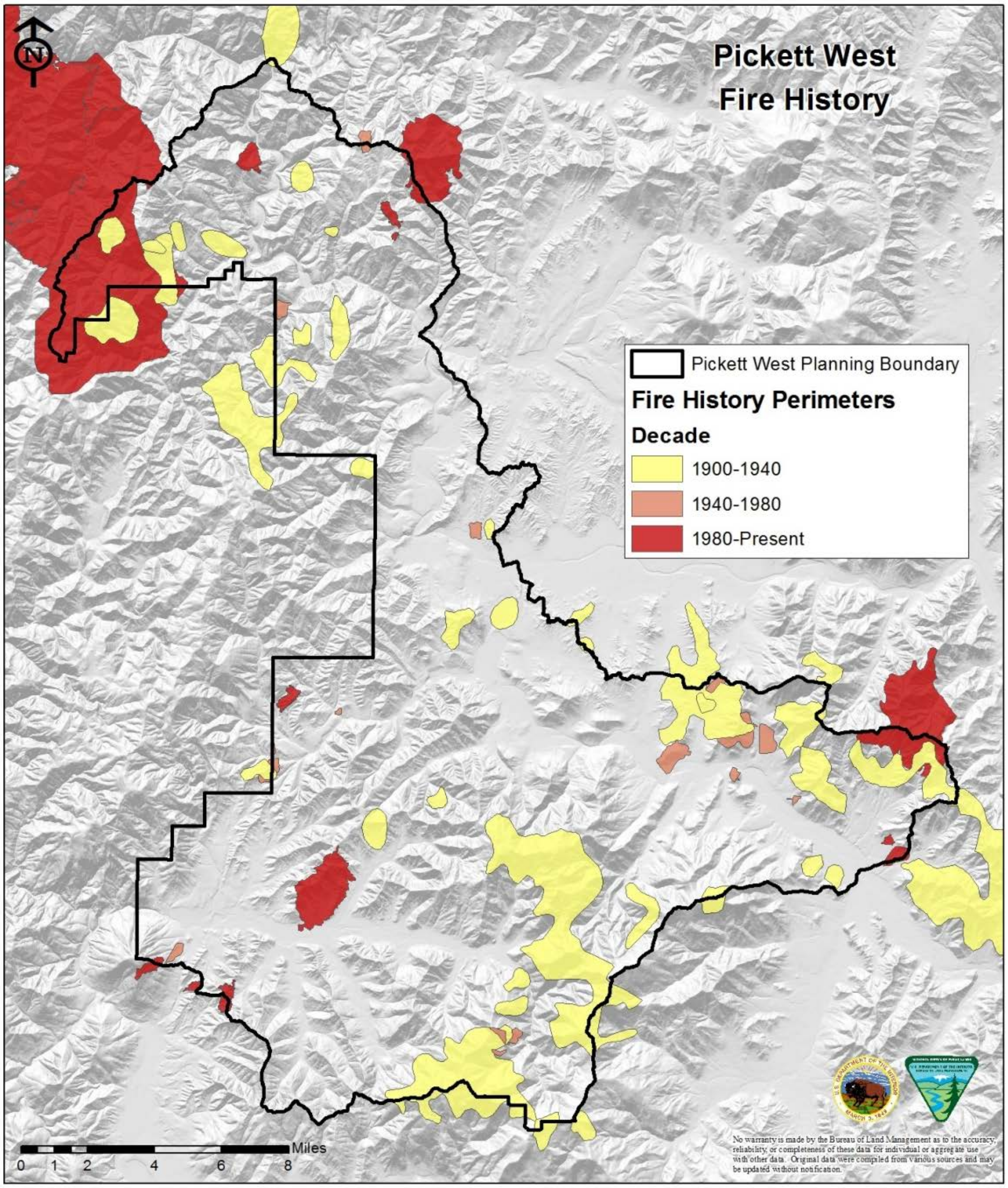
Ownership	Size Classes – Natural Caused Fires							Size Classes – Human Caused Fires						
	A	B	C	D	E	F	G	A	B	C	D	E	F	G
BLM	153	36	1	---	---	---	---	133	35	3	3	---	---	---
Private	118	25	---	---	---	---	---	913	200	14	1	1	1	---

**Data derived from Oregon Department of Forestry database from 1967 to 2014.*

Size Class A = Less than 0.25 acre
Size Class B = 0.26 to 10 acres
Size Class C = 10.1 to 100 acres
Size Class D = 100.1 to 300 acres
Size Class E = 300.1 – 1,000 acres
Size Class F = 1,000.1 to 5,000 acres
Size Class G = Greater than 5,000 acres

Oregon Department of Forestry database shows from 1914 to 2016 approximately 33,722 acres have burned across the Pickett West PA. In the early 1900's, data shows a more historic fire return intervals prior to active fire suppression and forest management, which started in the 1940's. As fire suppression techniques improved and objectives of suppressing all fires along with increase harvesting of the forest, a change in vegetation structure and compositions began to occur. In the 1980's a noticeable shift in fire behavior and severity was occurring in southwest Oregon and continuing to present day. Much of this can be contributed to fire suppression, past forest management, and climate change. Figure 3.2-1 depicts wildfire within or adjacent to the Pickett West PA from the turn of the century to present.

Figure 3.2-1 Wildfire History from 1900's to Preresent



Fire Exclusion/Suppression

In the mid-1900s, suppression of all fires became a goal of land management agencies. This altered the fire return intervals and severity from what would take place under the historical fire regime. Based on calculations using fire return intervals, two to five fire cycles have been missed in the southwest Oregon mixed conifer forests that occur at low elevations (Thomas and Agee 1986).

In ecosystems that historically burned frequently, particularly the Ponderosa pine and the dry mixed-conifer forest types found in the lower and mid elevation areas of the BLM Medford District (Sensenig 2002, Huff and Agee 2000), the exclusion of fire has promoted increases in fuel quantity and changes in fuel continuity and arrangement. Plant succession in the absence of fire shows a continuing shift to more fire-prone vegetative conditions within the Ponderosa pine, dry Douglas-fir and mixed-conifer forest types, increasing the potential for larger-scale crown and stand replacing fires, relative to the historic occurrence.

Fire history recorded over the past 30 years in southwest Oregon indicate a trend of more large fires which burn at higher intensities in vegetation types associated with southwest Oregon low to mixed severity fire regimes. This trend is also seen throughout the western United States. Contributing factors are shifting climate, land management practices and fire suppression (Higuera et al. 2015). Fire suppression actions suppress greater than 95 percent of fires during initial attack each year. The remaining 5 percent escape initial attack and generally burn under extreme weather conditions (Calkin et al. 2104, 2015).

Past Harvest Practices
Commercial timber harvesting has occurred in the PA on BLM-administered lands since the 1940s. The harvest intensity and acres has varied with harvest prescriptions and land management objectives over the past decades. Past harvest techniques have resulted in a wide range of stands of early to late-seral forests, which is one of the contributors to the current fire hazard ratings for the PA.

Approximately 1,659 acres of BLM-administered lands were logged through thinning prescriptions between 2000 to present and 11 acres have been fire salvage logged within the PA. These treatment acres included pre and post-harvest evaluation to determine activity slash mitigation, which included slashing, lopping and scattering, hand piling, hand pile burning, machine piling, machine pile burning, and/or underburning.

Past Fuels Reduction and Silviculture Treatments
From 2002 to present, understory treatment has occurred for hazardous fuels reduction, fire resiliency, forest health, young stand management, wildlife habitat, and treatments within the Wildland Urban Interface for public safety on approximately 11,102 acres of BLM-administered land within the PA. Hereafter, past fuel reduction and silviculture treatments are referred to as Hazardous Fuels Reduction Maintenance (HFRm). Treatments consisted of slashing, hand piling, hand pile burning, lopping and scattering, mastication, and underburning. The fire hazard on treated acres has been altered by reducing fuel loading, ladder fuels, and stand density to a more historical/desirable condition.

Microclimate
Timber harvest can increase fire severity, if not accompanied by adequate reduction of fuels, by increasing surface dead fuels (Sierra Nevada Ecosystem Project [SNEP] 1996, pp. 61-72). Studies

that correlate harvesting with increased fire behavior (Weatherspoon and Skinner 1995) are mostly based on the forest practice of not treating harvest and thinning debris (slash). Thus, it is the added ground fuel which in the drier, hotter microclimate resulting from opening the forest canopy that contributes to increased fire behavior in a wildfire situation.

Opening forest canopies results in microclimatic changes particularly at the forest floor. A more open stand allows more wind and solar radiation resulting in a drier microclimate compared to a closed stand. This change in fuel moistures plays a role in fire intensity and crown fire initiation. A drier microclimate generally contributes to more severe fire behavior. The degree of effects of microclimate change on fire behavior is highly dependent on stand conditions after treatment, mitigation to offset the effects of microclimate change, and the degree of openness. For example, Pollet and Omi (1999) found that more open stands had significantly less fire severity, while Weatherspoon and Skinner (1995) found greater fire severity.

Plantations are more susceptible to severe fire effects than unmanaged older forests (Weatherspoon and Skinner 1995). However, the same study indicated substantially less damage from wildfires where surface fuels were also treated. The structural attributes of young trees (crowns close to ground, crown consisting mostly of fine fuels), and the amount and location of forest floor fuels (thinning debris, forest floor vegetation) are important factors.

Predicted Climate Changes

Climate change is becoming a forest stressor, increasing drought effects on the forest. Warmer winters and earlier hotter summers have reduced snowpack leading to uncharacteristically large wildfires and insect and disease outbreaks (Hessburg et al 2015).

Several studies that model climatic change into the next century also caution land managers in the Pacific Northwest to plan for increased temperatures and possibly some increase in winter moisture in the form of rain over the coming years in the Pacific Northwest (Hessl 2004, Mote et al. 2003a, Mote et al. 2003b). These forecasts would indicate and suggest that climatic factors may have a more dramatic impact on wildland fire extent and severity. With increases in warmer winter moisture to inspire vegetation growth, along with warmer and dryer conditions in the summer months, what is considered to be extreme drought conditions now, could easily be experienced with Pacific Decadal Oscillations (PDO) or El Nino Southern Oscillation (ENSO) in the first half of this century. Change in ecosystem structure and spatial distribution is expected to result from this climatic variation, and wildland fire would be one of the agents that cause the changes in the ecosystems. Forest management activities such as timber harvest, pre-commercial thinning, and fuels management treatments are one way land managers can enhance ecosystem resilience and forest health, and protect private property.

Affected Environment for Fire Hazard

Fire Regimes

Fire regimes refer to a general classification of the role fire would play across a landscape naturally, meaning in the absence of modern human intervention, but including the influence of aboriginal burning (Agee 1993, Brown 1995). Fire regimes refer to the combination of fire frequency, predictability, intensity, seasonality, and extent characteristic of fire in an ecosystem. Coarse scale definitions for natural (historical) fire regimes have been developed by Hardy et al. (2001) and Schmidt et al. (2002) and interpreted for fire and fuels management by Hann and Bunnell (2001). The fire regimes are classified based on fire return interval (departure) and fire severity.

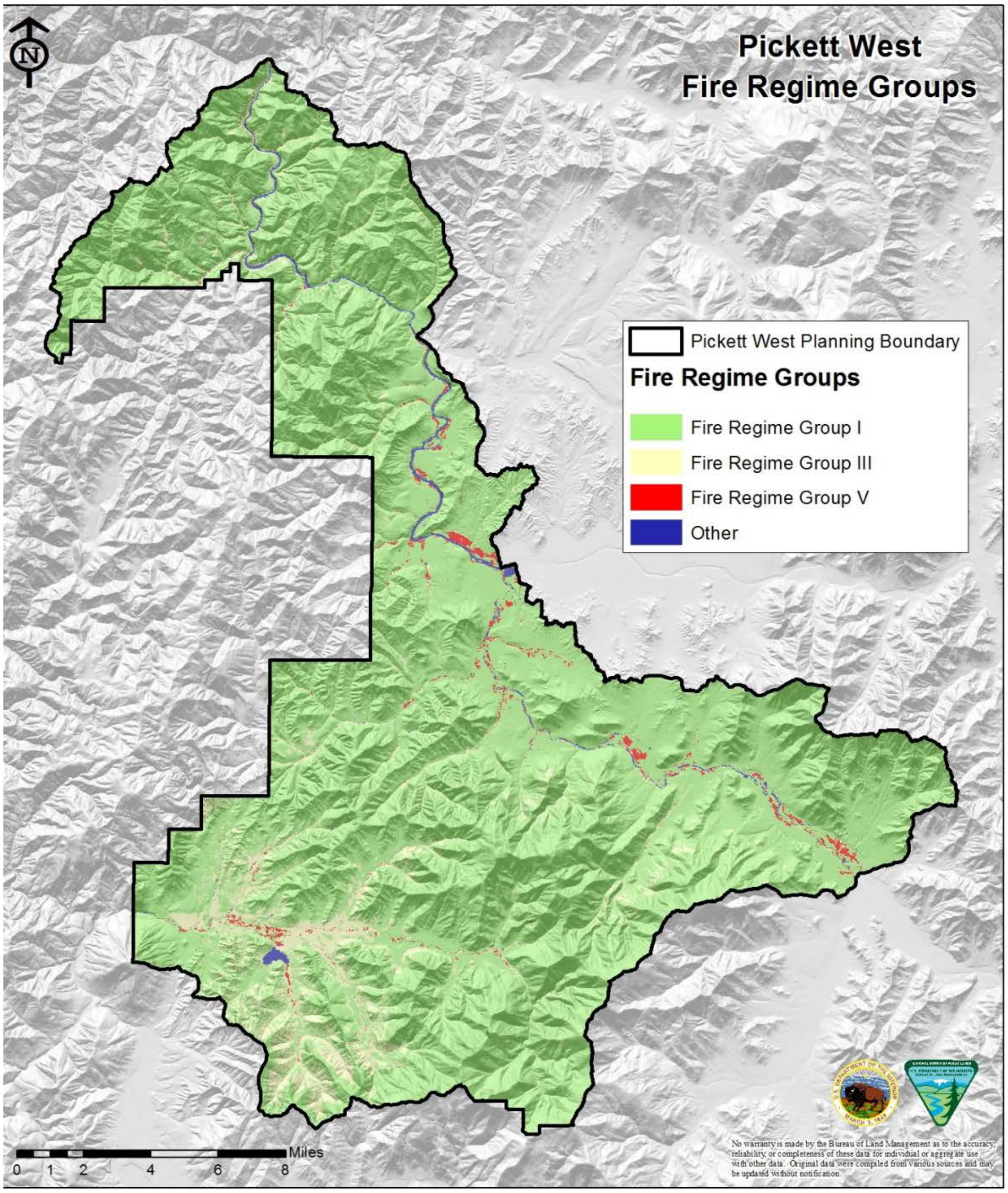
Fire severity is the measure of the amount of damage, or mortality caused by the fire. Lower fire severity means that a fire burns through the forest but stays on the ground without resulting in a drastic amount of mortality (less than 25 percent of the dominant overstory vegetation). High fire severity means that the fire burns hot enough to cause major mortality to the forest by burning through the crowns of the trees (over 75 percent of the dominant overstory vegetation).

Three historical fire regimes are found within the PA (Figure 3.1-2), (LANDFIRE, 2014, Fire Regime Groups, LANDFIRE 1.4.0), http://landfire.cr.usgs.gov/viewer/:

> *Fire Regime 1*: (186,075 acres) 0-35 years fire return interval and low (surface fires) to mixed severity. Typical climax plant communities include mixed conifer and dry Douglas-fir / ponderosa pine forests. Large stand-replacing fire can occur under certain weather conditions, but are rare events (i.e., every 200 years).
>
> *Fire Regime 3*: (13,773 acres) 35-100 + years fire return interval. Fire severity is mixed with large, high severity fires occurring rarely (i.e. every 200 years). This fire regime exhibits fire behavior that results in mosaic patterns on the landscape with burned and unburned patches. Typical plant communities include mixed conifer and Douglas-fir forest.
>
> *Fire Regime 5*: (1,775 acres) 200 + year fire return interval. Plant communities include mixed conifers and Douglas-fir/Western hemlock. High fire severity with stand replacement fires that reset large landscapes occurring every 200 + years.
>
> *Other*: (1,835 acres) Non-vegetative areas either barren or water.

According to LANDFIRE 2014 (http://landfire.cr.usgs.gov/viewer/) data, the Pickett West PA includes approximately 91 percent in Fire Regime 1, 7 percent in Fire Regime 3, 1 percent in Fire Regime 5 and 1 percent as Non vegetative areas.

Figure 3.1-2 Fire Regime Groups



LANDFIRE Refresh 2014 http://landfire.cr.usgs.gov/viewer/

Plant association groups are a credible link to historical ecological process, including fire regimes that occurred on sites in the past (Franklin and Agee 2003). Historical fire regimes and the departure from them correlate to the change from historical to current vegetative structure. The change in vegetation also helps to describe the difference in fuel loading (dead fuels and live in the form of increased vegetation) from historical to current conditions.

These changes in vegetation and fuel conditions help to determine the expected change in fire behavior and its effects. This difference in many respects is attributed to fire exclusion, but also includes all human practices that would affect the extent, severity, or frequency of fire events compared to historical accounts.

Conditional Flame Length (CFL)

Conditional Flame Length (CFL) is the average flame length of all fires that burned a pixel (270 x 270 meter area or grid cell) and is a measure of hazard, or the potential for losses from fire given a fire occurs. (Ager et al. 2013, Scott et al. 2013). CFL is calculated as the expected value of flame length based on flame length probabilities. CFL incorporates the effects of variability in fuel moisture, wind speed, and wind direction, as well as spread direction (heading, flanking, backing, etc.) on flame length (Scott et al. 2013, Ager et al. 2013). CFL is a method which can be used for prioritizing forest management treatments and fire suppression strategies for wildfire risk. Typically flame lengths less than four feet can generally be managed by fire suppression personnel using direct attack on the fire edge. Flame lengths greater than four feet generally require firefighting equipment and utilize an indirect attack strategy, where personnel back off to a defensible position away from the fire's edge (Table 3.2-2).

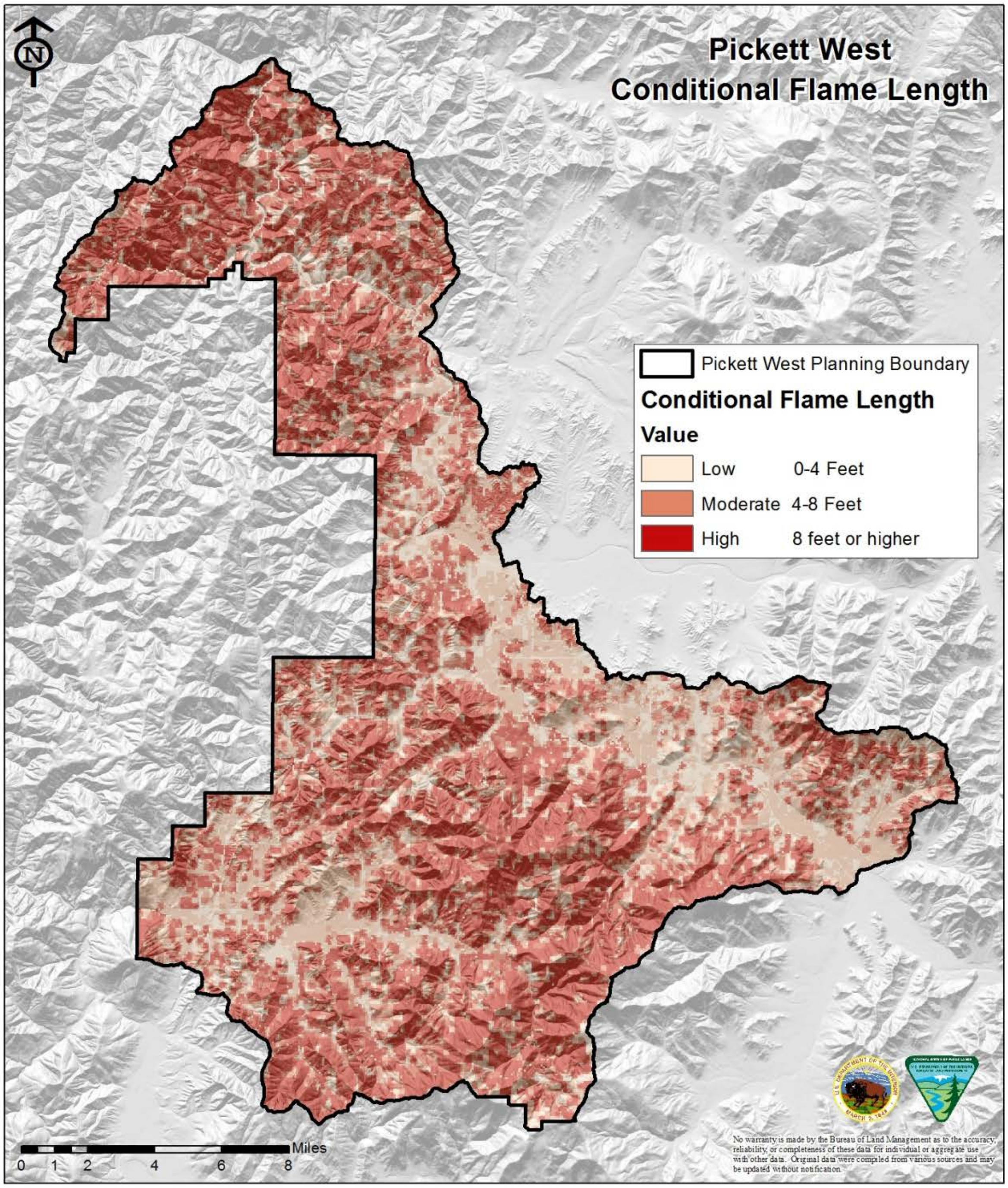
Table 3.2-2 Fire Behavior and Suppression Activities

Flame Length (in feet)	Fire Suppression Strategy / Fire intensity (Btu/ft/s)	Fire Suppression Tactics	
0-4	Direct Attack / < 100 Btu/ft/s		Hand crews: Fires can generally be attacked at the head or flanks by persons using hand tools. Hand line should hold the fire.
4-8	Direct Attack / 100-500 Btu/ft/s		Dozers, engines, aircraft: Fires are too intense for direct attack on the head by persons using hand tools. Hand line cannot be relied on to hold the fire. Equipment such as dozers, pumpers, and retardant aircraft can be effective.
8-11	Indirect Attack / 500-1000 Btu/ft/s		Backfiring operations: Fires may present serious control problems—torching out, crowning and spotting. Control efforts at the fire head will probably be ineffective.
11+	Indirect Attack / > 1000 Btu/ft/s		Backfiring operations: Crowning, spotting and major fire runs are probable. Control efforts at head of fire are ineffective.

(Andrews, Patricia et al., 2011 USDA, GTR-253)

Figure 3.2-3 (Conditional Flame Length by Classes - Low, Moderate and High) and Table 3.2-3 (Conditional Flame Length Classes – acres and ownership) illustrates the grouping of flame length classes using fire behavior and suppression strategies from direct and indirect tactics. Ninety percent of the PA is estimated to have a moderate to high CFL, where direct and indirect fire suppression tactics would require dozers, engines and/or aircraft for control efforts. As flame length increase, a more indirect strategy of backfiring/back burning vegetation from strategic location (ridges, roads, and indirect fireline) would occur.

Figure 3.2-3 Conditional Flame Length



Flame Length Classes: Low 0-4 feet, Moderate 4-8 feet, and High 8 Feet or Higher

Table 3.2-3 Conditional Flame Length

Conditional Flame Length Range (feet)	BLM (acres)	Private (acres)	Local Government (acres)	State (acres)	Total (acres)
Low (0-4)	7,424	12,298	530	547	20,799
Moderate (4-8)	22,381	38,620	1,071	530	62,602
High (8 plus)	65,263	50,937	2,067	1,339	119,606
Total (acres)	95,068	101,855	3,669	2,416	203,008*

**Additional four hundred and fifty (450) acres are non-vegetative in the PA.*

Likelihood of Wildfire

Burn probability (BP) models can display spatial variation in wildfire likelihood and intensity as a function of ignitions patterns, fire weather, topography, and fuel conditions (Scott et al. 2013). Wildfire likelihood is measured at a point on the landscape as the annual or conditional BP. Annual BP is the probability that a wildfire will burn a given pixel during a single calendar year. Annual BP is estimated across landscapes as the relative frequency of burning using a stochastic (or Monte Carlo) wildfire simulation system, which simulates thousands of iterations and then integrates those results (Scott et al. 2013). Figure 3.2-4 represents relative annual burn probability and uses locally calibrated surface fuels data. The relative annual burn probabilities were calculated by running 10,000 iterations, with each iteration representing a "fire year," within the large fire simulation system (FSim) (Metlen et al, 2015). Weather conditions and fire distribution and frequency were determined by historically (previous 20 year record) informed probability distributions and observations.

Figure 3.2-4 Relative Annual Burn Probability in the Pickett West Planning Area

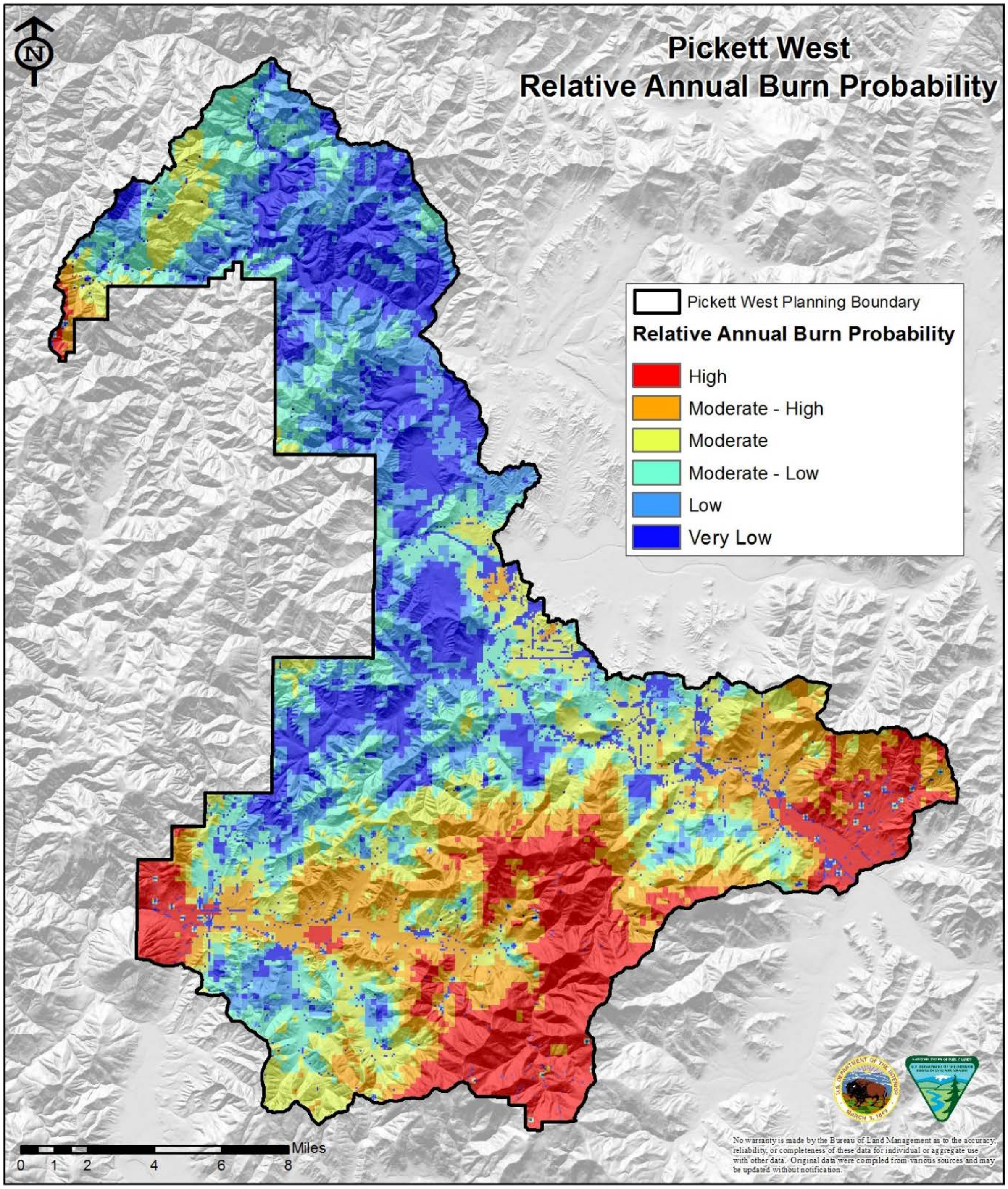


Table 3.2-4 shows the acres and ownership within the relative burn probability categories. Fifty-one (51) percent of BLM-administrated lands and forty-four (44) percent of private lands are moderate to high BP within the Pickett West PA.

Table 3.2-4 Relative Burn Probability Categories by Ownership (acres)

Planning Area Relative Burn Probability Categories	BLM		Private Lands	
	Acres	Percent	Acres	Percent
High	18,943	20	12,374	11
Moderate-High	16,469	17	15,824	15
Moderate	13,502	14	19,707	18
Moderate-Low	16,253	17	19,001	18
Low	18,188	19	18,284	17
Very Low	11,713	13	22,750	21
Total	**95,068**	**100**	**107,940**	**100**

**Additional four hundred and fifty (450) acres are non-vegetative in the PA.*

BP can assess on a landscape scale high value resources exposure to wildfire risk. Forest management planning (e.g., prescription and locations) and implementation can reduce fire hazards. Treatments (thinning and/or fire) in moderate to high burn probability areas in the appropriate landscape can improve landscape fire resilience. The Action Alternatives would treat approximately 4,423 acres of HFRm and 2,631 timber management acres (RT and DM) of moderate to high relative burn probability (Table 3.2-5). Overall, the action alternatives would lower the relative burn probability (moderate – high categories) within the PA on BLM-administered lands by 7 percent.

Table 3.2-5 Relative Burn Probability Categories by Treatment Type (acres)

Planning Area Relative Burn Probability Categories	Restoration Thinning & Density Management		Hazardous Fuels Reduction Maintenance	
	Acres	Percent	Acres	Percent
High	432	7	1,021	9
Moderate-High	1,318	22	1,751	16
Moderate	881	15	1,651	15
Moderate-Low	1,031	17	1,713	15
Low	1,478	25	2,937	27
Very Low	865	14	2,029	18
Total	**6,005**	**100**	**11,102**	**100**

Vegetation Departure and Restoration Need

Historic conditions within the dry forests were more resilient to fire disturbance than current conditions, in large part because frequent fire was present on the landscape (Brown et al. 2004, Hessburg and Agee 2003, North et al. 2009). Therefore, to measure dry forest fire resilience at the landscape scale, the BLM[11] quantified the departure of current vegetation structure and landscape

[11] The Nature Conservancy conducted this analysis of landscape-scale fire resiliency under an agreement with the BLM.

composition patterns from a set of reference conditions that represent the historic range of variability (Barrett et al. 2010, Keane et al. 2009). In this approach, less departure from reference conditions represents greater fire resiliency.

A recent regional evaluation of current forest structure suggests that 40 percent of Oregon and Washington's conifer forests are in need of treatment through thinning and/or prescribed fire (Haugo et al. 2014). The analysis conducted by Haugo and others demonstrates a new approach for evaluating where, how much, and what types of restoration are needed to move present day landscape scale forest structure towards a Natural Range of Variability (NRV) across eastern Washington, eastern Oregon, and southwestern Oregon. Haugo and others built upon the conceptual framework of the LANDFIRE and Fire Regime Condition Class (FRCC) programs (Barrett et al. 2010). The LANDFIRE FRCC conceptual framework measures current forest structure departure from the NRV reference condition for a particular site and assumes that, given natural disturbance processes (e.g., historic fire regime), a biophysical setting (analogous to potential vegetation types) will have a sustainable range of variation in the proportion of each successional stage for a given landscape (Barrett et al. 2010). This reference condition—the percentage of a biophysical setting in each seral stage—approximates a NRV, or ecological condition, based upon the natural biological and physical processes.

Haugo and others (2014) used Washington and Oregon specific datasets to assess the need for changes to current forest structure resulting from disturbance and/or succession at watershed and regional scales.

The Southern Oregon Cohesive Forest Restoration Strategy group prioritized landscapes for treatment based on Natural Range of Variability (ecological departure), fire regime, solar insolation and topographic positions, which are important facets that influence vegetation composition and structure (Metlen et al. 2015). Table 3.2-6 depicts successional classes ranging from late-closed to early condition demonstrating priority treatment locations (topographic positions) for forest management activities (forest health, landscape resiliency) and wildfire suppression strategies.

Table 3.2-6 Priority Treatments for Forest Management Activities, and Wildfire Suppression Strategies by Successional Class, and Topographic Positions.

Successional Class	Topographic Positions	Priority Multiplier
Late-closed	Ridges and warm mid-slopes	2
Mid-closed	Ridges and warm mid-slopes	0.5
Mid-closed	Bottoms and cool mid-slopes	0.3
Late-closed	Bottoms and cool mid-slopes	0.2
Mid-open	All	0
Late-open	All	0
Early	All	0

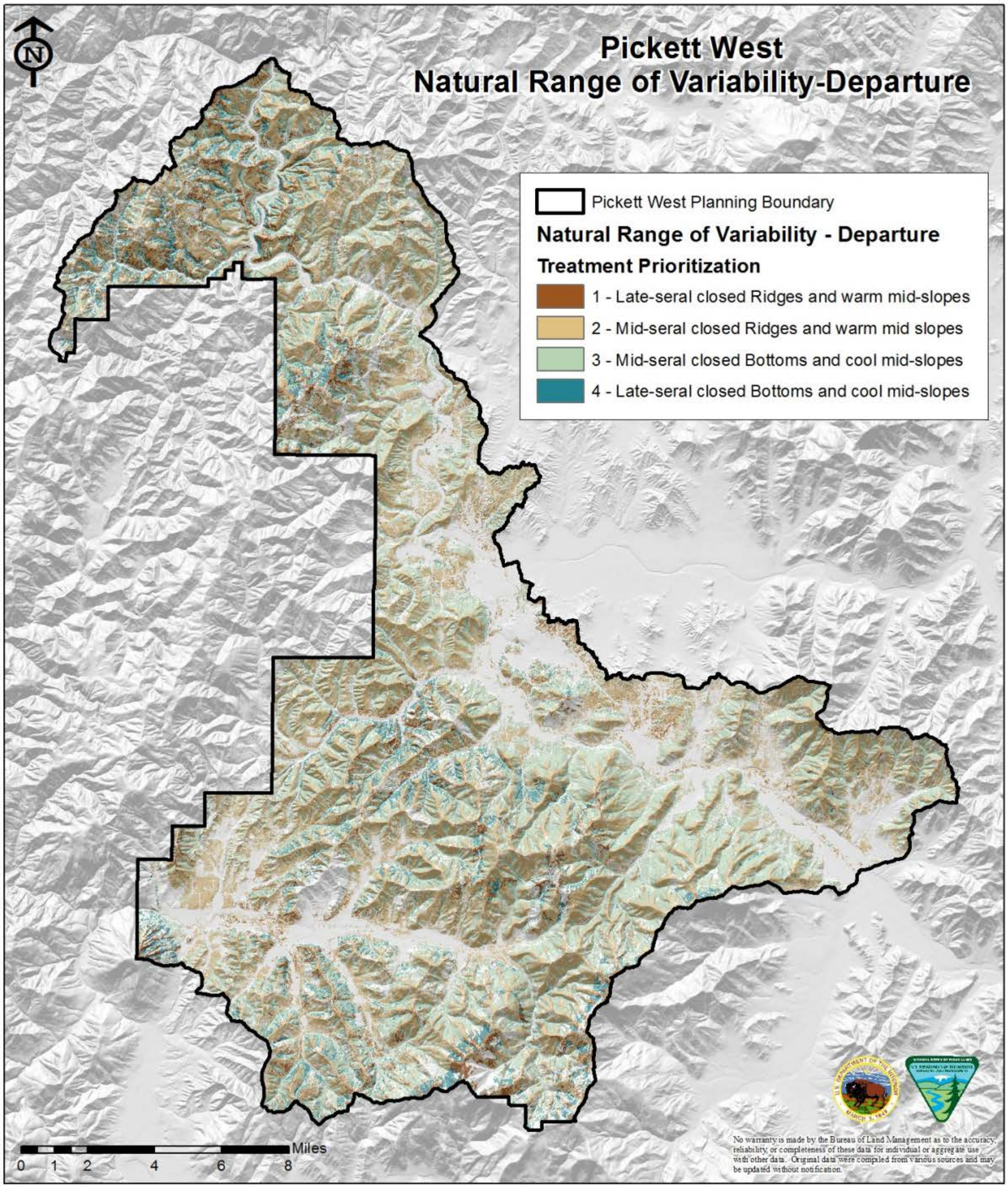
Metlen and others (2015) determined thinning relatively small, shade tolerant trees to reduce canopy cover, protect and promote larger trees was prioritized in excess late-closed forest on ridges or warm mid-slopes. Greater weight was given to thinning excess late-seral forest where in these settings was the significant greater ecological investment in growing large old trees (Table 3.2-7). Thinning was also prioritized in mid-seral closed stands on ridges and warm mid-slopes, which are most appropriate for more open conditions (Metlen et al. 2015).

The Pickett West watersheds have opportunities and a need to reduce excess closed late and mid-seral forested conditions, particularly on ridges or warm mid-slopes to reduce fire hazard. Seventy percent of the Pickett West PA indicates a need to treat priority late and mid-seral closed forests that are most departed from NRV (Table 3.2-7 and Figure 5).

Table 3.2-7 Natural Range of Variability Departure Categories by Ownership and Surplus Late and Mid-Closed

Treatment Prioritization for Surplus Closed	BLM		Private Lands	
	Acres	Percent	Acres	Percent
Late-seral closed - Ridges and warm mid-slopes	4,919	6	2,921	5
Mid-seral closed – Ridges and warm mid slopes	35,750	47	32,075	48
Mid-seral closed – Bottoms and cool mid-slopes	29,657	39	27,924	42
Late-seral closed – Bottoms and cool mid-slopes	5,927	8	3,230	5
Total	**76,253**	**100**	**66,150**	**100**

Figure 3.2-2 Natural Range of Variability – Treatment Priorities by Late and Mid-Seral Closed Condition



Evaluating the departure from the NRV of vegetation patterns and disturbance regimes provides a tool for prioritizing forest management actions on a landscape scale. Treatments (thinning and/or fire) in surplus closed forest, particularly in appropriate landscape positions (i.e. warm aspects and ridge tops), can improve landscape fire resilience. The action alternatives would treat approximately 8,352 acres of HFRm and 5,283 timber management acres (RT and DM) of Late and Mid-seral closed NRV (Table 3.2-7). The action alternatives would lower fire hazard on BLM-administered lands by 18 percent acres within the PA.

Table 3.2-7 Acres of Treatment under the Action Alternatives by Natural Range of Variability Surplus Closed Departure

Treatment Prioritization for surplus closed acres	Restoration Thinning & Density Management		Hazardous Fuels Reduction Maintenance	
	Acres	Percent	Acres	Percent
Late-seral closed – Ridges and warm mid-slopes	291	6	344	4
Mid-seral closed – Ridges and warm mid slopes	2,762	52	5,060	61
Mid-seral closed – Bottoms and cool mid-slopes	1,921	36	2,771	33
Late-seral closed – Bottoms and cool mid-slopes	309	6	177	2
Total	**5,283**	**100**	**8,352**	**100**

Fire Hazard

Fire throughout the Klamath Siskiyou province shaped the ecosystem prior to Euro-American settlement. As settlement expanded throughout the area fire suppression and land management objectives along with climate change have altered the historical low to mixed severity fires and have influenced current fire behavior (fire intensity and severity) throughout southwest Oregon (2002 Biscuit Fire, 2005 Blossom Complex Fire, 2013 Big Windy, Brimstone, Douglas Complex Fires, and Oregon Gulch Fire 2014).

Fire hazard describes a fuel complex, defined by vegetation type, arrangement, volume, condition and location. These characteristics combine to determine the threat of fire ignition, the spread of a fire and the difficulty of fire control or fire behavior. Fire behavior dictates which fire suppression strategy may be effectively employed, and therefore the extent to which a fire may grow and the subsequent damage it may cause.

Fire hazard is a useful tool in the planning process because it helps in the identification of broad areas within a watershed that could benefit from forest management activities. NRV, BP, and CFL define hazard ratings for the PA and reflect the results of climate, past human, and natural disturbances. In general, the existing fuel profile within the PA represents a moderate to high resistance to control under average climatic conditions

Vegetative management is a tool to reduce hazards across the landscape. By treating the understory and overstory vegetation, mangers can influence fire behavior across the landscape. Among the most effective techniques to reduce fire intensity and severity are those that increase Crown Base Height (CBH) and reduce Canopy Bulk Density (CBD) and Canopy Continuity (CC) (Peterson, et al. 2003). CBD and CBH are parameters which are important components of overall fire hazard. CBD is the mass of available canopy fuel per unit canopy volume. It is evaluated at the stand level, not an individual tree level. The CBH is the average distance (height) from the ground level to the lower branches of the trees that form the main forest canopy where there is sufficient crown loading in needle and 1 hour fuels for a certain level of surface fire intensity to transition into the crown (0.011 kg/m3) (Rebain 2010, Reinhardt and Crookston 2003). CC is difficult to quantify and the objective is to reduce physical contact of tree canopies and crown fire spread through the canopy. Potential crown fire activity is assessed based on the relationship of surface fuels, average height from the surface fuel to the lowest crowns of the trees (CBH), and the volume of crown fuel present across the upper strata of the vertical fuel layer (CBD).

Fuel Models

Fire behavior fuel models are grouped by fire-carrying fuel type. Fuels models are used to predict the potential behavior and effects of wildland fire. The majority of the PA can be identified within the timber understory (TU) and the timber litter (TL) fuel models. Table 3.2-8 shows the typical flame lengths associated with each of these fuel models during fire season weather conditions given a 5 mph wind. Figure 3.2-6 depicts fire behavior fuel models for the PA.

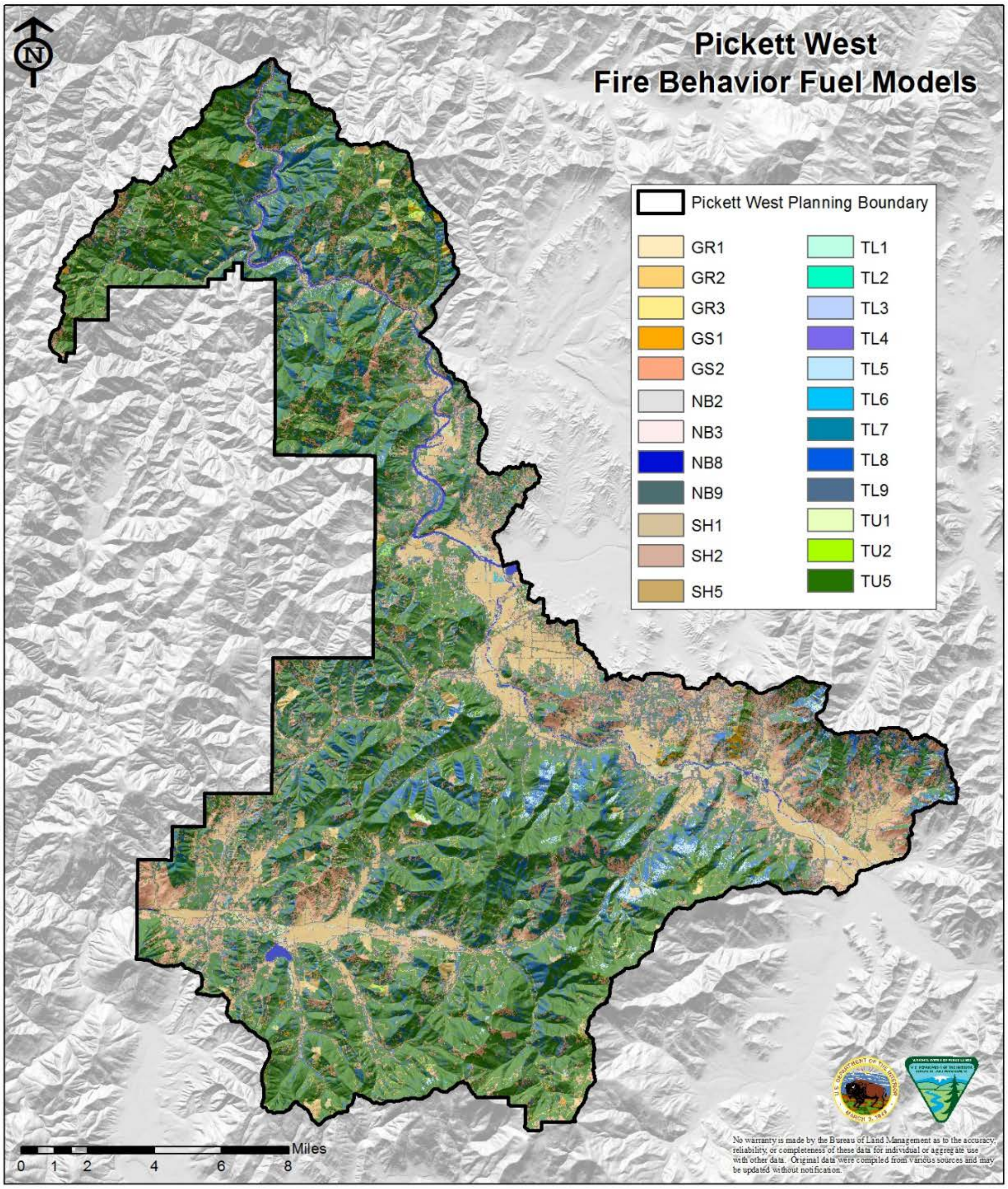
Table 3.2-8 Fire Behavior Fuel Models, Acres and Flame Lengths

Fire Behavior Fuel Model and Number	Fuel Model Group	BLM (acres)	Private (acres)	Local Government (acres)	State (acres)	Other (acres)	Total (acres)	Flame Length (feet)
NB1 (91) NB3 (93) NB8 (98) NB9 (99)	Non Burnable	1,149	4,724	229	457	356	6,915	0
GR1 (101) GR2 (102) GR3 (103)	Grass – Low Fuel Load	1,044	13,332	136	63	31	14,606	1-5
GS1 (121) GS2 (122)	Grass – Shrub – Low to Moderate Fuel Load	12,859	18,769	731	270	59	32,688	1-5
SH1 (141) SH2 (142) SH5 (145)	Shrub – Low to High Fuel Load	121	358	1	5	2	487	1-15
TU1 (161) TU2 (162)	Timber Understory – Low to Moderate Fuel Load	61,062	46,790	1,741	1,345	30	110,968	1-8

Fire Behavior Fuel Model and Number	Fuel Model Group	BLM (acres)	Private (acres)	Local Government (acres)	State (acres)	Other (acres)	Total (acres)	Flame Length (feet)
TU5 (165)								
TL1 (181) TL2 (182) TL3 (183) TL6 (186) TL8 (188) TL9 (189)	Timber Litter –Low to High Fuel Load	16,489	16,929	754	256	21	34,449	1-6
TL4 (184) TL5 (185) TL7 (187)	Timber Litter – Downed Logs – High Fuel Load	2,347	930	44	22	2	3,345	1-3
SB1 (201)	Slash – Blowdown – Low Fuel Load	---	---	---	---	---	---	2-4
SB2 (202)	Slash – Blowdown – Moderate Fuel Load	---	---	---	---	---	---	5-8
Total (acres)		**95,071**	**101,832**	**3,636**	**2,418**	**501**	**203,458**	

(Scott and Burgan, 2005. USDA, GTR-153)

Figure 3.2-3 Fire Behavior Fuel Models



3.2.2 Environmental Effects

Some of the objectives of the proposed forest management activities are to restore ecosystem functions, improve forest health, reduce stand density, create diversified stand structure, treat HFRm units, and reduce natural and activity based fuel hazards. These treatments are considered as having long-term beneficial effects decades into the future by setting forested stands on a trajectory toward larger, more fire resilient trees that are able to withstand wildfire events with a minimized amount of mortality within the stand/forest.

Alternative 1 – No Action

Direct and Indirect Effects

The proposed acres for Restoration Thinning, Density Management, incidental Mortality Salvage, Understory Reduction, and Hazardous Fuels Reduction Maintenance under the action alternatives would not be treated; therefore the ecological restoration and corresponding fuels reduction objectives for these areas would not be accomplished. Without treatment, the NRV of these stands would continue to deteriorate and move farther away from their reference condition, which means the fire regimes would continue to be substantially altered from their historical range. The risk of losing key ecosystem components (i.e. forest structure, biodiversity, wildlife and fish habitat) from wildfire is high.

The current trend would continue for surface, ladder, and aerial fuels (crown density). Crown base height (CBH) would decrease due to continued increases in understory density, increasing the potential for crown fire initiation. Crown bulk density (CBD) and crown continuity (CC) would increase, as would the potential for active crown fire events. CFL and BP would continue to increase and expand across the PA. With the expected increase in flame length, significant torching, crown fire activity, and tree mortality will generally result in the extensive mixed conifer forest (Ager. A. A., et al 2013).

With the exclusion of incidental mortality salvage, there would be a gradual increase in the number of dying and dead snags, which would increase fire behavior over time, making it more difficult to control wildfires with greater environmental impacts. Increase in large dead and down fuel would result in higher fire intensity and resistance-to-control. Increased hazard and risk would make it more difficult for firefighting crews to meet suppression objectives. As snags persist this would also increase spotting potential as a receptor and ignition source. Exclusion of morality salvage would lead to a decrease in public and fire fighters safety where snags are persistent in the PA. Increasing stand densities and fuel loadings would increase the chance of more acres that would burn in high intensity fires within the PA. Fire behavior (flame length and fire intensity) would dictate fire suppression strategy (Table 3.2-2). Flame lengths greater than 4 feet generally require specialized equipment and/or indirect attack methods.

With these conditions, wildland fire fighters and the public would be at greater risk of loss of life, property, and other values. Strategies and tactics for fire suppression would shift from direct attack to indirect attack utilizing topographic features such as ridgetops and existing roadways resulting in larger fires.

Fire suppression would continue, because there are no policies in place or being proposed that would allow fires to burn naturally across the Medford BLM District. Initial attack suppression goals (94 percent of new fire starts confined to 10 acres or less) would become increasingly difficult to attain due to increased fire line intensity and flame length. Initial attack success would decline over time resulting in larger fire sizes. Aerial attack effectiveness would decrease with increased fire behavior.

Fire suppression tactics of treating upper slopes to ridge tops with aerial applications of water or retardant can be effective control strategy. Untreated thick dense canopies (late and mid-closed successional classes) would restrict water or retardant from penetrating the forest canopy in reaching the forest floor. As a result, a wildfire could cause high tree mortality and/or replacement of stands.

Alternatives 2 and 3

The proposed Pickett West treatments for Alternatives 2 and 3 are Restoration Thinning, Density Management, incidental Mortality Salvage, Understory Reduction and Hazardous Fuels Reduction Maintenance. Treatments within these stands would directly affect fuel loading, fire behavior and fire severity in the short-term. With initial treatment or immediately following treatment and prior to activity slash disposal, fire behavior potential could increase due to increased surface fuels. The activity slash in the units may cause an initial shift from a timber type fuel model (TU or TL) to a slash/blowdown fuel model (SB1 or SB2) Table 3.2-8. Activity slash treatments (slashing, hand piling, hand pile burning, machine piling, machine pile burning, lopping and scattering, underburning and/or biomass removal) would reduce over-all fire behavior potential.

The implementation of forest thinning under Alternatives 2 and 3 involving thinning from below to remove suppressed, insects and disease, and/or over crowded intermediate and co-dominant trees while retaining the larger co-dominant and dominant trees within treated stands would promote fire resilient forest stands. On occasions, unhealthy dominant trees may be selected for removal/harvest over intermediate or co-dominant trees. Forest structure alteration that would occur from the thinning prescriptions would result in a reduction in ladder fuels, an increased crown base height, and the reduction of crown bulk density (canopy fuels). Treatments would reduce the likelihood of tree-to-tree crown fire; maintaining and promoting large diameter trees with thick fire resistant bark; and improving spatial heterogeneity. All of these are important factors in reducing the potential for initiating and sustaining a crown fire in these stands (Omi and Martinson 2002, Agee 1996, Agee and Skinner 2005). This would result in disrupting fuel continuity, uniformity and structure and a reduction to fire hazard, fire size, and potential loss of high value ecosystem components.

A reduction in fire behavior/fire hazard would provide more effective suppression opportunities, particularly within treated units and around values at risk, and would alter the current trend of large-scale high severity fire events. Wildland firefighter and public safety would greatly increase in treated areas and near improved road systems. Direct attack fire suppression strategies and tactics could be used to control fire, resulting in fewer acres burned and less threat to private property. The fire resilience of the Pickett West PA as a whole would improve due to the overall reduction in fire hazard within proposed treatment and previous treated units on BLM-administered lands.

Forest Management Activities

Restoration Thinning (RT) and Density Management (DM)

RT and DM treatments would aim to reduce stand basal area/stand density, by removing mostly cohorts and sub-dominate trees to improve growth, increase vigor, reduce insect and disease mortality of residual trees, and restore spatial heterogeneity. Prescriptions designed to improve spatial heterogeneity, through the creation of small openings, would promote patchier (low to mix severity) fire severity and intensity in the event of a wildfire and move conditions closer to historical vegetative and disturbance regimes. RT and DM would enhance species diversity, reduce the existing fire hazard, and promote fire resiliency. Treatments would reduce ladder fuels and the risk to older trees from wildfire and competition, while favoring more fire and drought tolerant tree species. Thinning treatments would reduce torching and crowning potential by increasing CBH and reduce CBD. There could be a short-term increase in surface fuels, usually less than two years from activity slash within units and at landing sites. These units would have a reduction in potential fire behavior following activity slash treatments.

Mortality Salvage (MS)
MS treatments would be designed to harvest dead and dying trees to reduce fuel loading, increase public and fire fighters safety and provide for economic value. Harvesting dead and dying trees would remove horizontal and vertical fuel loads that would contribute to high intensity wildland fire. Public, forest workers, and fire fighter safety would increase as hazard trees (snags) would be harvested along primary/secondary roads, ridgelines, and/or adjacent to or within treatment units.

MS harvest would transition the bulk of the fuel load from the canopy to the ground. Removal of snags reduces long-term fuel loads but generally results in increased amount of fine fuels for the first few years after harvest unless surface fuels are effectively treated (Peterson et al. 2009, McIver and Starr 2000). Concentrations of tree mortality are expected to be at low densities and scattered throughout the PA.

Hazardous Fuels Reduction Maintenance (HFRm)
HFRm prescriptions are designed to treat understory vegetation (less than eight (8) inches DBH) to reduce surface fuels, ladder fuels, and promote residual tree growth and vigor. HFRm acres within the PA have had a wide range of past treatments (slashing, hand pile, hand pile burn, lop and scatter, mastication and underburning,) over the past 15 year. Treatments were designed and implemented for forest health and to reduce fire hazard by increasing crown base height, reduce mid story canopy bulk density and reduce surface fuels. Continuing maintenance treatments would be necessary to maintain and/or move stands towards the desired NRV. BLM fire and fuels management personnel would conduct site evaluations to determine the priority and treatment(s) for follow-up maintenance. Maintenance treatment recommendations could be a combination of slashing, hand pile, hand pile burn, lop and scatter and/or underburning. If slashing is proposed, a short-term (1-2 years) potential increase in fire behavior due to an increase in curing/drying of surface fuels or until burning is completed or partial decomposition of activity slash.

Prescribed Burning

A number of ecological functions can be corrected by simply reintroducing fire in the ecosystem. However, the reintroduction of prescribed fire without thinning would be problematic due to the existing conditions of overly dense stands of trees that have developed during fire exclusion and would result in greater proportions of high severity fire than has historically occurred (Agee and Huff 1986). Therefore, understory reduction treatment areas/units initial entry would be understory thinning. Treatment for HFRm would be determined on reevaluating each unit for treatment needs.

Underburning

Periodic low intensity underburns would be used to maintain units in low fire hazard condition. Frequency and location of the underburns would be based on predicted fire behavior (flame lengths ≤4 feet), the representative fire regime and subsequent vegetation response. It is estimated that underburning throughout the PA would be on a 5-20 year rotation in areas classified as fire regime 1 and on a 10-30 plus year rotation for areas within fire regime 3 (Figure 3.1-2). Smoke emissions would be localized and below health hazard standards (see Issues and Alternatives Not Analyzed in Detail 1.7). Mortality to the residual stand would be minimal (<10 percent) as fire intensities would be low.

The objective is to reduce dead and down woody material, shrubs and small trees in the understory, and live and dead branches close to the ground. Underburning is conducted throughout the year when fuel and weather conditions permit. Typically, burning occurs between fall and spring. Summer or early fall burning is less common, but can be feasible to meet resource objectives and when risk of fire escape can be mitigated.

Most underburns require a control line around the burn area. Existing natural control lines such as major streams and rocky areas or manmade barriers such as roads are used as much as possible to minimize soil disturbance. In the absence of existing control lines, hand lines would be constructed using chainsaws and hand tools. Hand lines consist of the removal of all fuels down to mineral soil for a width of 1-3 feet, depending on fuel loading. Water bars would be used on slopes exceeding 20 percent and hand lines would rehabilitate naturally. Underburning is conducted using hand ignition methods such as drip torches as the primary ignition device. Desired fire intensity is site-specific based on the desired site conditions, vegetation type, size, and fuel loadings; fire intensity would be controlled by the pattern of ignition.

Hand Pile Burn

This treatment is designed to remove approximately 50 – 75 percent of the activity fuel 1 – 8 inches in diameter and greater than 2 feet in length. Fuel outside this size range is left untreated, however some smaller fuels are included in the piles to facilitate ignition. Piles are covered with 4 millimeter polyethylene sheeting (see Issues and Alternatives Not Analyzed in Detail 1.7) to create a dry ignition point. Piles are burned in the fall to winter season after at least one inch of precipitation to reduce the potential for fire to spread and to reduce the potential for scorch and mortality to residual trees and shrubs.

Activity Fuel Treatment (Disposal)

Activity fuel disposal methods to be considered would include slashing, lopping and scattering, hand piling, hand pile burning, machine piling adjacent to and on landings, machine pile burning, underburning or biomass removal. Where whole tree yarding or yarding with tops attached prescription are proposed, post-harvest evaluation would occur to determine slash mitigation measures. Where whole tree yarding or tops attached is not feasible or prescribed it is estimated that fuel loading (material 3 inches and less) could increase to 3-11 tons to the acre. Post-harvest evaluation would recommend slash mitigation to reduce fire hazards by hand piling, hand pile burning, lopping and scattering or underburning. In ground based harvest units machine pile and machine pile burn would be evaluated for slash disposal, any machine piling would be conducted from established skid trails. In proposed tether assist harvest systems activity slash will be left within the unit and placed on travel corridors as slash mats for equipment (forwarder and harvesters/processors) travel. Any excess activity slash will be evaluated post-harvest for additional fuel loading mitigation measures.

Increase fueling loading could change the existing fuel model from a timber type (TU or TL) to slash/blowdown group (SB1 or SB2) which in turn would create higher rates of spread and greater flame lengths in the event of a wildfire in the short-term (1-2 years) until slash mitigation measures are implemented. However, despite the temporary increase in ground fuels, research indicates that a reduction in crown fuels outweighs any increase in surface fire hazard (Omi and Martinson 2002). In some instances, the fuel hazard may be low, resulting in no post-harvest fuel hazard reduction treatment.

Understory Reduction

Understory reduction prescriptions are designed to reduce high density of vegetation within a stand. The priority for treatments is to treat understory vegetation (less than eight (8) inches DBH) to promote residual tree growth, vigor and reduce surface and ladder fuels. Prior to slash mitigation, fire behavior potential could increase from the current conditions due to increase in curing/drying of surface fuels. Activity slash would be recommended for slashing, hand pile, hand pile burn, lop and scatter, and/or underburning. Following activity slash treatment there would be a reduction in potential fire behavior both short and long-term by reducing fire intensity, severity and crowning potential by increasing CBH. Understory reduction treatments would be in conjunction with restoration thinning and density management units.

Biomass Removal

Biomass removal would be utilized wherever feasible. The removal/extraction of additional ground fuels created through forest management activities for utilization off-site would reduce the amount of fuel loading and smoke emissions and potentially the need for hand pile burning.

Changes in Microclimate and Effectiveness of Fuels Treatments

Management of forest stands can result in altered microclimates (Agee 1996). Increasing spacing between the canopies of trees can contribute to increased wind speeds, increased temperatures, drying of topsoil and vegetation, and increased shrub and forb growth (Agee 1996). A more open stand allows more wind and solar radiation resulting in a drier microclimate compared to a closed stand. A drier microclimate generally contributes to more severe fire behavior.

The degree of effects of microclimate change on fire behavior is highly dependent on stand conditions after treatment, mitigation to offset the effects of microclimate change, and the degree of openness. For example, Pollet and Omi (2002) found that more open stands had significantly less fire severity, especially in fuels treated areas, while Weatherspoon and Skinner (1995) found greater fire severity. In Pollet and Omi's study, more open stands had significantly less fire severity compared to the more densely stocked untreated stands. The degree of openness in the studied treated stands may not have been sufficient to increase fire activity. Weatherspoon and Skinner found commercially thinned stands in a mixed-conifer forest in the South Fork Trinity River watershed of the Klamath National Forest in northwest California burned more intensely and suffered higher levels of tree mortality than unlogged areas (Weatherspoon and Skinner 1995). The partial cuts they examined were typically overstory removals, where large (mature and old growth) trees were removed leaving smaller trees. The study validates that smaller trees, due to thinner bark and crowns closer to the ground, would suffer more damage than large trees. Harvest slash was not treated in the study areas adding to the fire intensity. The action alternatives for this project proposes to mitigate slash (slashing, hand piling, hand pile burning, machine piling, machine pile burning, lopping and scattering, underburning and/or biomass removal) generated by the treatments and forest thinning.

Moisture content of live vegetation is an important consideration. The moisture content of live fuels compared to fine dead and down fuels are generally much greater. Overstory canopy reduction resulting in the growth of live understory vegetation could contribute to reduced or increased surface fire behavior. Live fuels with higher moisture content can have a dampening effect on fire behavior compared to dead fine fuels (Agee et al. 2002, Agee 1996). Cured grasses and forbs can increase fire line intensity (Agee 1996); however, due to project design where ladder fuels have been removed and crown base heights increased, the risk of crown fire initiation and fire severity is reduced (Agee 1996, Omi and Martinson 2002, Van Wagtendonk 1996).

Cumulative Effects

Alternative 2 and 3 would help restore, maintain, and enhance fire-adapted ecosystems by reducing fire hazard within the PA. In the event of a wildfire, strategic locations would be utilized for fire suppression tactics to contain a fire within the PA, or to prevent a fire from entering it.

The cumulative effects of the Pickett West project are measured in terms of fire hazard. Past Hazardous Fuels Reduction (HFR) projects were designed to reduce the existing fire hazard by removing some of the surface, ladder fuels, and mid-story crown density. By treating the understory vegetation, potential fire behavior is reduced to surface fires and passive crown fires. Approximately 11,102 acres have been treated for HFRm from 2002 to present within the PA. Approximately 1,659 acres of BLM-administered lands were harvested between 2000 to present by thinning prescriptions and 11 acres were fire salvage logged within the PA.

The Pickett West project would implement forest management treatments within dry Douglas-fir (91 percent), Douglas-fir moist (5 percent), and variation of mixed-conifer (4 percent) forest types. Implementation of treatments would trend more towards the historical low to mixed severity fire regime in the PA, enhancing fire-adapted ecosystems by reducing fire hazard.

Restoration Thinning, Density Management, and Hazardous Fuels Reduction Maintenance (HFRm) treatments proposed under Alternative 2 and 3 are designed for forest health and landscape resiliency. The proposed HFRm treatments would re-evaluate past HFR acres within the PA for potential maintenance treatments. Continuation of maintenance treatments will provide long-term benefits by maintaining and/or reducing fire hazard on 11,102 acres. There are 6,005 acres proposed for timber harvest within the Pickett West PA. Past thinning prescriptions and proposed harvested units aim to reduce stand basal area and stand density, increase vigor, reduce insect and disease mortality and restore spatial heterogeneity. Proposed timber harvest prescription would enhance species diversity, reduce the existing fire hazard, and promote fire resiliency.

Silvicultural prescription for pre-commercial thinning (PCT) are designed to reduce high density vegetation, promote tree growth, vigor and reduce surface, and ladder fuels. In the foreseeable future (5 years) it is expected 1,500 acres of PCT would be treated in addition to the Action Alternatives within the PA. HFR under the Williams IVM Project and Cheney Slate Landscape Management Project is expected to continue on approximately 500 acres over the next couple of years.

Alternative 2 and 3 would result in a short-term increase (1-2 years) in fire hazard due to the presence of slash or until the time the activity slash is treated and/or partially decomposed. Alternative 3 would result in an increase of 1,464 acres in activity slash within the helicopter units as whole tree yarding is not feasible for slash removal. Helicopter harvest units could increase fuel loading thus increasing acres of SB1 and/or SB2. Slash mitigations measures prescribed would be based on fuel loading, fuel continuity, topography, aspect, access, and fire hazard. In some instances, lop and scatter may be the preferred treatment for promoting decomposition of activity slash. Treatments completed under the Pickett West Forest Management project would affect the fuel characteristics at the surface, mid and upper canopies, altering the current trend of large scale high severity fire events by disrupting fuel continuity, uniformity and structure, thereby reducing potential fire behavior.

The action alternatives considered under the Pickett West Forest Management Project, when combined with past, ongoing, and reasonably foreseeable actions on BLM-administered lands within the PA, would improve tree vigor, reduce the impacts of insects and disease, and improve fire resiliency at the landscape scale. Long-term beneficial effects are anticipated in terms of decreased fire hazard on approximately 17,107 acres, which could be utilized as strategic holding points for fire suppression personnel for the next 10 to 30 years.

3.3 Terrestrial Wildlife

This section discusses terrestrial wildlife habitats and the potential impacts to wildlife species from the Action Alternatives as described in Chapter 2 of this document.

The present-day composition and distribution of vegetation within the Pickett West planning area (PA) is influenced by site characteristics (soil types, aspect, and topography), natural disturbance (wildfires, insects, disease, etc.) and anthropogenic activities, including historical mining, rural residential development, agricultural activities, timber harvest, fuels reduction projects, fire suppression and exclusion, and road building.

A detailed discussion of the current vegetative composition within the PA, including the percentage composition of the plant association groups, seral stages, and past harvest activities within the PA is included in Chapter 3.1 Vegetation. The vegetation in the PA provides various habitat conditions for a wide array of wildlife species. Table 3.3-1 below illustrates the acres of each vegetative condition class found within the PA, and a list of some of the typical wildlife species that are commonly associated with these vegetative condition classes.

Table 3.3-1 Vegetation Condition Class of BLM-administered lands within the Pickett West PA

Vegetation Condition Class	Acres	Representative Species
Grass, Shrubs, Non-forest Land	4,119	Gopher snake, California ground squirrel, western meadowlark
Hardwood/Woodland	9,179	Western fence lizard, ringneck snake, wrentit, Acorn woodpecker, dusky-footed woodrat, western gray squirrel
Early -Seedlings/Saplings	13,996	Northwestern garter snake, mountain quail, pocket gopher
Poles (5-11 inches DBH)	5,674	Southern alligator lizard, Golden-crowned kinglet, porcupine
Mid (11-21 inches DBH)	14,461	Ensatina, Stellar’s jay, mountain lion
Mature (>21 inches DBH)	47,659	Northern spotted owl, northern flying squirrel, pileated woodpecker, pacific fisher

Scale of Analysis

For the purpose of this analysis, this EA section will hereafter refer to two reference scales: the project area and the planning area. The project area is defined as the footprint of all proposed treatments, such as areas where forest management or transportation management activities are proposed. The planning area (PA) is a geographically contiguous area surrounding the project area which is used to narrow the focus of the planning effort to a size and scope that allows the BLM to reasonably evaluate the area for possible management needs.

Methodology and Assumptions

- Coarse wood already on the ground will be retained and protected from disturbance to the greatest extent possible during treatment.
- Snags which do not need to be felled for safety reasons will be retained within the harvest units to the extent possible.
- All new routes (new construction, tractor swing, etc.) created for harvest operations would create on average a 24 foot wide right-of-way (total width) where all vegetation would be removed.
- Construction of landings created for harvest operations would create openings where all vegetation would be removed covering approximately a half acre for conventional landings (ground-based) or one acre for all helicopter landings.
- In some cases, multiple landings were analyzed in order to provide flexibility during project implementation; this represents a potential maximum and the associated foot print and disturbance is likely to be less than what is presented here.
- If a landing was proposed within a treatment area that would downgrade or remove the existing habitat where the landing was proposed, the landing impacts were considered part of the downgrade or removal treatment and not tabulated into the total treatment effects.
- Project Design Features will be properly implemented and followed as described in Chapter 2.

Only federally listed (Threatened & Endangered or Candidate), Survey and Manage, or Bureau Sensitive species known or suspected to be present within the Grants Pass Field Office management area **and** are affected by the Action Alternatives are addressed in this EA. Appendix E includes the complete list of all such species that may occur within the Grants Pass Field Office management area. The following subset of species in Table 3.3-2 below are those that are known or suspected to occur within the PA and have the potential to be affected by the Action Alternatives and are therefore evaluated in more detail:

Table 3.3-2 Wildlife Species Known or Suspected to occur within the Pickett West PA.

Wildlife Species Known, Suspected or Habitat Occurs in the PA			
Common Name	**Scientific Name**	**Status**	**Occurrenc**
Northern Spotted Owl	***Strix occidentalis***	**FT**	**Known**
Oregon Red Tree Vole	***Arborimus longicaudus***	**S&M**	**Known**
Great Gray Owl	***Strix nebulosa***	**S&M**	**Possible**
Pacific Fisher	***Pekania pennanti***	**SEN**	**Known**
Bald Eagle	***Haliaeetus***	**SEN/EPA**	**Known**
Peregrine Falcon	***Falco peregrinus***	**SEN**	**Known**

Status:

FT – Federally Threatened
SEN – Bureau Sensitive Species
C-T&E – Candidate Threatened and Endangered
S&M – Survey and Manage Species
EPA – Bald and Golden Eagle Protection Act
Occurrence:
Known – Species is known to occur in the PA
Suspected – Species has not been formally documented to occur within the PA, but reasonable potential to exist based on habitat.

3.3.1 Affected Environment – Northern Spotted Owl

Range-wide Status and Trends

Northern spotted owls (NSO) are a federally listed threatened species and are closely associated with old forests for nesting, foraging, and roosting throughout most of their range (Forsman et al. 1984; Carey et al. 1990; and Solis and Gutierrez 1990). The ideal NSO habitat consists of 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 (Spies and Franklin 1991).

The BLM, Forest Service (USFS), and USFWS have conducted a coordinated review of four reports containing information on the NSO. The reviewed reports include the following:

- Scientific Evaluation of the Status of the Northern Spotted Owl (Sustainable Ecosystems Institute, Courtney et al. 2004);
- Status and Trends in Demography of Northern Spotted Owls, 1985-2003 (Anthony et al. 2006);
- Northern Spotted Owl Five Year Review: Summary and Evaluation (USDI 2004b); and
- Northwest Forest Plan – The First Ten Years (1994-2003): Status and trend of northern spotted owl populations and habitat, PNW Station Edit Draft (Lint 2005).

Anthony et al. (2006) published meta-analysis of owl demographic data collected in 14 demographic study areas across the range of the northern spotted owl. Four of the study areas are in western Washington, six are in western Oregon, and four are in northwestern California. Although the agencies anticipated a decline of NSO populations under land and resource management plans during the past decade, Anthony identified greater than expected NSO population declines in Washington and northern portions of Oregon, and more stationary populations in southern Oregon and northern California. The most recent metadata analysis, published in 2016 (Dugger et al. 2016), found that fecundity, the number of female young produced per adult female, is declining. Dugger et al. (2016) concluded that fecundity, apparent survival, and/or populations were declining in most study areas, and that increasing numbers of barred owls and loss of habitat were partly responsible for these declines. The 2016 metadata analysis found these declines are occurring in more study areas than indicated in the last 2011 metadata analysis (Forsman et al. 2011). The 2016 data indicates that competition with barred owls may now be the primary cause of northern spotted owl population declines across their range.

These reports listed above did not find a direct correlation between habitat conditions and changes in NSO populations, and they were inconclusive as to the cause of the declines. Even though some risk factors had declined (such as habitat loss due to harvesting), other factors had continued, such as habitat loss due to wildfire, potential competition with the barred owl, West Nile virus, and sudden oak death (USFWS 2004; Lint 2005). The barred owl is present throughout the range of the NSO, so the likelihood of competitive interactions between the species raises concerns as to the future of the NSO (Lint 2005).

In more recent reports (Davis et al. 2011, Forsman et al. 2011), it has become more evident that the barred owl population is increasing across the range of the northern spotted owl. Forsman et al. (2011) indicates that the spotted owl populations have declined across most of the range, with the most significant declines occurring in Washington where the barred owl has been present the longest. Although analysis within the nearest NSO demography study (Klamath Study Area, or KSA) to the PA indicates a stable NSO population during the study period, the recent data shows the beginning of a trend towards a declining population (Davis et al. 2011). Davis et al. (2011) states that:

> *There is mounting evidence that barred owls are negatively impacting spotted owl population within the KSA. This is illustrated by several population trends beginning about 2003, which is when barred owl detections within the KSA exceed 10 percent of the sites. Spotted owl detections have been steadily decreasing since 2002 and reached the lowest point in 2010, the same year barred owl detections reached their highest level. Fecundity rates appear to be declining during the past 8 years and in only 1 of those 8 years was the rate above average. Fecundity rates for sites with known barred owl presence were lower than at other sites. If these trends continue a combination of lower occupancy and reduced fecundity, there may be cause for concern regarding the spotted owl population.*

On June 30, 2011, the USFWS released the Revised Recovery Plan for the Northern Spotted Owl (USDI 2011a). This Revised Recovery Plan recommends achieving recovery of the spotted owl through:

1. The retention of more occupied and high-quality habitat,
2. Active management using ecological forestry techniques, both inside and outside of reserves,
3. Increased conservation of spotted owls on State and private lands, and
4. The removal of barred owls in areas with spotted owls.

The Revised Recovery Plan also included a number of “Recovery Actions” that are near-term recommendations to guide the activities needed to accomplish the recovery objectives and achieve the recovery criteria included in the Revised Recovery Plan. Of the 33 Recovery Actions (RA) included in the Revised Recovery Plan, two were specifically considered and applied to the Pickett West project: RA10 and RA32. These two RAs are discussed at other points in this document, including Chapters 1.7, 2.2, and later in this section.

Project Specific Spotted Owl Information

For the purposes of this analysis, the vegetation within the Pickett West PA was typed into habitat categories pertinent to the NSO. These habitat types are distinct and not over-lapping and are used throughout this document to describe and quantify habitat conditions across the landscape. These habitat categories are as follows:

Nesting, Roosting, and Foraging (NRF) Habitat for the spotted owl consists of habitat used for nesting, roosting, and foraging. NSO NRF habitat also functions as dispersal habitat. Generally, this habitat is multistoried, 80 years old or more (depending on stand type and structural condition), and has sufficient snags and down wood to provide opportunities for nesting, roosting, and foraging. The canopy cover generally exceeds 60 percent, but canopy cover or age alone does not qualify a stand as NSO NRF habitat. Other attributes of NRF habitat include: a high incidence of large trees with various deformities (e.g., large cavities, broken tops, mistletoe infestations, and other evidence of decadence); large snags; large accumulations of fallen trees and other woody debris on the ground; and sufficient open space below the canopy for spotted owls to fly (Thomas et al. 1990).

NRF habitat can be further divided into two habitat categories: roosting & foraging habitat and nesting, roosting & foraging habitat. Roosting & foraging (RF) habitat has an average canopy cover greater than 60 percent and canopy structure is generally single layered. Overstory trees are generally greater than 16 inches in diameter, and the presence of snags and down wood are not considered a requirement. Nesting (N) habitat has high canopy cover (> 60 percent), a multilayered structure, and large overstory trees >21 inches in diameter. Deformed, diseased, and broken-top trees, as well as large snags and down logs, are also present. Nesting habitat meets all NSO life requirements.

NSO NRF habitat in southwest Oregon is typified by mixed-conifer forest, recurrent fire history, patchy habitat components, and a relatively high incidence of woodrats (a high quality spotted owl prey species in the Klamath Province) (Forsman et al. 1984, 2004; Ward et al. 1998; Hamer et al. 2001).

Forsman et al. (1984) described some of the differences in NRF habitat within the Klamath Mountains Province that are typical of large parts of the Medford District:

> *…Eighty-one percent of all nests in northwestern Oregon were in cavities, compared to only 50 percent in the Klamath Mountains. These differences appeared to reflect regional differences in availability of the different nest types. Dwarf mistletoe infections in Douglas-fir (and numerous debris platforms that were associated with dwarf mistletoe infections) were common in the mixed coniferous forests of the Klamath Mountains and the east slopes of the Cascades, but did not occur in western Oregon.*

Forsman et al. (1984) documented the range of nest trees for platform nests (n=47) as 36 to 179 cm (14.2 to 70.5 inches) diameter at breast height averaging 106 centimeters (41.7 inches) DBH.

Mistletoe is occasionally used as a nesting substrate in southwest Oregon, which sometimes makes smaller trees suitable as nest trees. For spotted owls, features that support nesting and roosting habitat typically include a moderate to high canopy (70-90 percent); a multistoried, multi-species canopy with large overstory trees (greater than 30 inches in diameter); a relatively high incidence of larger trees with various deformities, including mistletoe, large snags, large accumulations of fallen trees and wood on the ground; and flying space (Thomas et al. 1990). NRF habitat also functions as dispersal habitat.

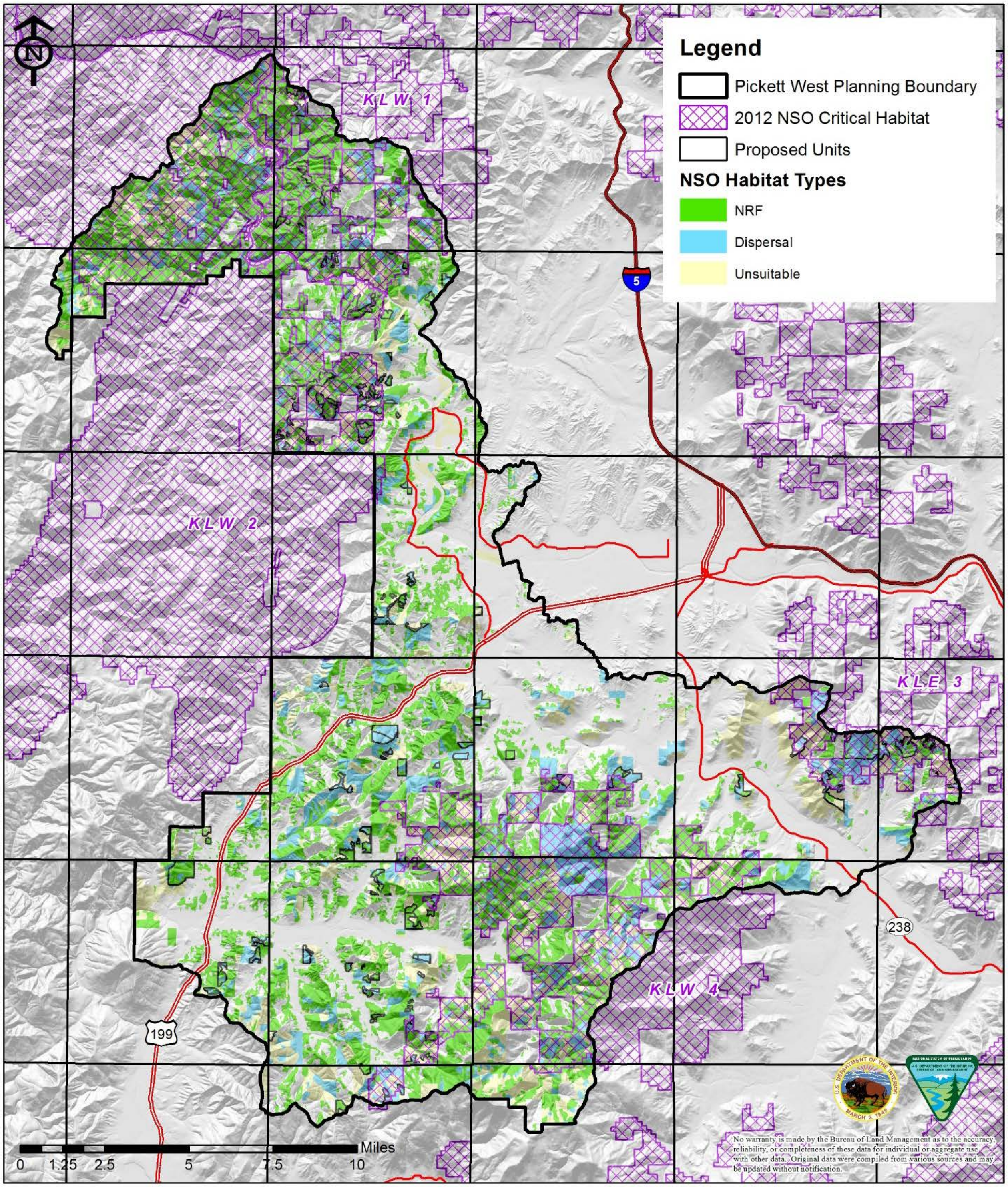
Structurally complex habitat, as defined by Recovery Action 32 (RA32) in the 2011 Revised Recovery Plan for the Northern Spotted Owl is a sub-set of NRF habitat. Under the NSO Recovery Plan, the *USFWS* recommends that agencies "maintain substantially all of the older and more structurally complex, multilayered conifer forests on federal lands" (USDI 2011a). These forests are characterized as having large diameter trees; high amounts of canopy; and decadence components such as broken-topped live trees, mistletoe, cavities, large snags and large coarse wood. Stands proposed for potential timber management in the Pickett West PA were evaluated to determine if any areas met the structurally complex habitat definition. Through field evaluations, 127 acres were determined to meet RA32 stand conditions and were withdrawn from consideration for treatment.

All areas proposed for noncommercial treatments (Hazardous Fuels Reduction Maintenance) would be assessed to determine if RA32 stand conditions are present prior to implementation. Any areas identified as RA32 would be dropped from treatment, however the incidence of RA32 occurring in any proposed HFRm units is expected to be negligible as these stands have already been treated and the habitat would have already been simplified from these prior treatments. The initial RA32 screening did not yield a high amount of structurally complex habitat within the potential treatment pool of stands because the majority of older and more complex stands were already dropped from consideration due to the RA10 screening process described in more detail in Chapter 2.2.

Dispersal-Only Habitat is a subcategory of all dispersal habitat for northern spotted owls. Thomas et al. (1990), defined dispersal habitat as forested habitat more than 40 years old, with canopy cover greater than 40percent, an average tree diameter greater than 11 inches, and flying space for owls in the understory but does not provide the components found in NRF. It provides temporary shelter for owls moving through the area between NRF habitat and some opportunity for owls to find prey, but does not provide all of the requirements to support an owl throughout its life. Dispersal will be used throughout this document to refer to dispersal-only habitat.

Unsuitable Habitat for the NSO is forest land that currently does not meet either the NRF or Dispersal definitions. Lands classified in this condition are made up from two sub-classifications 1) lands capable of becoming suitable habitat in the future but are currently not functioning as habitat (i.e. young plantations) or 2) non-habitat lands are site limited and will never provide habitat (i.e. meadows, open oak woodlands, agricultural fields, human habitations).

Figure 3.3-1 NSO Habitat Types and 2012 Critical Habitat within the PA



All existing habitat within the PA was categorized into one of the three categories of NSO habitat described above. The habitat values were derived from two sources: 1) in areas that do not have proposed commercial treatments, habitat values were obtained from a BLM GIS (Geographical Information Systems) dataset representing NSO habitat values across BLM-administered lands, and 2) in areas that are proposed for commercial treatments, field visits were conducted by BLM wildlife technicians and biologists to further identify and delineate the habitat values within those areas.

Habitat on lands other than BLM-administered lands were only categorized into NRF or not NRF, and thus areas identified as not NRF were assigned into an unclassified category composed of either dispersal only or unsuitable habitat quality. Table 3.3-3 below provides information on the types and amounts of habitat by land ownership within the PA.

The habitat within the Pickett West PA has been managed in a variety of ways (see Silviculture Chapter 3.1) and the existing habitat is moderately to highly fragmented into small blocks, mostly confined to sections (<640 acres) of BLM-administered lands. The majority of the private land within the PA has been clear-cut and provides little habitat value for species associated with late-successional habitat (77.3 percent of all private lands in the PA are not functional NRF). It is expected that private timber lands would be managed primarily for timber production and harvested on a 50-80 year rotation. As a result, NSO habitat within the Pickett West PA is expected to be mostly limited to federally administered lands. Private lands within the PA currently contain 37 percent of the total existing NRF habitat within the PA, while BLM-administered lands contain 63 percent of the existing NRF habitat present across the PA. On the BLM-administered lands within the PA, approximately 43 percent of the BLM-administered lands meet the minimum habitat standards of NRF habitat, 25 percent are dispersal and 32 percent are unsuitable. The spatial distribution of these habitat types across the PA are visually depicted in Figure 3.3-1.

Table 3.3-3 Acres of NSO Habitat Types within the Pickett West PA

Habitat Type	**Ownership**		**TOTAL**
	BLM	**Other**[1]	
Nesting, Roosting & Foraging (NRF)	41,300 (43.4%)	24,565 (22.7%)	65,865 (32.4%)
Dispersal Only Habitat	23,814 (25.0%)	*	23,814 (11.7%)
Unsuitable Habitat	29,971 (31.6%)	*	29,971 (14.7%)
* = Unclassified (not NRF)	0	83,808 (77.3%)	83,808 (41.2%)
TOTAL	**95,085**	**108,373**	**203,458**

Specific to the Pickett West PA, there are 59 known NSO territories with at least a portion of their home range (1.3 mile radius from the center of activity) that overlaps an area proposed for active management under the Pickett West project (Figure 3.3-2).

The NSO sites within the PA have received varying amounts of surveys in the past, with some sites receiving relatively few and sporadic surveys, while others have had more routine and recent surveys. NSO surveys are on-going and all known sites that have the potential to be negatively affected by the Pickett West project will be surveyed to protocol (USDI 2012) prior to project implementation. Recent survey results from the 2016 survey season revealed a trend of extremely low occupancy rates. Although survey results from a single survey season are not definitive, this trend is expected to continue, and this assumption is supported by the results from trends found in other larger demographic studies (Dugger et al. 2016, Hollen et al. 2015).

During the project planning and development of Pickett West, the IDT followed principles in the Recovery Plan Implementation Guidance: Interim Recovery Action10 Medford Bureau of Land Management/Rogue River-Siskiyou National Forest/USFWS Roseburg Field Office (USDA/USDI 2013) while designing the location and intensity of the proposed treatments included in each Action Alternative. Factors that influenced this process include occupancy rates across all known NSO sites within the PA, existing habitat types and percentages within the 0.5 mile cores and home ranges of known owl sites, and abiotic factors such as topography, slope position, and the Relative Habitat Suitability (MaxEnt) model described in the 2011 Revised Recovery Plan for the Northern Spotted Owl (USDI 2011a).

Only those sites that have had pair occupancy from recent protocol surveys are considered "high value" sites, and conversely all sites that are demonstrated to be unoccupied through protocol surveys are considered "low value". As described in more detail in Chapter 1.5 #5 of this EA, this project is designed to avoid the incidental take of NSOs and any decision issued from this EA would have a valid Biological Opinion that would support the BLM's determination that the project would not cause incidental take of NSO pairs or resident singles. Further details about this approach and components of each alternative are included in Chapter 2 and Table 2-1.

Barred Owls

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

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

BO surveys are not required, but BOs are detected opportunistically while conducting NSO surveys. While the BLM did not specifically survey for BOs, a study in the Oregon Coast range suggests that over the course of a season, NSO surveys to protocol (> 3 visits) allow approximately 85 percent of the BOs present in the area to be detected (Wiens et al. 2011). Additionally, the USFWS's Protocol for Surveying Proposed Management Activities That May Impact Northern Spotted Owls allows for a reasonable assurance that NSOs in an area will be detected, even where barred owls are present (USDI 2012). The USFWS and cooperators conducted analyses of historical NSO survey data, leading to estimates of detection rates for NSOs that account for the effects of BO presence. Within the Pickett West PA, NSO surveys have detected a number of breeding pairs of BOs and resident singles.

Spotted Owl Critical Habitat

The Pickett West PA overlaps a portion of the Final Revised Critical Habitat for the NSO (USFWS 2012B), specifically portions of the KLW 1, KLW 2 and KLW 4 Subunit of the Klamath West Habitat Unit and a portion of KLE 3 Subunit of the Klamath East Habitat Unit (Figure 3.3-1). All of these subunits are expected to function primarily for east-west and north-south connectivity between subunits and critical habitat units, as well as for demographic support. These subunits facilitate NSO movements between the western Cascades, coastal Oregon, and the Klamath Mountains (USFWS 2012B).

Approximately 58,693 acres of the Critical Habitat Designation is within the Pickett West PA boundary, encompassing approximately 62 percent of the federal lands within the PA (Table 3.3-4).

Table 3.3-4 Acres of NSO Critical Habitat by Critical Habitat Unit and Sub-units

Critical Habitat Unit	Critical Habitat Sub-unit	Acres
Klamath East	KLE 3	4,609 (8%)
Klamath West	KLW 1	15,862 (27%)
Klamath West	KLW 2	14,759 (25%)
Klamath West	KLW 4	23,463 (40%)
TOTAL		**58,693**

3.3.2 Environmental Effects

Alternative 1 - No Action

Direct/Indirect Effects to NSO and its Habitat

Under the No Action Alternative, the treatments proposed under this EA would not occur, and the current habitat conditions across the PA would not be affected by this project. NSOs that inhabit and utilize the Pickett West PA would not be impacted from any loss of habitat or project-related disturbance, and would be expected to behave and utilize the habitat within the PA in the same fashion as they have in the past. While the amount of NSO habitat would not be changed from active management under the No Action Alternative, the future fate of the existing habitat is of interest. In particular, habitat loss to high-severity fire and stand level dynamics (stand succession) are key concerns.

Under the No Action Alternative, no loss of NRF or dispersal habitat would be expected on BLM-administered lands across the PA from active forest management. Estimating the potential loss of NRF or dispersal habitat due to wildfire or other disturbance events is a much more difficult and enigmatic question. The recent trends in the southwest Oregon and Northern California Klamath Provence illustrate that fire has been converting mature forest structure at a higher rate than harvest, making the retention of these types of forests problematic in dry forested ecosystems (Courtney et al. 2004; Spies et al. 2006). This trend is epitomized by the large fires that have burned across southwestern Oregon over the past five years: the 2013 Doulas Complex and Big Windy fires which collectively burned an estimated 77,000 acres to the north and west of the PA, and the 2015 Stouts Creek Fire, which burned approximately 26,500 acres within the Galesville/South Umpqua LSR to the northeast of the PA.

High severity fires could be expected to remove or downgrade habitat in a stochastic pattern across the landscape, setting back forest succession and development, and likely resulting in the loss of large tree structure critical to late-successional forest habitat dependent species. High severity fires resulting from these dense stand conditions would cause more severe impacts to soils, which may prolong the recovery and colonization of mycorhizzal processes, and macroinvertebrate and small mammalian prey food webs important to suitable foraging areas for NSOs. For additional information about fire and fuels risks under the No Action Alternative, see 3.2 Fire and Fuels Chapter for fire hazard information.

In southwest Oregon, the reduction in fire frequency has reduced the role of fire as an ecological factor, influencing stand development and altering historic forest structures, processes, and functions. While there would no reduction in the NSO habitat quality of areas that would not receive treatments under the No Action Alternative, the trajectory of these untreated stands is not favorable in terms of developing into high quality NSO habitat. This is because trees growing in dense conditions grow in height, but very little in diameter (Oliver and Larson 1996, pg. 75), and the overall stand growth would remain stagnate as the untreated stands would be left in overly dense conditions. Overstocked stand conditions would result in relatively slow growth rates that would prolong crown differentiation (Tappeiner et al. 2007, p.124). Eventually, some trees would become dominant and shade out suppressed trees. These trees would stand as small-diameter snags and ultimately fall, but would not create openings as occur in late-seral stands because of their small size. The remaining dominant trees would soon expand their crowns into the newly-available growing space, increasing the effects of mortality on understory vegetation. Multiple waves of such competition mortality would occur before dominant tree density would be low enough for understory reinitiation. This growth trajectory would be unfavorable to the development of mature and late-successional forest attributes (Sensenig, 2002). For additional information related to forest succession and stand development processes within the PA under the No Action Alternative see the vegetation portions of this EA, Chapter 3.1and 3.2.

BLM standard road maintenance, including activities such as road surface, ditch, road bank and fills, hazardous tree removal, culvert replacement, may occur and is not expected to downgrade spotted owl habitat. Temporary and permanent right-of-way (ROW) construction would continue on private lands and potentially on BLM-administered lands consistent with reciprocal ROW agreements to allow private harvesting, resulting in the potential for removal of suitable and dispersal habitat.

Action Alternatives - Alternative 2 and 3

Direct and Indirect Effects to NSO and its Habitat from Vegetation Management – Effects which are common to both Action Alternatives

As detailed in Chapter 2 of this document, a suite of management activities are proposed under Alternative 2 and 3 that are designed to achieve multiple objectives, including: a reduction of vegetation density, reduced risk of high-severity fire, increased growth and vigor of residual trees, and increased heterogeneity in terms of stand and species composition across the landscape. Table 3.3-5 below describes the proposed treatments and what NSO habitat type they would occur in across the PA.

Table 3.3-5 Acres of Proposed Treatment Types within NSO Habitat Types.

ALTERNATIVE 2				
Treatment Type	**NRF**	**Dispersal**	**Unsuitable**	**Total**
Density Management - NSO Dispersal Objective (DM-D)	800	133	8	941
Density Management NSO NRF Objective (DM-NRF)	655	847	128	1,630
Restoration Thinning (RT)	1,749	1,428	257	3,434
Hazardous Fuels Reduction Maintenance	2,681	3,613	4,813	11,108
New Routes[1]	5.6	7.7	11.8	25.1
Landings[2]	16.9	16.4	23.4	56.6
Alternative 2 Total	***5,908***	***6,045***	***5,241***	***17,195***
ALTERNATIVE 3				
Treatment Type	**NRF**	**Dispersal**	**Unsuitable**	**Total**

Density Management - NSO Dispersal Objective (DM-D)	0	0	0	0
Density Management NSO NRF Objective (DM-NRF)	2,476	1,694	253	4,424
Restoration Thinning (RT)	727	713	141	1,581
Hazardous Fuels Reduction Maintenance	2,681	3,613	4,813	11,108
New Routes[1] (Tractor-swing only)	8.0	4.6	4.3	17.0
Landings[2]	53.0	48.4	52.6	154.0
Alternative 3 Total	***5,945***	***6,073***	***5,264***	***17,284***

1 = Combined total of all new routes, including all new temporary route construction, Tractor-swing roads and operator spurs (see Chapter 2 for a detailed description of these types of activities).
2 = Combined total for all conventional (ground-based) landings and helicopter log & service landings.
DG = NSO habitat downgrade; T&M = NSO habitat Treat and Maintain

The effects of habitat modification activities and the duration of those effects on NSOs depend upon the type of silvicultural prescriptions used and the location of the harvest relative to habitat. When discussing changes to spotted owl habitat, the following definitions are used to describe the anticipated effects of the activities associated with the Action Alternatives to the NSO habitat types within the Pickett West PA:

1. A **Treat and Maintain** of NRF or dispersal habitat means an action or activity would occur within NRF or dispersal habitat but would not change the habitat classification post-treatment. The NRF stand would retain an average of 60 percent canopy cover post-treatment, large trees, multistoried canopy, standing and down dead wood, and diverse understory adequate to support prey; and may have some mistletoe or other decay. Dispersal habitat would continue to provide at least 40 percent canopy cover, flying space, and trees 11 inches DBH or greater, on average.

2. A **Downgrade** of NSO habitat means to alter the function of spotted owl NRF habitat so the habitat no longer supports nesting, roosting, and foraging behavior, but would retain enough tree cover to support NSO dispersal. Downgrade is defined when the canopy cover in a NRF stand drops to 40-60 percent at the stand level, and when conditions are altered such that an NSO would be unlikely to continue to use that stand for nesting, roosting and foraging. Downgraded NRF continues to provide dispersal habitat.

3. A **Removal** of NRF or dispersal habitat results when management activities within NRF or dispersal habitat remove high levels of canopy cover and basal area, so the habitat no longer functions as NRF or Dispersal habitat post-harvest. Removal drops canopy cover to less than 40 percent and otherwise changes the stand so it no longer provides any habitat value for NSOs.

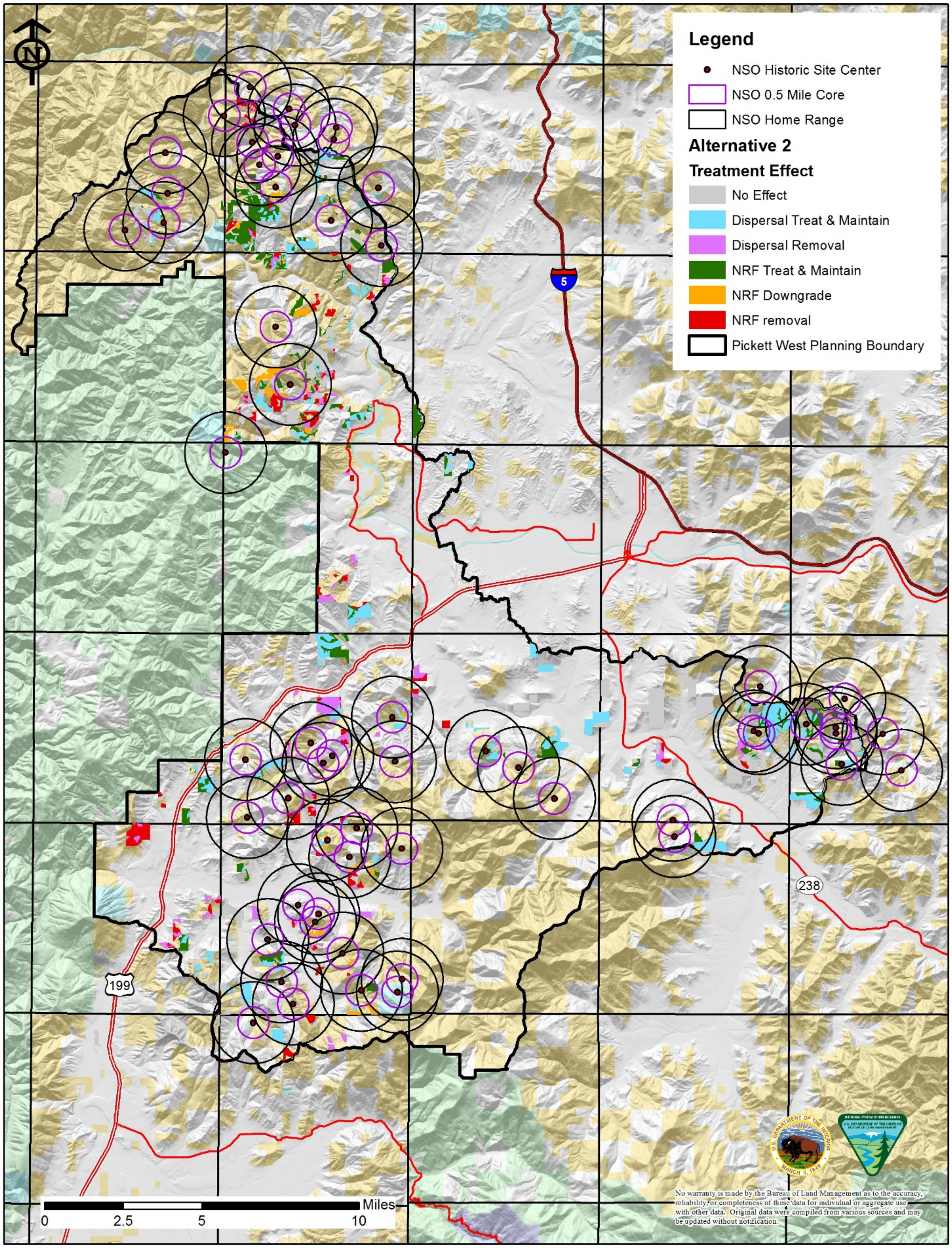
All of the treatments proposed under the Action Alternatives can be assigned into one of the general effect types listed above, and are presented in Table 3.3-6 below. These classes of effects are used to assess the treatment impacts to the existing habitat present within the PA. Canopy cover is used as one of the critical habitat thresholds because it is highly important to NSO nest site selection and general habitat use because increased levels of canopy afford protection from predators, and regulate temperature extremes (Courtney et al. 2004). However, canopy cover alone is not the only important habitat element to NSOs. Other important components are structural diversity (vertical layering and mistletoe clumps, crown structure, and complexity), decadence features (including snags, down logs, cavities, and broken top trees), sufficient space for easy flight beneath the overstory, and access to prey.

Implementation of treatments that downgrade NSO NRF habitat have the potential to reduce nesting, roosting, and foraging opportunities in treated stands. The downgrading of NRF habitat is likely to result in some adverse impacts to NSOs by decreasing flying squirrel abundance by removing mid-story and overstory structure from those acres (Wilson 2010, Manning et al. 2012) which could reduce NSO foraging opportunities. Also, reducing canopy cover below 60 percent would likely increase predation risk to NSOs in these stands, and introduce ecological edge effects to the affected stands as well as to adjacent stands of NRF habitat, extending the area of impact beyond the treated areas. Harvest prescriptions that result in the downgrade of NRF habitat may remove some key habitat elements, including large diameter trees with potential nesting cavities or platforms, multiple canopy layers, adequate forest cover, as well as hunting perches used by NSOs.

When analyzing the impacts to spotted owls from timber harvest and other vegetation treatments, the amount, intensity, and duration of the harvest are not the only factors to consider. A critical factor to consider is the spatial distribution of the habitat found across the landscape and where the proposed treatments would occur in relation to known NSO nest sites. The areas surrounding a NSO nest site can be delineated into three concentric circles. A Nest Patch is the area within a 300-meter radius (70 acres) around a known or likely nest site. A Core Area has a radius that captures the approximate core use area, defined as the area around the nest tree that receives disproportionate use (Bingham and Noon 1997). The Medford District uses a 0.5 mile radius (~500 acre) circle to approximate the core area. The Provincial Home Range is an approximation of the median home range size used by spotted owls in the Klamath Mountains Province. Medford District uses the median home range estimated for southwestern Oregon of 3,400 acres or a circle with a radius of 1.3 miles.

These concentric circles represent three scales of use during the course of breeding and non-breeding season. Figure 3.3-2 depicts the known NSO sites and the associated circles representing the above described areas of use for each site across the PA. These three areas of use represent how NSOs utilize the forest environment around their nest sites, and the importance of the habitat located within each spatial scale to a given NSO pair. They also provide a better understanding of how habitat altering treatments may affect NSOs life functions depending on where the treatment would occur in relation to known NSO nest sites.

Figure 3.3-2 Northern Spotted Owl Sites within the Pickett West Planning Area



A great deal of planning and forethought went into the determination of where specific prescription would be applied. During the development of the Action Alternatives the IDT considered recommendations found in the following documents: the Rogue Basin Cohesive Forest Restoration Strategy, Southern Oregon Forest Restoration Collaborative (SOFRC 2015), the Recovery Action 10 Plan Implementation Guidance (USDA/USDI 2013), the NSO Critical Habitat Designation (Federal Register 2012), and the 2011 Revised Recovery Plan for the Northern Spotted Owl, "Restoring Dry Forest Ecosystems" (USDI 2011a, Section III, pp. 32-38).

Specifically, the following recommendations were used to reduce and minimize impacts to NSO in the PA:

- No commercial treatments would occur within the Nest Patch area of any NSO site;
- No habitat downgrade would occur within any high value owl sites;
- Limit the total amount of commercial treatments to <30 percent of the available NRF in any 0.5 mile core area;
- Where habitat downgrade or removal is proposed, it is proposed to occur only in "low value" owl sites and the treatment is designed to emphasize dry forest habitat restoration, consistent with "Restoring Dry Forest Ecosystems" section of the Revised Recovery Plan for the Northern Spotted Owl (USDI 2011a, pp. III-32-38), and direction included in the 2012 NSO Critical Habitat Rule (USDI 2012).

The combination of the intensity of harvest (habitat effects) and spatial location of treatments are assessed below by alternative in order to evaluate the relative differences between the Action Alternatives and the No Action Alternative.

Effects to Northern Spotted Owl Prey

Treatments associated with the Action Alternatives that would treat and maintain NSO habitat may impact NSO foraging by changing habitat for NSO prey species. Effects to NSO prey species would be expected to occur due to Action Alternative treatments. Quantifying those impacts is somewhat problematic due to limited information on prey species abundance for the PA. Studies have shown variations of prey availability across different stands within the range of the NSO, which is likely reflected locally within the PA.

Edges created from harvest can be areas of good prey availability and potentially increased prey vulnerability (i.e., better hunting for owls) (Zabel et al. 1995). Prey animals may be more exposed in the disturbed areas or could move away from the disturbed area for the short-term. Changes in prey availability occur as cover is disturbed and prey species move around in the understory. As a result, they can become more vulnerable and exposed. The disturbance could attract other predators such as hawks, other owls, and mammalian predators. This may increase foraging competition for owls in the treatment area, but the exposure of prey would also improve prey availability for NSOs.

Bingham and Noon (1997) reported that an NSO core area (closest to the nest) is the area that provides the important habitat elements of nest sites, roost sites, and access to prey, benefiting NSO survival and reproduction. Rosenberg and McKelvey (1999) reported that NSOs are "central place" animals with the core area being the focal area. Several studies (Wagner and Anthony 1998, Dugger et al. 2005, Zabel et al. 2003, Bingham and Noon 1997) indicate the core area size for the Klamath province is 0.5 miles from the nest site (or 500 acres). Therefore, effects to prey species are most critical at the nest patch and core areas.

All of the treatments proposed under the Action Alternatives were designed to help reduce any negative effects to NSO prey species by incorporating untreated pockets (leave "islands" or "skips") throughout the treatment areas. This strategy is expected to provide unaltered portions of the stand throughout the PA that have the potential to serve as refugia for NSO prey species during project implementation. Residual trees, snags, and down wood retained in the thinned stands would provide some cover for prey species over time, and would help further reduce any negative effects to spotted owl prey species.

Effects of Noise Disturbance to Northern Spotted Owls

Mandatory PDFs would be incorporated into the Action Alternative activities. Nesting owls are confined to an area close to the nest, but once the young fledge, they can move away from noise and activities that might cause them harm. Since all projects would follow mandatory PDFs that restrict activities to outside of the breeding season and beyond recommended disturbance distance thresholds, as established by the USFWS, no harm to nesting owls, or their young, is expected from project-related noise or activities.

Effects to Northern Spotted Owl from Roads

No new permanent roads would be built under either Action Alternative. A number of short spurs of a temporary design would be constructed. After implementation is completed, these temporary routes would be fully decommissioned. Assuming a maximum of 24 feet total width for all temporary routes (including tractor swing roads), a total of 25.1 acres of habitat would potentially be removed, including 8 acres of NRF and 7.7 acres of dispersal with the remaining occurring in unsuitable habitat.

There are landings associated with ground-based, cable, and helicopter yarding systems. Many of the landings are located within existing road prisms and temporary routes. Due to the uncertainty of where the exact location of landings would be needed to facilitate harvest operations, the analysis conservatively estimates multiple landings, and incorporates landings associated with multiple harvest systems to provide flexibility during implementation. These values are predicted maximums, and actual treatment impacts after implementation is complete are expected to be lower than presented here. The combined impact of all landings could potentially result in the removal of 53 acres of NRF habitat and 48.4 acres of dispersal.

The effects of this road work and associated landings to the NSOs present in the PA are anticipated to be minimal. The total amount of habitat impacted is low (0.1% of the existing NRF in the PA, federal lands only) and occurs in very small isolated pieces scattered across the PA, with the largest individual impact from potential helicopter landings at one acre. Edge effects from this construction are expected to be minimal because all construction would occur within units proposed for timber extraction or in locations already impacted by previous road construction.

Effects of Barred Owl Competition with Northern Spotted Owls

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

Although NSO populations have been declining for many years, the presence of barred owls exacerbates the decline. Recent studies (Olson et al. 2005, p. 918; Forsman et al. 2011a, pp. 69-70, 75-76) have established negative relationships between barred owl presence and declines in spotted owl population performance across the range of the subspecies.

Removal or downgrade of habitat reduces the overall amount of available habitat and can therefore increase competition between these two species as habitat becomes increasingly limited. The effect of the vegetative treatments included under either Action Alternative is expected to have an extremely limited effect on competitive interactions between these two species because at most a small proportion (2.7 percent) of the overall available NRF habitat within the PA would be lost (removed or downgraded) as a result of project implementation. The effect would be further reduced because the habitat loss is spread throughout the PA in many small non-contiguous locations.

Direct and Indirect Effects to NSO and its Habitat - Specific to Alternative 2

Specific to Alternative 2, a total of approximately 2,549 acres of NSO NRF habitat would be downgraded or removed by the combined effects of all timber harvest treatments, specifically the Density Management - Dispersal (DM-D) and Restoration Thinning (RT) treatments. In addition, the construction of temporary routes and landing construction required to facilitate harvest operations are expected to remove 5.6 acres and 16.9 acres of NRF habitat, respectively. Table 3.3-6 illustrates the acres of each type of NSO habitat and the potential effect to each habitat type that would result under full implementation of either Action Alternative. All of the understory reduction (UR) and Hazardous Fuels Reduction maintenance (HFRm) treatments proposed under the Pickett West project are anticipated to result in a treat and maintain effect to the habitat type where these activities are implemented, or are expected to have no effect in unsuitable habitat.

Table 3.3-6 Treatment Effects to NSO Habitat Type on BLM-administered Lands in the Pickett West PA

ALTERNATIVE 2						
Habitat Type	**Pre-Project Acres (percent)**	**Treat and Maintain**	**Downgrade**	**Removal**	**Post-Project Acres (percent)**	**Percent change (PA)**
NRF	41,300 (43.4%)	3,336	800	1,771	38,729 (40.7%)	-2.7%
Dispersal-only	23,814 (25.0%)	4,595	NA	1,452	23,162 (24.4%)	-0.6%
Unsuitable	29,971 (31.6%)	5,242	NA	NA	33,194 (34.9%)	+3.3%
Total	**95,085**	**13,173**	**800**	**3,223**	**95,085**	**NA**
ALTERNATIVE 3						
Habitat Type	**Pre-Project Acres (percent)**	**Treat and Maintain**	**Downgrade**	**Removal**	**Post-Project Acres (percent)**	**Percent change (PA)**
NRF	41,300 (43.4%)	5,157	0	788	40,512 (42.5%)	-0.8%
Dispersal-only	23,814 (25.0%)	5,308	NA	767	23,047 (24.2%)	-0.8%
Unsuitable	29,971 (31.5%)	5,264	NA	NA	31,526 (33.2%)	+1.7%
Total	**95,085**	**15,729**	**0**	**1,555**	**95,085**	**NA**

In their entirety, the treatments proposed under Alternative 2 would result in a total loss of 2,571 acres (6.2 percent) of NRF habitat across the PA (harvest areas plus the additional potential effects of new temporary route construction and landings), or a reduction of 2.7 percent of the proportion of all the NRF habitat on federally managed lands within the PA. An additional 3,336 acres of treatments in NRF habitat throughout the PA would result in the treatment and maintenance of 8.1 percent of the existing NRF habitat on federally managed lands.

Approximately 4,595 acres of proposed treatments would occur within dispersal-only habitat, which would directly impact 19.3 percent of the dispersal-only habitat on BLM-administered lands, or 7.1 percent of all dispersal habitat (combined NRF and dispersal-only) on BLM-administered lands. Treatments included under Alternative 2 would result in the removal of 1,452 acres of dispersal habitat, resulting in the reduction of 2.2 percent of all available dispersal habitats on federal lands.

The remaining treatments associated with Alternative 2 would treat and maintain the existing habitat where treatments are proposed and would primarily impact NSO prey and foraging opportunities. These treatment effects are considered short-term negative effects to prey and are discussed above in more detail under Section 3.3.2 Effects to Northern Spotted Owl Prey.

Under Alternative 2, no management activities of any kind are proposed in the Nest Patch of any known or historic NSO sites located within the PA.

Within the Pickett West PA, there are 59 cores (0.5 mile radius) that are associated with the known NSO sites that are being considered in this analysis. Of these 59 cores, 39 have treatments proposed within a portion of the 0.5 mile core. In total, 1,519 acres (770 in dispersal and 749 in NRF) would be treated across all 39 core areas, including 280 (37 percent) acres of NRF downgrade or removal and 469 (63 percent) acres of NRF treat and maintain. The downgrade and removal described above occurs in “low value” sites and the treatments are designed to emphasize dry forest habitat restoration which is consistent with both the Revised Recovery Plan for NSO and direction included in the 2012 NSO Critical Habitat Rule. Treatments are expected to benefit the NSO sites in the long-term.

Within the Pickett West PA, there are 59 Provincial Home Ranges (1.3 mile radius) that are associated with known NSO sites that overlap the PA. The Alternative 2 would take place within at least a portion of the home range of all 59 historical NSO sites. The majority (77 percent) of the proposed treatments are designed to treat and maintain the existing habitat type where implementation is to occur (Table 3.3-6); with stand level treatments that result in the downgrade of NRF habitat occurring in 39 “low value” (unoccupied) NSO territories.

As described above in the Affected Environment section, The NSO sites within the PA have received varying amounts of surveys in the past and recent survey results from the 2016 survey season revealed a trend of extremely low occupancy rates. Based on these survey results, only those sites that have had pair occupancy from recent protocol surveys are considered “high value” sites, and conversely all sites that are demonstrated to be unoccupied through protocol surveys are considered “low value”. This project must avoid the incidental take of NSOs and any decision issued from this EA would have a valid Biological Opinion that would support the BLM’s determination that the project would not cause incidental take of NSO pairs or resident singles. In order to meet this requirement, protocol surveys would continue to occur through the time of project implementation, should a NSO site become occupied in subsequent years any proposed downgrade or removal would trigger re-initiation of consultation with the USFWS and the treatment would be modified, dropped or otherwise altered to avoid direct adverse impacts to the NSOs at the site.

At the time of the publication of this EA, there are six NSO sites across the PA that were occupied by NSO pairs and are considered high value sites. Under Alternative 2, there are a total of 151 acres of NRF downgrade and/or removal that would occur in three of these six high value NSO sites.

While the full implementation of Alternative 2 would result in the downgrade of 800 acres of NRF habitat to dispersal-only habitat, these treatments would have long-term beneficial effects to the forest structure and overall forest health. Treatments under Alternative 2 would reduce competition and increase the vigor of the residual trees left in the stand (Latham and Tappeiner 2002), while simultaneously reducing ladder fuels and decreasing the stand fire hazard rating. A specific goal of the prescription is to leave the largest and oldest trees in the stand, and retain all large hardwoods and snags. A substantial portion of the physical structure of the habitat in the treatment areas would still be present after implementation. Therefore, the treatment effects to habitat are mostly related to changes in canopy cover, understory composition, and an increase in stand level heterogeneity.

Additionally under alternative 2, 1,771 acres of NRF habitat would be treated with a Restoration Thinning (RT) prescription, which is likely to drop the residual canopy cover of the stand after treatment to <40 percent. Although the residual canopy cover of these stands is likely to be <40 percent canopy cover, the RT prescription is not driven to achieve a specific canopy cover target, but rather emphasizes retaining habitat features and tree structure that are reflective of the historic conditions of these stands prior to fire exclusion. As described in both the NSO Critical Habitat Designation (USFWS 2012b), and the 2011 Revised Recovery Plan for the Northern Spotted Owl, "Restoring Dry Forest Ecosystems" (USFWS 2011, Section III, pp. 32-38), long-term spotted owl recovery could benefit from forest management where the basic goals are to restore or maintain ecological processes and resilience. Alternative 2 attempted to incorporate this strategy by placing Restoration Thinning treatments in locations where high quality NSO NRF habitat is unlikely to develop and/or occupy the site in the long-term, considering abiotic variables such as slope position, aspect and fire probability. These areas are modeled as low Relative Habitat Suitability (MaxEnt) (USFWS 2011), and both the Recovery Plan and the Critical Habitat Rule recognize that in these areas, treatments should emphasis ecological restoration, rather than the development of high-quality NSO NRF habitat. Although the RT treatments would remove habitat from the PA, these treatments are expected to have long-term beneficial effects of providing stand level resilience, increasing tree species diversity, and protecting and culturing older legacy stand components, especially large hardwoods and pines.

Overall, the spacing, timing, and the retention of key habitat features as called for under the PDFs for this project (Chapter 2.4) are likely to avoid adverse impacts to NSOs with respect to prey availability; although localized, short-term changes in prey species distribution and abundance are likely to occur within treated stands. The dispersion of treatment sites over a large area is especially important in maintaining NSO prey populations within the PA. Residual trees, snags, and down wood retained in the treated stands would provide some cover for prey species over time and would help reduce harvest impacts to some prey species, such as dusky-footed woodrats. Treatment implementation would be spread out temporally and spatially within the PA, leaving untreated areas available for NSO foraging, reducing the impact of these effects at the project level.

Direct and Indirect Effects to NSO and its Habitat - Specific to Alternative 3

Specific to Alternative 3, a total of approximately 727 acres of NSO NRF (foraging) habitat would be downgraded by the combined effects of all timber harvest treatments (DM-D & RT). In addition, the construction of temporary routes and landing construction required to facilitate harvest operations would remove an estimated 8 acre and 53 acres of NRF habitat, respectively (Table 3.3-5).

In their entirety, the treatments proposed under Alternative 3 would result in a total loss of 788 acres (1.9 percent) of the NRF habitat across the PA (harvest areas plus the additional potential effects of new temporary route construction and landings), or a reduction of 0.8 percent of the proportion of NRF habitat on federally managed lands within the PA. An additional 5,157 acres of treatments in NRF habitat throughout the PA would result in the treatment and maintenance of 12.5percent of the existing NRF habitat on federal lands.

Approximately 5,308 acres of proposed treatments would occur within dispersal-only habitat, which would directly impact 22.3 percent of the dispersal-only habitat on BLM lands, or 8.2 percent of all dispersal habitat (combined NRF and dispersal-only) on BLM-administered lands. Treatments included under Alternative 3 would result in the removal of 767 acres of dispersal-only habitat, resulting in the reduction of 1.2 percent of all available dispersal habitats on federally managed lands in the PA.

Under Alternative 3, all NRF stands within the home range of any known NSO territory are proposed for Density Management - Dispersal prescriptions only, which would treat and maintain the NRF habitat where the treatments occur. Of the 59 historic NSO sites considered for analysis, all sites have proposed treatments that would occur in the home range, and 39 of these sites would have treatments occurring within the 0.5 mile core area.

As Alternative 3 was designed to minimize impacts to NSO habitat, all stand level treatments are Treat & Maintain treatments and would not downgrade or remove NRF habitat. This includes the six high value NSO sites. A very small amount (7 acres total) of NRF removal would occur under alternative 3 within the home range of these six high value NSO sites in order to facilitate harvest operations. However, this minute loss of NRF habitat is inconsequential at the home range scale of these sites.

Although all the treatments proposed under Alternative 3 are designed to treat and maintain the NSO habitat where proposed treatments would occur in a NSO homerange, small amounts of NRF and dispersal removal are expected to occur within 35 of the NSO sites in the PA. This small amount of removal would occur from temporary route construction and from new landing construction that would be required to facilitate safe harvest operations. These areas of removal are small isolated patches of $\leq$ 1 acre and are often located near previously disturbed locations (i.e. existing roads) but in some cases would need to be expanded or newly created. No more than 11 acres, or 3.7 acres on average of habitat removal (NRF and dispersal only combined) would occur in any NSO core or homerange from the cumulative total of all potential new routes and landings.

Comparison of the Action Alternatives 2 and 3

As described in Chapter 2 of this EA, each of the Action Alternatives emphasized different project components and approaches to achieve the Purpose and Need of the project. Table 2-1 provides a comparison table that identifies key differences between the Action Alternatives.

The following section is intended to provide a comparison of the expected differences that would result under the different approaches of each Alternative specific to NSOs and NSO habitat.
Each Action Alternative was designed in part to emphasize different approaches under the RA10 process (USDA/USDI 2013), which is described in more detail in Chapter 2, p. 44-45. As a result, Alternative 2 proposes activities that would result in 1,783 more acres of NRF downgrade or removal across the PA, or 1.9 percent increase in the total loss of NRF habitat across the PA in comparison to Alternative 3.

The 1,783 acres of NRF that would be treated and maintained under Alternative 3 but downgraded or removed under Alternative 2 are situated in locations that were modeled as low Relative Habitat Suitability by the RHS MAXent model (USDI 2011a), upper slopes and ridges, and southerly aspects. These areas are not expected to be able to support high-quality NSO habitat for extended time periods. The current stand composition is heavily departed from the historic Natural of Range Variability in these areas and Douglas-fir is dominating these sites and the species that are typically associated with more open grown conditions (true oaks and pines) are declining. Therefore, while Alternative 3 would retain more NRF habitat overall across the PA, other wildlife species that are associated with open late seral forest conditions would not see the benefit of proposed Restoration Thinning proposed under Alternative 2.

Alternative 2 would result in the downgrade or removal of 151 acres of NRF habitat found within the six high value NSO sites in the PA. Alternative 3 would implement a lighter prescription (i.e. Treat & Maintain) on these same acres and only seven acres of NRF would be removed under Alternative 3 within these six high value NSO sites. Ultimately, this project must avoid the incidental take of NSOs and any decision issued from this EA would have a valid Biological Opinion that would support the BLM's determination that the project would not cause incidental take of NSO pairs or resident singles. Consultation with the USFWS is on-going and the determinations contained within the forthcoming Biological Opinions for this project would have major relevance to which Action Alternative or blend of Alternatives is selected.

Alternative 3 proposes more helicopter harvesting (899 acres more) compared to Alternative 2. Although there are typically fewer impacts to soil and hydrological resources (see Chapter 3.5) by utilizing helicopter harvest systems, there are some trade-offs that do impact wildlife habitat. Specifically, the BLM estimates that an additional 36 acres of NRF and 32 acres of dispersal-only habitat (Table 3.3-5) would be removed under Alternative 3 that would not be removed under Alternative 2 in order to create the required landings to facilitate helicopter harvesting. However, because Alternative 3 is proposing mostly treat and maintain treatments, the overall effects of

Alternative 3 are less (1.9 percent) than Alternative 2 in terms of the overall reduction of the amount of NRF habitat across the PA.

Alternative 3 includes a diameter cap of 21” DBH. It is difficult to quantitatively assess the impact of restricting the harvest of trees >21” DBH because the BLM does not currently have the precise numbers of how many trees and where these trees are across the proposed treatment areas.

Nevertheless, a qualitative assessment suggests that reducing the number of larger conifers removed from a stand would benefit NSOs by leaving more canopy and dominant tree structure which in turn would benefit some NSO prey species. However, in some cases the diameter cap could work to simplify the residual stand structure because the trees selected for removal are shifted from a range of size classes into just those <21” DBH (see Chapter 3.1 for additional discussion on this topic). This could result in stands that are more resilient to crown fire (Chapter 3.2 Fire and Fuels) but are simplified into more-or-less single storied stands that are not as biologically diverse as multi-layered stands (Tews et al. 2004).

Conclusions for Action Alternatives 2 and 3

In summary, Alternatives 2 and 3 would have minimal adverse impacts to the NSOs found within the PA given that:

- No treatments would occur within the nest patch area of any known NSO site;
- A small amount (Alternative 2 - 6.2 percent or Alternative 3 - 1.9 percent) of the total NRF habitat located within the PA would be negatively affected (downgrade or removal);
- The majority of existing NRF habitat within the PA would not receive any treatments (Both Action Alternatives 86 percent); and
- The majority of the proposed treatments (Alternative 2 – 76 percent or Alternative 3 - 91 percent) are designed to treat and maintain the functionality of the habitat where the treatment occurs and would not reduce the overall amount of NRF or dispersal-only habitat found within the PA.

The Action Alternatives are expected to result in long-term beneficial effects to the NSOs found within the PA by:

- Reducing the risk of high-severity fire occurring within the treated areas and/or reducing the probability of high-severity fire occurring in “high value” habitat areas;
- Increasing growth and vigor of the trees and vegetation remaining within the treated areas; and
- Ultimately accelerating the development of the treated stands into more complex, structurally diverse forests in comparison to the No Action Alternative.

Environmental Effects to Northern Spotted Owl Critical Habitat

<u>Alternative 1 - No Action</u>

Direct and Indirect Effects to NSO Critical Habitat

Under the No Action Alternative, no treatments would occur within any NSO Critical Habitat Units. Similar to the description given for the No Action Alternative for NSOs forest stand conditions within the 2012 NSO Critical Habitat would continue to develop along the general current trends toward higher density stand conditions, especially in the understory, than what was historically present in the area. Habitat conditions would remain generally unchanged at the Critical Habitat Unit scale in the short term unless a major disturbance such as fire, wind throw, insect infestation, or disease occurred.

At longer time scales, the growth of late-successional forest habitat or of young stands toward late-successional forest habitat under this alternative is uncertain. Second-growth stands with high tree densities and single canopy layering may not develop the large crowns and diameters and vertical and horizontal layering and spacing created by fire (Sensenig 2013). Fire hazard would continue to increase and be the highest threat of Critical Habitat loss in forest stands where the density of hardwood and conifer stems and fuel ladders is high (Spies et al. 2006).

Direct and Indirect Effects to NSO Critical Habitat

<u>Alternatives 2 and 3</u>

Under the Action Alternatives, a mixture of activities are proposed to occur within the Revised 2012 Critical Habitat for the NSO. Table 3.3-7 below describes the sub-set of the proposed treatments that would occur within the Revised 2012 Critical Habitat (CH) and what NSO habitat type they would occur in. Approximately 62 percent of the federal lands in the PA are designated NSO CH, and 42 percent of all the proposed treatments would occur within NSO CH.

The 2012 Final Critical Habitat Rule and principles in the 2011 Recovery Plan were used to inform specific prescriptions when treatment units are located within the 2012 designated CH. As detailed in Chapter 2.2, any proposed treatment area that fell within NSO CH was further evaluated using several factors including slope position, aspect, current species composition by plant association group (PAGs) and the Relative Habitat Suitability model (USDI 2011a). Units situated in favorable locations where these factors indicated the potential for developing and maintaining high quality NSO habitat was increased were assigned light treatments (treat and maintain) such that the existing habitat functionality would be maintained but the treatment would still improve overall stand resiliency and vigor. Conversely, if the unit was situated in locations that indicated low potential to develop high quality NSO habitat, the treatments were designed to emphasize ecological restoration and create stand conditions more reflective of the historic Natural Range of Variability.

This is consistent with the direction in the Final Critical Habitat Rule: “In some areas, forest stands [in areas designated as Critical Habitat] are not on a trajectory to develop into high-value habitat, ecological processes have been disrupted by human actions, or projected climate change is expected to further disrupt or degrade desired forest conditions. In these areas, land managers may choose to implement active management, as recommended in the Revised Recovery Plan for the Northern Spotted Owl (USDI 2011a), to improve ecological health and development of forest conditions more favorable to northern spotted owls and other biodiversity” (USDI 2012, pp. 26-27).

In general, prescriptions (e.g., vegetation management, prescribed fire, etc.) that apply ecological forestry principles to address the restoration and conservation of broader ecological processes in areas where this is needed, while minimizing impacts to structurally diverse or mature and old forests that does not require such management can be compatible with maintaining the critical habitat‘s essential features in the long-term at the landscape scale (USDI 2011a, p. III-14). The Pickett West project adheres to this strategy by; 1) proposing treatments with minimal negative impacts (treat and maintain) in any stands that are currently high quality NSO habitat (nesting) or where abiotic factors indicate the area is capable of developing and sustaining high quality NSO habitat (i.e. high RHS value, northerly aspects and lower slopes and drainages), 2) proposing restoration treatments in locations that are not expected to develop and sustain high quality NSO habitat (i.e. low RHS value, southerly aspects and upper slopes and ridges) that emphasize creating spatial heterogeneity and increased species and structural diversity that ultimately work to provide long-term stand resilience.

Table 3.3-7 Acres of Proposed Treatment within NSO Critical Habitat by Alternative.

ALTERNATIVE 2				
Treatment Type	**NRF**	**Dispersal**	**Unsuitable**	**Total**
Density Management - NSO Dispersal Objective (DM-D)	590	38	7	635
Density Management NSO NRF Objective (DM-NRF)	573	708	102	1,383
Restoration Thinning (RT)	538	313	47	898
Hazardous Fuels Reduction Maintenance	1,434	1,129	1,641	4,204
New Routes[1]	3.5	3.6	6.6	13.7
Landings[2]	11.3	10.6	13.2	35.1
Alternative 2 Total	***3,150***	***2,202***	***1,817***	***7,169***
ALTERNATIVE 3				
Treatment Type	**NRF**	**Dispersal**	**Unsuitable**	**Total**
Density Management - NSO Dispersal Objective (DM-D)	0	0	0	0
Density Management NSO NRF Objective (DM-NRF)	1,699	1,012	135	2,846
Restoration Thinning (RT)	0	46	24	70

Hazardous Fuels Reduction Maintenance	1,434	1,129	1,641	4,204
New Routes[1] (Tractor-swing only)	6.0	2.8	2.0	17.0
Landings[2]	26.0	18.2	14.5	58.7
Alternative 3 Total	***3,165***	***2,208***	***1,817***	***7,190***

1 = Combined total of all new routes, including all new temporary route construction, tractor-swing roads and operator spurs.
2 = Combined total for all conventional (ground-based) landings and helicopter log & service landings.

Under Alternative 2, a total of 7,169 acres of various treatment types would occur within designated NSO CH, Table 3.3-7. Approximately 3,150 acres of various treatment types are proposed to occur within NRF habitat type located within CH, of which 1,142 acres are anticipated to result in a NRF downgrade or removal, Table 3.3-8. Approximately 2,202 acres of various treatment types are proposed to occur within dispersal-only habitat type located within CH, of which 327 acres are anticipated to result in the removal of dispersal-only habitat. All other treatments proposed to occur under Alternative 2 within NSO CH would treat and maintain the existing habitat condition where the treatments occur, and would not alter the amount of habitat available within the CH Unit, nor adversely modify any of the Primary Constituent Elements within these treated areas.

The activities proposed in NSO CH under Alternative 3 are similar to those proposed under Alternative 2, but all commercial harvest treatments under Alternative 3 would treat and maintain the existing habitat condition where the treatments occur. Although Alternative 3 is designed to treat and maintain the NSO habitat where treatments are proposed, a small amount of NRF (32 acres) and dispersal-only habitat (67 acres) would be downgraded or removed as a result of creating temporary tractor-swing routes and landings.

Table 3.3-8 Treatment Effects to NSO Habitat Types in NSO Critical Habitat

ALTERNATIVE 2				
Habitat Type	**Treat and Maintain**	**Downgrade**	**Removal**	**TOTAL**
NRF	2,007	590	552	3,150
Dispersal-only	1,875	NA	327	2,202
Unsuitable	1,817	NA	NA	1,817
Total	**5,699**	**590**	**880**	**7,169**
ALTERNATIVE 3				
Habitat Type	**Treat and Maintain**	**Downgrade**	**Removal**	**TOTAL**
NRF	3,134	0	32	3,166
Dispersal-only	2,141	NA	67	2,208
Unsuitable	1,817	NA	NA	1,817
Total	**7,091**	**0**	**99**	**7,190**

Specific to Alternative 2, treatments that would downgrade or remove NRF habitat are proposed in locations where the Relative Habitat Suitability (USDI 2011a) is modeled as low. Many of these stands are comprised of mixed conifer and hardwoods, including ponderosa pine, sugar pine and black oak tree species that are relatively scarce within the PA. These stands are reaching high stocking levels that form a dense overstory with many trees having poorly developed crowns (stem-exclusion phase). The increased density of Douglas-fir has created increased competition for resources and is negatively affecting the pine and oak component of these stands (for more discussion on this subject see the Vegetation Chapter Section 3.1).

The proposed Restoration Thinning prescriptions that would thin treated forest stands to a wider spacing, leaving the most vigorous individuals of the stand remaining, emphasizing the retention of pine and oak species. The Density Management and Restoration Thinning treatments would work to increase the structural variation across the treatment area and improve habitat quality in the long-term by increasing growth rates of the remaining trees in thinned areas (Miller and Emmingham 2001, Roberts and Harrington 2008), and creating variable habitat conditions across the stand including pockets of high density and small openings that provide improved access to prey species (Harrington et al. 2005).

The loss of 1,142 acres of NRF habitat within NSO CH would likely result in some short-term adverse impacts to this NRF habitat by decreasing flying squirrel abundance by removing mid-story and overstory structure from those acres (Wilson 2010, Manning et al. 2012), which could reduce NSO foraging opportunities. Also, reducing canopy over below 60 percent would likely introduce ecological edge effects to the affected stands as well as to adjacent stands of NRF habitat, extending the area of impact beyond the treated areas.

Table 3.3-9 below shows the amount of NSO habitat types found within each Critical Habitat Subunit that overlaps the Pickett West PA. Collectively, Alternative 2 would negligibly affect the intended conservation function of the CH subunits in which they occur because at the most (under Alternative 2), the proposed treatments would only result in a reduction of 1.4 percent and 0.7 percent of the available NRF and dispersal habitat within the CH sub-unit KLW 1, respectively.

Neither of the Action Alternatives would appreciably reduce the capacity of any of the CH Subunits to facilitate NSO dispersal. At most, under Alternative 2, the total amount of all KLW 1 dispersal habitat (NRF + dispersal-only) would be reduced by an estimated 0.7percent. This small loss of dispersal habitat across the CH sub-unit would not noticeably reduce the ability of the KLW 1 Subunit to facilitate the dispersal of NSOs across and between other CH Subunits or units. NSOs are able to disperse through a fragmented mosaic of roads, clear-cuts, non-forest areas, and a variety of forest age classes (Forsman et al. 2002).

Even though some adverse impacts are anticipated where NRF habitat is downgraded, the Action Alternatives are expected to result in long-term beneficial effects to NSOs and the Revised 2012 CHU because the thinning treatments (DM and RT) would accelerate the development of the relatively homogeneous stands toward late-successional habitat faster than if the stands were left untreated (Hayes et al. 1997). The proposed treatments would also increase survivability and vigor of more drought or fire-tolerant species (pines, cedars, hardwoods) on ridge tops and in areas where site conditions do not favor Douglas-fir, or Douglas-fir is suppressing the occurrence of pines. The activities proposed under the Action Alternatives, especially the Understory Reduction treatments, would help reduce the likelihood of high severity fire occurring within the CH. The Fire and Fuels Chapter 3.2, provides a detailed explanation and analysis on this topic. Specific to NSOs, this approach is supported by complex modeling procedures that indicate that active management of sites with high fire hazard was more favorable to NSO conservation over the long term (75 years) compared to no management (Roloff et al. 2012).

Table 3.3-9 NSO Critical Habitat Baseline by Subunit and Percent Change by Alternative.

ALTERNATIVE 2						
PRE PROJECT				**POST PROJECT***		
CHU Subunit	**NRF**	**Dispersal-Only**	**All Dispersal**	**NRF**	**Dispersal-Only**	**All Dispersal**
KLE-3	40,004	44,497	84,501	39,999 (-0.01%)	44,446 (-0.1%)	84,445 (-0.07%)
KLW-1	72,080	45,511	117,591	71,019 (-1.4%)	45,806 (0.6%)	116,825 (-0.7%)
KLW-2	91,442	36,709	128,151	91,442 (0.0%)	36,709 (0.0%)	128,151 (0.0%)
KLW-4	91,286	52,251	143,537	91,210 (-0.08%)	52,270 (0.04%)	143,480 (-0.04%)
ALTERNATIVE 3						
PRE PROJECT				**POST PROJECT***		
CHU Subunit	**NRF**	**Dispersal-Only**	**All Dispersal**	**NRF**	**Dispersal-Only**	**All Dispersal**
KLE-3	40,004	44,497	84,501	40,002 (0.0%)	44,484 (-0.03%)	84,487 (-0.02%)
KLW-1	72,080	45,511	117,591	72,053 (-0.04%)	45,497 (-0.03%)	117,549 (-0.0%)
KLW-2	91,442	36,709	128,151	91,442 (0.0%)	36,709 (0.0%)	128,151 (0.0%)
KLW-4	91,286	52,251	143,537	91,283 (0.0%)	52,210 (-0.08%)	143,494 (-0.03%)

** = Value in parentheses indicates percent change at subunit scale*

A great deal of planning and forethought was used during the development of Alternatives 2 and 3 in terms of the spatial location and magnitude of the proposed treatments in relation to known NSO sites and current habitat conditions across the landscape. Where the downgrade or removal of NRF habitat is proposed, the vegetative community is comprised of species assemblages (pine and oak) that require lower canopy cover and densities to persist at longer time scales. The proposed suite of management activities included under Alternatives 2 and 3 are consistent with both the Revised Recovery Plan for the Northern Spotted Owl (USDI 2011a) and the 2012 Final Revised Critical Habitat (Federal Register 2012) management recommendations of active management using ecological forestry techniques, both inside and outside of reserves.

Cumulative Effects on NSO and its Critical Habitat

Cumulative effects are environmental changes that are affected by more than one land-use activity, and can include beneficial changes. Cumulative effects for wildlife species and habitat are reviewed at the watershed level to capture the varying habitats, species home ranges, and varying degrees of species mobility. Technical issues that complicate analysis of cumulative effects include the large spatial and temporal scales involved, the wide variety of processes and interactions that influence cumulative effects, and the lengthy lag-times that often separate a land-use activity and the landscape's response to that activity.

Past fire suppression, road building, and timber harvest throughout the PA have resulted in habitat modification and fragmentation, and have changed the distribution and abundance of wildlife species within and surrounding the PA. Timber harvest has occurred on BLM-administered lands in the Pickett West PA since the 1950. The associated habitat loss has negatively affected late-successional forest habitat dependent species by reducing stand seral stage and changing habitat structure. However, species associated with younger forested conditions have benefited from these changes due to the increased acres of young stands.

Private lands surrounding the PA are made up of early, mid, and late-seral forests, agriculture, urban areas, and barren land. Most private forest lands are managed as tree farms for production of wood fiber on short forest rotations. It is expected that any remaining late-seral forests on private timber lands would be converted to early seral forest over the next one or two decades.

For those species dependent on early seral habitat, private forest lands do not always provide quality habitat as competing vegetation that includes flowering plants, shrubs, and hardwood trees are regularly sprayed with herbicides to reduce competition with future harvestable trees.

A detailed synopsis of the future foreseeable projects that are expected to occur within the PA is included in Appendix D. The effects to NSO habitat from these past projects have been accounted for already within the NSO habitat baseline. Projects such as young stand management and fuel reduction treatments are expected to result in long-term beneficial effects through habitat development and risk-reduction. These types of treatments would not change the current habitat types or amounts present in the PA. Other future foreseeable projects like road maintenance or water source maintenance would not have any direct effect to NSOs or NSO habitat. Construction of new roads on BLM-administered lands through the reciprocal right-of-way (ROW) agreements held with private industrial forest landowners have the potential to remove or downgrade small patches (<10 acres) of NRF or dispersal habitat within the PA. Although this potential exists, there are no current requests for new ROWs on BLM-administered lands, and thus a more detailed analysis is not possible. If one assumes 10 acres of NRF habitat loss to ROWs on a decadal basis, this would equate to a loss of <0.1 percent of the existing NRF within the PA per decade.

An estimated 4,000 acres of harvest is expected to occur on private lands in the foreseeable future (Appendix D). Non-federal lands are not expected to provide demographic support for spotted owls across and between physiographic provinces (Thomas et al. 1990). The Medford BLM assumes these past management practices would continue and reduce the amount of NRF habitat for spotted owl on non-federal lands in the future. Future private harvest is accounted for in part in this analysis by only including habitat found on federally managed lands. The amount of private land harvest at the watershed level would not preclude NSOs or other late-successional forest species from dispersing within or through the Pickett West PA.

After considering the potential impacts from other projects that are likely to occur within the PA in addition to the Action Alternatives, it is unlikely these cumulative impacts would appreciably reduce or diminish the survival or recovery of the NSO, due to the small percentage of habitat that would be affect at the provincial and the range-wide levels. Additionally, with the small level of harvest, this project would not preclude NSOs occupying viable territories and continuing to reproduce in the PA.

Survey and Manage Wildlife Species

The species included as part of the North West Forest Plan Survey and Manage (S&M) program have changed over the lifespan of the program. The current direction and list of species included as Survey and Manage is given in Instruction Memorandum No. OR-2014-037 (USDI 2014). Two wildlife species currently included on the Survey and Manage species list occur within the PA: the red tree vole and the great gray owl. Some of the species previously included as S&M (i.e. *Helminthoglypta hertleini* – Oregon Shoulderband) remain on the BLM's Special Status Species List and are considered in that section below.

<u>Red Tree Vole</u>

3.3.3 Affected Environment

The red tree vole (*Arborimus longicaudus*) is an arboreal rodent species with very low dispersal capabilities. Red tree voles (RTVs) depend on conifer tree canopies for nesting, foraging, travel routes, escape cover, and moisture (Carey 1991). Douglas-fir needles provide the primary food and building materials for nests (Huff et al. 2012). The broad management objective for this species under the S&M program is to retain sufficient habitat to maintain its potential for reproduction, dispersal, and genetic exchange (USDA/USDI 2000a).

Pre-disturbance surveys for red tree voles are required where there is suitable RTV habitat (Huff et al. 2012) and the proposed activity is likely to have a significant negative impact on the species' habitat, its life cycle, microclimate, or life support requirements that affects persistence of red tree voles (USDA/USDI 2001). Stands that are aged <80 years old do not require surveys (USDI 2014d).

Several pervious RTV surveys have been completed across the PA under prior planning efforts. However, the current RTV survey protocol states: "At the survey polygon scale, survey results which locate "active" red tree vole nests are considered valid for 10 years" (Huff et al. 2012). All prior surveys are older than 10 years and are not being considered for this analysis. All areas of suitable habitat (Huff et al. 2012) that are proposed for commercial harvest (DM & RT) are being surveyed and this new survey effort represents a more current data set of the distribution of active and inactive RTV nests within proposed management units.

Surveys for RTVs are currently on going across the Pickett West PA. All areas of suitable RTV habitat that are proposed for a treatment type that trigger the need for pre-disturbance surveys would be completed prior to any forthcoming Decision Record for this project.

In addition, the BLM recognizes that the exact number and location of RTVs across the PA may be of interest to the reader, a more detailed synopsis of the location of all active RTV nests and habitat areas would be included in any forthcoming Decision Record.

3.3.4 Environmental Effects on Red Tree Vole and its Habitat

Alternative 1 - No Action

Under the No Action Alternative, none of the proposed harvest activities would occur, and the forested stands in the PA would continue to develop along their current pathways. Therefore, none of the potential RTV habitat found on BLM-administered lands within the PA would be altered. Stand replacement fire would remain the greatest risk to the existing RTV habitat found within the PA (Courtney et al. 2004, Spies et al. 2006).

Action Alternatives - Alternative 2 and 3

Direct and Indirect Effects to Red Tree Voles – Effects which are common to both Action Alternatives

The BLM is required to manage all known active and associated inactive RTV nests located from protocol survey efforts in accordance with current RTV management recommendations (USFS/BLM 2000). This project has incorporated the direction of the RTV management recommendations as a Project Design Feature to ensure project consistency with the Survey & Manage Standards and Guides (USDA/USDI 2001). All active and associated inactive RTV nests must be incorporated into a RTV Habitat Area (USDA/USDI 2000a). These Habitat Areas are designed to protect the physical integrity of the RTV nests from both management activities and natural disturbances such as windthrow, and provide a short-term approach to maintaining habitat at red tree vole sites. Any management that occurs within a Habitat Area should not remove or modify nest trees, the canopy structure of the stand, or remove any of the dominant, codominant, or intermediate (Daniel et al. 1979) crowns (USFS/BLM 2000). To meet these standards, all RTV Habitat Areas that occur in the Pickett West PA would be treated with only Understory Reduction (UR) or Hazardous Fuels Reduction maintenance (HFRm) treatments. Therefore, the amount of thinning (DM & RT) that is authorized under any alternative would be less than what is presented in the Action Alternatives. Based on a review of similar projects, reductions are likely to range from 15-30 percent of the total acres analyzed in this EA.

The BLM anticipates minimal direct impacts to RTVs as a result of implementing the actions included under either Action Alternative because all known RTV nests in the PA that require management would be protected following the RTV management recommendations (USFS/BLM 2000) as described above. Outside of these buffered RTV Habitat Areas, various thinning treatments (DM & RT) would remove some individual trees from the overstory and midstory that could provide potential RTV nesting structure. The commercial treatments would reduce the overall cover and inter-connectivity of the canopy remaining in the residual stand, indirectly reducing the short-term (<30 years) habitat quality for RTVs in these treatment areas. Undiscovered nests located outside of the buffer areas may be negatively affected due to reduced canopy cover by isolating nests and reducing dispersal capability. A small number of undiscovered nests may also be lost through removal of nest trees, but this is expected to occur only rarely as protocol surveys are designed to locate the majority of the populations of RTVs in a survey area and any missed detections are likely to be isolated or sink populations. The vast majority of all RTV populations found within the project units would not be directly affected by either Action Alternative.

The non-commercial treatments (UR & HFRm) proposed under either Action Alternative would remove vegetation primarily from the understory or the smaller components of the midstory. This would have minimal effects on RTV habitat, as the trees removed by this type of treatment are rarely used by RTVs and do not provide high quality nesting habitat. These treatments would potentially reduce the connectivity of the canopy, but adequate arboreal pathways would remain throughout the treated areas for RTVs to travel and disperse.

Red Tree Vole Conclusions for Action Alternatives 2 and 3

All known active RTV sites and associated inactive nest sites would be protected in accordance with current management guidelines (USDA/USDI 2000b). Assuming that the NSO habitat category of NRF equates to suitable RTV habitat, approximately 6.2 percent of the suitable RTV habitat present on BLM-administered lands in the PA would be degraded by the activities proposed under either Action Alternative. Therefore, the activities proposed under either Action Alternative would minimally affect the RTV populations within the PA.

Considering the negligible direct effects, and limited indirect effects to RTVs and RTV habitat in the Pickett West PA from the activities proposed under either Action Alternative, the selection of either Action Alternative would not decrease the likelihood of RTV persistence across the PA, and a sufficient amount of high quality RTV habitat would remain after project implementation to allow the RTV populations to stabilize in a well-distributed pattern across the BLM-administered lands in the PA.

Great Gray Owl

3.3.5 Affected Environment

Great gray owls (*Strix nebulosa*) nest in open forests closely juxtaposed with large meadows. Preferable habitat contains broken topped trees, abandoned raptor nests, mistletoe clumps, and other platforms which provide suitable nest trees. They prefer foraging habitat that is relatively open, with grassy areas where pocket gophers and voles occur, the great gray owl's primary prey (Huff and Godwin 2016). The two habitat types must be in close proximity, and prey availability is an important aspect of overall habitat quality.

A number of previous great gray owl (GGO) surveys have been conducted throughout the Pickett West PA under prior planning efforts, and no territorial GGOs were detected in any of the watersheds where the Pickett West project is being planned. GGOs have been confirmed nesting in the Williams Creek watershed to the southeast of the Pickett West PA. No nesting territories have been detected west of the Williams Creek watershed on the BLM-administered lands in the Grants Pass Field Office management area, and all known nesting GGOs on the Medford District have been east of the Pickett West PA, where natural meadows and open, grassy forest stands are more widespread. Habitat is somewhat limited within the Pickett West PA; some serpentine influenced open rocky meadows exist in the PA, but these areas offer sub-optimal habitat and have thus far been demonstrated to not support GGOs.

The current GGO survey protocol requires one year of surveys (Huff and Godwin 2016). Surveys are being conducted this survey season (2017) following current protocol standards. All areas that provide suitable habitat and could be affected by a treatment type that trigger the need for pre-disturbance surveys would be surveyed to protocol prior to any forthcoming Decision Records for this project. The results of the surveys would be disclosed in any Decision Record for this project.

3.3.6 Environmental Effects on Great Gray Owl and its Habitat

Alternative 1 - No Action

Forested stands would continue to develop along their current pathways. Successional stand development would continue to be influenced by fire suppression, high stem densities, and ladder fuels. The risk of stand replacement fire events would remain at current levels or increase. Foraging areas (meadows) would continue to be encroached upon by fire intolerant plant species, thereby reducing potential foraging opportunities.

Action Alternatives - Alternative 2 and 3

Direct and Indirect Effects to Great Grey Owls – Effects which are common to both Action Alternatives

There is a low likelihood that GGOs would be directly affected by either Action Alternative because there are no known GGO nests or pairs in or adjacent to units proposed for treatment, and overall foraging habitat is highly limited across the PA. While some of the commercial thinning treatments (Restoration Thinning and Density Management – Dispersal) may modify potential nesting habitat by reducing canopy cover below 50 percent and removing a limited amount of potential nest trees, the majority of all treatments (>90 percent) are expected to have no effect to GGOs because they are located too far away from potential foraging areas for these stands to be used by GGOs. All other treatment activities (Density Management – NRF and all Hazardous Fuels Reduction Maintenance treatments) proposed under either Action Alternative would not reduce the quality of the habitat for GGOs where they occur.

The PDFs included in Chapter 2.4 would further eliminate any potential direct effects to GGOs by precluding treatments that would negatively affect GGO habitat in any areas that GGOs are found in the PA. Additionally, any potential negative effects from project related disturbance would not occur because the seasonal restrictions included in the PDFs would further reduce any negative effects to this species from project related disturbance.

Great Grey Owl Conclusions for Action Alternatives 2 and 3

Considering the negligible direct effects, and limited indirect effects to GGOs and GGO habitat in the Pickett West PA from the activities proposed under either Action Alternative, the selection of either Action Alternative would not decrease the likelihood of GGO persistence across the PA.

<u>BLM Bureau Sensitive Species</u>

The BLM Special Status Species (SSS) program includes species listed or proposed for listing under the Endangered Species Act (ESA) and species requiring special management consideration to promote their conservation and reduce the likelihood and need for future listing under the ESA. The SSS list is periodically updated to reflect taxonomic and status changes and was most recently updated in January 2015 (USDI 2015a). This list has two categories of species: Sensitive and Strategic.

The Medford District Resource Management Plan guidance states, “Manage for the conservation of Federal candidate and Bureau-sensitive species and their habitats so as not to contribute to the need to list, and to contribute to the recovery of the species” (USDI 1995). Additionally, BLM Manual 6840, the BLM handbook on Special Status Species Management provides the following direction “Bureau sensitive species will be managed consistent with species and habitat management objectives in land use and implementation plans to promote their conservation and to minimize the likelihood and need for listing under the ESA or other provision of BLM Manual 6840.02” (USDI BLM 2015d).

According to BLM Special Status Species Management (USDI 2004a), only Sensitive species (including Threatened, Endangered and Candidate species) are required to be addressed in NEPA documents. All Sensitive species were considered and evaluated for this project, and only those that could be impacted by the Action Alternatives are discussed in more detail. Appendix E includes a table of all the current SSS that occur on the Grants Pass Field Office management area and a brief description of why a more detailed analysis is not required.

Action Alternatives - Alternative 2 and 3

Direct and Indirect Effects to Bureau Sensitive Species – Effects which are common to both Action Alternatives

The actions proposed under either Action Alternative are likely to impact a limited assortment of habitat components important to the SSS species present in the PA. Generally, these impacts would be limited to the reduction of the existing snags present across the treatment area, and would primarily affect the woodpecker and bat species that utilize snags for foraging and roosting (primarily Lewis' woodpecker, white-headed woodpecker, fringed myotis and pacific pallid bat). Although the PDFs in Chapter 2 require the retention of snags and CWD whenever feasible, it is sometimes necessary to fall some snags during commercial harvest operations due to safety concerns.

Alternative 2 proposes 6,005 acres of commercial thinning treatments where there would be the potential need to fall snags for safety concerns. This represents approximately 6.3 percent of the federal lands within the PA. Most existing snags should remain present within these treated areas. This small reduction in the quantity of the existing snags across the PA would result in a minimal and inconsequential reduction in the available habitat for those species that rely on snags as a primary habitat feature, and would not result in a loss of species viability or create significant trends toward federal listing for any Special Status Species.

Pacific Fisher

3.3.6 Affected Environment

The Pacific fisher (*Pekania pennanti*) was petitioned for listing as endangered or threatened under the Endangered Species Act on December 12, 2000. In 2003 the USFWS released their notice of 90-day petition finding and initiation of status review (Federal Register 2003) and in 2004 published their Notice of 12-month petition finding, concluding that listing fishers as threatened was warranted, but was precluded by higher priority listing actions (Federal Register 2004). Most recently, The USFWS issued a proposal to list the West Coast Distinct Population Segment (DPS) of fisher as a threatened species under the Endangered Species Act (Federal Register 2014). On April 14, 2016, the USFWS issued its finding that the fisher does not require the protection of the Endangered Species Act. The state of Oregon lists the fisher as a sensitive species in the critical category, and it is currently listed as a federal sensitive species.

Fisher occurrence is closely associated with low to mid-elevation (generally less than 4,000 feet) forests with a coniferous component, large snags or decadent live trees and logs for denning and resting, and complex physical structure near the forest floor (Aubry and Lewis 2003). Forest type is probably not as important to fishers as the vegetative and structural complexity that lead to abundant prey populations and potential den sites (Lofroth et al. 2010).

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

Fishers have large home ranges and male home ranges are considerably larger than those of females. Fisher home range sizes across North America vary from 3,954 to 30,147 acres (16 to 122 km^2) for males and from 988 to 13,096 ac (4 to 53 km^2) for females (Powell and Zielinski 1994, Lewis and Stinson 1998). However, Beyer and Golightly (1996) reported that male home ranges in northern California may be as large as 31,629 acres (128 km^2). Researchers have suggested that the home range size of fishers increases with decreasing habitat quality (Truex et al. 1998).

The NRF habitat type described above in the NSO section can also represent suitable fisher denning and resting habitat because there is a direct correlation of key habitat features used to assess NSO habitat and fisher habitat (high canopy cover, multi-storied stands, large snags, and large down trees on the forest floor). Using NSO habitat as a surrogate for fisher habitat has been accepted by the courts as a reasonable practice (KS Wild v. US BLM, Case No. 06-3076-PA, Order and Judgment 9/10/2007). The NSO habitat category of dispersal-only habitat is likely to contain some of these habitat elements as well, but at lower densities.

Based on the NSO habitat analysis, approximately 41,300 acres of suitable fisher denning and resting habitat exist on BLM-administered lands within the Pickett West PA (43 percent of the BLM lands in the PA). However, all of these acres may not provide optimal fisher habitat because past harvest practices and land ownership patterns have resulted in fragmented habitat. BLM “checkerboard” ownership may be one of the primary factors limiting the ability of BLM-administered lands to provide optimal habitat for fishers (USDA/USDI 1994b).

There are several documented fisher detections in and around the Pickett West PA, based on both visual encounters by BLM field staff or through photographic documentation at baited camera stations. The majority of these detections are located in the higher elevation Late-Successional Reserves in the southeast portion of the PA, and to the west outside of the PA. In the general geographic region of the Pickett West PA, the Rogue River may represent a barrier to this species as all the documented sightings are south of the Recreation and Wild Sections of the Rogue River. There are no known denning sites within the Pickett West PA.

3.3.7 Environmental Effects on Fisher and its Habitat

Alternative 1 - No Action

Under the No Action Alternative, there would be no loss or degradation of Fisher habitat within the Pickett West PA from active forest management. The habitat throughout the PA would continue to develop along current successional pathways. The development of key late-seral and old growth forest stand conditions would be the same as described above for the NSO. Without treatment, the current stand conditions would likely develop into less complex stand structures and species compositions than that of late successional stands (Sensenig 2002), or at the very least, would require a much longer time scale to develop into more complex, late successional habitat (Tappeiner et al. 1997). Habitat conditions would remain generally unchanged at the unit scale in the short term unless a major disturbance such as fire, wind, insects, or disease occurred. Particularly to fishers, the greatest risk of no action is the potential wildfire related loss of large live remnant conifers as well as snags and down wood important to fisher denning and resting habitat. In addition, the loss of suitable denning structure provided by large hardwoods, particularly black oak (*Quercus kelloggii*) is a concern as these tree types are especially at risk in the Klamath Mountains without active management or low severity fire that provide growing conditions that allow these shade-intolerant species to out compete encroaching conifers (Cocking et al. 2011).

Action Alternatives - Alternative 2 and 3

Direct and Indirect Effects to Fishers – Effects which are common to both Action Alternatives

In general terms, the treatments proposed under either Action Alternative would have varying degrees of impacts to fisher habitat. Precise quantification of the effects of the suite of management activities proposed across the Pickett West PA is difficult because there are currently no established empirical thresholds at which the reduction of structural elements may begin to negatively affect fishers (Naney et al. 2012). The Density Management – Dispersal and the Restoration Thinning treatments would reduce the overall residual canopy cover of the treated areas, removing hiding cover and other habitat features. The Density Management – Nesting, Roosting, Foraging, Understory reduction and Hazardous Fuels Reduction maintenance treatments would reduce habitat quality in the short-term by simplifying the habitat structure of the stand, but would not reduce overstory canopy to a degree that would bring it below the level associated with suitable fisher denning and resting habitat.

Long-term, beneficial indirect effects are expected from all of these treatments by reducing competition of the residual stand, thereby increase overall stand vigor and growth rates (Latham and

Tappeiner, 2002). The thinning treatments, especially the RT is designed to retain and culture the larger, older forest components in the treatment areas, essentially culturing the species and stand composition that are critical habitat elements to the fisher. These treatments would reduce the habitat quality in the short-term by reducing the overall canopy and simplifying the stand structure to a degree, but would improve the habitat quality for fishers over long-term scales (> 30 years) by retaining and promoting the growth rates of large conifers and hardwoods that compose critical habitat elements across the treatment areas.

The immediate effects to fisher foraging opportunities should be minimal, because the large amount of untreated areas within the PA would continue to provide hunting habitat while canopy cover in the treated stands increases. Additionally, treatments would retain key habitat characteristics such as large snags and coarse woody debris (CWD) to provide existing and future habitat for fishers.

Disturbance from treatment activities would likely be the principal effect to fisher within the PA. However, fishers are highly mobile and with large home ranges, they would likely move to another part of their home range while the activity is ongoing. The Project Design Features included in Chapter 2.4, would reduce negative effects to fishers and fisher habitat. These include the retention of key structural elements such as old-growth and decadent trees, snags, CWD, and large hardwoods for denning.

A maximum of approximately 13.8 percent of the all BLM-administered lands with the Pickett West PA would be impacted by both Action Alternative and many areas such as the Inner Riparian Zones, NSO RA-32 habitat, RTV habitat areas, 100-acre owl cores, NSO nest patches, Administratively Withdrawn land and other reserves would continue to provide undisturbed habitat for fishers throughout the PA. Implementation of either Action Alternative would be spread out both spatially and temporally, which would allow fishers to shift their use patterns to areas of their home range that would not be impacted by project activities.

Under Alternative 2, approximately 14.3 percent of all the NRF habitat on BLM-administered lands within the PA would receive a treatment of some type, and 6.2 percent of the NRF habitat in the PA would have residual canopy cover values across each treatment area ≤40 percent after project implementation.

Alternative 3 would also treat a similar amount of all NRF habitat in the PA (14.3 percent), but only 1.9 percent of the suitable denning and resting habitat in the PA would have residual canopy cover values across each treatment area ≤40 percent after project implementation. Therefore, Alternative 2 would result in a short-term reduction of habitat quality in 4.3 percent more of the suitable denning and resting habitat in the PA compared to Alternative 3. Although the habitat quality of these treated areas would be reduced for fishers in the short-term, these areas would not see the long-term benefit from the competitive release and increased vigor and longevity that results in the long-term from these treatments.

Fisher Conclusions for Action Alternatives 2 and 3

A maximum of 6.2 percent of the suitable fisher denning and resting habitat in the PA would be degraded in the short-term as a result of implementing either Action Alternative. However, a large amount of untreated habitat would remain well distributed across the PA, and fishers are expected to inhabit the PA in much the same manner as they have in the past. Disturbance from treatment activities would likely be the principal effect to fisher within the PA. However, fishers are highly mobile and with large home ranges, they would likely move to another part of their home range while the activity is ongoing. The Project Design Features included in Chapter 2.4, would reduce negative effects to fishers and fisher habitat, and areas such as riparian reserves, NSO RA-32 habitat, RTV habitat areas, 100-acre owl cores, NSO nest patches, Administratively Withdrawn land and other reserves would continue to provide undisturbed habitat for fishers throughout the PA. The project activities proposed under either Action Alternative are not expected to negatively affect the overall fisher population within the PA to a degree that would reduce the overall population size because the treatments would impact a relatively small proportion (2.7 percent) of the overall available habitat, and would be spread out in time and space such that fishers could continue to occupy and breed across the PA.

Bald Eagle

3.3.7 Affected Environment

On August 8, 2007, the USFWS removed (delisted) the bald eagle (*Haliaeetus leucocephalus*) from the Federal List of Threatened and Endangered Wildlife (Federal Register Vol. 72, No. 130, July 9, 2007, 37346 -37372), but they remain a Bureau Sensitive species. Bald eagles nest in large trees, usually within one mile of large bodies of water (Federal Register 2007). Suitable nesting habitat is present within the PA adjacent to the Rogue and Applegate Rivers, and around Lake Selmac in the Deer Creek Watershed. A total of 12 bald eagle nests are known (some active and some historic) across the Pickett West PA, constituting four active bald eagle territories within the PA. The primary source of foraging opportunities within the PA are the Rogue and Applegate Rivers as well as Lake Selmac. An estimated 14,613 acres of suitable bald eagle habitat is distributed across the PA within one mile of these foraging areas.

3.3.8 Environmental Effects on Bald Eagles and its Habitat

Alternative 1 - No Action

Under the No Action Alternative, management activities would not remove or alter suitable habitat within the PA and habitat would continue to develop along current successional pathways. The development of key late-seral and old-growth forest stand conditions would be the same as described above for the NSO. Particularly to bald eagles, the greatest risk of No Action is the potential wildfire related loss of large live remnant conifers needed to support bald eagle nesting structures.

Action Alternatives - Alternative 2 and 3

Direct and Indirect Effects to Bald Eagles – Effects which are common to both Action Alternatives

For this analysis on effects to bald eagles, only those treatments that would occur within 1 mile of suitable foraging habitat (Applegate and Rogue Rivers and Lake Selmac) were considered, as all mature forest habitat within one mile of the river is considered suitable habitat, and thus treatment activities within this one mile zone could potentially have negative impacts to eagle habitat. Approximately 4,097 acres (~24 percent) of all treatments are proposed within one mile of suitable foraging areas found within the PA. Of these acres, a total of 694 acres of all treatment types (~4 percent of all the actions proposed) would have the potential to negatively affect bald eagle habitat within the PA.

There are no direct effects anticipated to the bald eagles that occur within the Pickett West PA as there are no treatments proposed to occur in known nest stands that would impact the overstory tree structure of the stands. Hazardous Fuels Reduction treatments are proposed to occur in the nest stand of one eagle territory, but this activity would only have the potential to cause noise related disturbance and would be ameliorated by required seasonal operating restrictions (Chapter 2.4) to avoid disturbance during the nesting season.

Commercial treatments (DM & RT) under either Action Alternative within the 694 acres of suitable eagle habitat would have short-term negative indirect effects to bald eagles by removing some potential nest/roost trees. However, the commercial thinning treatments would result in long-term beneficial affects by leaving stand densities that develop large diameter trees with large open limb structures needed for bald eagle nesting and roosting trees. Bald eagles typically roost and nest in super-dominant trees (generally >36 inches DBH) with large crowns that protrude above the majority of the canopy. Trees that provide this type of habitat are not being considered for harvest under any Action Alternative, and are being targeted for release.

Conclusion

In general, very little impact to eagle habitat would occur from the implementation of either Action Alternative because only 694 acres of treatments are proposed to occur in suitable eagle habitat, and a large amount of untreated eagle habitat (95.3 percent) would remain untreated throughout the project area. No direct effects are anticipated from either Action Alternative, and seasonal operating restrictions would preclude disturbance near any active nest sites, thereby eliminating any effects to Bald Eagles during the breeding season from project activities.

Peregrine Falcon

3.3.9 Affected Environment

The peregrine falcon (*Falco peregrinus*) nests on rock cliffs and outcrops and feeds on a variety of birds including pigeons and waterfowl. Suitable habitat is very limited within the PA. There are two known peregrine falcon nest sites within the Pickett West PA.

3.3.10 Environmental Effects on Peregrine Falcon and its Habitat

<u>Alternative 1 - No Action</u>

Forested stands would continue to develop along their current pathways. Successional stand development would continue to be influenced by fire suppression, high stem densities and ladder fuels. The risk of stand replacement fire events would remain at current levels or increase. Peregrine falcons would continue to utilize the habitat within the PA in the same fashion as they have in the past.

<u>Action Alternatives - Alternative 2 and 3</u>

Direct and Indirect Effects to Peregrine Falcon – Effects which are common to both Action Alternatives

The vast majority of the activates proposed under either Action Alternative would have no effect on peregrine falcons or their habitat because the location of these proposed activities are sufficiently distant from any known or potential nesting habitat. There are no proposed treatments within 0.5 mile of any peregrine sites, the seasonal restrictions included in the PDFs would further reduce any negative effects to this species from project related disturbance.

Peregrine Falcon Conclusions for Action Alternatives 2 and 3

There are no anticipated direct or indirect effects to peregrine falcons or their habitat in the Pickett West PA from the activities proposed under either Action Alternative, and the selection of either Action Alternative would not affect peregrines flacons in the PA or decrease the likelihood of persistence across the PA.

Cumulative Effects for all Wildlife Species from the Implementation of Alternatives 2 and 3

The Pickett West project proposes a suite a management activities that would at most (Alternative 2) remove 2.7 percent, and modify 8.1 percent of the all the NSO NRF habitat in the PA. These treatments, coupled with the other recent and reasonably foreseeable projects described in Appendix D, would increase fragmentation within the watersheds. However, the only other activities that are likely to remove substantial amounts of NRF habitat within the watersheds would be timber harvest on private lands or large wildfires.

The Medford BLM assumes private harvest will continue and reduce the amount of NRF habitat for spotted owl on non-federally managed lands over time. Non-federally managed lands are not expected to provide demographic support for NSO across and between physiographic provinces (Thomas et al. 1990, USDA/USDI 1994b), and the above analyses does not include habitat on private lands within the PA for this reason. This amount of removal at the watershed level would not preclude NSOs or other late-successional forest species from dispersing within or through the watersheds. Additionally, even when the Pickett West project is combined with the foreseeable actions listed in Appendix D, it is unlikely the actions proposed in this project would appreciably reduce or diminish the survival or recovery of the NSO or other SSS wildlife known to occur within the PA. This is because of the small percentage of suitable habitat affected at the provincial and the regional population levels. The level of harvest associated with this project would not preclude owls occupying historic home ranges and continuing to reproduce in the PA and watersheds.

There is no evidence that current forest practices on federally managed land immediately threaten any terrestrial wildlife species in Oregon. Even though the Action Alternatives may potentially adversely disrupt local individuals of sensitive wildlife species and may cause the loss of habitat in some cases, this project is not expected to affect long-term population viability of any Bureau Sensitive or former S&M wildlife species known to be in the area. Additionally, this project combined with other actions in the watershed would not contribute to the need to federally list any Bureau Sensitive or S&M wildlife species, because of the small scope of the activities proposed under the Action Alternatives and the presence of a diversity of habitat within the Pickett West PA.

If the maximum acres were treated, Action Alternative 2 would only treat 18 percent of the federally administered lands within the Pickett West PA. Because of the relatively small footprint of the project, and because of the dispersed distribution of proposed treatments across the watershed, no substantial negative effects are anticipated to any Bureau Sensitive or Survey and Manage wildlife species from implementing the Pickett West project.

3.4 Soils

Methodology

- Soil compaction and productivity levels are calculated within a disturbed area such as a treatment unit boundary, landing, or route surface.

- Data analysis began with a review of Map 6 *Sensitive Soils and Frost Prone Areas* from the 1995 ROD/RMP. GIS data from the 2016 ROD/RMP was utilized as the best available information and field surveys were employed to refine the accuracy of map and GIS data.

- Natural Resource Conservation Service data was used to establish fragile/sensitive soil data.

Assumptions

- Soil compaction levels are reduced during decommissioning activities.

- Soil productivity loss was determined by calculating the percentage of displaced or compacted soil within the unit and reducing it by 35 percent growth loss.

- The proper implementation of Best Management Practices and Project Design Features protect soils from compaction and erosion.

3.4.1 Affected Environment for Soils

Soil Compaction

Soil compaction, often accompanied by rutting, is typically a result of the inappropriate use of heavy forest machinery (Ampoorter et al. 2010, p. 2). Soil compaction is the increase in soil bulk density (weight per unit volume) compared to undisturbed soil, and a decrease in porosity (particularly macro-pores) resulting from applied loads, vibration, or pressure. For this reason, soils that are typically high in clay content are most susceptible to compaction.

Susceptibility to soil compaction is dependent on several inherent properties such as soil texture, parent material, and moisture retention (Brais 1997, p. 197). Some places within the PA contain vast areas of shrink-swell soils that are rich in smectite clay minerals. Ground-based tractor, cable yarding, and helicopter yarding would be used in this project. Areas that were previously tractor yarded contain abandoned skid trails that have been heavily compacted. These heavily compacted soils usually have a massive or extremely platy (flat-like) soil structure that doesn't permit proper soil water movement. Heavily compacted soil prevents water infiltration which can cause overland flow and sediment transport. Low soil water infiltration also reduces the recharging of groundwater supplies that tree roots use in their development. For this project, the level of soil compaction was calculated as the percentage of soil compacted relative to the entire timber unit.

Soil Productivity

All forest management activities affect soils, with effects ranging over a continuum from nearly none where the activity is minimal to large (Grigal 2000, p. 168). Soil productivity is defined as the capacity of soil, in its normal environment, to support plant growth. For forest soils, productivity is more focused on the volume of trees produced. Similarly, site productivity can be defined as the capacity of a forest site to capture carbon and convert it to biomass (Powers 2006, p. 519). In other words, the productivity of a forest soil can be estimated by the soil's ability to produce timber. Disturbance of a soil's physical, chemical, and biological properties should be conserved as much as possible to ensure site productivity and seedling survival. It is widely known that frequent use of heavy equipment in intensive forest practices leads to soil compaction and reduced productivity (Gomez et al. 2002, p. 1334). Soil productivity loss was determined by calculating the percentage of displaced or compacted soil within the unit and reducing it by 35 percent growth loss.

Soil Erosion

Soil erosion is the removal of topsoil faster than the soil forming processes can replace it, due to natural or human activities. In forestry, erosion is a concern because it is a mechanism for soil and nutrient transport from the forest ecosystem which could result in decreased forest productivity (Swanson and Dyrness 1975, p. 393). Soil compaction and soil erosion share a direct relationship – as one increases so does the other. When a soil is compacted water infiltration is reduced or prohibited which causes overland flow resulting in topsoil erosion. Timber harvesting activities such as machinery movement, route, skid trail, and landing construction can cause soil erosion either by compacting or detaching the soil.

In the PA, serpentine-derived soils are extremely susceptible to erosion due to their deteriorated physical condition. Serpentine-derived soils contain a large amount of weathered serpentinite rock which upon weathering causes the soil to have elevated levels of magnesium and heavy metals. Erosion of serpentine-derived soils would spread these minerals and potentially restrict vegetation and tree growth which results in fewer roots to bind the soil profile together and less duff cover to protect the soil from natural impacts. Actions were taken to protect the soil from erosion by the use of Project Design Features (i.e. decompacting).

Fragile and Sensitive Soils

Fragile soils are limited in some manner for reforestation and are described in the Timber Productivity Capability Classification (TPCC) Handbook (BLM 1986). The most common fragile soil in the PA was identified as colluvium and/or residuum weathered from serpentinite. Colluvium is sediment transported downslope by gravitational forces whereas residuum is rock that has degraded or weathered in place. In the PA, we mostly find colluvium on top of residuum at the toe slope and we find residuum on the summit or shoulder slope. This occurs because colluvium generally get transported downslope leaving behind the more stable residuum to weather *in situ*. These soils tend to be weakly developed with shallow serpentinite lithic contacts in the soil profile. Serpentinitic soils display strong chemical fertility limitations owing both to a low Carbon/Magnesium ratio and high levels of Chromium and Nickel (Hseu et al. 2007, p. 389). Soils that are low in carbon and high in heavy metals tend to be difficult to reforest due to the high carbon demands of timber and poisonous effects of chromium and nickel. Serpentinite that is near the surface is also chemically unstable and easily weatherable which makes it prone to slope failure. Fragile soils classified as serpentinitic were either withdrawn from harvest activities or had less disruptive harvesting techniques implemented for the following reasons:

- Generally are steep slopes (>70 percent),
- Shallow serpentinitic lithology, and
- Soil fracturing and transport.

Serpentinitic soils on steep slopes are prone to mass movement and instability due to their poor physical condition. Soils with shallow serpentinite lithology can be easily made infertile when timber activities fracture and break up the shallow material to expose it to surface weathering making it prone to transport thereby creating additional problems in relation to reforestation.

Sensitivity to Prescribed Fire

Wildfire and prescribed fire in pine forests result in an increase in net N mineralization by; removing a of portion of the duff and mineral soil from the forest floor, volatilization of organic compounds, denaturation of organic Nitrogen compounds, and the killing of soil microbial biomass (Deluca et al. 2000). Additionally, prescribed fires can have a profound effect on carbon and nitrogen dynamics which are the master variables that determine soil fertility (Johnson 2001 p. 227). Prescribed fires also contribute to erosion by removing the protective duff layer of the forest floor and exposing mineral soil. Moreover, wildfires and prescribed fires can contribute to erosion by the development of a hydrophobic layer of waxes and resins just below the soil surface which limit water infiltration (Huffman 2001, p. 2877). Additionally, prescribed fire has been the most common fuel-reduction practice used in seasonally dry forests in the U.S. since the 1970's (McIver 2013, p. 64). Although wildfires and prescribed fires present many concerns to forest soil health fertility, they occur naturally without human interference and play an important role in understory regeneration and mineral nutrient cycling. For this project, fuels reduction would occur at the unit scale and is expected to cause little to no soil disturbance.

3.4.2 Environmental Effects

<u>Alternative 1 – No Action</u>

Soil Erosion, Compaction, and Productivity

Under the No Action Alternative there would be no changes in current levels of soil erosion, compaction or productivity levels given that no disturbance associated with timber harvest activities would take place. Furthermore, there would be no direct effects on soils on BLM-administered lands in the PA, as there would be no route construction/reconstruction, landing construction, cable yarding or ground based yarding. Considering that soil erosion and compaction would not be occurring, by consequence soil productivity would not be affected as the two measures are inversely related. At depths greater than 6 inches, soil compaction tends to recover slowly through natural soil processes.

Prescribed Fire and Fragile/Sensitive Soils

In the forest environment, the recycling of soil nutrients is mostly derived through the decay of organic materials in the form of forest litter (i.e. leaves, needles, woody debris, roots, etc.). In addition to soil nutrient cycling, both macro- and micronutrients, surface litter and duff provides an acidic pH which regulates nutrient availability which is conducive to forest sustainability. In the event of a wildfire or prescribed fire the duff layer would be consumed thereby volatilizing nitrogen and solubilizing phosphorus. The loss of the protective duff layer would also expose moisture – rich mineral soil and would lead to a reduction in soil moisture. In the absence of prescribed burning, there would be no changes in soil nutrients levels or other ecosystem services provided by the protective duff layer that insulates the forest floor.

There would be no change to the condition of fragile soils in the absence of timber harvesting. Timber harvesting activities including route construction would damage these sensitive soils thereby causing the detrimental effects that are associated with soil erosion and loss of soil productivity.

Under the No Action Alternative there would be no direct or indirect effects to fragile or sensitive soils on BLM-administered lands from prescribed fire or timber harvesting because these activities would not occur.

Alternatives 2 and 3

Prior to timber harvest activities, field surveys were conducted to identify areas of slope instability. If units were found to have past, current, or future mass movement depending on the severity, those areas were avoided and/or the timber harvest method was modified. The main soil order that presented slope stability, erosion, and productivity problems was Pearsoll-Rock outcrop complexes 58F (20 – 60 percent slopes) and 58G (60 – 90 percent slopes) as defined by the USDA – NRCS Soil Survey of Josephine County. These soils comprise 50 percent Pearsoll series which is an extremely stony clay loam which presents stability risks due to the lack of cohesion throughout the soil profile. The rock outcrop part makes up about 25 percent of the complex. Mitigation measures were taken because these soils contain extremely shallow serpentine bedrock which is within 14 inches of the soil surface. As mentioned in the Affected Environment, serpentine-derived soils present major challenges with respect to soil stability and forest regeneration. Furthermore, the Pearsoll series formed from colluvium derived from serpentintite and peridotite which indicates that the subsoil may lack cohesion and stability on steep slopes.

Both Action Alternatives would consist of a mix of harvest methods. Two common objectives for both Action Alternatives would be to; 1) maximize ridgetop roads where feasible and 2) limit new temporary road distances to 0.5 miles. However, the main objective of Alternative 3 would be to minimize new temporary route construction. Table 3.4-1 below lists the expected type of soil disturbance for each timber harvest method.

Table 3.4-1 Soil disturbance incurred by harvesting method.

Harvest method	Skid trails	Forwarder trails	Corridors trails	Landings
Ground based or tractor yarding	✓	✓	-	✓
Cable yarding	-	-	✓	✓
Helicopter yarding	-	-	-	✓
Tethered assisted yarding		✓	-	✓
Tractor swing route	✓	-	✓	✓

Corridor trails would be expected to have a 6-foot wide width of soil disturbance due to the width of the log. Skid trails would be expected to have 12-foot wide width of soil disturbance to take into account the log, width of machinery tires, and natural lateral movement about the trail. Forwarder trails are would be expected to have the same 12-foot wide width of disturbance as skid trails, however, the log load would be in suspension for the tethered-assist harvest method. Temporary roads would be expected to have a 20-foot wide width of soil disturbance to account for the width of the road bed and the vehicle turning radius. Landings for helicopter based harvesting would be expected to cover approximately 1 acre due to the various component requirements and larger tree size. All other landings are assumed to be approximately 0.25 acre area.

Ground based yarding

Of all the harvesting methods, ground-based yarding is considered the most destructive to the soil surface causing the most amount of soil disturbance. Ground based yarding operations would employ the following Best Management Practices and Project Design Features to reduce the severity of soil compaction, displacement, and erosion:

- No harvesting operations unless the soil moisture is less than 25 percent, or as approved by the Authorized Officer.
- Operations will only be conducted on pre-authorized skid trails or alternate trails as approved by the Authorized Officer.
- Skid trails and landings on native surface roads, they will be decompacted to reduce soil bulk density if the 12 percent soil disturbance threshold is exceeded.

Decompaction can be accomplished by the use of tool/machinery to reduce the soil bulk density and allow for water infiltration, aeration, and optimal seedling survival. After implementation of the above Best Management Practices and Project Design Features the detrimental effects of soil compaction and loss of soil productivity would be mitigated.

Cable yarding

Cable yarding systems cause less soil disturbance than ground based systems. The cable system suspends one end of the log and transports it the landing rather than a tractor moving throughout the unit and causing soil impacts. Cable yarding systems usually operate in units where the slope is greater than 35 percent. In all units, the greatest disturbance would generally occur within 100-150 feet of the landings where corridors merge. Use of the appropriate Best Management Practices and Project Design Features are expected to limit the extent of soil disturbance to 12 percent or less.

Helicopter yarding, tethered assist yarding, and tractor swing routes

Helicopter yarding extracts the log from the unit by fully suspending it until it reaches the landing. For soil resources, helicopter yarding is expected to cause negligible soil disturbance or loss of soil productivity. Tethered – assist yarding equipment would be operating on an approximately 18 inch thick slash layer, and therefore most of the soil disturbance would be mitigated. Tractor swing routes would impact soil resources in the form of skid trails, corridors, and landings. Although it would be expected to cause some amount of measurable soil disturbance, implementation of Best Management Practices and Project Design Features are expected to keep soil disturbance within threshold limits.

Temporary routes

Temporary routes are low impact routes utilized to access proposed treatment units. These routes consist of new temporary routes and re-construction of existing routes to their original design and are intended to be used temporarily, see Table 3.4-2. With regard to soil resources, all temporary routes will be decommissioned after use thereby mitigating soil erosion, compaction, and loss of soil productivity. Best Management Practices and Project Design Features used are:

- Limit the number of passes across the paths,
- Operate on a slash mat where feasible,
- Conduct operations only when soil moisture is less than 25 percent,

Table 3.4-2 Temporary route road lengths.

Road Type	Alternative 2	Alternative 3
New (miles)	13.5	0
Re-construction (miles)	8.6	6.8

Prescribed burning

Prescribed burning would occur in specific units throughout the PA to reduce the intensity of potential future wildfires. As mentioned in Chapter 3.2, prescribed burning and wildfires consume organic matter and surface duff which are critical to nutrient cycling , particularly carbon and nitrogen. For soil resources in the PA, the main burning concern are those soils identified as the Pearsoll – Rock outcrop complex, see Appendix J for details. These soils are classified as category 1 sensitive soils. Due to the high potential for fire related damage that could lead to soil erosion and loss of productivity, fuels treatment would be avoided on these soils. Moreover, lop and scatter fuels treatments are not expected to cause measurable amounts soil disturbance and would be implemented in places agreed upon by the Soil Scientist and Fuels Specialist.

Cumulative Effects

The effects of past actions on soil resources in the Pickett West PA are analyzed in aggregate in the Affected Environment and establish the current baseline for this analysis. Federal projects would adhere to the aforementioned 12 percent and 5 percent thresholds, thus soil resources would not be directly, indirectly, or cumulatively impacted. The BLM has proposed future timber harvest activities in the Pickett West PA that would cause soil disturbance but with implementation of the appropriate BMPs and PDFs, this disturbance would be mitigated to or below the threshold limit of 12 percent as given in the 1994 Medford District RMP Environmental Impact Statement. By limiting soil disturbance to the threshold limit the potential for accelerated erosion would also be limited. Similar to soil disturbance, loss of soil productivity would limited to 5 percent or less with installment of those same mitigation procedures. Soil disturbance is expected to remain consistent with current levels over the long-term, but may vary annually.

Summary

For the PA, there would be no changes to the current levels of soil disturbance and loss of productivity under Alternative 1. For Alternative 3, in order to minimize construction of new temporary roads, helicopter – based harvesting would more than double, tethered – assist acres would be reduced by nearly a factor of three, and cable – based harvesting acres would be reduced as well, see Table 2.3.2. The implementation of Alternative 3 would make use of existing temporary routes by renovating and reconstructing them. However, the approximate distances of tractor – swing routes would double to compensate for the lack of new temporary routes. The major differences between Alternative 2 to Alternative 3 would be the reduction in tethered – assist harvesting and the increase in tractor swing harvesting. When tethered – assist acreage is reduced the soil impacts due to landings and corridors would be reduced. When tractor swing acreage is increased the soil impacts due to skid trails, corridors, and landings would be increased. When the shifts in the other harvesting methods between Alternatives 2 and 3, along with the two aforementioned methods, are factored in the overall disturbance and loss of productivity is similar. Table 3.4-3 reflects these similarities along with the No Action Alternative.

Table 3.4-3 Soil disturbance and loss of soil productivity.

Soil condition	Alternative 1	Alternative 2	Alternative 3
Average disturbance per unit (percent)	No changes	6.3	6.4
Average loss of productivity per unit (percent)	No changes	2.2	2.2
Each unit have 5percent or less in loss of soil productivity (Y/N)	No changes	No	No
Each unit have 12% or less soil disturbance (Y/N)	No changes	No	No

Some units would have higher amounts of disturbance and loss of productivity but the average amount across the whole PA would be below the thresholds of 12 percent and 5 percent. The units with values above the thresholds tend to correlate with tractor or cable – based harvesting systems on units of less than 10 acres. The units that would potentially exceed the thresholds would be closely monitored to assure the effectiveness of the BMPs/PFDs. It is expected that the average amount of soil disturbance per unit would be consistent with the impact analysis and conclusions provided by the 1994 Medford RMP EIS.

3.5 Hydrology and Water Quality

Methodology

- A more comprehensive analysis for hydrology and water quality is given in the Pickett West Timber Project - Hydrology and Water Quality Resource Report; please refer to this report as needed to support this analysis.

- Hydrology is evaluated at U.S. Geological Survey streamflow measurement sites in the Illinois River near Kirby, the Rogue River at Grants Pass, and the Applegate River near Wilderville.

- Equivalent Clear-cut Area (ECA) provides an estimation of areas with less than 30 percent canopy cover using the National Agriculture Imagery Program (NAIP) aerial photography (USDA 2016). These areas may be from recent events such as timber harvest activities, activity fuels treatments, agriculture, or wildfires.

- Road densities and roaded areas were calculated using BLM GIS base layer for roads in the area by calculating an average of a 40 foot disturbance width.

- Where data is available this analysis is quantitative and makes use of Geographical Information System (GIS). Estimates for peak flow enhancement, road density and roaded area are calculated for the three fifth field watersheds in the PA [Hellgate Canyon – Rogue River (HUC10 #1710031002), Lower Applegate River (HUC10 # 1710030906), and Deer Creek (HUC10 # 1710031105)], 6th and 7th field subwatersheds.

- Potential water quality impacts are evaluated by reviewing the Oregon's 2010 303(d) list for impaired waters and considering monitoring information. Water quality standards are set by the State of Oregon DEQ and approved by the Environmental Protection Agency to achieve characteristics needed to support beneficial uses and values such as aquatic life or drinking water.

- Water quality changes that may occur due to elevated nutrient/sediment loads resulting from accelerated erosion are considered in this analysis based on potential increases from the baseline condition described in the Affected Environment.

- Field surveys conducted from June 2016 to March 2017 were used to identify the inception point for ephemeral, intermittent and perennial streams, springs, wetlands, waterbodies and unstable slopes in an area near proposed commercial timber harvest units.

Assumptions

- Land management on non-federal lands in the Analysis Areas will continue to follow current trends for timber harvest and other disturbance (there are 95,088 acres of non-BLM lands in the PA, 53 percent of the PA). Actions on non-BLM lands will be consistent with the Oregon Forest Practices Act, and all state, federal, and local laws.

- Harvest operations described in this analysis would be modified during implementation, but should not result in substantial changes to the methods, amount of disturbance or intensity described.

- The haul routes for commercial timber extraction would use the existing road network with additional road maintenance including removing brush, repairing drainage features such as culverts and cleaning ditches, and improving travel surfaces by blading and/or adding gravel to bring roads up to haul standards.

- This analysis will focus on accelerated erosion (above natural and/or background levels described for the Affected Environment) resulting from the implementation of the Action Alternatives. Natural disturbances such as fire, beavers, and intense storms are part of background levels. Accelerated erosion is defined as erosion that is a consequence of human activity and outside of an assumed natural background levels.

- For project consistency, 190 feet was selected for this the Site Potential Tree Height (SPTH) to determine the Riparian Reserve Land Use Allocation (RR). Fish bearing steams have fish presence verified or presence not verified and have a 380 foot buffer. The non-fish bearing intermittent and perennial streams have a 190 foot buffer.

- Culvert replacements may occur as a requirement of the timber or stewardship contract, as part of a reciprocal right-of-way agreement, through a watershed partner, and/or with BLM deferred maintenance funding. Culvert replacements on fish-bearing streams would be done within the instream work window and utilize proper dewatering methods.

- The Aquatic Conservation Strategy (ACS) provides a list of Riparian Management Objectives and Standards and Guidelines (Frissell 2013). An analysis of the ACS for this project was completed, see Appendix C: ACS Consistency Analysis.

- The proper implementation of Best Management Practices and Project Design Features would be protective of water quality by reducing erosion and sedimentation, protecting wood recruitment to streams, and protect riparian shading.

3.5.1 Affected Environment

The Planning Area (PA) is located in the Applegate, Illinois, and Lower Rogue Subbasins. The PA comprises about 203,459 acres; 47 percent of which is managed by the BLM and 50 percent is private, with 3 percent Josephine County or Oregon State lands. For a general description of the

Planning Area see Chapter 2: *Planning Area Overview*. Forest lands in the PA are generally recovering from drought conditions, settlement and a history of fire suppression and timber harvest that have impacted the vegetation in the PA, generally making it less-resilient to landscape disturbance (See Section 3.1.1 Affected Environment for Vegetation).

The PA has one Key Watershed, Taylor Creek, and one deferred watershed, White Creek. Key Watersheds contain the best habitat with the greatest potential for salmon recovery and accordingly receive increased protection and the highest priority for restoration programs. Deferred watersheds are identified as areas having high watershed cumulative effects from past management activities. The 1995 ROD/RMP allows for management activities of a limited nature to occur in this area so long as the effects would not increase the cumulative impacts (pp. 42-43 and pp. 56-57).

Hydrology

There are five Watershed Analysis (WA) documents that cover portions of the PA. The Deer Creek WA is in the Illinois subbasin, the Cheney-Slate, Murphy and Applegate WAs are in the Applegate subbasin, and the Hellgate Canyon – Rogue River watershed in the Lower Rogue (Table 3.5-1, watershed summary table).

Table 3.5-1 Hydrological Unit Code Boundaries within the Planning Area

Subbasin (HUC 08)	Watershed (HUC 10)	Subwatersheds (HUC 12)	Subwatershed Tributaries
Illinois (HUC#17100311)	Deer Creek	Upper Deer Creek	South Fork, North Fork, Mainstem
		Middle Deer Creek	Crooks Creek, White Creek
		McMullin Creek	McMullin Creek, Reeves Creek, Thompson Creek
		Lower Deer Creek	Anderson Creek, Squaw Creek, Draper Creek, Davis Creek, Clear Creek
		Caris Creek-Applegate River	Claris Creek, Oscar Creek, Board Shanty Creek, Grays Creek, Miller Creek
Applegate (HUC# 17100309)	Lower Applegate River	Murphy Creek	Spencer Creek, Case Creek, Dry Creek, Madronna Creek, Onion Creek, Iron Creek
		Cheney Creek	Cheney Creek, Bull Creek, Jackson Creek
		Slate Creek	Waters Creek, Slate Creek, Round Prairie Creek, Minnie Creek, Elliott Creek, Welter Creek, Salt Creek
Lower Rogue (HUC# 17100310)	Hellgate Canyon – Rogue River	Baum Slough	
		Pickett Creek-Rogue River	Pickett Creek, Shan Creek, Limpy Creek, Dutcher Creek, Pass Creek
		Taylor Creek	Schoolmarm Creek
		Galice Creek	Mill Creek, North Fork Galice Creek, Mill Creek, Quartz Creek, Birch Creek
		Stratton Creek-Rogue River	Zig Zag Creek, Hog Creek, Maple Gulch
		Bailey Creek-Rogue River	Centennial Gulch, Rich Gulch, North Fork Rocky Gulch, Bailey Creek, Smith Creek, Ash Gulch

Deer Creek Watershed (HUC5 #1710031105) - The Deer Creek watershed is located within the Klamath Mountain Geomorphic Province of southwestern Oregon approximately 15 miles southwest of Grants Pass. This 72,605 acre watershed receives from 51 to 80 inches of precipitation annually. This watershed ranges in elevation from near 1,200 feet above sea level to near 5,550 feet and has over 531 miles of creeks that drain into Deer Creek which is one of the major tributaries of the Illinois River and eventually the lower Rogue River (USDI 1997). The hydrology of Deer Creek is discussed in greater detail in the Hydrology and Water Quality Resource Report.

Conversion of the bottom lands to agriculture in the Deer Creek watershed has led to the filling of sloughs, backwaters, and areas that once were filled by flooding or subsurface flows. Presently the riparian zone on private lands generally consists of a narrow band of hardwoods, with some areas lacking any vegetation at all (USDI 1997). The historical fire regime of the Deer Creek Watershed is dominated by a low-severity regime at the lower elevations and transitions into the moderate-severity regime at its higher elevations. The probability of stand replacement type of fire is likely higher than during pre-European settlement (USDI 1997). See Chapter 3.2 Fire and Fuels Affected Environment for more information.

Hellgate Canyon – Rogue River (HUC5 #1710031002) - The Hellgate Canyon Rouge River or the Rogue-Recreation Watershed as it is described in the WA is located within the Klamath Mountain Physiographic Province of southwestern Oregon in Josephine County approximately five miles west of the city of Grants Pass. This 93,367-acre watershed receives from 31 to 67 inches of precipitation. Elevation in this watershed goes from near 700 feet above sea level to near 4,400 feet and has over 457 miles of creeks that drain into the Rogue River (USDI 1999b). The hydrology of Hellgate Canyon-Rogue River watershed is discussed in greater detail in the Hydrology and Water Quality Resource Report.

There has been a large amount of mining activity within the Rogue River watershed dating back to the 1850s. There are several current claims within the watershed, with some minor mining activity occurring on these claims. The majority of the mining activities occurring at this time are small scale such as dredging and panning. Mining activities may cause stream turbidity and contamination due to runoff of un-reclaimed areas (USDI 1999b).

The watershed analysis for the Recreation section of the Rogue River recommends the implementation of fuel hazard reduction treatments. These would create opportunities to compartmentalize wildfires into small drainages and prevent large scale wildfire occurrence. Additionally, they reduce the risk of a high- intensity fires and return to a condition that would exhibit a low-intensity fire regime (USDI 1999b).

The flows of the Rogue River are affected by storm events, snow melt, and releases or detention of the Lost Creek and Applegate Dams. The seasonal pattern of precipitation does not supply much rainfall between May and September. As a result, stream recharge by ground water is limited during the summer months. Intense rainfall in localized storms can also occur any time, but storm events are more likely in the winter.

Lower Applegate Watershed (HUC5 #1710030906) - The Lower Applegate Watershed is located within the Klamath Mountain Physiographic Province of southwestern Oregon in Josephine County approximately seven miles southwest of the city of Grants Pass. This 90,605 acre watershed receives from 24 to 78 inches of precipitation. This portion of the watershed in the PA is described in the Murphy (USDI 2000) and Cheney-Slate (USDI 1996) WAs. The Lower Applegate watershed ranges in elevation from near 900 feet above sea level to near 5,500 feet. There are approximately 380 miles of streams in Murphy Watershed (USDI 2000) and 345 miles of streams in the Cheney-Slate watershed (USDI 1996).

The Applegate Lake formed by Applegate Dam is a 988-acre reservoir that was completed in 1980 and has moderated low flows somewhat in the Applegate River. In addition to controlling floods, the dam was intended to store water for irrigation and recreation. The hydrology of the Lower Applegate watershed is discussed in greater detail in the Hydrology and Water Quality Resource Report. The watershed analysis for the Murphy watershed recommends the implementation of fuel hazard reduction treatments at strategic locations throughout the watershed and to pursue extensive density management thinning in both natural and planted stands (USDI 2000). The Cheney-Slate WA recommends thinning in all riparian areas (USDI 1996).

Water Quality

Water quality standards are set by the State of Oregon Department of Environmental Quality and approved by the Environmental Protection Agency to achieve characteristics needed to support beneficial uses such as supporting aquatic life or providing drinking water. Water quality can be based on biological or physical properties in addition to chemical properties. Water Quality in the PA is discussed in greater detail in the Hydrology and Water Quality Resource Report.

There are four Water Quality Restoration Plans (WQRPs) that cover the federally-administered lands in the PA. They are the McMullin WQRP (USDI 2005a) and Deer Creek WQRP (USDI 2011c) for the Illinois subbasin, the Hellgate-Rogue WQRP (USDI 2011b) for the Lower Rogue subbasin, and the Applegate WQRP (USDA/USDI 2005) for the Applegate subbasin. Specific recommendations for forest management includes implementing silvicultural treatments designed to promote hardwoods and conifers, and to minimize sedimentation with good road management.

After reviewing the information available from the WQRPs, the most common water quality concern in the PA is water temperature. Water temperature is critical for aquatic life success, especially for salmon, but also is an important variable (along with nutrients) in determining the availability of dissolved oxygen. Shade tolerant species in riparian reserves important for maintaining stream temperature generally maintain their abundance even through periods of drought, severe fire, and moderate erosion events (Colombarolia and Gavina 2010). However, this resiliency has likely been reduced by road building, harvesting, and mining.

To understand the spatial and temporal variability of stream temperatures more directly, BLM currently monitors stream temperature at various sites and supplies data to DEQ for listing decisions. There are 20 BLM historical monitoring sites and 5 current BLM monitoring sites in the PA.

Another approach has been to use Thermal Infrared Radiometry (TIR) and modeling. Oregon DEQ used this technique to provide information for the 2008 TMDL for the Rogue River Basin (Oregon DEQ 2008). This information shows the spatial variability of stream temperatures and the importance of these springs as cold water refuge for fish species (ODEQ 2003).

Both sedimentation and nutrients are generally elevated in the first two years after disturbances such as fire, timber harvest, and/or severe storm events, but tends to diminish as vegetation reestablish and precipitation approaches normal values. Buffering the Inner Zone of the riparian reserve on streams can be effective in "filtering" increased nutrients from vegetation treatments upslope. A recent study showed that, as a general rule, in terrain with gentle side slopes, a 100 foot forest buffer retains about 80 percent of the nitrogen and phosphorus passing through in surface and subsurface flow (Frissell, Evaluation of the NWFP, 2013).

Specific recommendations for forest management in these WQRPs relevant to this project include silvicultural treatments designed to promote achievement of site potential hardwood and conifers, and to minimize sedimentation with good road management.

3.5.2 Environmental Effects

<u>Alternative 1 – No Action</u>

Direct and Indirect Effects

Under the No Action Alternative there would be no changes to peak flow, road density or roaded area as described in the Affected Environment. No new maintenance to haul roads would occur under the No Action Alternative. However, road use, road maintenance, silvicultural treatments, water source improvement and other activities would be expected to continue on BLM-administered lands and non-BLM-administered lands under the No Action Alternative (see Chapter 2 for specific actions and the assumptions for this analysis). These activities are likely to contribute to baseline conditions with accelerated erosion increasing sedimentation and changes in hydrology related to storm response.

The majority of sediment movement in streams occurs with high intensity storm events, especially after disturbances such as wildfires or due to soil disturbance from human activities. Often this sediment is stored in the stream channels and floodplains and released downstream in subsequent peak flow events. Primary sediment sources include: episodic landslides and slumps usually associated with intense winter storms, hillslope erosion, stream bank erosion, roads, motorized recreation, mining, wildfires, and forest management activities. A primary driver can be the result of poorly designed and/or poorly maintained forest roads (Wemple 2003).

The PA has an established road system used for accessing private and public land. The development of this road system has resulted in current and past accelerated erosion. Even properly maintained roads alter hillslope hydrology, by intersecting slow-moving subsurface groundwater and converting it to more rapid surface flow. Surface runoff can move rapidly through the ditch-culvert systems, and if hydrologically connected to a stream.

Elevated precipitation and surface runoff leads to enhanced peak flows and reduction in water storage in the uplands. These factors can interact to cause indirect changes in channel morphology by altering the streamflow timing, volume, and sediment loads (Furniss, Roelofs and Yee 1991). Roads contribute to stream sedimentation at different levels depending on: road design, surface type, depth and quality road surface aggregate, location of the road, position on the slope, fill material, underlying geology, maintenance frequency, condition near stream crossings, and moisture levels of road material during use. As road surfaces increase, the potential for sedimentation in a watershed generally increases (ODEQ 2003).

The condition of riparian areas, channel morphology, and hydrology can be affected by land use activities such as timber harvest or road use and maintenance, and may increase surface water temperatures in streams. Direct effects to elevated summertime stream temperatures may result (ODEQ 2008) from a combination of these factors.

Cumulative Effects

The cumulative effects analysis area for considering effects to water resources are the three 5th field watersheds located in the PA [Hellgate Canyon – Rogue River (HUC10 #1710031002), Lower Applegate River (HUC10 # 1710030906), and Deer Creek (HUC10 # 1710031105)]. Peak flow enhancement, water yield and changes in hillslope hydrology were considered for these watersheds. Past actions are described in Chapter 3: Cumulative Effects and Appendix D. The mining history and wildfire history can result in impacts that can be cumulative for hydrology and water quality. Both can increase surface runoff and lead to long-term water quality issues. This is reflected in the Affected Environment Section for Hydrology and Water Quality.

Present actions that contribute to cumulative effects include timber harvest, vegetation treatment projects, some limited mining projects and right-of-way projects for utility corridors and roads on both BLM and non-BLM-administered lands (See Chapter 3: Cumulative Effects and Appendix D). Many of these projects may increase ECA or roaded area and may result in peak flow enhancement or impact water quality. Specific direct and indirect impacts that can be cumulative are reducing riparian shading, increase surface runoff with roads and compaction, and increase sedimentation through soil disturbance and erosion.

It is reasonable to assume timber harvest on private and Josephine County timber lands would occur at similar scope and scale, as is shown in the 2016 aerial photographs. As timber harvest lands are replanted there is a point when the new vegetation offsets the contribution to the potential for enhanced peak flows or water yield, this is when the soils are stabilized and the evapotranspiration rates approximate or exceed the pre-disturbance rates (in general 5 to 15 years after harvest). This means, as new timber stands are harvested, other older stands are no longer less than 30 percent canopy cover and do not contribute to the ECA or enhanced peak flows.

Peak Flow Assessment for Current and Reasonably Foreseeable Conditions

Peak flow enhancement refers to a changing response (timing and/or magnitude) in the flow of a stream or river during high flow events. Increased water yield would be an increase in the volume of water over an annual water year. Enhanced peak flows and changes in water yield are the result of all activities described in the soils cumulative section for the baseline conditions and can be evaluated by estimating ECA and roaded area by watershed.

These parameters must be evaluated regardless of land-ownership and on a watershed scale and are therefore a good indicator of cumulative impacts from past and recent actions. Forest management practices on private lands and historical practices on BLM-administered lands have led to single age and uniform timber stands known as plantations. Long-term paired watershed experiments indicate that the conversion of mature and old-growth conifer forests to plantations of native Douglas-fir produced persistent summer streamflow deficit of 50 percent relative to reference basins, in plantations aged 25 to 45 years (Perry and Jones 2016).

Studies have found enhancement of peak flows can be attributable to changes in flow routing due to roads and in water balance due to treatment effects and vegetation succession (Jones and Grant 1996, Thomas and Megahan 1998). Within the PA, there are approximately 1,300 miles of existing system roads with 466 miles on BLM-administered land, based on BLM GIS data.

Grant et al. (2008) suggests that the mean response lines for ECA are a good predictor of enhanced peak flow. Peak flows can be analyzed with regard to elevation breaks between the rain, transient snow, and the seasonal snow zones for southern Oregon which are 2,500 feet, 5,000 feet and >5,000 feet, respectively (Jefferson 2011).

Table 3.5-2 Equivalent Clear-cut Area within the Analysis Area

Analysis Area Name	Analysis Area (Acres)	ECA (Acres)	percent Total
Deer Creek	72,605	10,001	14%
Hellgate Canyon-Rogue River	93,367	9,047	10%
Lower Applegate River	90,605	9,702	11%
Pickett West Planning Area	203,458	15,612	8%
BLM Lands in the PA	95,088	1,388	2%

ECA is based on digitizing canopy openings based on 2016 Aerial Photography. Openings include other non-treed areas such as recent burn scars.

Peak flow enhancement is generally more difficult to predict with larger watersheds (> 2,472 acres) and where there is seasonal variance (Grant et al. 2008). Road density is more likely to impact peak flows on small watersheds and impacts diminish with larger watersheds (Gucinski et al. 2001). Therefore, the same GIS analysis used for 5th field watersheds was run for each of the 7th field sub-watersheds. These sub-watersheds ranged from 50 acres to 9,326 acres with the average being 1,465 acres. To summarize, none of the analysis areas showed ECAs above thresholds with the exception of 14 sub-watersheds due primarily to agriculture in the river bottoms and therefore unlikely to contribute to enhanced peak flows. Results are presented in the Hydrology and Water Quality Resource Report.

The current road density within the PA is approximately 3.94 mi/mi^2 (See Table 3.5-3). This road density is likely to be the same or decrease under the No Action Alternative, since the basic road network is in place to harvest timber on both private and public lands. As harvest is completed, roads are often storm-proofed and if done properly are unlikely to contribute to peak flows in the future. Any new road construction unrelated to this project is likely to be off-set by decommissioning of unused roads, or be so small as to not change the overall road densities in the Analysis Areas, which are roughly 4 mi/mi^2.

Table 3.5-3: Road Density and Estimated Road Disturbance

Analysis Area Name^	Analysis Area (Acres)	Analysis Area (mi^2) *	Roads (mi)	Road Density (mi/mi^2)	Road Disturbance$^+$ (Acres)	Percent Roaded Area
Pickett West Planning Area	203,458	318	1,254	3.94	6,080	3.0 %
BLM Ownership in Picket West	95,088	149	466	3.13	2,259	2.4 %
Hellgate Canyon-Rogue River	61,827	97	336	3.46	1,629	2.6 %
Lower Applegate River	77,746	121	461	3.81	2,235	2.9 %
Deer Creek	63,886	100	456	4.56	2,211	3.5 %

^These are the portions of the 5th level (HUC5) watersheds
* miles = mi
$^+$ Roaded Area, calculated by assuming and average disturbance width of 40 feet

Roaded area of the existing BLM road system in the Planning Area.

The percentage of roaded area for each Analysis Area is estimated at less than 4 percent, with the exception of Deer Creek which is 3.5 percent (Table 3.5-3), well below 12 percent; which is the threshold that may result in observable increases of peak flow according to most studies (Ziemer 1981).

Peak flow enhancement and water yield increases are not identical, but both are influenced by canopy cover, ECA, and roaded area. Water yield refers to the total water produced from a watershed including base flows. Based on numerous paired watershed studies, water yield does not show a measurable increase until 20 percent of forest canopy is removed. Any measurable enhancement of peak flows evaporates 2-4 years after the initial disturbance as vegetation reestablishes and effective canopy and transpiration increase (Best et al. 2003). It is unlikely that 20 percent of the canopy will be removed in the PA from cumulative actions on all lands.

Water Quality Assessment for Current and Reasonably Foreseeable Conditions

The major concerns for water quality from past, present, and future projects are changes in nutrients, sediment, and water temperature. These can all be detrimental to the aquatic habitat of salmon species due to the production of algal blooms, loss of dissolved oxygen, high stream temperatures, and loss of physical habitat due to sedimentation. This also applies to the resident fish and other aquatic life, particularly resident cutthroat, which are present in PA streams.

When determining effects, it is important to consider that changes to stream conditions may be related to climate changes or may be the result of unrelated actions, making project specific effects difficult to differentiate from background conditions. A recent study in the Deschutes watershed was not able to detect any temperature response within a 35 year record of requiring riparian buffers for timber harvest. Improvements due to buffers may have been masked by warming climatic conditions (Reiter et al. 2015). Other studies have found harvesting, road construction, and changing forest and riparian management practices, and natural hydrologic events (peak flows and associated mass soil movements) tend to obscure specific cause-and-effect relationships in stream temperature (Beschta and Taylor 1988). A study of 20 large watersheds found statistically significant changes in climate could obscure streamflow, nutrients, and total suspended solids loads in as much as 30-40 percent of study watersheds (Johnson et al. 2015).

<u>Alternative 2</u>

The purpose and need of Action Alternatives 2 and 3 are to provide a sustainable supply of timber, improve stand resiliency, and enhance or maintain northern spotted owl habitat. The Watershed Analysis documents for the PA indicate that existing forest stand conditions demonstrate there is a need to improve forest resiliency and reduce the long-term risk of disturbances such as disease outbreaks or potential catastrophic wildfire. The Watershed Analysis process was employed in the 1995 Medford RMP as a means to implement ecosystem management and bring both visibility and accountability to land management decision making (Montgomery et al. 2005).

The proposed forest management treatments and prescriptions are described in detail in Chapter 2: Alternatives: Alternative 2 and 3. The treatments are restoration thinning (RT), density management (DM), hazardous fuels reduction maintenance (HFRm), and/or understory reduction (UR). Treatments would result in post-treatment canopy covers of 30 percent to 60 percent depending on the prescription (See Appendix I: Commercial Treatment Unit Summary Table).

Commercial Thinning Forest Management Treatments

No commercial treatment would be proposed in Outer Riparian Zones currently meeting Aquatic Conservation Service (ACS) objectives. Of the 43,500 acres originally considered for Riparian Reserve (RR) treatments in the PA, only 1,040 acres in Alternative 2 are being analyzed for Outer Riparian Zone commercial thinning (~17 percent of all proposed units). Field work did not identify any Outer Riparian Zones that could not be benefited by thinning for forest health. If unstable soils were identified in the field surveys non-commercial treatment buffers were extended.

Riparian thinning has the goal of promoting species diversity, forest health, and improving resiliency to landscape disturbances with the primary goal to achieve ACS objectives (See Appendix C: ACS Review). Commercial thinning, UR and HFRm can achieve these goals by reducing competition for desirable species, reducing fuel loading, and putting forest stands on a trajectory to achieve complexity of age and structure.

Commercial thinning in Outer Riparian Zone should enhance the growth of large conifers; especially in riparian stands that are unnaturally overstocked. Such thinning should reduce the fire, insect, and disease hazard (See Chapter 3.1: Affected Environment for Vegetation). The Northwest Forest Plan (NWFP) recommends commercial thinning be focused on previously harvested dense stands, unnaturally dense stands of mid to late-seral trees along wide valley channels or steep ground that are at elevated risk of catastrophic fires and loss of ecological function, or in under-stocked stands that would provide the greatest benefit to streams with severe water temperature problems.
No commercial treatment buffers or the Inner Riparian Zone make up roughly 13 percent of the unit acre totals. No commercial treatment buffers (120 feet for perennial, 50 feet for intermittent) have been applied to protect aquatic resources. Canopy cover in the RR would remain above 30 percent or 60 percent depending on the silvicultural prescription in the Outer Riparian Zones, therefore species diversity and forest health would be maintained. No cut buffers have been shown to be effective at protecting in-stream wood recruitment (Brenda et al. 2015). Buffers are also effective in protecting in-stream wood recruitment, however placement or tipping can increase the positive channel aspects more quickly than buffers alone (Brenda et al. 2015).

Potential water quality impacts from riparian zone treatment would increase stream temperatures if riparian vegetation in the primary shade zone is reduced or the near-stream microclimates are impacted. The primary shade zone is the part of the stream that would receive direct sunlight between 10 am and 2 pm if there were no shading. The 120 foot no commercial treatment buffer exceeds the minimum distance needed to protect the primary shade zone of most streams (ICS 2013). Near-stream microclimate gradients are topographically controlled, but also generally within this first 120 feet. Therefore, increases in stream temperatures are not anticipated.

Based on a study conducted on the Rogue River Siskiyou National Forest in 2006 a no-cut buffer of 60 feet was found to be effective in maintaining the Angular Canopy Density and therefore the effective stream shade (USDA/USDI 2012a). The joint study for implementing the NWFP found that density management or thinning beyond 15 meters (50 feet) from streams does not measurably affect microclimate (USDA/USDI 2012a). No impacts to perennial stream shading are anticipated for any of the UR or HFRm treatments proposed for this project, since they would adhere to a 60 foot no-treatment buffer under both Action Alternatives.

The Inner Riparian Zone buffers should be protective of wood recruitment to perennial streams. Empirical modeling studies suggest that the majority of in-channel wood recruitment comes from within 120 feet of the stream channel (ICS 2013). The HFRm treatment would be within 60 feet, but leave any tree boles that are greater than 6 inches on site for potential wood recruitment (see PDF Chapter 2.4). UR leaves all material on site, so no additional impacts to wood recruitment are anticipated from these forest management treatments.

Seeps, springs, and wetland would be protected with a 25 foot buffer. One study found that 95 percent of the erosion features from timber harvest 32.8 feet from streams delivered no sediment to stream channels (Rashin et al 2006). In addition to the stabilizing effect of the root network, adjacent trees also dissipate stream energy during high or overbank flows, further reducing bank erosion. Studies have shown that “vegetation immediately adjacent to the stream channel is most important in maintaining bank integrity” (FEMAT 2013). These buffers are designed to protect the root network of typical trees in this area, reduce erosion, direct impacts to wetlands, potential impacts to hydric soils, and avoid sedimentation.

Temporary routes and operator spurs would be built and renovated to allow for hauling from the commercial thinning units as proposed. These routes are typically outsloped, with no drainage ditches, 14 feet wide, and turn-outs for passing only when necessary. Drainage features would also be minimal, but may include culverts on stream crossings. These routes would be winterized before the end of the dry season by installing water bars and fully-decommissioning after use. Road decommissioning would include blocking routes, removing any culverts, decompacting (tilling below the compacted route surface area) to allow for water infiltration, installing water bars, and applying seed and mulch.

Impacts from the use of these routes and spurs can be expected during hauling and would include erosion and some increase in sedimentation that would decrease once the routes are winterized. There are also truck turn-arounds that would be needed, these are similar to landings for disturbance (¼ acre). Minor elevated surface runoff and sedimentation could occur during the short-term (1-2 years), but after reclamation takes hold impacts would be indistinguishable from undisturbed areas. Many of these routes and spurs are on ridge tops and any additional sediment or runoff is unlikely to be transported to surface waters.

Due to vegetation buffers, BMPs, and PDFs to address hydrologically connected units or roads, elevated runoff is likely to infiltrate and sediment is likely to be deposited in the uplands. Dry condition requirement for ground-based activities, use of temporary routes and tractor swing trails, and/or hauling along with proper decommissioning measures would reduce direct and indirect impacts to hydrology and water quality.

Commercial thinning may include Mortality Salvage (MS) in some places but would mostly be Density Management (DM) to promote “treat and maintain (TM)” or allow for a “down grade (DG)” habitat values for northern spotted owls. This results in a canopy target value of 40 percent or 60 percent for portions of units. Commercial thinning may also include Restoration Thinning (RT) which can result in canopy covers of 30 percent or greater. More site specific detail is given in the Hydrology and Water Quality Resource Report.

Impacts from commercial thinning can be differentiated by the type of yarding system that is used as well as harvest methods. Yarding of the thinned timber would be done with suspension systems, helicopter yarding, or ground based yarding using forwarder trails or traditional skid trails. Some units would not have commercial thinning and would not have the need for yarding. Effects from yarding timber are described based on the yarding method that is anticipated for each unit (tractor, cable, or helicopter). More site specific detail is given in the Hydrology and Water Quality Resource Report.

Temporary routes, landings, hydrologically connected corridors/skid trails, and other areas of exposed soils that are not already reclaimed or decommissioned would be winterized prior to October 15; skid trails in the RR would be scarified, seeded, water barred, mulched, and blocked. Ground-based skidding requires the use of an integral arch system and partial suspension to reduce soil disturbance and compaction. These can also use tractor swing routes that enable yarders to “walk” up designated skid trails. Localized erosion within units would persist on skid trails and forwarder trails until vegetation is re-established. Inner Riparian Zone buffers adjacent to and below units would capture and filter sediment from reaching ditches and/or streams at a level that would be similar to that which would occur naturally. Tractor swing routes provide for access to cable yarding areas where building a temporary route would be infeasible. Skid trails and tractor swing routes would be decommissioned by deompacting skid trails in units that are identified as being hydrologically connected to surface waters. Localized erosion within units would persist on skid trails and forwarder trails until vegetation is re-established.

Thinning with helicopters involves hand crews to fell the trees and attach them to the helicopter cable. Very little disturbance is expected to soils and no effects to Hydrology and Water Quality are expected beyond those described that are common to all. Direct effects at helicopter landings and road use for timber haul are expected. Of the 106 helicopter landings anticipated, 21 would be for loading logs, 35 would be for servicing helicopters and 60 would be for both. Of the landings, 76 are expected to be located on BLM-administered lands and 30 would be on private lands.

Localized erosion within units would persist on temporary routes, skid trails, truck turn-around areas, and landings until vegetation becomes re-established. Efforts are made during implementation to located new disturbance in current disturbance, reduce the number of passes, and avoid steep pitches for ground-based equipment, and other activities that may result in erosion. These techniques are applied on a site by site basis to reduce impacts and reclamation techniques (seeding and water bars) where these features cannot be avoided.

Understory Reduction and Hazardous Fuel Management Treatments
There is 6,005 acres of UR and 11,102 acres of HFRm treatment to maintain tree and brush densities in previously treated stands as funding allows. Treatments could include slashing, hand piling, hand pile burning, chipping, lop and scatter, biomass removal, and/or understory burning. Within the RR, material to be hand piled would be limited to 8 inches on the large end of the log to provide for soil protection and small wood recruitment, treatments could occur within 60 feet of perennial streams and 25 feet of intermittent streams, including ignition sources for underburning. These buffers for UR and HFRm should be protective of bank erosion, reduce potential impacts to hydric soils, and avoid sedimentation (see discussion related to spring buffers).

Activity slash for all forest management treatments would be managed by machine or hand pile/burned, chipped, lopped and scattered, and/or underburned based on a post-harvest assessment of fuel loading. Any of the commercial thinning units could have a UR or underburning treatment after the commercial thinning. Underburning (low intensity prescribed burning beneath the forest canopy) would be considered after mechanical operations have been completed to further reduce fuel loadings, recycle nutrients, and stimulate plant growth.

UR and HFRm forest management treatments would involve the use of passenger vehicles and ground crews, but no timber hauling. Piles made by the removal of less than 8 inch diameter material would be burned in the winter and would result in soil disturbance at the location of the burn piles. Plastic would typically be placed near the top to keep handpiles dry while burned under high moisture conditions in the winter. Soil heating under piles would occur, but due to the high soil moisture in the winter would result in soil disturbance at the location of the burn piles, effects are not likely to persist more than 1-2 years.

Direct and Indirect Effects

The thinning prescriptions described in Alternative 2 are designed to improve forest health and resiliency to disturbances such as fire, drought, and insects. This is accomplished by reducing canopy density and improving stand health and diversity (See Chapter 3.1, Vegetation Analysis).

Roads, Hauling and Temporary Route Impacts on Surface Runoff and Water Quality
No new permanent roads would be built and all temporary routes would be fully-decommissioned. Therefore, there would be no long-term increase in road density under Alternative 2. New temporary routes, renovation of existing temporary routes, and tractor swing routes would be fully-decommissioned after use. With the proposed 28 miles of temporary routes, there would be a slight increase to road density and roaded area during harvest (see Table 3.5-4). Since these routes would be fully decommissioned after use the road density and roaded area would return to the No Action Alternative rates in 1-3 years depending on the success of reclamation. Therefore, the construction of these routes are not expected to result in any measureable change in effects beyond baseline conditions.

Table 3.5-4 Road Density and Estimated Road Disturbance

	(Acres)	(mi^2) *	Roads (mi)	Road Density (mi/mi^2)	Road Disturbance⁺ (Acres)	Percent Roaded Area
Alternative 1: No Action	95,088	149	466	3.13	2,259	2.38 %
Alternative 2			494	3.32	2,395	2.52 %
Alternative 3			484	3.25	2,347	2.46 %
* miles = mi ⁺ Roaded Area, calculated by assuming and average disturbance width of 40 feet						

Roaded area of the existing BLM road system of the BLM-administer land in the Planning Area.

Road density is more likely to impact peak flows on small watersheds than larger watersheds (Gucinski, et al. 2001), therefore, road density and roaded area was also calculated for 7th field watersheds. See the Hydrology and Water Quality Resource Report for more information.

There is a potential that reciprocal right-of-way holders might improve and use these same temporary routes described here for this timber harvest, but this would be a potential with or without using the temporary route for this project. Therefore, it can be assumed that these 28 miles would only add to the road densities for 1-2 years during their use and would recover to background conditions after successful reclamation. Haul routes are existing so no increases to road densities would be predicted from timber haul.

Landings and roaded area for Alternative 2 do not add a significant amount of ECA (see Table 3.5-5). Increases in peak flow have not been found in most paired-watershed studies until roads and other impermeable areas occupied more than 12 percent of the watershed (Ziemer 1981). Harvest activities would add an estimated maximum of 631 acres to the ECA for the PA during the short-term (1-3) years, but with successful reclamation no long-term increase in the ECA area would occur.

There are watersheds that exceeded the thresholds for ECA that have commercial timber units proposed (Units 3-5, 7-3, and 30-3). Since ECA in these watersheds is mostly due to agricultural practices on private lands and since the minimum canopy cover after harvest would be above 30 percent for both Action Alternatives, no additional impacts expected. The percentages of ECA including the anticipated roaded area in any of the 5th field Watersheds would not exceed the 19 percent or 29 percent thresholds described for rain-on-snow or rain dominated systems with the additional disturbance, see the No Action Alternative, above.

Table 3.5-5 Estimated Equivalent Clear-cut Area Estimates for Alternative 2

	Analysis Area (Acres)	Landings*	Temp Routes (mi)	Additional Openings (acres)	Estimated ECA (Acres)	percent Total
Alternative 1: No Action	72,605	0	0	0	10,001	13.8 %
Alternative 2		1,556 - 106	28	631	10,632	14.6 %
Alternative 3		1,276 - 154	18	561	10,562	14.5 %
* (number of cable and ground based landings - number of helicopter landings). The average opening is estimated at ¼ acre for cable and ground and 1 acre for helicopter.						

Equivalent Clear-cut Area is based on Digitizing Canopy Openings from 2016 Aerial Photography. Openings include other non-treed areas such as recent burn scars in the BLM-administer land in the Planning Area.

The likelihood of increases to peak flow as a result of Alternative 2 would be low, since road density within the PA would be almost identical to pre-disturbance condition (this project would add 28 miles (135 acres) of short-term disturbance as compared to 1,774 acres of estimated road disturbance in the PA for the existing road system).

Properly maintained roads would be expected to have low levels of erosion unless utilized for hauling under wet conditions. Prior approval from the Authorized Officer would be required for wet season use of rocked roads (generally October 15 – May 15). Hydrologic effects of roads and other disturbance are strongly influenced by landscape condition, road design and construction, and storm history. As discussed in the No Action Alternative, the primary effect of the existing road network is the interception of shallow groundwater flow. Road impacts are dramatically less when drainage ditches have adequate relief culverts, drainage systems, and the road shape is adequate for shedding water. Maintenance activities on the haul routes would diminish these direct impacts from the haul routes.

Hydrologically-connected disturbance from roads, trails, landings, and corridors have the potential for adverse effects, including sedimentation, surface and groundwater dynamics, and changes in flow characteristics (Furniss et al. 2013). Haul routes have been evaluated to determine which road segments may be hydrologically connected to perennial streams.

Of the proposed haul routes, there are 548 stream crossings and of these there are 117 perennial stream crossings. Road maintenance is especially important on the segments that have been identified as being hydrologically connected to surface waters (Hydrologically Connected Haul Routes in the Hydrology and Water Quality Resource Report). Proper road maintenance, BMPs (See Chapter 2.4 BMPs and PDFs) and good project administration should reduce the risk of this source being above background conditions for sediment delivery to surface waters. Any increase in sedimentation associated with the actions described for Alternative 2 are unlikely to be detectable above effects described for the No Action Alternative.

Hauling timber and other vehicle travel to support commercial thinning activities proposed in Alternative 2 would degrade the road surfaces in some locations. One research study found that roads contribute sediment at 7.5 times the rate with heavy traffic (defined as more than four loaded log trucks per day) as days when there is no traffic or little traffic with light vehicles on the weekends (Reid 1981). On aggregate and natural surface roads hauling may create road fines that can be aerosolized into dust or deposited in drainage ditches. When drainage features on roads fail, erosion can be increased by vehicle travel on poorly maintained roads. Both of these activities can cause sediment to be deposited in inside ditches and along roadways, creating sediment sources that can be transported during rain events.

In some areas, small pulses of sediment at stream crossings and hydrologically connected surface disturbances would likely occur during seasonal rain events from area roads. These sediment pulses have the potential to briefly increase turbidity. Intense localized thunderstorms (micro-bursts) may cause more extensive erosion and even debris flows. If an intense storm event happens to occur 1-2 years after treatments, the magnitude of sediment and timber debris would likely be elevated in treated areas relative to untreated areas. The magnitude of increased peak flows due to forest harvest diminishes as peak flows increase in intensity (Jones and Grant 1996).

Roads may have adequate drainage features or they may require maintenance to bring them up to standards (231 miles total). There are 231 miles of existing roads that would receive some level of maintenance under Alternative 2. Typical maintenance may include, but is not limited to: road blading and reshaping; spot rocking and surface replacement; ditch cleaning; cut-bank sluff removal; culvert inlet and outlet clearing; catch basin cleaning; culvert replacement; and removing vegetation (including trees) along roadsides to improve sight distance for travel. PDFs direct vegetation to be cut rather uprooted, up to 5-8 feet from either edge of the road prism.

Restoring drainage features may include: rolling dip structures, building new rolling dip features, installing culverts for cross drains to drain inside ditches, and culverts for crossing surface flow paths. There are some locations were culverts are failing. In some cases they would be replaced; in other cases, they would not be replaced if hauling is still possible. Culvert failure can cause road damage, erosion, and sedimentation (when the culvert is hydrologically connected to perennial water).

Properly functioning ditchlines with adequate water movement and little scour may have brush removed by cutting and not pulled or mechanically cleaned. Mechanical treatment would include using a backhoe, excavator, or road grader to reshape the ditch. Accumulated sediment would be hauled to a stable location not hydrologically connected to the stream system. These maintenance activities would occur in the dry season (October 15 – May 15). Timber hauling during the wet or dry season would be stopped when road surfaces become saturated and extensive rutting and ribboning of the road surface occurs. Haul would continue only after roads dry out (see Chapter 2.4: BMPs and PDFs).

Maintenance activities may include adding cross-drains to inside road ditches to divert surface flow to stable soils and vegetation to re-infiltrate. In some locations sediment basins may be installed to settle out sediment before important stream crossings. Vegetative buffers adjacent to and below units would capture and filter sediment from reaching ditches and/or streams. In areas where ground based activities allowed sediment to reach road drainage ditches, site specific use of PDFs such as placement of sediment detention features would be employed. Any potential increase in sedimentation on a sub-watershed scale is expected to be indistinguishable from background conditions.

Riparian Shade and Stream Temperature
Stream shading reduces radiant energy from solar radiation responsible for increasing stream temperature. Solar radiation is the most important radiant energy source for the heating of streams during daytime conditions and therefore has a strong relationship to seasonal variability of daylight (R. L. Beschta 1988). The primary shade zone is the vegetation that shades the stream during the warmest part of the day (10 am - 2 pm), and therefore most responsible for increases in stream temperature (USDA/USDI 2012a).

A no commercial treatment buffer of 120 feet is expected to fully protect the primary shade zones for trees 100 feet or taller on hillslopes up to 60 percent (USDA/USDI 2012a, p. 29). There may be some minor removal of shade in the zone when UR treatments would occur. This is expected to be minimal and short-term. In addition to shade, temperatures in the area around the stream form a micro-climate zone that can have significantly lower air temperatures than the surrounding forest, important for maintaining stream temperatures. This micro-climate zone has been estimated at 50 feet, this would be protected by no treatment buffers for UR and HFRm as described in the impacts common to both Action Alternatives.

Thinning in the riparian corridors outside of the 120-foot buffer is expected to reduce some shading during cooler parts of the day. However, healthy riparian stands are more likely to successfully withstand disturbance and provide stability and shade to stream systems. Thinning treatments in the secondary shade zone therefore should improve the ability of the riparian stand to provide long-term shade. Effects from thinning in the secondary zone has dramatically less impact to stream temperature than does thinning in the primary zone (USDA/USDI 2012a, p.31). The 120-foot buffer is expected to fully protect the primary shade zone and micro-climate in riparian areas in the PA.

Thinning and UR treatments in Alternative 2 account for 2.4 percent of the riparian reserve on BLM managed lands in the PA. Riparian thinning in the secondary shade zones or the Outer Riparian Zone of the RR is unlikely to result in a measureable change in stream temperatures due to the small amount of treatment proposed and the protection of the primary shade zone.

Wood Recruitment to Stream Channels
Coarse woody debris is important for maintaining the proper function of stream systems in southern Oregon. Coarse wood provides channel complexity, captures sediment, and creates pools and

waterfalls. In addition to oxygenating water, water retention and cycling in and out of the alluvial aquifer cools water and improves water quality. The physical and chemical benefits of coarse wood improve conditions for aquatic life including salmonids. Large coarse woody debris is often more stable and less likely to migrate downstream with flood flows, but moderate and small diameter wood can often provide the same benefits to stream channels.

Coarse wood in streams is primarily recruited through near-stream inputs (e.g. tree mortality and bank erosion) and landslides and debris flows. Empirical studies indicate that 95 percent of total instream wood (from near-stream sources) comes from distances of 82 to 148 feet (ICS 2013).

For near-stream riparian inputs, empirical data and modeling studies suggest that stream wood input rates decline exponentially with distance from the stream and vary by stand type and age (ICS 2013). The Interagency Coordinating Subcommittee (ICS) report compared studies and showed that 90 to 100 percent of the wood recruitment came from within 35 meters of the stream. A no treatment buffer of 120 feet (36.6 meters) would likely retain at least 95 percent of the wood available for recruitment to the stream from stands that have been harvested in the past (ICS 2013, 31). Treatment of old-growth stands is not proposed under any of the Action Alternatives and a 120-foot buffer on perennial streams was selected to protect this wood recruitment zone.

White Creek Deferred Watershed

The White Creek deferred watershed was identified as having high watershed cumulative effects from management activities. Under Alternative 2 there are no treatment units proposed within this watershed. Under Alternative 2 the reconstruction of approximately 1,084 feet of ridge top routes are proposed and approximately 193 feet of new routes, these routes are located on the ridge that separates White Creek watershed from the adjacent Cedar Creek watershed. These routes would be decommissioned after use which follows RMP direction to implement management activities within deferred watersheds so long as the activities are of a limited nature. Hauling is proposed on rocked and surfaced roads and includes specific improvements such as improving the road surfacing and drainage features on BLM Road 38-6-18 (see PDF section). Current conditions on the White Creek Road (BLM 38-6-18.0) include some drainage features that are failing after the crossing on Deer Creek. The drainage through this section of the road are not adequate and have resulted in road and resource damage due to the constriction of flow into only one culvert. The culverts near the intersection of road 38-7-13.4 White Creek East are failing and need to be replaced and drainage features redesigned. The road surface has failed above the crossing on White Creek due to poor drainage features and would need to be repaired before use for hauling. Direct impacts under Alternative 2 would be to improve the drainage features and maintenance of this main road that would reduce indirect impacts to hydrology and water quality to White Creek.

Taylor Creek Key Watershed

The Taylor Creek watershed is listed as a key watershed in the 1995 ROD/RMP. Key watersheds serve as refugia for maintaining and recovering habitat for anadromous salmon and resident fish species. Thinning treatments are proposed within this watershed. There are proposed temporary reconstructed and newly constructed temporary routes proposed within this watershed. This would include about 1,500 feet of reconstruction, 450 feet of operator spur routes, and about 700 feet of new temporary route construction. These temporary routes would be decommissioned after use and therefore there should be no net increase in the amount of roads in this watershed. There are 2.5 miles of haul routes, mostly along the ridgetop, between Taylor Creek and Pickett Creek under both Action Alternatives.

This amount of route construction proposed under Alternative 2 in the headwaters of Taylor Creek is not likely to result in any measurable or quantifiable changes to hydrology or water quality necessary to maintain the habitat values for anadromous salmon and resident fish species downstream.

Cumulative Effects

For this project, it was determined that little to no sedimentation would occur from individual units, landings, and crossings along haul routes. In other words, no measureable sedimentation would occur above natural background levels described for the No Action Alternative. Therefore, water quality measures would not be negatively affected. Some short-term direct and indirect effects to water quality were identified due to pulse increases in sediment and turbidity from road work, generally during the first significant storm event of the wet season. While these effects from sediment could potentially occur, it would still remain within acceptable water quality limits for turbidity, and sediment loads would be difficult to distinguish from background levels.

No treatment buffers, BMPs, and specific associated PDFs identified in Chapter 2.4.2, would result in no direct or long-term sediment input to streams and thus no cumulative effects to water quality. In addition to sediment filtering, the no treatment buffers would also retain trees that contribute to the primary shade zone for streams, and thus would maintain stream temperatures.

The risk of negative effects to water quality from Alternative 2 is low. There would be no changes to current slope stability or risk of slope failure. The potential for periodic slope failures within the range of natural variability would still remain in association with areas exhibiting an historic disposition to soil movement, particularly in the event of a major storm.

Based on the data analyzed, the risk of peak flow enhancement from roads alone would be low. All roads in the PA currently occupy less than 5 percent of the land base. Statistically significant increases in peak flows have been shown to occur only when roads occupy at least 12 percent of the watershed, based on an extensive review of the literature of peak flows in western Oregon (Harr, 1976). Alternative 2 would not increase road densities since all temporary routes would be fully decommissioned after use. However, these same routes could be used as part of a reciprocal right-of-way agreements, but it is assumed this would be off-set by decommissioning in other locations. Landings constructed in new disturbance would be rehabilitated, therefore no increase in ECA or road densities, and no perceptible increase in peak flows would be expected.

For this project, it was determined that no cumulatively measurable or significant alterations to the hydrologic function or quality of waters in the Lower Applegate watershed or Hellgate Canyon-Rogue River tributaries to Rouge River Basin, and Deer Creek watershed tributary to the Illinois Subbasin would occur.

Alternative 3

Alternative 3 was developed in response to public comments received during the scoping period. Specific elements include no new temporary route construction, no commercial treatments within Riparian Reserves, and northern spotted owl treat and maintain prescriptions within their critical habitat.

Direct and Indirect Effects

There would be 1,038 acre of commercial treatment purposed within the Outer Riparian Zone under Action Alternatives 2, but not under Alternative 3, due to no harvest in the Outer Riparian Zone. There is no difference in the acreage anticipated for Understory Reduction (UR) or Hazardous Fuels Reduction maintenance (HFRm). Under Alternative 3 there are 1,028 acres of restoration thinning (RT) and 3,185 acres of Density Management (DM). In general, this change in prescription for these acres result in more canopy after the treatment and less harvest. This will be coupled with 21 inch diameter restriction.

The siviculture analysis indicates that the ability to manage species and structure diversity would be reduced with the 21 inch diameter restriction and stands are likely to be more homogenous and some stands would not be treated at all. Although direct impacts from the change and prescription and the diameter change are difficult to quantify for hydrology and water quality, overall forest health is not likely to improve as much under Alternative 3 as compared to Alternative 2, and therefore it may result in less resiliency to future disturbance. However, since less trees are harvested and maybe less units overall a reduction in direct and indirect impacts from yarding and hauling would be anticipated.

No commercial thinning would occur in the Outer Riparian Zone under Alternative 3. The higher risk for disturbance is based on the assumption that the treated stands would be more resilient and resistant to future disturbance as compared to untreated stands. Less resilient stands are likely to have more long-term indirect impacts on hydrology and water quality due to the propensity for more complete and severe wild fire and disease outbreaks. Understory reduction and fuel maintenance treatments would still be expected to provide some benefits to riparian stands.

No commercial thinning in the Outer Riparian Zone would extend the vegetative buffer between streams and treatment. This may improve infiltration and filtering of surface waters. There is no specific scientific literature that has identified a measurable difference for no-treatment buffers at these distances. It is likely that 120 feet may be just as effective as 190 feet. No improvement in wood recruitment or stream temperatures should be expected from Alternative 3 since the 120-foot applied under Alternative 2 should be fully protective of the primary shade zone and would protect nearly all the potential wood recruitment to stream channels.

There may be some additional wood recruitment and solar radiation on intermittent stream channels. But there is no scientific literature that has shown a definitive connection between increased temperatures in intermittent streams and downstream impacts to perennial streams. Intermittent streams likely benefit from wood recruitment reducing sediment production from these streams, thus sediment production from intermittent streams may decrease somewhat from Alternative 2.

There is no commercial harvesting proposed in White Creek under either Action Alternative. However, under Alternative 2 the road network would be used to haul timber harvested from the adjacent sub-watershed. This would result in road maintenance activities that would not occur under Alternative 3, since the haul routes would not be used.

No direct or indirect impacts were identified under Alternative 2 for the Key Watershed Taylor Creek. In general, Alternative 3 would not construct some of the new temporary routes and operator spurs proposed under Alternative 2, but would still implement the forest management treatments. These proposed spurs and routes are on ridgetops and are not expected to result in measurable impacts under Alternative 2, therefore the forgoing of these routes is not expected to lessen impacts under Alternative 3. There are 2.5 miles of existing haul routes mostly along the ridgetop between Taylor Creek and Pickett Creek under both Action Alternatives. Temporary routes would be decommissioned after use and therefore there should be no net increase in the amount of roads in this watershed.

There would be 383 acres less of conventional ground based harvesting, 831 acres less of tether assist, and 723 acres less of cable yarding under Alternative. Helicopter yarding would increase by 899 acres as the other methods of yarding methods decrease. Helicopter yarding has the least impacts on hydrology and water quality as compared to the other yarding methods due to not needing to yard the logs along the ground. In some cases helicopter yarding may have some assistance from ground-based equipment in cutting and yarding logs, but this is a subset of the units and only ones that have access and slopes that would accommodate this mechanical equipment.

Alternative 3 would have more tractor-swing routes compared to temporary haul routes (5 miles in Alternative 2 and 11 miles in Alternative 3). While tractor swing routes have a smaller footprint on the landscape than newly constructed temporary routes, soil within these tractor swing routes may experience greater displacement due to the dragging of a single end of a log or group of logs. Project design features such as securing exposed soil prior to rain events would prevent sediment from mobilizing offsite. Tractor swing routes and temporary routes would be fully decommissioned following use and are expected to leave a smaller footprint on the landscape

Haul routes in White Creek a deferred watershed would not be used under Alternative 3 and would reduce the crossings by 10 as compared to Alternative 2. No maintenance would be done on these haul routes, the current condition of roads in White Creek is poor. There are many instances of failing drainage systems and poor surfacing. These would be repaired under Alternative 2 as part of normal maintenance. Due to the poor condition of these roads an increase in sedimentation and runoff could be expected under Alternative 3 for White Creek. The magnitude of this increase is nearly impossible to quantify and maintenance actions could still be accomplished by deferred maintenance or under another project.

No new permanent roads would be built and all temporary routes would be fully decommissioned after use, therefore there would be no increase in road density under Alternative 3 after implementation. Impacts from non-commercial forest management treatments would be identical.

Effects from harvest operations to both soil and water resources would be similar with lower acres of treatment and less use of the road system for timber hauling under Alternative 3 as compared to Alternative 2.

Cumulative Effects

Cumulative effects would be similar to those described for the No Action Alternative and Action Alternative 2. There would be fewer acres of commercial thinning under Alternative 3 as compared to Alternative 2 (4,213 acres compared to 5,251 acres), mainly due to not thinning the Outer Riparian Zone (See Table 2-2: Action Alternative Totals). The change in commercial treatment acres is not likely to result in a difference in cumulative effects at a watershed scale since the minimum canopy cover is 30 percent for all commercial treatments. Changes in harvest systems would result in different site specific impacts, but are generally less then what was analyzed in Alternative 2. There would be slightly less disturbance to soils and water resources and a higher potential risk for catastrophic disturbance in the Outer Riparian Zone (wildfire, insects and/or disease) in addition to the effects described for the No Action Alternative.

3.6 Fisheries

Methodology

- The fisheries analysis utilized data regarding distribution and fish presence/absence from Oregon Department of Fish and Wildlife, BLM Aquatic Resource Information Management System, and StreamNet.

- GIS was utilized to determine the distance from the proposed treatment units to fish bearing streams.

- Critical habitat was designated in the Federal Register and is the best available information.

- It is assumed that paved roads do not contribute sediment to streams.

- Coho critical habitat and Essential Fish Habitat are not going to be degraded due to the application of Inner and Outer Zone stream buffers, PDFs, and BMPs.

Assumption

- Fish distribution and presence/absence data from ODFW, BLM ARIMS, and StreamNet is the best and most current available data.

3.6.1 Affected Environment

The scale of the analysis for the PA totals 203,459 acres (~139 square miles) and includes portions of the Deer Creek, Gold Hill-Rogue River, Grave Creek, Hellgate Canyon-Rogue River, Lower Applegate, and Sucker Creek Watershed. The area provides habitat for special status species, including Southern Oregon/Northern California Coasts Coho (SONCC) Salmon (*Oncorhynchus kisutch*); Klamath Mountains Province (KMP) Steelhead (*Oncorhynchus mykiss*); Southern Oregon Coast and Northern California Coast Chinook (*Oncorhynchus tshawytscha*), and Pacific Lamprey (*Entosphenus tridentatus*). In addition, resident Coastal Cutthroat Trout (*Oncorhynchus clarki*) are present in streams of the PA (Table 3.7-1). Non-game species such as speckled dace, sculpin, and redside shiner also inhabit streams in the watersheds listed above.

Streams in the watersheds are stocked with hatchery fish from the Cole Rivers Hatchery. This hatchery is operated by the Army Corps of Engineers as mitigation for habitat loss due to the construction of Lost Creek and Applegate Dam. This hatchery is responsible for the rearing and releasing of spring Chinook salmon, winter steelhead, summer steelhead, coho salmon, and rainbow trout. Also, Lake Selmac supports a warm water and cold water recreational fishery. Hatchery trout supplement the fishery and bass were introduced in the 1960's. Information on current fish distribution includes historical surveys, Oregon Department of Fish and Wildlife (ODFW) Aquatic Inventory observations, StreamNet, and the Cheney/Slate (USDI 1996), Deer Creek (USDI 1997), Grave Creek (USDI 1999a), Rogue-Grants Pass (USDI 1998b), Rogue-Recreation Section (USDI 1999b) Murphy (USDI 2000), and Sucker Creek Watershed Analysis (USDI 2007a).

Table 3.6-1 Fish-bearing streams within the Pickett West PA

HUC 10	Stream name	Fish Species
Deer Creek	Clear Creek	SONCC Coho, KMP Steelhead, Cutthroat Trout
	Crooks Creek	SONCC Coho, KMP Steelhead, Cutthroat Trout
	Deer Creek	SONCC Chinook, SONC Coho, KMP Steelhead, Cutthroat Trout
	Haven Creek	KMP Steelhead, Cutthroat Trout
	Thompson Creek	SONCC Coho, KMP Steelhead, Cutthroat Trout
	Ryan Creek	Cutthroat Trout
	Quedo Creek	Cutthroat Trout
	McMullin Creek	Cutthroat Trout

HUC 10	Stream name	Fish Species
	Rogue River	SONCC Chinook, SONCC Coho, KMP Steelhead, Cutthroat Trout
Hellgate Canyon-Rogue River	Stratton Creek	KMP Steelhead, Cutthroat Trout
	Little Stratton Creek	Cutthroat Trout
	Hog Creek	KMP Steelhead, Cutthroat Trout
	Little Pickett Creek	Cutthroat Trout
	Pickett Creek	SONCC Coho, KMP Steelhead, Cutthroat Trout
	Blue Gulch	Cutthroat Trout
	Dutcher Creek	SONCC Coho, KMP Steelhead, Cutthroat Trout
	Applegate River	SONCC Chinook, SONCC Coho, KMP Steelhead, Cutthroat Trout
Lower Applegate River	Waters Creek	SONCC Chinook, SONCC Coho, KMP Steelhead, Cutthroat Trout
	Slate Creek	SONCC Coho, KMP Steelhead, Cutthroat Trout
	Elliot Creek	SONCC Coho, KMP Steelhead, Cutthroat Trout
	Cheney Creek	SONCC Coho, KMP Steelhead, Cutthroat Trout
	Miller Creek	KMP Steelhead, Cutthroat Trout
	Caris Creek	KMP Steelhead, Cutthroat Trout
	Jackson Creek	SONCC Coho, KMP Steelhead, Cutthroat Trout

Federally Threatened Fish Species

Salmon are listed under the Endangered Species Act (ESA) by evolutionarily significant units (ESU). An ESU is a stock of Pacific salmon that is 1) substantially reproductively isolated from other specific populations units, and 2) represents an important component in the evolutionary legacy of the species. The northernmost extent of the federally listed threatened SONCC Coho Salmon is the Rogue Basin. See Table 3.6-2 below for a list of treatment units and their proximity to fish bearing and Coho Critical Habitat (CCH).

Southern Oregon/Northern California Coast Coho

On June 28, 2005, the National Oceanic and Atmospheric Administration (NOAA) Fisheries Service published a final determination to retain SONCC Coho Salmon as a threatened species under ESA (Federal Register Vol. 70, No. 123). Designation of Critical Habitat became effective on May 5, 1999 (Federal Register Vol. 64, No. 86). SONCC Coho Salmon are present throughout the PA and in proximity to proposed units and haul routes, Table 3.7-2.

Table 3.6-2 Distance from Proposed Treatment Units to Fish Bearing Streams and CH

HUC 10	Stream name	Units in Proximity	Range to Fish Bearing Stream	Range to Coho Critical Habitat
	Clear Creek	35-3, 35-4	222-873 feet	222-873 feet

HUC 10	**Stream name**	**Units in Proximity**	**Range to Fish Bearing Stream**	**Range to Coho Critical Habitat**
Deer Creek	Crooks Creek	3-6, 3-7, 33-4, 33-5, 33-6, 33-7, 33-8 34-2, 34-3	120 feet - 1.2 miles	120 feet - 1.2 miles
	Deer Creek	3-5, 3-8, 11-1, 11-3, 11-7, 11-9, 13-3, 13-4, 14-1, 14-2, 17-2, 23-3, 23-4, 23-5,	734 feet - 1.9 miles	734 feet - 1.9 miles
	Haven Creek	26-4, 35-9, 35-10, 35-11	487 feet - 0.6 miles	487 feet - 0.6 mile
	Thompson Creek	3-9, 3-10, 3-11, 4-1, 9-5,26-1, 26-2, 26-3, 31-11	698 feet-1.7 miles	698 feet-1.7 miles
	Quedo Creek	13-4	343 feet	See Deer Creek
	McMullin Creek	9-5, 31-11	1.4 miles-2.7 miles	See Thompson Creek
Hellgate Canyon-Rogue River	Rogue River	3-1, 3-4, 7-1, 7-2, 9-1, 9-2, 9-3, 10-1, 15-1, 15-2, 19-1, 20-1, 21-1, 22-1, 22-2, 22-3, 29-2, 29-3, 31-1, 31-2, 31-3,	120 feet-2.0 miles	876 feet-2.0 miles
	Stratton Creek	5-1, 5-2, 5-3, 21-2, 27-2, 29-1, 33-1	120 feet-0.6 miles	120 feet-1.9 miles
	Little Stratton Creek	27-2	0.5 miles	See Stratton Creek
	Hog Creek	1-1, 3-2, 11-5	120 feet-0.9 miles	120 feet-1.1 miles
	Little Pickett Creek	22-2, 22-3	1.5 miles	See Rogue River

HUC 10	Stream name	Units in Proximity	Range to Fish Bearing Stream	Range to Coho Critical Habitat
	Pickett Creek	3-3, 20-2, 27-1, 27-3, 29-4, 29-5, 30-1, 30-2, 31-4, 31-5, 31-6, 31-7, 31-8, 31-9, 33-2, 33-3,	120 feet-1.8 miles	120 feet-2.0 miles
	Blue Gulch	23-1, 27-7, 27-8	120 feet-0.6 miles	See Dutcher Creek
	Dutcher Creek	23-1, 27-5, 27-6, 27-7, 27-8, 27-9,	900 feet-1,990 feet	900 feet-1.4 miles
	Madams Creek	35-1, 35-2	1.6 miles-1.9 miles	1.6 miles-1.9 miles
Lower Applegate River	Applegate River	15-11, 20-4, 23-6, 26-7	494 feet-1.1 miles	494 feet-1.1 miles
	Waters Creek	5-4	1,274 feet	1,274 feet
	Slate Creek	9-4, 15-3, 15-4	120 feet-2,825 feet	120 feet-2,825 feet
	Elliot Creek	15-5, 15-6, 15-7, 21-4, 22-4	241 feet-2,165 feet	241 feet-0.9 mile
	Cheney Creek	7-3, 7-5, 13-1, 23-2	260 feet-0.4 mile	260 feet-0.4 mile
	Miller Creek	13-7, 13-8, 23-7, 23-8	0.9 mile-1.7 miles	0.9 mile-1.7 miles
	Caris Creek	17-5, 20-5, 21-13	0.6 mile-1.3 miles	0.6 mile-1.3 miles
	Jackson Creek	21-6, 21-7	120 feet	120 feet
	Miners Creek	13-9, 18-1	1.7 mile-1.8 mile	1.7 mile-1.8 mile
	Oscar Creek	14-5	2.2 miles	2.2 miles
	Bull Creek	17-1	1,929 feet	1,929 feet

Bureau Sensitive Species

KMP Steelhead and SONCC Chinook are both Bureau Sensitive Species and listed as Sensitive Species by the State of Oregon. KMP Steelhead are located throughout the Deer Creek, Hellgate Canyon-Rogue River, and Lower Applegate watershed with habitat preferences similar to those of other salmonids. KMP Steelhead tend to occupy streams with higher gradients than do SONCC Coho Salmon, and their distribution is similar to resident cutthroat trout, where access is not blocked by manmade or natural barriers. SONCC Chinook are found in the Deer Creek, Rogue River, and

Applegate River mainstems within the PA. Pacific lamprey use many of the tributaries of the three watersheds within the PA and their distribution overlaps with coho and steelhead habitat.

Aquatic Habitat, Coho Critical Habitat, and Essential Fish Habitat

Spawning substrate

The availability of spawning substrate is an important factor in fish productivity. The quality of spawning habitat varies according to the amount and quality of the spawning substrate. Gravel and small cobble substrate that is relatively free from embedded fine sediment provides ideal spawning substrate for resident and anadromous salmonids (Bell, Fisheries Handbook of Engineering Requirements and Biological Criteria 3rd ed. 1990). During incubation of eggs and alevins, survival and emergence rates can be reduced when sediment exceeds 15 percent of the area (Bjornn 1991).

According to ODFW Aquatic Habitat Inventory Surveys, sand, and fine organics made up a substantial portion of riffle units, as illustrated in Table 3.7-3. There was an average of 21.4 percent of riffles comprised of sand and fines with a range from 2.0 to 47.0 percent. The percentage of spawning gravel within the PA was moderate. Gravel substrate made up an average of 32.1 percent of riffle units, ranging from 13 to 55 percent.

Table 3.6-3 Selected Habitat Index Values for Streams in the Pickett West Project

Hydrologic Unit Code 10	Stream Name	Percent Sand and Organics	Percent Gravel	Percent Pool Habitat	Average Key Pieces* (per 100m)
Deer Creek	McMullin Creek Reach 1	14.0	45.0	16.3	NA
	Crooks Creek Reach 1	NA	NA	NA	NA
	Crooks Creek Reach 2	NA	NA	NA	NA
	Crooks Creek Reach 3	NA	NA	NA	NA
	Deer Creek Reach 1	6.0	13.0	30.3	0.6
	Deer Creek Reach 2	2.0	23.0	34.2	3.3
	Deer Creek Reach 3	6.0	20.0	0.0	0.0
	Deer Creek Reach 4	6.0	44.0	20.7	2.7
	Deer Creek Reach 5	11.0	49.0	22.8	5.7
	Deer Creek Reach 6	5.0	47.0	13.9	1.2
	Deer Creek Reach 7	7.0	26.0	1.4	1.1
	Deer Creek Reach 8	5.0	42.0	3.5	8.8
	Deer Creek Reach 9	10.0	33.0	0.8	45.9
	Deer Creek Subtotals	7.2	34.2	14.4	7.7
Hellgate Canyon-Rogue River	Little Stratton Creek Reach 1	11.0	55.0	5.1	0.8
	Pickett Creek Reach 1	13.0	19.0	39.0	0.2

Hydrologic Unit Code 10	Stream Name	Percent Sand and Organics	Percent Gravel	Percent Pool Habitat	Average Key Pieces* (per 100m)
	Pickett Creek Reach 2	11.0	23.0	31.9	0.4
	Pickett Creek Reach 3	18.0	25.0	12.9	1.9
	Stratton Creek Reach 1	23.0	24.0	8.9	1.4
	Stratton Creek Reach 2	47.0	34.0	12.8	2.7
	Hog Creek Reach 1	17.0	27.0	13.7	1.6
	Hog Creek Reach 2	23.0	30.0	9.3	0.8
	Hog Creek Reach 3	34.0	39.0	8.9	3.1
	Hellgate Canyon-Rogue River Creek Subtotals	21.9	27.6	14.3	1.3
Lower Applegate River	Waters Creek Reach 1	17.0	30.0	20.8	0.0
	Waters Creek Reach 2	11.0	29.0	21.4	0.2
	Slate Creek Reach 1	31.0	35.0	31.3	1.3
	Slate Creek Reach 2	15.0	28.0	64.3	0.1
	Slate Creek Reach 3	9.0	21.0	33.7	0.3
	Slate Creek Reach 4	12.0	21.0	21.3	0.2
	Elliot Creek Reach 1	21.0	40.0	15.5	0.3
	Elliot Creek Reach 2	25.0	40.0	16.9	0.5
	Elliot Creek Reach 3	25.0	33.0	4.3	0.9
	Cheney Creek Reach 1	0.0	42.0	23.6	NA
	Cheney Creek Reach 2	0.0	52.0	29.7	NA
	Cheney Creek Reach 3	0.0	44.0	22.3	NA
	Oscar Creek Reach 1	20.0	40.0	6.8	0.0
	Oscar Creek Reach 2	40.0	20.0	7.9	0.6
	Bull Creek Reach 1	32.0	40.0	12.4	0.8
	Jackson Creek Reach 1	8.0	28.0	5.6	0.8
	Jackson Creek Reach 2	18.0	43.0	12.1	1.7
	Lower Applegate Creek Subtotals	35.0	34.5	20.6	0.6
Average for the planning area		**21.4**	**32.1**	**16.4**	**3.2**

**Key pieces of large woody debris are pieces with a minimum diameter of 60 centimeters and a minimum length of 10 meters. These pieces are dead or dying trees, either natural or cut, occurring within the stream channel. Key pieces are typically the anchor pieces around which other material is deposited and trapped.*

Pool quality

Pools are important habitat features for juvenile rearing during summer months, when lower water levels and higher stream temperatures add to stress, and during high flow events when off-channel habitat provides refuge. Salmonids are typically larger in size and found in greater numbers in deeper pool habitats (Rosenfeld et al 2000). Surveyed stream reaches (see Table 3.6-3) had an average of 16.4 percent pool habitat by area, and an average 3.2 key pieces per 100 meters of stream.

Large Woody Debris

Large woody debris refers to all pieces of wood at least 15 centimeters in diameter and 3.0 meters in length, and larger, including all rootwads. These pieces are found at least partially within the stream's active channel and are both natural or cut dead and dying trees. Large woody debris is important in the formation of deep scour pools and off-channel habitat, and retention of gravel substrate (Bilby and Ward 1989). The pools and off-channel habitat provide refuge for salmonids during high flow events and reserves of cool water during low flow months when water temperatures may become elevated (Swanston 1991).

Stream channels in the PA have low levels of large woody debris and key pieces. On average, there are 3.2 key pieces per 100 meters of stream. Foster et al. (2001) describe key pieces as those greater than 10 meters in length and 60 centimeters in diameter.

Habitat Access

There are nine road culverts within the Deer Creek Watershed that restrict passage of juvenile salmonids. They include; South Fork Deer Creek, South Fork Deer Creek (Tributary #2), South Fork Deer Creek (Tributary #1), White Creek #1, White Creek #2, Thompson Creek (Tributary #1), Thompson Creek (Tributary #2), Draper Creek #2, and Draper Creek #3.

Grave Creek Watershed contains eighteen culverts that restrict coho, steelhead, resident, or juvenile passage. They include multiple barriers on the following streams; Grave Creek, Rock Creek, Wolf Creek, Bummer Gulch, Clark Creek, Boulder Creek, Baker Creek, Slate Creek, Big Boulder Creek, and Last Chance Creek

The Murphy Watershed Analysis lists numerous barriers within the Lower Applegate HUC 10. Barriers are listed on Applegate River, Murphy Creek, Board Shanty Creek, Caris Creek, Oscar Creek, Onion Creek, Miners Creek, Miller Creek, and Rocky Creek.

The Hellgate Canyon-Rogue River Watershed contains four significant barriers to fish passage. Hog Creek, Stratton Creek, Upper Stratton Creek, and Pickett Creek Tributary have passage issues for anadromous and juvenile passage.

Within the Sucker Creek Watershed, BLM conducted a culvert inventory in 2002 on BLM land. Three passage barriers are listed on Bear Creek, and one barrier on Little Bear Creek. The BLM replaced one culvert on Bear Creek and one on Little Grayback Creek with bottomless structures to improve fish passage in 1999 and 2003 respectively.

The McMullin Creek drainage does not contain anadromous fish. Lake Selmac was created for irrigation and recreational purposes, and the dam impounding it blocks all upstream fish migration. Coho habitat is abundant above the dam and would be used for coho spawning if passage past the dam were possible. Although habitat upstream of manmade barriers usually meets the current definition of Coho Critical Habitat (CH), the final rule (CFR 50, Part 226.210) regarding SONCC Designated CH establishes that the Lake Selmac Dam is the upstream extent of CH.

Coho Critical Habitat
As previously discussed, CH for SONCC Coho salmon was designated in the Federal Register (Federal Register 1999). CH is found adjacent to 15 units (3-6, 5-1, 5-2, 5-3, 11-5, 27-3, 28-2, 28-4, 28-5, 27-3, 33-3, 23-1, 9-4, 21-6, and 21-7) at an average of 120 feet in Crooks Creek, Stratton Creek, Hog Creek, Pickett Creek, Panther Gulch, Dutcher Creek, Slate Creek, and Jackson Creek. All other units are found further away from CH. See Table 3.6-2 Distance From Proposed Treatment Units to Fish Bearing Streams and CH.

Essential Fish Habitat
Streams and habitat currently or historically accessible to Chinook and coho salmon are considered Essential Fish Habitat (EFH), designated for fish species of commercial importance by the Magnuson-Stevens Fishery Conservation and Management Act of 1996 50 CFR, Part 600, Subsection J, EFH.

Streams within the PA designated as EFH include Deer Creek, Clear Creek, Crooks Creek, Thompson Creek, Haven Creek, Rogue River, Stratton Creek, Hog Creek, Pickett Creek, Slate Creek, Elliot Creek, Cheney Creek, Jackson Creek, Applegate River, Miller Creek, Miners Creek, Caris Creek, and other streams accessible to coho and Chinook salmon.

3.6.2 Environmental Effects

<u>Alternative 1 – No Action</u>

Direct and Indirect Effects

Under the No Action Alternative, there would be no vegetation treatments or associated activities within the PA. There would be no road maintenance, route renovation, or route construction associated with harvest.

Cumulative Effects

Within the PA other projects that would be anticipated to occur including other vegetation management projects such as timber sales, and fuel reduction projects, along with mining plans of operations, instream or riparian restoration projects, and miscellaneous projects.

Vegetation management projects and/or timber sales include: HF/YSM, Brimstone Fire and Timber Salvage, Cheney Slate Timber Sale, Medford District Insect and Disease Mortality Salvage for Safety Categorical Exclusion, Private Industrial Forest Lands, and East West Junction Timber Sale. These projects are BLM approved projects and would follow all provisions of the Clean Water Act (40 CFR Subchapter D) and Department of Environmental Quality's (DEQ's) provisions for maintenance of water quality standards. These projects would; apply riparian reserve buffers when in proximity to streams and CH, and apply PDFs and BMPs such as ones that minimize ground disturbance within the Riparian Reserves, don't allow fording of live streams with heavy equipment, limit expansions of landings or new landings within Riparian Reserves, minimize shade removal and sediment inputs, and maintain levels of large woody debris in order to minimize effects to listed species and their habitat. Projects associated with private lands would comply with Oregon Forest Practices that are designed to protect aquatic resources.

Mining activity projects within the PA include: Crooks Creek and Limestone Caves Mineral Withdraw, Section 13 Mining Plan of operation, and Stray Dog Mining Plan of Operation. These projects contain BMPs, PDFs, or Conditions of Approval that minimize shade removal, sediment inputs, or loss of large woody debris in order to minimize effects to listed species and their habitat. In-stream Restoration Projects such as Waters Creek In-stream Restoration Project contain BMPs, PDFs, and permits through various agencies, which allow for short-term impacts to enhance degraded coho critical habitat.

Miscellaneous projects include projects such as: California Oregon Broadcasting Inc. right-of-way, Recreational Activities, Medford District Road and Pump Chance Routine Maintenance Categorical Exclusion, Applegate Ridge Trail System, Reciprocal right-of-way Permits, and Special Recreation Management Areas from the 2016 ROD/RMP. These type of projects would either be located outside Riparian Reserves so that the effect to listed species would be negligible or contain BMPs and PDFs that minimize effects to listed species and their habitat. Road maintenance activities that benefit hydrologic function within the PA will also benefit habitat for fish and aquatic species.

Under the No Action Alternative, there would be no project-related road maintenance activities. Road maintenance activities improve the function of system roads and decrease non-point source pollution that may emanate from unmaintained roads. Thus, under the No Action Alternative, there would be no decrease to non-point source pollution within the PA associated with project activities. Additionally, under the No Action Alternative, Riparian Thinning would not occur, thus there would be no benefit to ACS objectives or aquatic species associated with this Alternative (for more information on ACS, see Appendix C). Therefore, this project is not anticipated to cumulatively effect fish species and habitat within the Pickett West PA.

<u>Alternative 2</u>

Direct and Indirect Effects

Federally Threatened Fish Species

Stand treatments, yarding, landing construction and rehabilitation, temporary route construction and reconstruction (including route decommissioning), road maintenance, hauling, and activity fuel treatments would have no effect on SONCC Coho Salmon (ESA-Threatened) and CH. For the Pickett West project PA, the closest CH (Crooks Creek, Stratton Creek, Hog Creek, Pickett Creek, Panther Gulch, Dutcher Creek, Slate Creek, and Jackson Creek) is approximately 120 feet from the closest treatment units (3-6, 5-1, 5-2, 5-3, 11-5, 27-3, 28-2, 28-4, 28-5, 27-3, 33-3, 23-1, 9-4, 21-6, and 21-7). These treatment units would have Riparian Reserves of 190 feet for non-fishbearing and 380 for fish bearing streams.

The Pickett West PA haul road segments and road related activities intersect 22 streams segments containing CH. Since seven crossings occur on bituminous (paved) surface type, they are dropped from further analysis because erosion from paved roads is not expected. These 15 road segments represent bridges and/or culverts on CH streams. All roads listed in Table 3.7-4 cross each stream once except for Stratton Creek which is crossed five times by the 35-7-4.2 road. Sediment would not be expected to enter CH as a result of haul or maintenance of haul roads, with dry condition haul, properly functioning cross drains, and sediment barriers installed, where needed, to prevent sediment delivery into CH. Project activities would follow all provisions of the Clean Water Act (40 CFR Subchapter D) and Department of Environmental Quality's (DEQ's) provisions for maintenance of water quality standards.

Table 3.6-4 Critical Habitat Crossings within the Pickett West Planning Area

Structure #	Road #	Creek	HUC 10	Road Surface
1	35-7-27.0	Panther Gulch	Hellgate Canyon-Rogue River	Bituminous
2	38-7-27.0	Thompson Creek	Deer Creek	Bituminous
3	38-7-34.0	Haven Creek	Deer Creek	Bituminous
4	38-6-18.0	Deer Creek	Deer Creek	Bituminous
5	37-7-34.0	Crooks Creek	Deer Creek	Bituminous
6	38-7-3.0	Crooks Creek	Deer Creek	Aggregate
7	39-7-21.0	Bear Creek	Sucker Creek	Bituminous
8	35-7-33.1	Pickett Creek Tributary 1	Hellgate Canyon-Rogue River	Aggregate
9	35-7-27.1	Pickett Creek	Hellgate Canyon-Rogue River	Aggregate
10	34-7-3.0	Butte Creek	Grave Creek	Aggregate

Structure #	Road #	Creek	HUC 10	Road Surface
11	34-7-3.0	Grave Creek	Grave Creek	Aggregate
12	36-7-22.0	Dutcher Creek	Hellgate Canyon-Rogue River	Natural
13	37-7-10.0	Slate Creek	Lower Applegate River	Aggregate
14	37-4-4.1	Birdseye Creek	Gold Hill-Rogue River	Aggregate
15	37-7-13.0	Cheney Creek	Lower Applegate River	Aggregate
16	35-7-4.2	Stratton Creek	Hellgate Canyon-Rogue River	Aggregate
17	35-7-11.1	Hog Creek	Hellgate Canyon-Rogue River	Aggregate
18	35-7-4.2	Stratton Creek	Hellgate Canyon-Rogue River	Aggregate
19	35-7-4.2	Stratton Creek	Hellgate Canyon-Rogue River	Aggregate
20	35-7-4.2	Stratton Creek	Hellgate Canyon-Rogue River	Aggregate
21	35-7-4.2	Stratton Creek	Hellgate Canyon-Rogue River	Aggregate
22	38-6-18.0	White Creek	Deer Creek	Bituminous

Bureau Special Status/Sensitive Species (SSS)

KMP Steelhead, SONCC Chinook, and Pacific Lamprey are within Deer Creek, Gold Hill-Rogue River, Grave Creek, Hellgate Canyon-Rogue River, Lower Applegate, and Sucker Creek HUC 10 Watershed. KMP Steelhead, SONCC Chinook, and Pacific Lamprey habitats are contained within the CH analyzed for SONCC coho salmon. SSS in the Pickett West PA are approximately 120 feet from the closest treatment units (3-6, 5-1, 5-2, 5-3, 11-5, 27-3, 28-2, 28-4, 28-5, 27-3, 33-3, 23-1, 9-4, 21-6, and 21-7). These treatment units would have Riparian Reserves of 190 feet for non-fishbearing and 380 for fish bearing streams. The Pickett West PA haul road segments and road related activities intersect 15 streams containing SSS. These 15 road segments represent bridges and/or culverts on SSS streams.

Treatment units, yarding, landing construction and rehabilitation, temporary route construction and reconstruction (including route decommissioning), road maintenance, hauling, and activity fuel treatments would have no effect on KMP steelhead, SONCC Chinook, Pacific Lamprey. Sediment would not be expected to enter SSS habitat as a result of haul or maintenance of haul roads, with dry condition haul, properly functioning cross drains, and sediment barriers installed, where needed, to prevent sediment delivery into SSS streams. Project activities would follow all provisions of the Clean Water Act (40 CFR Subchapter D) and Department of Environmental Quality's (DEQ's) provisions for maintenance of water quality standards. Fish species are listed as special status species by ESUs. See the Federally Threatened Fish Species section above for the definition of ESUs.

Aquatic Habitat, Coho Critical Habitat, and Essential Fish Habitat

Spawning substrate
Stream substrate is likely to be similar to the description within the Affected Environment because the proposed activities would occur outside of the no treatment Inner Riparian zone and BMPs and PDFs in upslope areas and along haul routes would greatly reduce the likelihood of harvest related sediment entering spawning substrate.

Pool quality
Pool quality would not be effected by proposed harvest and road related activities. Activities would occur outside of Inner Riparian zones and Best Management Practices and Project Design Features in upslope areas and along haul routes would greatly reduce the likelihood of harvest related sediment affecting pool quality.

Large Woody Debris
Fish bearing streams would receive a 120 foot buffer on either side of the stream, or 50 feet on non-fish bearing streams. These buffers would be sufficient to keep large wood at current levels. As a result, there would be no probability of an effect to Large Woody material as a result of proposed harvest and road related activities.

Habitat access
Habitat access would remain unaltered under Alternative 2 and 3. Fish passage culverts or bridges are not proposed to be replaced or upgraded under this project.

Critical Habitat
See Federally-Threatened Species above for a discussion on CH.

Essential Fish Habitat
Treatment units, yarding, landing construction and rehabilitation, temporary route construction and reconstruction (including route decommissioning), road maintenance, hauling, and activity fuel treatments would not adversely affect coho and Chinook salmon EFH. EFH in the Pickett West PA is approximately 120 feet from the closest treatment units (3-6, 5-1, 5-2, 5-3, 11-5, 27-3, 28-2, 28-4, 28-5, 27-3, 33-3, 23-1, 9-4, 21-6, and 21-7). These treatment units would have Riparian Reserve buffers averaging 380 feet. The Pickett West PA haul road segments and road related activities intersect 15 streams at various locations containing EFH. These 15 road segments represent bridges and/or culverts on EFH streams. Sediment would not be expected to enter EFH as a result of haul or maintenance of haul roads, with dry condition haul, properly functioning cross drains, and sediment barriers installed, where needed, to prevent sediment delivery into EFH. Project activities would

follow all provisions of the Clean Water Act (40 CFR Subchapter D) and Department of Environmental Quality's (DEQ's) provisions for maintenance of water quality standards.

Cumulative Effects

Within the PA other projects that would be anticipated to occur including other vegetation management projects such as timber sales, and fuel reduction projects, along with mining plans of operations, instream or riparian restoration projects, and miscellaneous projects.

Vegetation management projects and/or timber sales include: Hazardous fuels/Young stand management, Cheney Slate Timber Sale, Medford District Insect and Disease Mortality Salvage for Safety Categorical Exclusion, Private Industrial Forest Lands, and East West Junction Timber Sale. These projects are BLM approved projects and would follow all provisions of the Clean Water Act (40 CFR Subchapter D) and Department of Environmental Quality's (DEQ's) provisions for maintenance of water quality standards. These projects would; apply riparian reserve buffers when in proximity to streams and Critical Habitat, and apply PDFs and BMPs such as ones that minimize ground disturbance within the Riparian Reserves, don't allow fording of live streams with heavy equipment, limit expansions of landings or new landings within Riparian Reserves, minimize shade removal and sediment inputs, and maintain levels of large woody debris in order to minimize effects to listed species and their habitat.

Foreseeable private harvest occurring within the PA would comply with Oregon Forest Practices Act. The BLM does not regulate harvest on private land. The requirements of the Oregon Forest Practices Act are intended to protect fish, wildlife, and water quality when forest management activities occur near waters of the state and within riparian management areas (ODA 2016, p. 10). There are expected to be no cumulative impacts to waters of state and aquatic resource because BLM actions and private land harvest are implemented under state and federal laws and regulations. While the BLM is not directly regulated under the Oregon Forest Practices Act the agency meets and exceeds the requirements of the Act.

Mining activity projects within the PA include: Section 13 Mining Plan of Operation, and Stray Dog Mining Plan of Operation. These projects contain BMPs, PDFs, or Conditions of Approval that minimize shade removal, sediment inputs, or loss of large woody debris in order to minimize effects to listed species and their habitat.

In-stream Restoration Projects such as Waters Creek In-stream Restoration Project contain BMPs, PDFs, and permits through various agencies, which allow for short-term impacts to enhance degraded coho critical habitat in the long-term.

Miscellaneous projects include: California Oregon Broadcasting Inc. right-of-way, Recreational Activities, Medford District Road and Pump Chance Routine Maintenance Categorical Exclusion, Applegate Ridge Trail System, Reciprocal right-of-way Permits, and Special Recreation

Management Areas from the 2016 ROD/RMP. These type of projects would either be located outside Riparian Reserves so that the effect to listed species would be negligible or contain BMPs and PDFs that minimize effects to listed species and their habitat. Road maintenance activities that benefit hydrologic function within the PA would also benefit habitat for fish and aquatic species.

Under Action Alternative 2, there would be project-related road maintenance activities. Road maintenance activities improve the function of system roads and decrease non-point source pollution that may emanate from unmaintained roads. Thus, under Alternative 2, there would be a decrease to non-point source pollution within the PA associated with project activities. Additionally, under the Alternative 2, Riparian Thinning would occur, thus there would be a benefit to ACS objectives or aquatic species associated with this Alternative (for more information on ACS, see Appendix C). With the implementation of the BMPs, PDFs, stream buffers, and seasonality of ground disturbance there would be no direct or indirect effects from Alternative 2 and therefore this project is not anticipated to cumulatively effect fish species and habitat within the Pickett West PA.

Alternative 3

Direct and Indirect Effects

Alternative 3 has a 21 inch diameter restriction within the Matrix and Matrix Adaptive Management Land Use Allocations, no new temporary route construction-only reconstructed and renovated routes are proposed, no commercial treatments are proposed within Riparian Reserves, and proposed treatments would treat and maintain habitat within northern spotted owl Critical Habitat and northern spotted owl home ranges.

Under Alternative 3, since Riparian Thinning would not occur, there would be no benefit to ACS objectives or aquatic species associated with this Alternative (for more information on ACS, see Appendix C).

With the implementation of the PDFs there would be no direct or indirect effects from Alternative 3. The Alternative 3 would be even less impactful then the analysis of Alternative 2.

Cumulative Effects

Within the PA other projects that would be anticipated to occur including other vegetation management projects such as timber sales, and fuel reduction projects, along with mining plans of operations, instream or riparian restoration projects, and miscellaneous projects.

Vegetation management projects and/or timber sales include: HF/YSM, Cheney Slate Timber Sale, Medford District Insect and Disease Mortality Salvage for Safety Categorical Exclusion, Private Industrial Forest Lands, and East West Junction Timber Sale. These projects are BLM approved projects and would follow all provisions of the Clean Water Act (40 CFR Subchapter D) and

Department of Environmental Quality’s (DEQ’s) provisions for maintenance of water quality standards. These projects would; apply riparian reserve buffers when in proximity to streams and CH, and apply PDFs and BMPs such as ones that minimize ground disturbance within the Riparian Reserves, don’t allow fording of live streams with heavy equipment, limit expansions of landings or new landings within Riparian Reserves, minimize shade removal and sediment inputs, and maintain levels of large woody debris in order to minimize effects to listed species and their habitat. Projects associated with private lands would comply with Oregon Forest Practices that are designed to protect aquatic resources.

Mining activity projects within the PA include: Section 13 Mining Plan of operation, and Stray Dog Mining Plan of Operation. These projects contain BMPs, PDFs, or Conditions of Approval that minimize shade removal, sediment inputs, or loss of large woody debris in order to minimize effects to listed species and their habitat.

In-stream Restoration Projects such as Waters Creek In-stream Restoration Project contain BMPs, PDFs, and permits through various agencies, which allow for short-term impacts to enhance degraded coho critical habitat.

Miscellaneous projects include projects such as: California Oregon Broadcasting Inc. right-of-way, Recreational Activities, Medford District Road and Pump Chance Routine Maintenance Categorical Exclusion, Applegate Ridge Trail System, Reciprocal right-of-way Permits, and Special Recreation Management Areas from the 2016 ROD/RMP. These type of projects would either be located outside Riparian Reserves so that the effect to listed species would be negligible or contain BMPs and PDFs that minimize effects to listed species and their habitat. Road maintenance activities that benefit hydrologic function within the PA will also benefit habitat for fish and aquatic species.

Under Action Alternative 3, there would be less project-related road maintenance activities when compared to Alternative 2. Road maintenance activities improve the function of system roads and decrease non-point source pollution that may emanate from unmaintained roads. Thus, under the Alternative 3, there would be a smaller decrease to non-point source pollution within the PA associated with project activities. Additionally, under the Alternative 3, Riparian Thinning would not occur, thus there would be no cumulative benefit to ACS objectives or aquatic species associated with this Alternative (for more information on ACS, see Appendix C). With the implementation of the BMPs, PDFs, stream buffers, and seasonality of ground disturbance there would be no direct or indirect effects from Alternative 3 and therefore this project is not anticipated to cumulatively effect fish species and habitat within the Pickett West PA.

3.7 Cultural and Paleontological Resource

Background Information

For purposes of this analysis, cultural resources are defined as the physical remains of past human activities including objects, features, sites and landscapes, as well as historic buildings and structures.

Elements of natural landscapes which may be associated with the cultural practices or beliefs of Native Americans are also considered cultural resources. Paleontological resources are defined as the fossilized remains or imprints of past organisms.

Issues and Concerns
Activities associated with the action alternatives have potential to directly or indirectly affect:

1. Cultural resources that are eligible for the National Register of Historic Places (NRHP);
2. Properties of traditional religious and cultural significance to contemporary Native American groups, and;
3. Paleontological resources as defined by the Paleontological Resources Protection Act (PRPA).

Methodology
Federal agencies use the Section 106 process set forth in the National Historic Preservation Act (NHPA) as a framework for identifying and evaluating historic properties and assessing effects to these properties. The linkage between the Section 106 process and the mandate to preserve our national heritage under NEPA is well understood and is formally established in 36 CFR 800.3b and 800.8.

The BLM Medford District is party to the *State Protocol between the Oregon-Washington State Director of the Bureau of Land Management and Oregon State Historic Preservation Office* (Protocol). The Protocol provides a streamlined Section 106 review process for most undertakings, including the Pickett West project.

As per NHPA and the Protocol, an effect is a direct or indirect alteration of the characteristics of an historic property that qualifies it for inclusion on the NRHP. As per the NHPA, effects are adverse when the alterations diminish the integrity of a property's location, setting, materials, workmanship, feeling, or association.

To assess effects for purposes of this undertaking, the Criteria of Adverse Effect identified in the NHPA was utilized as follows (see 36 CFR 800.5(a) (1) and (2)):

- No Effect – there are no historic properties affected by the proposed undertaking.
- No Adverse Effect – there may be an effect, but the effect would not alter any of the characteristics that qualify the historic property for the NRHP. Utilizing Project Design Features (PDFs) is appropriate for achieving a No Adverse Effect determination.
- Adverse Effect – the integrity of a historic property would be diminished by the undertaking through alteration of the characteristics that qualify the property for the NRHP. The alteration can be caused directly as a result of the undertaking or as an indirect consequence.

The range of potential effects are provided below in Table 3.8-1.

Table 3.7-1 Alterations and Levels of Significance

Type	Level Of Significance	Amount/Type of Effect	NHPA Determination Of Effect
Negligible	None or barely measurable	Neither beneficial or adverse	No Effect
Minor	Measurable, slight and localized	Neither beneficial or adverse	No Adverse Effect
Moderate	Measurable, changes one or more character defining features	May be beneficial or adverse	No Adverse Effect (if beneficial) Adverse Effect (if not beneficial)
Major	Substantial, changes to one or more character defining features are permanent	Adverse	Adverse Effect

Cultural resource surveys were conducted with strict adherence to Class III standards in accordance with the Secretary of the Interior's Standard and Guidelines for Archeology and Historic Preservation (43 CFR § 7).

Assumptions

Forest floor visibility is fair to poor due to heavy undergrowth, riparian vegetation, leaf litter, and needle cast.

3.7.1 Affected Environment

For the purpose of analysis, cultural resources are divided into three categories: prehistoric and historic archaeological sites, and tribal traditional cultural resources. While this division does not necessarily alter the way in which the BLM manages a given tract of land, it does provide a better understanding of properties that require protection.

Archaeological sites – primarily historic – are expected to occur within the PA. The cultural resource sensitivity of lands therein is considered to be high due to the area's rich mining history. Paleontological resource sensitivity within the PA is considered to be low, and to date, no known paleontological resources are known to exist in the area.

The following is a broad historical overview of the human or cultural mechanisms that have influenced the PA. Ecosystem models based solely on biological and physical elements often disregard the complex interaction between humans and their environment. More than any other phenomenon, cultural landscapes provide a unique opportunity to interpret the history of the effects humans have had on the environment. Together, natural, and cultural influences have shaped the overall character of the project vicinity.

Prehistoric

Southwestern Oregon is located within the homelands of several contemporary cultural groups with ancestral ties to the land including the Cow Creek Band of Umpqua Tribe of Indians, the Confederated Tribes of the Siletz Indians, and the Confederated Tribes of the Grand Ronde Community of Oregon.

Archaeologically documented occupation of southwestern Oregon dates back at least 10,000 years. The majority of prehistoric sites recorded in the region date to the late Holocene period, often referred to as the Late Archaic Period, which spans from approximately 1,500 years before present. The few archaeological excavations conducted near the PA have been at lower elevations, along major stream terraces, and tend to date to the late Holocene (Late Archaic) period.

Settlement and subsistence patterns of the late Holocene centered around small permanent villages typically located on the terraces of major waterways. Seasonal rounds into the surrounding uplands provided other resources not available in the lowlands. While fish, especially salmon, came from the valley streams, the uplands provided a variety of other food resources including deer and elk, and plants such as acorns, pine nuts, camas, tarweed, sunflower seeds, manzanita berries, huckleberries, and blackberries (Gray 1985, pp. 56-65; LeLande 1991, pp. 5-6; Tveskov et al. 2006, pp. 12-14). Abundant small game animals, birds, eggs, and grasshoppers also made up a portion of the diet (Gray 1987, pp. 30-34).

Various tools were utilized in gathering and preparing food resources including baskets, digging sticks, hopper mortar bases, stone pestles and boiling stones (Gray 1987, pp. 30-34). Game was killed with stone or bone tipped arrows and spears, and butchered with stone knives. Fish were caught using dip nets, basketry, fish traps, hook and line, and weirs made of vine maple poles. Today contemporary Native people take an active role in the management of their ancestral lands and the BLM works with tribal governments to identify and address Native American concerns and traditional uses of BLM-administered land.

Although prehistoric use of the PA most certainly occurred, no prehistoric sites have been recorded to date.

Historic

The first European travel into the region began in the 1820s. The Rogue Valley was first visited in the historic period by Hudson Bay Company trappers in 1827, led by Peter Skene Ogden. By 1846, increased travel and settlement led to the establishment of the Applegate Trail by Jesse and Lindsay Applegate. An associated route from Fort Vancouver, through the Rogue Valley, to the Sacramento Valley in California, became known as the Siskiyou Trail which became a well-established travel route by 1830 (Mackie 1997, pp. 3-33). Traffic on the Applegate/Siskiyou trail system increased with James Marshall’s discovery of gold at Sutter Mill in 1848 and the corresponding discoveries in the Rogue and Illinois River basins.

The influx of foreigners into southwest Oregon in the 1850s devastated local native communities largely through the introduction of disease, loss of subsistence areas, and later on, full scale conflict. Violent encounters started as small-scale raids and skirmishes on both sides, but as western migration into the area increased, the violence escalated into warfare. The Rogue River Indian War of 1855 to 1856 ended with a forced march of the remaining native peoples to reservations far from their traditional lands.

Despite conflicts between settlers and native populations, mining continued to expand into southwestern Oregon. The earliest mining techniques required little more than a mining pan or sluice box, and miners could work alone as they panned along the rivers and creeks, picking up the free placer gold, also known as “easy” gold. However, by the 1870s, most of the easily accessed gold-bearing placer deposits along the streams had been depleted.

The early gold rush, along with other economic activities, including ranching and farming, gave rise to substantial settlements in the area. By the 1860s, settlers using donation land claims to acquire blocks of land had populated all of the bottomlands along most major tributaries.
The construction of the Oregon and California Railroad into Douglas County in 1883, and its connection with the Southern Pacific line in Ashland in December 1887, ushered in a new era of movement, exchange, flow and circulation of materials, people, and information throughout southwest Oregon. It also gave local farmers access to new markets where they could sell their produce, thus helping to develop and expand farming occupations in the valleys. Solomon Abraham and W.R. Willis platted the city of Glendale to service the railroad being built along Cow Creek.

The introduction and use of hydraulic mining techniques in the latter 19th century and into the early 20th century started a second ‘boom period’ of mining in the region. Hydraulic mining technology developed in California was quickly accepted in southwestern Oregon and allowed miners to work the rich bank deposits along and above the rivers and creeks (Kramer 1999, pp. 36-44). Although hydraulic mining required more capital investment and better organization on the part of the miners, it also allowed larger areas to be systematically mined with less effort, thereby increasing the possibility of extracting more riches.

Along with hydraulic mining, decreased options for small-scale placer mining after the 1860s facilitated the move into lode mining which involved freeing or extracting heavy metals such as gold deposits trapped or locked inside native rock. Lode mining was historically less appealing, and required significantly higher amounts of labor and capital to turn a profit when compared with the working of alluvium deposits through placer or hydraulic methods. Still, in some instances large veins of free standing gold were discovered and some miners “struck it rich.”

Both placer mining and lode mining were abundant and central to the local economies of the various communities in southwest Oregon into the 20th century, between 1900 and 1950 (Ramp & Peterson

1996, p. 15-23). This was aided in part by the Great Depression era, which saw many people returning to mining with hopes of making a living.

With the advent of the Second World War, mining of gold was halted by order L-208 issued by the War Production Board. This order mandated that "all non-essential mining efforts be halted in order to provide more men and equipment to mine metals essential for the war" (Kramer 1999, p.35-44). After World War II, commercial gold mining in the region never recovered, even after the order was repealed in mid-1945. This was due to increases in the labor expenses related to mining, the increase in overall national prosperity and the availability of employment in the post-war world. By that time it is estimated that Oregon produced 5.9 million ounces of gold, with about 60 percent of that extracted prior to 1900 (Kramer 1999, p. 11). Gold mining lost its allure and declined as a commercial activity in the area but continues to this day in the form of small scale-independent operations.

With the decline of mining as a significant economic activity, harvesting started to play a larger role in the development and economy of southwestern Oregon. The timber industry's most active and productive period extended from the 1960s to the 1980s to meet the demand of the economic boom of the post-war era (Stepp 2001, p. 5). This sector continues to be a very important part of the local economy, although it has seen a steady decline since the 1980s due to more strict environmental regulations and a decline in quality timber due to previous overexploitation.

Paleontology

No paleontological resources have been documented within the PA, although their presence is not outside of the realm of possibility. In 1995, fossils confirming Paleocene strata were reported from the Tyee basin near Roseburg in Douglas County, and Jurassic-age fossilized plants have been recorded in Douglas County as well. In addition, Eocene mollusks as well as pelecypods and gastropods can be found in looking glass exposures at the mouth of the Little River near Glide in Douglas County, and shallow water nearshore sands of Jurassic plant locales in Douglas County may eventually yield the bones of dinosaurs (Orr and Orr 2009, p. 84).

3.7.2 Environmental Effects

<u>Alternative 1 - No Action</u>

Under the No Action Alternative, the exclusion of fire and other treatments across the landscape would lead to continued natural accumulation of organic litter (duff, branches, and large branches). This may result in the production of more intense burning through cultural sites in the event of a wildfire. Thus, the No Action Alternative would not benefit cultural resources.

<u>Action Alternatives 2 and 3</u>

Direct and Indirect Effects

An extensive literature search and intensive field inventories identified a number of archaeological resources within the larger boundary of overall PA.

Pre-field research indicated that there are 13 previously identified sites located within the overall PA. Ten of those lie outside of project units, and three within.

1. 35HS11-343 – a historic mining site within minimal surface indicators and two adits. The site was determined to be ineligible for the National Register of Historic Places (NRHP) and will therefore be withdrawn from future management consideration.

2. 35HS11-344 (Panther Gulch Mining Ditch) - this linear feature has not been be evaluated for National Register eligibility. A condition assessment will be completed, and appropriate mitigation measures will be developed to ensure that no adverse effects will occur in consultation with the State Historic Preservation Office.

3. 35HS11-356 – consists of a historic cabin/tent platform and associated artifacts and mine futures. The site was also determined to be ineligible for the NRHP and will therefore be withdrawn from future management consideration.

4. 35HS11-366/367 – consists of habitation areas with the remains of several structures and scattered historic artifacts, as well as evidence of associated mining activities (hard rock and hydraulic). Newly define d site boundaries indicate that the majority of site constituents fall outside of unit boundaries. A small portion of this site will be flagged for avoidance.

No new resources were identified as a result of intensive field inventories.

In the event that previously unidentified cultural resources are encountered during project implementation activities, project design features (PDFs) include a stipulation that the project would be redesigned to protect the cultural resource values

Due to the implementation of PDFs the treatments proposed under the action alternatives would have no direct or indirect effect on heritage resources.

PDFs ensure that the Action Alternatives would not have any direct or indirect effects on cultural resources. There are no eligible properties located within the Area of Potential Effect as defined by Section 106 of the NHPA.

Cumulative Effects

Reducing fuel loads within the PA reduces the likelihood of a catastrophic fire event, leading to the better management and protection of cultural resources in the long-term.

All foreseeable projects proposed on BLM-administered lands that reduce fuels loading would have a similar outcome as described directly above. All projects implemented on BLM-administered lands would utilize a flag and avoid strategy for known sites and they would utilize projects design features which directs a suspension of any activities if evidence of cultural resources were discovered during project implementation.

The Oregon State Historic Preservation Office governs cultural resource on lands in Oregon. The BLM assumes that cultural resources which are not on public lands would receive protection under the OSHPO protocol.

3.8 Special Status Plants and Fungi

Methodology

- Information pertaining to Threatened and Endangered, Survey & Manage, and Interagency Special Status/Sensitive Species Program plant sites was obtained from the Medford District BLM Geographic Biotic Observation (GeoBOB) database and hardcopy site reports.

- Geographical Information Systems (GIS) was utilized to query BLM-administered acreage, and stand age.

- The PA boundary was determined, for this resource, as the upper ridgelines encompassing the Deer Creek, Lower Applegate, Hellgate Canyon - Rogue River 10th field watersheds.

Assumptions

- Private land would continue to be harvested and re-planted, and will be subject to requirements listed within Oregon's Forest Practices Act (www.oregon.gov).

3.8.1 Affected Environment for Botanical Resources

Due to the combination of fire return intervals, climate, unique soil types (frequent serpentine and serpentine-influenced soils), and geographic location, the Klamath Ecoregion – which encompasses the PA – has rich biological diversity. This area hosts a plethora of botanical species, including several endemic species, many of which are associated with serpentine soil (Sleeter and Calzia, 2014).

Uncommon plant sites occur at higher densities as compared to other regions within the Klamath Ecoregion (GeoBOB, 2015). 'Uncommon,' as used in the context of this write-up, is a broad definition encompassing all species included in the three basic designations guiding BLM plant species conservation efforts;

- Federal Threatened or Endangered (T/E), governed by the Endangered Species Act (ESA),

- Survey and Manage (S&M), governed by the Northwest Forest Plan, and
- Interagency Special Status/Sensitive Species Program (ISSSSP), governed by BLM Special Status Species policy, as outlined in BLM Manual 6840

Plant and fungi species found within final proposed unit boundaries are broken out into their respective designations/categories – Threatened and Endangered (T/E), Bureau Special Status (BSS) / Interagency Special Status Species Policy (ISSSSP) species, and Survey and Manage (S&M) - discussed in more detail below.

Specially Designated Areas
In addition to many uncommon plant sites, the PA encompasses a Fritillaria Management Area (FMA) and 6 Areas of Critical Environmental Concern (ACECs) and Research Natural Area (RNAs), including the Brewer Spruce RNA, Crooks Creek ACEC (per the 1995 RMP, which is encompassed by the Deer Creek ACEC per the 2016 RMP), Deer Creek ACEC, Eight Dollar Mountain ACEC, Iron Creek ACEC (per the 1995 RMP), and Pickett Creek ACEC. The PA also includes a segment of the Illinois Valley Botanical Area (1995 ROD/RMP), for information regarding proposed treatments within the Illinois Valley Botanical Area see Chapter 1.7, Issues and Alternatives Considered but Not Analyzed in Detail. Many of these areas were set aside because they contain botanically-related relevant and important values. With the exception of the Pickett Creek ACEC and the Fritillaria Management Area there are no proposed commercial or fuels treatments within ACECs and RNAs listed above.

Unit 32-1 totals approximately 10 acres of which approximately 3 acres are within the Pickett Creek ACEC and Fritillaria Management Area. The 2016 ROD/RMP does not preclude timber harvest in these areas so long as the treatments are intended to increase fire resilience and improve and maintain habitat for Gentner's fritillary.

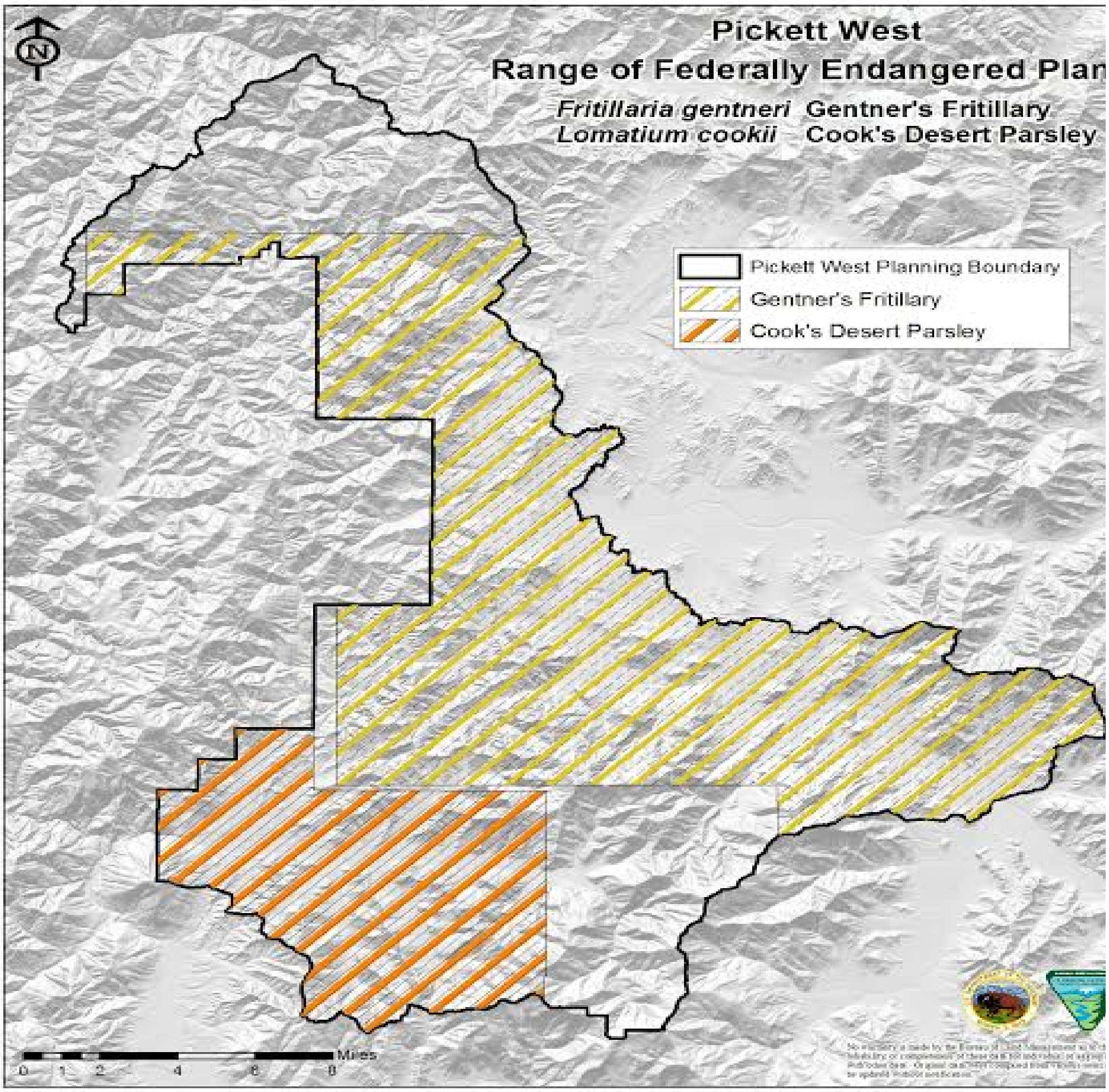
<u>T/E Plants</u>

There are four federally listed plants on the Medford District: *Arabis macdonaldiana, Fritillaria gentneri, Limnanthes pumila* ssp. *grandiflora*, and *Lomatium cookii*. *Arabis macdonaldiana, Lomatium cookie*, and *Fritillaria gentneri* have ranges which extend into the Grants Pass Field Office management area.

The Pickett West PA contains special status plant and fungi species, including two federally listed plant species, Cook's lomatium (*Lomatium cookii*) and Gentner's fritillary (*Fritillaria gentneri*). Their official ranges, as established by the USFWS, occur within the PA, but do not overlap each other (See Figure 3.8-1). In addition, Cook's lomatium has designated critical habitat (CH), and 3 (IV 1A, IV 1B, and IV 2) of the 15 CH polygons occurring in the Illinois Valley fall within the PA boundary. Two timber units fall directly adjacent to CH Unit IV 1B, but no forest management activities, including haul routes, are proposed within the CH polygons. All project activities must conform to Project Design Criteria as set forth in the

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

Figure 3.8-1 Map of Gentner's fritillary and Cook's lomatium ranges within Pickett West PA



The final proposed Pickett West units were surveyed according to the Service's protocol. Vascular plant surveys were conducted in the spring of 2016 and 2017, as of the release of the Pickett West EA no new T&E plant sites were found. Surveys are expected to continue through the spring and summer of 2017 and 2018 and the results of these surveys would be disclosed within all subsequent decision for this project. Any subsequent plant sites that are discovered would be appropriately buffered. There would be no anticipated adverse effect from Action Alternatives 2 or 3 on any federally listed plant. There may be beneficial effects to Gentner's fritillary via habitat modification (canopy reduction and prescribed burning) in some areas within the FMA.

A goal of this project is to enhance and improve site conditions for Gentner's fritillary within the FMA. Approximately three acres of unit 32-1 is within the FMA, and the proposed treatment is consistent with the Conservation Agreement for Gentner's Fritillary in Southwestern Oregon (USDI, 2015a). This conservation agreement with the Service sets clear desired conditions for dry mixed-conifer-hardwood forest, including the following:

- Multi-aged mix of fire-resistant conifers, hardwoods, shrubs, grasses, and forbs.
- Retention of legacy conifers and hardwoods.
- An abundance of hardwood patches, canopy gaps, and grassy openings dispersed throughout the stand.
- Fuel loading and arrangement characteristic of low- or mixed-severity fire regimes, including limited accumulation of grass thatch and leaf litter.
- Low abundance of non-native invasive plants.

The Conservation Agreement allows for treatments, including:

- Manually thinning trees to reduce canopy closure, enhance gaps, maintain grassy openings, and promote shrub and understory development.
- Reducing fuels beneath and adjacent to large fire-tolerant conifers and hardwoods to reduce fire- related mortality.
- Removing young conifers and reduce the density of small hardwoods within hardwood patches.
- Girdling large conifers that have grown through canopies of mature hardwoods.
- Prescribed burning - Lop and scatter or pile and bum cut vegetation, depending on volume and site conditions, and/or underburning to reduce density of small trees, reduce litter accumulation, and stimulate native fire-dependent species.
- Treating non-native invasive plants by hand-pulling, herbicide application, and prescribed fire.

The silvicultural prescription for unit 32-1 under Alternative 2 is Restoration Thinning, this treatment is expected to retain a minimum of 30 percent canopy cover post treatment. Under Alternative 3 the silvicultural prescription if Density Management, this treatment is expected to retain 40-60 percent canopy cover post-harvest. Both of the treatments listed above in the Action Alternatives may utilize post treatment fire to reduce fuel loading. Gentner's fritillary show positive responses to fire activity and decreases in canopy cover. Thus, the proposed treatments within the FMA are expected to benefit Gentner's fritillary and the FMA (Siskiyou BioSurvey 2013).

<u>Bureau Special Status, ISSSSP, & Survey and Manage Plants</u>

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

In addition to the aforementioned Special Status Species policy, Survey and Manage requirements were re-instated as of April 2013. Direction regarding Survey and Manage has morphed over the last several years. On December 17, 2009, the U.S. District Court for the Western District of Washington issued an order in *Conservation Northwest, et al. v. Sherman, et al.*, No. 08-1067-JCC (W.D. Wash.), granting Plaintiffs' motion for partial summary judgment and finding NEPA violations in the *Final Supplemental to the 2004 Supplemental Environmental Impact Statement to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines* (USDA and USDI, June 2007). In response, parties entered into settlement negotiations in April 2010, and the Court filed approval of the resulting Settlement Agreement on July 6, 2011. According to that direction, projects that are within the range of the northern spotted owl were subject to the survey and management standards and guidelines in the 2001 ROD, as modified by the 2011 Settlement Agreement.

A subsequent lawsuit was filed in April 2013, and the 2011 list was rescinded. Interim guidance directed projects to be analyzed under the 2001 list without Annual Species Reviews (ASRs), unless the project met one of the four Pechman exemptions.

In the most recent Survey and Manage direction, communicated in IM-OR-2014-037, the District Court vacated the 2007 RODs on February 18, 2014, which resulted in returning the BLM to the status quo in existence prior to the 2007 RODs. The prior status quo includes the use of the 2001, 2002, and 2003 Annual Species Reviews (except the change/removal made for the red tree vole) and the "Pechman exemptions".

The Pickett West 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 District Resource Management Plan.

For vascular and nonvascular species, this project utilizes the 2003 Survey and Manage species list (and associated Survey and Manage categories), as pre-disturbance surveys occurred under the most recent direction.

Similarly, for fungi surveys occurring from spring and fall of 2016, through the fall of 2017 (as per the 2-year protocol outlined in Survey & Manage Category B Fungi Equivalent-Effort Survey Protocol, Version 1.0, February 2012), this project utilizes the December 2003 species list, which 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.

In addition, for the following fungi species, based on our discretion to determine the location, timing and intensity of timber harvest, and discretion to provide additional project design features to reduce impacts, the Pickett West IDT is incorporating the following design features for these species:

- Complete equivalent effort surveys for project work in old-growth forests for *Clavariadelphus truncatus* (outside Jackson Co. Oregon). Known site management is already required using the 2003 Annual Species Review category.

- Complete equivalent effort surveys for project work in old-growth forests and manage known sites for *Galerina atkinsoniana* and *Phaeocollybia olivacea.*

Proposed activities encompassed in the Pickett West project do not fit the criteria of any of the Pechman exemptions, but the project is consistent with the Medford District Resource Management Plan/Forest Land and Resource Management Plan as amended by the 2001 *Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (2001 ROD).

Survey Results

Vascular and nonvascular plant surveys were conducted in the spring(s) of 2016 and 2017. Professional botanists surveyed the PA units using intuitive controlled methodology, wherein areas supporting high potential habitat were surveyed more intensively. Surveys were also conducted in compliance with the 2001 Survey and Manage protocol, which requires surveys for Category A and C species. Survey and Manage protocol requires managing known (documented) sites of Category A, B, C, and E species, managing ‘high-priority’ Category D species, and no site management requirement of Category F species.

Table 3.9-1 below shows the results for areas surveyed in 2016 and early 2017. Table 3.8-1 also shows previous surveying efforts which overlapped into final Pickett West units (Medford District’s rare plant database, GeoBOB).

All sites, whether historic or resulting from the most recent surveys, have been compiled and listed in Table 3.9-1 below. All subsequent sites discovered during 2017 and 2018 spring surveys for vascular, nonvascular, and fungi would be disclosed in the decision(s) for this project. Any discovered sites would appropriately buffered. Note: fungi sites resulting from 2016 and early 2017 surveys are listed within the *Survey and Manage Fungi* section.

Table 3.8-1 Federally Endangered, Bureau Sensitive, and Survey and Manage Plant Sites in Pickett West

Species	Common Name	Sensitive	Survey & Manage Category	Number of Sites	Township, Range, and Section
Buxbaumia viridis	Bug-on-a-stick moss	No	E	14	(2)T35S-R7W-28 (12)T36S-R7W-27
Camassia howellii	Howell’s camas	Yes	NA	13	(2)T35S-R7W-9 (9)T35S-R7W-28 (2)T35S-R7W-29
Chaenotheca chrysocephala	Yellow-headed pin lichen	No	B	10	T35S-R7W-3 T35S-R7W-28 T35S-R7W-33 T36S-R7W-11 (2)T35S-R7W-30 (2)T34S-R7W-21
Chaenotheca ferruginea	Needle lichen	No	B	26	(4)T34S-R7W-7 (2)T34S-R7W-27 (3)T35S-R7W-9 T35S-R7W-22 (2)T35S-R7W-28 (2)T35S-R7W-31 T36S-R7W-11 (3)T36S-R7W-23 (2)T37S-R7W-15 (2)T37S-R7W-21 2)T37S-R7W-20 T37S-R7W-33
Chaenotheca furfuracea	Sulphur pin lichen	No	F	4	T37S-R6W-7 T37S-R6W-23

Species	Common Name	Sensitive	Survey & Manage Category	Number of Sites	Township, Range, and Section
					T37S-R7W-22 T37S-R7W-33
Chaenotheca subroscida	Lemondrop whiskers	No	E	15	(2)T35S-R7W-11 (4)T35S-R7W-9 (2)T35S-R7W-33 (1)T36S-R7W-3 T36S-R7W-23 T37S-R5W-20 T37S-R7W-23 T38S-R8W-3 T38S-R7W-31
Clavariadelphus occidentalis		No	B	3	(3)T38S-R8W-3
Clavariadelphis truncatus		No	D	1	T37S-R7W-20
Cypripedium fasciculatum	Clustered lady's slipper	Yes	C	20	(3)T35S-R7W-28 (2)T35S-R7W-11 (2)T37S-R7W-9 (5)T37S-R7W-15 T37S-R5W-13 T37S-R4W-20 (2)T38S-R8W-3 (2)T39S-R7W-3 (2)T37S-R5W-23
Cypripedium montanum	Mountain lady's slipper	No	C	5	(4)T35S-R7W-11 T35S-R7W-28
Dendriscocaulon intricatulum	Dendrisco-caulon lichen	No	B in 2001, off in 2003 and 2011 if within	56	(6)T37S-R5W-26 T35S-R7W-22 T37S-R8W-35 T38S-R8W-3

Species	Common Name	Sensitive	Survey & Manage Category	Number of Sites	Township, Range, and Section
			Josephine and Jackson Counties.		(3)T37S-R5W-15 (2)T35S-R7W-3 (2)T37S-R5W-23 (3)T38S-R7W-11 (2)T37S-R5W-14 (18)T37S-R5W-13 T35S-R7W-28 (3)T35S-R7W-20 (5)T35S-R7W-29 (3)T35S-R7W-33 (2)T36S-R7W-27 T37S-R4W-17 (2) T37S-R4W-18
Dendrocollybia racemosa	fungi	No	B	27	(2)T37S-R7W-15 (2)T38S-R7W-31 (7)T36S-R7W-23 (2)T35S-R7W-10 (2)T38S-R8W-3 (4)T37S-R7W-20 (2)T34S-R7W-7 (2)T35S-R7W-31 (2)T35S-R7W-28 (2)T35S-R7W-33

Species	Common Name	Sensitive	Survey & Manage Category	Number of Sites	Township, Range, and Section
Fritillaria gentneri	Gentner's fritillary	Endangered	NA	82	Locations not disclosed due to the sensitivity of site information pertaining to a federally listed (endangered) species.
Galerina atkinsoniana	fungi	No	Off in 2003, but a D for 2011 settlement	1	T36S-R7W-23
Leptogium siskiyouensis		No	NA	1	T35S-R7W-9
Leptogium teretiusculum	Shrubby vinyl lichen	No	E	1	T35S-R7W-33
Limnanthes alba ssp. gracilis		Yes		1	(3)T36S-R7W-33
Lotus stipularis		Yes		4	(2)T35S-R7W-27 T34S-R7W-19 T38S-R7W-35
Phaeocollybia attenuata		No	D	5	(3)T35S-R7W-31 T37S-R7W-20 T38S-R8W-3
Phaeocollybia californica	California phaeocollybia	Yes	B	4	(2)T35S-R7W-31 (2)T38S-R7W-11

Species	Common Name	Sensitive	Survey & Manage Category	Number of Sites	Township, Range, and Section
Phaeocollybia kauffmanii		No	D	1	T35S-R7W-30
Phaeocollybia olivacea	Olive phaeocollybia	No	F in 2003, D in 2011	2	T35S-R7W-30 T37S-R7W-33
Phaeocollybia piceae	Spruce phaeocollybia	No	B	1	T35S-R7W-31
Piperia candida		No		1	T35S-R7W-9
Pyrola dentata		Yes		1	T35S-R7W-30
Ramaria abietina		No	B	1	T37S-R5W-13
Rafinesquia californica		Yes	NA	2	(2)T35S-R7W-13
Ramaria rainierensis		No	B	1	T37S-R5W-13
Ramaria rubrievanescens		No	B	4	T38S-R8W-3 T35S-R7W-30 (2)T35S-R7W-31
Ramaria rubripermanens		No	D	5	(2)T37S-R7W-33 T35S-R7W-31 T35S-R7W-33 T38S-R7W-22
Ramaria stunzii		No	B	1	T35S-R7W-31
Rhizopogon ellipsosporus		Yes	B	2	(2)T36S-R7W-23
Rhizopogon truncatus		No	D	14	T38S-R7W-31 T36S-R7W-23 T38S-R8W-3 T34S-R7W-31 T38S-R7W-26 T35S-R7W-31 (3)T38S-R7W-11

Species	Common Name	Sensitive	Survey & Manage Category	Number of Sites	Township, Range, and Section
					T38S-R7W-22 (2)T37S-R7W-15 (2)T37S-R7W-20
Sedum moranii		Yes	NA	9	(2)T35S-R7W-20 (7)T35S-R7W-29
Sophora leachiana		Yes	NA	28	(21)T35S-R7W-27 (6)T35S-R7W-28 T35S-R7W-33
Solanum parishii		Yes	NA	1	T35S-R7W-29
Spathularia flavida		No	B	1	T35S-R7W-10
Tremiscus helvelloides		No	D	2	T38S-R8W-3
Tricholoma venenatum		No	B	1	T36S-R7W-23

Recommended Plant Site Protection for Federally Endangered, Bureau Sensitive, and Survey and Manage (S&M) Vascular and Nonvascular plant species

Federally endangered Gentner's fritillary and Cook's lomatium plant sites within final project units, landings, and temporary routes would be buffered as discussed within the 2014 Programmatic Biological Assessment (USDI, 2014a). Buffer sizes vary from 25-300 feet depending on the type of treatment (fuels treatment or timber harvest) or activity (piling of fuels and landing construction).

Bureau Sensitive vascular species, including Howell's camas, Clustered lady's slipper, Limnanthes, *Lotus stipularis, Pyrola dentata, Rafinesquia californica, Sedum moranii, Sophora leachiana, and Solanum parishii* would receive a protection buffer ranging from 5-200 feet in diameter, depending on site specific conditions and unit prescriptions.

For Survey and Manage (S&M) species, S&M protocols state Category A, B, and E species are under a "manage known sites" requirement. Therefore, the Category A, B, and E species in the above table would receive a 5-200 foot buffer, depending on site specific conditions and unit prescriptions.

Category C and D species are a 'manage high-priority site' species. All Survey and Manage category C species are assumed 'high-priority,' and would be buffered to ensure species persistence at each site. Buffers may range from 5-200 feet, depending on site-specific conditions and unit prescriptions.

It is important to note that regarding the above-mentioned buffers; 1) the size of the buffer may be smaller than what is defined in the PDFs per the botanist's recommendation, taking into consideration the species affected and the proposed treatment, and 2) the actual buffer itself may be comprised of either a physical buffer made from flagging, or a virtual buffer provided on a map. In either case, the intent of the buffer is to provide awareness of the site, and to prevent any activity from occurring within the buffer radius that would jeopardize species persistence.

<u>Bureau Special Status (ISSSSP) & Survey and Manage Fungi – PRESENT, NOT AFFECTED</u>

Bureau Special Status Fungi

Approximately 743 acres within the Pickett West final proposed units were surveyed for ISSSSP and Survey and Manage (S&M) fungi. For more information about these surveys, please refer to the Survey and Manage Fungi section (below) for more information.

The majority of Pickett West final proposed project units occur in stands less than 180 years old and, with the exception of incidental fungi sites reported by contractors, units less than 180 years old were not surveyed for ISSSSP Sensitive fungi. Pre-disturbance surveys for Special Status fungi are not practical, nor required per BLM – Information Bulletin No. OR 2004-121, which states "If project surveys for a species were not practical under the Survey and Manage Standards and Guidelines (most Category B and D species), or a species' status is undetermined (Category E and F species), then surveys would not be practical or expected to occur under the Special Status/Sensitive Species policies (USDA/USDI 2004a, p.3)." Current special status fungi were previously in the aforementioned S&M categories which did not consider surveys practical, and are therefore exempt from survey requirements. With the instatement of the new Interagency Special Status Species Policy (ISSSSP), 14 species of fungi were designated as Sensitive; 10 are suspected to occur on the Medford District, while the remaining 4 have been documented (Table 3.9-2). As mentioned above, none of these species require surveys.

Table 3.8-2 Bureau Sensitive (ISSSSP) Fungi Documented on the Medford District*

Species	Category	Status
Boletus pulcherrimus		Sensitive
Phaeocollybia californica	B	Sensitive

Species	Category	Status
Rhizopogon ellipsosporus	B	Sensitive
Rhizopogon exiguus	B	Sensitive

**For the entire list of Bureau Sensitive Fungi Documented or Suspected on the Medford District see the Botanical Specialists Report contained within the Administrative Project Record.*

Of the 4 documented species, two (per fungi surveys in 2016 within Pickett West and the Oregon/Washington Geographic Biotic Observation (GeoBOB) database), *Phaeocollybia californica* (PHCA40) and *Rhizopogon ellipsosporus* (RHEL3), have been found in the Grants Pass Field Office management area and within the Pickett West PA. The sites were found during pre-disturbance surveys for the Pickett West project and will receive protection buffers as previously described under the Survey and Manage Fungi section of this write-up. As such, BLM contends that the likelihood of contributing toward the need to list is not probable.

Survey and Manage Fungi

Approximately 743 acres within the Pickett West final proposed units exceeded 180 years in age and exhibited stand complexities as described in the 2001 Survey and Manage Standards and Guides, and as such, were surveyed for both Survey and Manage and ISSSSP Sensitive fungi. Sites recorded as a result of the spring and fall visits of 2016 are reflected in this write-up, but since surveys will not be completed until after this EA is scheduled for release, results of the 2017 spring and fall surveys would be communicated through the Decision Record for this EA. For units awaiting survey clearances which are scheduled for 2017, no project implementation will ensue until survey results are received.

Aside from the 743 acres and incidental fungi findings located during vascular and nonvascular surveys, final units within the Pickett West PA were not surveyed for fungi to Survey and Manage protocol standards. For NEPA decisions signed in fiscal year 2011 and beyond for habitat-disturbing activities in old-growth forests, the 2001 Survey and Manage ROD (Forest Service and Bureau of Land Management 2001, S&G-9) gives direction to conduct equivalent effort surveys for category B fungi species if strategic surveys have not been completed for the province encompassing the project.

The Survey and Manage Standards and Guides defines old growth forest as an ecosystem distinguished by old trees and related structural attributes that are typically at least 180 to 220 years old (USDA/USDI 2001, p. 79). Strategic surveys have not been completed for category B fungi for the province containing the Pickett West PA, and with the exception of the 743 acres and incidental fungi findings, equivalent effort surveys have not been completed as units do not exceed 180 years of age and exhibit structural attributes associated with old growth (such as multiple canopy layers, numerous large snags, and heavy accumulations of downed woody debris) to trigger fungi surveys.

Like vascular and nonvascular surveys, professional botanists surveyed the 743 acres for fungi within PA units using intuitive controlled methodology, wherein areas supporting high potential habitat were surveyed more intensively. Surveys were also conducted in compliance with the 2001 Survey and Manage protocol, which requires surveys for Category A and C species. Survey and Manage protocol requires managing known (documented) sites of Category A, B, C, and E species, managing 'high-priority' Category D species, and no site management requirement of Category F species. As previously mentioned, fungi surveys are generally triggered when stands exceed 180 years of age and exhibit structural attributes associated with old growth. Results of surveys conducted in 2016 revealed the following new sites (see Table 1-1); (3) *Clavariadelphus occidentalis,* (1) *Clavariadelphus truncatus,* (1) *Galerina atkinsoniana,* (2) *Mycena quinaultensis),* (5) *Phaeocollybia attenuata,* (2) *Phaeocollybia californica,* (1) *Ramaria rubripermanens,* (12) *Rhizopogon truncatus,* (1) *Spathularia flavida,* (2) *Tremiscus helvelloides,* and (1) *Tricholoma venenatum.*

Site management of fungi sites will mirror those described for vascular and nonvascular special status species; special status fungi sites would receive a protection buffer ranging from 5-200 feet in diameter, depending on species, site specific conditions, and unit prescriptions.

3.8.2 Environmental Effects

<u>Alternative 1 – No Action</u>

Direct and Indirect Effects

T&E, ISSSSP Sensitive, & Survey and Manage Vascular Plants
There would be no direct or indirect effects to ISSSSP Sensitive or Survey and Manage vascular plants under Alternative 1 because no physical disturbance would occur that could impact them.

ISSSSP Sensitive & Survey and Manage Nonvascular Plants
No direct or indirect effects would occur to ISSSSP Sensitive or Survey and Manage nonvascular plants resulting from Alternative 1 because no activities would occur that could impact them.

ISSSSP Sensitive & Survey and Manage Fungi
There would be no direct or indirect effects to ISSSSP Sensitive or Survey and Manage fungi under Alternative 1 because no physical disturbance would occur. There would be no loss of late-successional forest which may provide suitable habitat for the 10 suspected and 4 documented Medford District BLM Sensitive fungi.

Cumulative Effects

With the exception of fuels treatments, Alternative 1 would not contribute additional cumulative effects to ISSSSP or Survey and Manage vascular, nonvascular, or fungi species. The amount of mid-seral and late-successional forest on BLM-administered lands would remain unchanged.

Past, present, and reasonably foreseeable activities within the Pickett West PA are broken out into their respective categories for clarity.

Past Activities

Timber Harvest on Private Land

Information is not available about rare plant populations in the Pickett West PA prior to BLM botanical surveys, which began during the last 35 years. However, past activities, particularly timber harvest on private lands, likely affected Special Status plants and populations by damaging or destroying individuals or reducing or degrading suitable habitat.

Past Harvest on BLM-administered Land

Past sales and vegetation management projects which have occurred within the last 10 years within the current PA include; Deer North Timber Sale, Hazardous Fuel Reduction, and the Young Stand Management Programmatic (silviculture treatments on BLM-administered land within the project PA). Bureau Special Status and Survey and Manage plants and fungi found during pre-disturbance surveys for each of those projects were entered into the GeoBOB database, and sites which merited protection received 'no treatment' buffers.

Present and Reasonably Foreseeable Activities

Discretionary Activities

The following activities have been previously analyzed and approved projects may still occur within the PA in the future: Cheney Slate Timber Sale, East West Junction Timber Sale, Section 13 Mining Plan of Operation, California Oregon Broadcasting Inc, right-of-way, Hazardous Fuel Reduction, Young Stand Management, Waters Creek in-stream restoration, Powell Creek in-stream restoration, Medford District Road and Pump Chance Routine Maintenance Categorical Exclusion, Medford District Insect and Disease Mortality Salvage for Safety Categorical Exclusion, and the Applegate Ridgeline Trail. For more information, please reference Appendix D of the Pickett West EA for a brief description of each project.

Timber Harvest and Reforestation on Private Land

Although specific harvest plans for private industrial forest lands are not available, industry has been actively harvesting and replanting within the Pickett West PA and would continue to do so. BLM assumes commercial harvest will occur in the future on relatively short rotations, and that privately-owned forests will remain in early to mid-seral stages. Sensitive and Survey and Manage species do not receive protection on privately-owned lands, but will continue to be protected and conserved on federal lands, according to BLM policy (IM OR-91-57).

Non-Discretionary Actions

Reasonably foreseeable activities within the Pickett West PA include non-discretionary Reciprocal right-of-ways (ROW) where certain private timber companies can request access into their lands via building a new road across BLM-administered lands. These actions may occur in all Land Use

Allocations. Aside from the Endangered Species Act and other federal laws, there is no requirement for reciprocal ROW actions to be consistent with ISSSSP or Survey and Manage policy. As such, BLM assumes there is a possibility of Bureau Sensitive or Survey and Manage plant/fungi site degradation if a site were within the area requested for the ROW. Since the actual locations, extent, and magnitude of these actions are not known, the impacts associated cannot be assessed.

Future wildfire events
As naturally-ignited wildfires have occurred in the Klamath-Siskiyou Ecoregion in the past, BLM assumes future fires would occur. Current trends as a result of fire suppression/exclusion would continue. Stands within the Pickett West PA would likely burn at severe intensities given past wildfire suppression activities which have resulted in the current stocking levels found within the PA. The potential for intense, stand-replacing fires, and the risk of direct mortality or damage to Special Status plants or fungi and/or loss of suitable habitat from high severity wildfire would remain unchanged from current conditions.

Conclusion
The discretionary activities occurring on BLM- administered lands, listed above, would apply the required buffers for T&E vascular plant sites, ISSSSP Sensitive and Survey and Manage vascular plant sites, nonvascular plant sites, and fungi sites. Alternative 1 would not contribute additional cumulative effects to ISSSSP vascular/nonvascular plants, or fungi on BLM- administered lands. The amount of mid-seral and late-successional forest on BLM-administered lands would remain unchanged.

Other activities described above including timber harvest and reforestation on private land, non-discretionary actions, and wildfire events are speculative and cannot be predicted with enough accuracy to assess the effects to T&E vascular plant sites, ISSSSP Sensitive and Survey and Manage vascular plant sites, nonvascular plant sites, and fungi sites. While there is no reliable data for rare plant population on private lands, it is assumed that timber harvests, likely affected Special Status plants and populations by damaging or destroying individuals or reducing or degrading suitable habitat. There is no requirement for non-discretionary ROW actions to be consistent with ISSSSP or Survey and Manage policy, therefore the BLM assumes some Special Status plants and populations may be damaged or destroyed; the location, extent, and magnitude of these activities is not known, and is therefore speculative. Wildfires are a natural process occurring on the landscape and the risk of direct mortality or damage to Special Status plants or fungi and/or loss of suitable habitat from high severity wildfire would remain unchanged from current conditions.

Under the No Action Alternative there is no expected decrease to T&E vascular plant sites, ISSSSP Sensitive and Survey and Manage vascular plant sites, nonvascular plant sites, and fungi sites on BLM-administered lands. The No Action Alternative would not increase the likelihood of contributing toward the need to list any ISSSSP Sensitive and Survey and Manage vascular plants, nonvascular plants, and fungi species.

Alternative 2

Of the 203,459 acres encompassed within the Pickett West PA, 95,088 acres are administered by BLM. Alternative 2 of the Pickett West project proposes to treat 6,005 acres (or 6.3 percent of BLM-administered land) through activities including: treatment of 2,571 acres of Density Management, 3,434 acres of Restoration Thinning, 6,005 acres of Understory Reduction (not additional, this happens within the same units as Density Management and Restoration Thinning). In addition, 11,102 acres (or 11.6 percent of BLM-administered land within the PA) of Hazardous Fuels Reduction Maintenance is proposed. Definitions for these treatments are listed in Chapter 2. Table 2-1 and 2-2 provides a summary of treatments.

In addition to forest management, project activities also include treatment of slash (typically via lop & scatter, hand pile & burn, chipping, and/or biomass utilization), maintenance underburning, vegetation treatments which produce woody biomass and special forest products, and road work, including 14 miles of new temporary route construction, 9 miles of existing route renovation/re-construction, 5 miles of tractor swing routes, and 231 miles of road maintenance (on existing haul routes).

Direct and Indirect Effects

T&E, ISSSSP Sensitive, & Survey and Manage Vascular Plants
Under Alternative 2, there would be no direct or indirect effects that would jeopardize the presence or persistence of T&E, ISSSSP, or Survey and Manage vascular plants because sites requiring protection within final planning units (Appendix I and J) would receive protection buffers. However, BLM assumes there would be potential positive direct or indirect effects to one or more said species because many species, including Gentner's fritillary, show positive responses to fire activity and decreases in canopy cover from thinning (Siskiyou BioSurvey 2013).

ISSSSP Sensitive & Survey and Manage Nonvascular Plants
Under Alternative 2, there would be no direct or indirect effects that would jeopardize the presence or persistence of ISSSSP or Survey and Manage nonvascular plants because sites requiring protection within final planning units (Table 1-1) would receive protection buffers.

ISSSSP Sensitive & Survey and Manage Fungi

ISSSSP Sensitive Fungi
While the effects of soil disturbance (resulting from mechanized equipment and green tree removal) to above-ground plants have been well documented, much less information pertaining to below-ground fungi and their associated mycelial network is available. Addressing direct and indirect effects to ISSSSP fungi species is further complicated, because official fungi surveys were only performed for ISSSSP Sensitive fungi within 743 acres of the Pickett West units – because units, with the exception of those aforementioned, are less than 180 years old and do not exhibit stand complexities typically associated with ISSSSP fungi.

Even if surveys had been conducted, surveys address only fruiting bodies, or sporocarps, not the mycelial network. This fruiting body and mycelial situation is analogous to looking for a flowering plant which reproduces from a bulb, but does not produce flowers every year. In any given year, the plant may not flower, but the underground bulb is still present. Thus, even if surveys were conducted and no sites were found, it does not ensure that Sensitive fungi are absent in treatment units.

While forest management activities (tree-felling, tractor operations, and/or yarding, prescribed/pile burning, etc.) can damage fruiting bodies and/or the shallow portions of mycleial networks, management activities do not decimate mycelial networks – especially when green trees are left within the unit (Luoma et al 2004, and 2006). Such trees serve as "hubs" for mycelial networks, from which the surrounding underground vicinity is re-populated with respective fungi species as the mycelial networks expand and radiate outward, thereby interfacing with root systems of new conifers (Luoma et al 2006).

Potential habitat for many of the Bureau Sensitive species exists in portions of the PA, as specific areas of the PA exhibit a predominant Douglas-fir component (generally considered an indicator species, but recorded sites commonly have white-fir as well). However, predicting presence of Sensitive fungi is difficult because habitat requirements are poorly understood. Because of their rarity across the Northwest Forest Plan area, it is unlikely that populations are present in the final treatment units which have not already been surveyed.

In the short-term (0-3 years), proposed management actions would result in soil displacement and erosion, potentially affecting fungi species recolonization efforts within treatment units and along roads. These effects are localized and not expected to remain in the long-term (3+) because mycelial networks are able to re-colonize areas of disturbance.

Survey and Manage Fungi

Addressing direct and indirect effects to Survey and Manage fungi species is complicated because fungi surveys were only performed for Survey and Manage fungi within 743 acres of the Pickett West units. As described previously, because the majority of units, with the exception of those aforementioned, are less than 180 years old and do not exhibit the stand complexities as described in the 2001 Survey and Manage Standards and Guidelines, they do not trigger fungi surveys.

Historic sites documented and listed in Table 3.8-1 and would be buffered, as would sites found during the 2014-2016 surveys within the aforementioned 743 acres. In addition, BLM assumes at least half of the harvest activities would likely occur when the species are dormant and the ground is drier (typically after June 1) thereby reducing compaction so possible effects to sites would be further minimized.

Thinning/Commodity Extraction – Ground based

Harvest can have varying degrees of adverse impacts on fungi, depending on the level of tree removal and ground disturbance. Removing, disturbing, or compacting the top layer of organic material and mineral soil via ground-based harvest systems could negatively impact fungi because the main and most extensive part of the fungus consists of a below-ground mycelia network that resides in the top few inches of mineral soil. Mycelia networks are often connected to multiple trees through their root systems. In one study, fungal mycelia networks ranged in size from 1.5-27 square meters (Dahlberg and Stenlid 1995). Disruption of mycelia networks could occur during timber harvest, construction or ripping of roads or landings, removal of host trees that sustain the ectomycorrhizae, or burning post-harvest slash piles (Amaranthus et al. 1996).

Although the effect of these activities on fungi could result in loss of species diversity and abundance, more recent studies indicate fungi species persist under a variety of management regimes (Gordon 2012). In addition, in a study conducted on a timber harvesting project by Jennings et al (2011), results suggested “that nutrients critical to soil productivity were reduced by mechanical applications used in timber harvesting, yet soil bacteria and fungi, essential to mediating decomposition and nutrient cycling, appeared resilient to mechanical disturbance.”

If Sensitive Survey and Manage fungi are present, Alternative 2 may have a potential short-term (0-3 years) risk of impacting fungi species, because Alternative 2 proposes temporary routes and the harvesting of trees, which involves soil disturbance, and therefore mycelium disturbance. However, green trees would be left intact because all proposed treatments are thinnings, and root systems associated with retained green trees serve as refugia for many ectomycorrhizal fungi mycelia (Luoma el al, 2006). Thus, the BLM assumes that although a Sensitive Survey and Manage species may incur a short-term setback, the species would re-colonize the area over the long-term (3-100 years).

Commodity extraction – Helicopter
In general, helicopter-based harvest systems pose less potential for ground disturbance compared to ground-based systems. Helicopter harvesting has been shown to result in maintaining species richness in relation to green trees retained in non-salvage operations (Luoma et al 2006). All Pickett West units would retain green trees, the roots of which serve as refugia for many ectomycorrhizae fungi mycelium (Luoma el al 2006).

Temporary Routes/Landing Construction
Potential direct and indirect effects to fungi resulting from road/landing construction are similar to effects of harvesting, albeit on a smaller scale. While temporary routes do not typically involve as much affected acreage as units, they have a period of heavy use by log trucks and harvest equipment, resulting in concentrated soil compaction.

A recent study has demonstrated that temporary routes which are sub-soiled after use are colonized by ectomycorrhizae fungi which, in addition to other findings, suggests disturbance on the forest floor has less of an effect to soil microbial communities (including mycelial networks) than overstory removal (Jennings et al 2011). In addition, as mentioned in the harvest effects discussion, green trees are retained and are typically within 10 feet of the temporary route surface. Therefore, BLM assumes there is a refugia for fungi mycelia, including ISSSSP and Survey and Manage fungi species. While there may be short-term (0-3 years) effects to mycelia networks, there would not be effects which threaten the persistence of ISSSSP and Survey and Manage fungi in the long-term (3-100 years).

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

Prescribed Burning
Alternative 2 proposes prescribed burning activities on 11,102 acres, which comprises roughly 11.6 percent of the acres within PA. Fire is a natural process that has been suppressed since the turn of the 20th century, and as a result, fuel loads have accumulated on much of our public lands. While the intent of fuels reduction (decreasing the chance of ignition and spread of high-intensity wildfire) provides an overall benefit to fungi species, there are some possible short-term (0-3 years) impacts. As previously mentioned, fungi could be directly impacted from radiant heat during burning activities (pile or broadcast burning). Effects of burning include damage or death of mineral soil fungi including the mycelia and spores; loss of litter, organic matter and large wood, resulting in reduced moisture retention capability, loss of nutrient sources, and changes in fungal species diversity and abundance. Implementation of Alternative 2 creates the greatest threat of damage to fungi from burning activities because a majority of fuels reduction implementation utilizes piling and burning or broadcast burning. However, the area impacted by burning activities would be a small percentage of acreage compared to the total amount of acres receiving fuels reduction treatments within the PA. More specifically, it is not likely that all 11,102 acres would be conducive to the use of broadcast burning activities.

Cumulative Effects

Threatened and Endangered, Bureau Sensitive, Survey and Manage Vascular plants, Nonvascular plants, and Fungi
Information is not available for rare plant populations in the Pickett West PA prior to BLM botanical surveys, which began during the last 35 years. However, BLM assumes that past activities, described in the affected environment, likely affected T&E, Bureau Sensitive, Survey and Manage plants, and fungi populations by damaging or destroying individuals or reducing or degrading suitable habitat.

BLM assumes commercial harvest would occur in the future and privately-owned forests would be in early to mid-seral stages. Sensitive species do not receive protection on privately-owned lands, but would continue to be protected and conserved on federally administered lands, according to BLM policies and federal regulations.

Federally listed, Threatened and Endangered, Bureau Sensitive, and Survey and Manage plants would not be directly impacted by the activities proposed in Alternative 2 because surveys have been conducted and the Threatened and Endangered, Sensitive, and Survey and Manage plants located would receive protection buffers. Project design features would reduce the risk of introducing or spreading noxious weeds during project implementation, which could potentially impact Threatened and Endangered or Bureau Sensitive vascular plant habitat. Federally listed Gentner's Fritillary and Cook's lomatium plant sites would be protected per the directives outlined in the current Biological Assessment (USDI 2014a), and no Sensitive or Survey and Manage vascular or nonvascular plants would trend toward listing (ISSSSP) or cease persisting (Survey and Manage) as a result of implementing the activities proposed in Alternative 2.

There could be potential cumulative effect from the proposed project on Sensitive fungi. However, the proposed harvest would occur on matrix lands, which are designated for timber production and harvest. Across the Northwest Forest Plan area, approximately 14 percent of the 8 million acres are matrix lands and are available for harvest, while 86 percent are designated as late-successional reserves, congressionally reserved and administratively withdrawn areas, and Riparian Reserves. BLM estimates that over the next 50 years, late-successional forest would develop at 2.5 times the rate of loss through stand-replacement fires and harvest (USDA/USDI 2004c, pp. 107-111). This reserve system spread across the landscape is intended to provide protection and development of late seral habitat for the protection and expansion of late-successional associated rare plants. Under the Northwest Forest Plan, at least 15 percent late seral (80-plus years old) conifer forest must be maintained in each 5th field watershed (USDA/USDI 1994c, p. C-44).

Because of their rarity across the Pacific Northwest Forest Plan area, it is unlikely Sensitive fungi are present in the Pickett West timber harvest units which did not receive fungi surveys. The risk is low that additional occurrences would be impacted. The same holds true for Survey and Manage A & C fungi. It is protection of species at the landscape level that ensures Sensitive species will not trend toward listing and Survey and Manage species will persist. The assumption is made by BLM that protecting known sites (current and future) of these Sensitive and Survey and Manage (categories A-E) fungi, in addition to conducting large-scale inventories throughout the Pacific Northwest, will be adequate in ensuring that this project would not contribute to the need to list them (USDI 2004a, pp. 5-2) or jeopardize persistence (2001 Survey and Manage Standards and Guidelines p-3).

Alternative 3

Alternative 3 proposes similar activities as Alternative 2, although the proportions differ and there are additional requirements as described in Chapter 2. Under Alternative 3, proposed Pickett West project activities include the following: treatment of 3,185 acres of Density Management, 1,028 acres of Restoration Thinning, and 6,005 acres of Understory Reduction, and 11,102 ac of Hazardous Fuels

Reduction. In addition, Alternative 3 includes 0 miles of new temporary route construction, 7 miles of existing route renovation/re-construction, 11 miles of tractor swing routes, and 218 miles of road maintenance (on existing haul routes). Table 2-1 provides a summary of treatments, Tables 2-2 provides more specific details.

Direct and Indirect Effects

For botanical resources, direct and indirect effects of Alternative 3 are generally the same as described in Alternative 2, albeit on a lesser scale due to less proposed new temporary route construction, renovation, reconstruction, and maintenance.

Threatened and Endangered, ISSSSP Sensitive, Survey and Manage Vascular Plants
Under Alternative 3, there would be no direct or indirect effects that would jeopardize the presence or persistence of Threatened and Endangered, ISSSSP, or Survey and Manage vascular plants because sites requiring protection within final treatment units (Table 1-1) would receive protection buffers. However, BLM assumes there would be potential positive direct or indirect effects to one or more said species because many species, including *Fritillaria gentneri*, show positive responses to fire activity and decreases in canopy cover from thinning (Siskiyou BioSurvey, 2013).

ISSSSP Sensitive, Survey and Manage Nonvascular Plants
Under Alternative 3, no direct or indirect effects that would jeopardize the persistence or presence of nonvascular ISSSSP Sensitive or Survey and Manage species would occur because sites requiring protection within final treatment units (Table 1-1) would receive protection buffers.

ISSSSP Sensitive, Survey and Manage Fungi
This analysis supplements that which was discussed under Alternative 2.

Under Alternative 3, direct and indirect effects to potential ISSSSP Sensitive and Survey and Manage fungi generally mirror those described in Alternative 2 (direct and indirect effects) as aforementioned in this botanical analysis, with one exception, from a fungi perspective, Alternative 3 proposes less new temporary route construction and existing route renovation.

For ISSSSP and Survey and Manage fungi and their associated mycelial networks, if present within final units, less overall compaction from heavy equipment activity associated with new temporary route construction, renovation, and reconstruction would result as compared with Alternative 2.

BLM reasons that if less acres of compaction occur, short-term (0-3 years) effects listed in Alternative 2 would affect fungi mycelial networks to a lesser extent, therefore species would not have as large an area to re-colonize over both the short and long-term (4-100 years).

Cumulative Effects

Alternative 3 would not contribute to additional cumulative effects to ISSSSP or Survey and Manage vascular, nonvascular, or fungi species compared to Alternative 2, because less area (234 miles in Alternative 3 versus 260 acres in Alternative 2) would be affected in Alternative 3. The amount of mid-seral and late-successional forest on BLM-administered lands would remain unchanged.

3.9 Noxious Weeds

Methodology

- Calculations for noxious weed populations includes locations within proposed and final units, directly adjacent to proposed and/or final units (along the roads, landings, etc.), and along proposed haul routes.

- GIS and past survey reports were utilized to query BLM-administered acreage and weed species reported within the PA.

- The PA boundary was determined, for this resource, as the upper ridgelines encompassing the Deer Creek, Lower Applegate, Hellgate Canyon - Rogue River 10th field watersheds.

Assumption

- Private land would continue to be harvested and re-planted, and will be subject to requirements listed within Oregon's Forest Practices Act (www.oregon.gov).

3.9.1 Affected Environment for Noxious Weeds

Over the last 150 years activities such as motor vehicle traffic, recreational use, rural and urban development, timber harvest, road construction, and natural processes have introduced and transported noxious weeds into the Rogue Valley. Noxious weeds are defined as plants that are "considered by a governmental agency to be injurious to public health, agriculture, recreation, wildlife, or property" (ODA, 2013). Noxious weeds are spread by the wind and by seed via attachment to vehicles and vectors such as humans, animals, and birds, and are able to grow on suitable habitat, generally considered as any newly disturbed ground and/or an influx of light due to canopy removal.

Since the 1970's, a recognition that weeds were causing environmental damage resulted in the passage of State noxious weed laws, the Carson-Foley Act of 1968 – Plant Protection Act of 2000, and Presidential executive orders (EO) like Invasive Species E.O. 13112, which directs federal agencies to combat noxious weeds on federal lands. Additional direction is provided by the Medford District Resource Management Plan (1995 ROD/RMP), which states the District is to "contain and/or reduce noxious weed infestations on BLM-administered land...(p. 92)," and "...survey BLM-administered land for noxious weed infestations…(p. 93)." However, these activities are funding dependent.

The 1995 ROD/RMP directions for weed management are intended to be met at a landscape level; whether the direction is achieved is not intended to be measured at the site specific level nor with the implementation of each project. Thousands of acres of weed treatments have occurred on federal (and non-federal) lands over the last decade across the Medford District with the RMP-driven objective of containing or reducing, not eradicating, noxious weed populations (Budesa 2006). In an effort to continue to contain and/or reduce noxious weeds on federally administered land, the BLM annually treats known weed populations within the Grants Pass Field Office management area (annual acreage treated is dependent on funding). In 2016, over 500 acres of BLM-administered lands in the Grants Pass area were treated.

Due to the checker-boarded nature of land ownership as discussed in the Affected Environment at the beginning of Chapter 3, noxious weed management is challenging because seed sources are scattered throughout the PA, across all ownerships, and not all private landowners treat noxious weed populations occurring on their respective land(s). In an effort to prevent noxious weeds from establishing in areas disturbed by forest management activities proposed in the Pickett West project, several roadsides within the Pickett West PA have been treated for noxious weeds since 2016, and are scheduled for monitoring/re-treatment in 2017.

Lastly, regarding the Pickett West Affected Environment as it pertains to the noxious weeds resource, it should be noted that the portion of the Pickett West PA which occurs within the Illinois Valley falls within the proximity of an Alyssum (*Alyssum corsicum* and *A. murale*) infestation, a Class A-rated noxious weed.

Alyssum was introduced to the area in the early 2000's by a private company who later abandoned test plots where Alyssum was planted (in various private fields across the Illinois Valley), as well as storage areas containing baled alyssum. Since the mid 2000's a collective effort of federal, state, and nonprofit entities have partnered and created the Alyssum Working Group, tasked with the goal of eradicating Alyssum from the Illinois Valley. All proposed units, landings, and proposed temporary routes have been surveyed for Alyssum along with the suite of other noxious weeds targeted in pre-disturbance surveys.

As of 2016, two known sites of Alyssum occur within the PA boundary and are confined to the Hwy 199 corridor; both sites have been treated and are annually monitored. These two sites were located during surveys conducted by the Alyssum Working Group, an effort independent of the Pickett West project.

Survey Results

All final Pickett West units have been surveyed for noxious weeds (including alyssum) although not all surveys occurred in the same year; surveys were conducted in 2016 and 2017. Documented sites within the PA include *Cytisus scoparius* (Scotch Broom), *Lathyrus latifolius* (perennial peavine), *Rubus armeniacus* (Himalayan blackberry), *Rubus laciniatus* (Cutleaf or Evergreen blackberry), *Centaurea pratensis* (Meadow knapweed), *Centaurea maculosa* (Syn: *Centaurea biebersteinii*) (Spotted knapweed), *Cirsium arvense* (Canada thistle), *Chondrilla juncea* (Rush skeletonweed), *Centaurea nigra* (Lesser knapweed), *Hedera helix* (English Ivy). *Genista monspessulana* (French broom)

Based on population sizes, per noxious weed reports provided by professional botany contractors, the Pickett West project botanist estimated that approximately 43.3 acres, or 0.6 percent (6,005 commercial treatment acres plus road activities - assuming 6 acres per mile 1,560 equals 7,565 acres)([43.3/7,565]*100=0.57 or 0.6 percent) of the thinning units, including understory reduction units, road renovation/improvement, and proposed new temporary route construction acreage harbor noxious weeds. One of the species reported, Himalayan blackberry, is commonly found throughout our region and although small, isolated patches might be treated, it is not practical to target for priority treatment due to its predominance across the landscape.

Table 3.9-1 2016 and 2017 Plant Surveys Revealing Noxious Weed Species in the Pickett West PA Units

Location in Township, Range, Section	Species	Coverage in Square Feet	Oregon Department of Agriculture Designation	Plant Description/Habitat Requirements
T34S-R7W-S27 T35S-R7W-S1 T35S-R7W-S11 T35S-R7W-S22 T35S-R7W-S26 T35S-R7W-S31 T35S-R7W-S33 T37S-R7W-S20 T38S-R7W-S11 T38S-R7W-S21 T38S-R7W-S22 T38S-R8W-S3	Himalayan Blackberry	100 2600 36000 18520 1100 500 954000 100 300 36000 24000 470 **Total acres 1,073,690**	B*	Himalayan blackberry is a robust, clambering or sprawling, evergreen shrub which grows up to 9.8 feet (3 m) in height (Munz, 1974). Himalayan blackberry typically grows in open weedy sites, such as along field margins, railroad right-of-ways, roadsides, and riparian areas (Crane, 1940; Hitchcock et. al, 1973; Laymon, 1984; Roberts, 1980).
T31S-R8W-31	Cutleaf blackberry			Cutleaf blackberry is a nonnative perennial plant very similar to Himalayan

Location in Township, Range, Section	Species	Coverage in Square Feet	Oregon Department of Agriculture Designation	Plant Description/Habitat Requirements
				blackberry, but not as robust or as invasive. Vegetative characteristics are similar to Himalayan blackberry, but the compound leaves of Cutleaf are deeply serrated (OSU EC1594-E, 2008).
T37S-R7W-S15	Perennial peavine	1,600 **Total acres**	B	Perennial peavine, a European native, is a prolific perennial which resprouts each spring and grows to between 2-7 feet. Peavine is found in sun or in shaded environments, and can thrive in a variety of soil types. Seeds constitute a food source for wildlife, but large patches of peavine reduces native vegetation.It is found in all states except Florida and North Dakota (ODA, 2015).
T31S-R8W-S19 T31-R8W-S31 T31-R9W-S35	Canada thistle		B*	Generally, Canada thistle establishes and develops best on open, moist, disturbed areas, including ditch banks, overgrazed pastures, meadows, tilled fields or open waste places, fence rows, roadsides, and campgrounds; and after harvest, road building, fire and landslides in natural areas (Romme et al, 1995). Canada thistle is an early seral species, susceptible to shading, and grows best when no competing vegetation is present (Donald, 1994). Canada thistle growth may be discouraged in disturbed natural areas if suitable native species are seeded densely enough to provide sufficient competition (Haber, 1997).
T35-R7W-S31 T37-R7W-S20	Knapweed note: because many knapweeds share similar biological	4,500 22,500 **Total acres 27,000**	B*	Meadow knapweed, a hardy biennial/perennial, favors moist roadsides, sand or gravel bars, river banks, irrigated pastures, moist meadows, and forest openings (ODA, 2005). Prefers full sun and well-drained soils. Many infestations start on rights-of-way or from infested

Location in Township, Range, Section	Species	Coverage in Square Feet	Oregon Department of Agriculture Designation	Plant Description/Habitat Requirements
	characteristics, they are grouped together in this report.			gravel or fill. Seeds are often transported by automobiles, contaminated fill and gravel, and by wildlife (King Co., DNR, 2004).
T35S-R6W-S30 T35S-R6W-S31 T35S-R7W-S22 T35S-R7W-S26 T35S-R7W-S27 T35S-R7W-S33 T35S-R7W-S35 T36S-R7W-S23 T37S-R7W-S15 T37S-R7W-S20 T37S-R7W-S21 T38S-R8W-S3	Broom note: because many brooms share similar biological characteristics, they have been grouped together in this report.	1700 12600 520 390000 5000 3000 350000 22000 10 10 400 40 **Total acres 785,280**	B*	Scotch broom is a long-lived, brushy, early seral colonizer which does not grow well in forested areas, but invades rapidly following harvest, land clearing, and burning (Mobley, 1954). Scotch broom is generally intolerant of shade and will not grow in heavily shaded places (DiTomaso, 1998; Peterson and Prasad, 1998), and is typically shaded out once native species are established (Bossard, 2000; Williams, 1983) or forest canopy closes (Sawyer et. al, 2000).
T31S-R4W-S29 T31S-R4W-S31	Rush skeletonweed		B*	Rush skeletonweed is a long-taprooted biennial/perennial which prefers two soils types found in the pacific northwest: the sandy to gravely and well drained soils, and the shallow soils over bedrock, typical in the channeled scablands (Old, 1981). Rush skeletonweed is primarily a species of disturbed roadsides although it is also found on river banks, dry river beds, degraded coastal dunes, and eroded ground (McVean, 1966). Seeds are commonly transported via wind currents, and are often carried up to 20 miles from the original seed source (McLellan, 1991).
Total square feet		1,887,570 square feet = 43.3 acres		

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

3.9.2 Environmental Effects

Alternative 1 – No Action

Direct and Indirect Effects

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

Table 3.9-2 Factors Affecting the Determination of the Rate of Noxious Weed Spread

Activity	Role in Potential Noxious Weed Seed Dispersal
Private Land	Private lands host a perpetual source for noxious weed seed, which can be dispersed when seeds attach to tires, feet, fur, feathers or feces, or when natural processes such as wind and/or flooding events transport the seed from its source to another geographical vicinity.
Harvest on Private Lands	Harvest activity presents a key dispersal opportunity for noxious weed seeds per 1) attachment to tires/tracks of mechanized harvest equipment, tires of trucks, and various other harvest-related substrates which subsequently transport the seed from its source to another geographic vicinity, 2) creation of openings for potential noxious weeds colonization and 3) a lack of PDFs – such as equipment/vehicle washing, etc. - which attempt to reduce the activity's spread of noxious weed seeds.
Motor Vehicle Traffic (including Log Trucks)	Roads on public land include public use, which results in a plethora of seed-dispersing activities occurring on a daily basis. Private landowners use public roads to haul logs, undertake recreational pursuits, and/or access their properties. This transportation often occurs along BLM-administered roads, which are situated within a checkerboarded ownership arrangement. How or when seed detachment occurs is a random event could take place within feet or miles from the work site/seed source, presenting a high likelihood of detachment on public lands.
Recreational Use	The public often recreates on BLM-administered public lands, and can spread seed from their residences to public land in a variety of ways such as attachment to vehicle tires, hikers' sox, shoes, or other clothing, the fur of domesticated animals, etc.

Activity	Role in Potential Noxious Weed Seed Dispersal
Rural and Urban Development	Rural development occurring within the checkerboard land arrangement often requires public landowners to acquire a right-of-way (ROW) from the BLM to legally access their parcel(s). These ROWs, or use of BLM-administered roads is often granted. Please refer to 'Motor Vehicle Traffic' and 'Private Land,' for clarification of how this affects the spread of noxious weeds from private to public lands.
Natural Processes	Wind, seasonal flooding, and migration patterns of birds/animals are a few natural processes that potentially spread noxious weeds, especially from private land to public land. Wind carries seeds, and deposits them at random intervals. High water caused by flooding reaches vegetation (often harboring a noxious weed component) growing on the banks of rivers/creeks/streams, and deposits seeds downstream.

The activities mentioned above would contribute to noxious weed spread, which could degrade some elements of the environment. To predict the rate of this degradation would be highly speculative, as the extent of weed expansion is dependent on many factors. The degree of degradation would depend on the noxious weed species, as some, such as scotch broom and meadow knapweed, are more intrusive and/or have a higher tolerance to heat generated from wildfires, than others.

Across the Grants Pass management area, the more aggressive species are prioritized and slated for treatment under Medford District's *Integrated Weed Management Plan and Environmental Assessment OR-110-98-14*. However, the success of implementing the weed management plan would be temporary, as harvest on non-federal lands, recreational use, rural and urban development, natural processes, and vehicle traffic will continue to spread noxious weed populations into the PA regardless of treatment activities analyzed in this document.

Cumulative Effects

<u>Past activities</u>

Timber Harvest on Private Land

Information is not available about noxious weed populations in the Pickett West PA prior to BLM surveys, which began during the last 35 years. However, past activities, particularly timber harvest on private lands, likely affected noxious weeds and populations by improving suitable habitat.

Past Harvest on BLM-administered Land

Past sales and vegetation management projects which have occurred within the last 10 years within the PA include; Deer North Timber Sale, Hazardous Fuel Reduction, and the Young Stand Management Programmatic Categorical Exclusion (silviculture treatments on BLM-administered land). Noxious weeds found during predisturbance surveys for each of those projects were entered into the Medford District noxious weed database, and sites which merited treatment were treated for at least one to three years following treatment activities.

Present and Reasonably Foreseeable Activities

Discretionary Activities

The following activities have been previously analyzed and approved projects may still occur within the PA in the future: Cheney Slate Timber Sale, East West Junction Timber Sale, Section 13 Mining Plan of Operation, California Oregon Broadcasting Inc, right-of-way, Hazardous Fuel Reduction, Young Stand Management, Waters Creek in-stream restoration, Powell Creek in-stream restoration, Medford District Road and Pump Chance Routine Maintenance Categorical Exclusion, Medford District Insect and Disease Mortality Salvage for Safety Categorical Exclusion, and the Applegate Ridgeline Trail. For more information, please reference Appendix D of the Pickett West EA for a brief description of each project.

Timber Harvest and Reforestation on Private Land

BLM assumes commercial harvest would occur in the future on relatively short rotations, and that privately-owned forests will remain in early to mid-seral stages. Noxious weeds may or may not receive treatment on private lands. While BLM has some knowledge of private timber companies treating their lands with herbicide, BLM assumes at least 50 percent of private land does not treat noxious weeds.

Non-Discretionary Actions

Reasonably foreseeable activities within the Pickett West PA include non-discretionary reciprocal right-of-ways (ROW) where certain private timber companies can request access into their lands via building a new road across BLM-administered lands. These actions may occur in all Land Use Allocations. Aside from the Endangered Species Act and other federal laws, there is no requirement for reciprocal ROW actions to be consistent with BLM policies regarding noxious weeds, however, reciprocal ROW action are assumed to be incompliance with Oregon State noxious weed laws. BLM assumes there is a possibility for noxious weed establishment if a non-discretionary reciprocal ROW action were to occur within Pickett West PA. Since the actual locations, extent, and magnitude of these actions are not known, the impacts associated cannot be assessed.

Future wildfire events

As naturally-ignited wildfires have occurred in the Klamath-Siskiyou Ecoregion in the past, BLM assumes future fires would occur. Current trends as a result of fire suppression/exclusion would continue. Stands within the Pickett West PA would likely burn at severe intensities given past wildfire suppression activities which have resulted in the current stocking levels found within the PA. The potential for intense, stand-replacing fires, and the risk of direct mortality or damage to noxious weeds populations from high severity wildfire would remain unchanged from current conditions.

Conclusion

Cumulative indirect effects of noxious weed spread include the potential degradation of wildlife habitat (Rice et. al. 1997, Harris and Cranston 1979), a decline in natural diversity (Forcella and Harvey 1983, Tyser and Key 1988, Williams 1997), and a decline in water quality (Lacey et al. 1989); however, a very small amount of Pickett West unit acreage (approximately 0.6 percent of unit acreage under Alternative 2) harbored noxious weeds prior to the project, making it difficult to quantify any potential decline in ecosystem health related to existing noxious weed populations, or to quantify the potential decline in ecosystem health related to any additional noxious weed populations potentially established by the activities described in Table 3.9-2.

Alternative 1 would not contribute additional cumulative effects to noxious weeds. The amount of mid-seral and late-successional forest on BLM-administered lands would remain unchanged.

Alternative 2

Direct and Indirect Effects

In the short-term (approximately 1-5 years), proposed activities within the PA, including route construction, landing construction, lop-and-scatter and/or piling and burning of activity fuels, and associated hauling, could result in spreading noxious weeds. However, BLM contends that the rate at which this potential spread would occur is unknown due to the indistinguishable causal effect of other activities and factors listed in Table 3.9-2 on the spread of noxious weeds. The outcome of the following activities would provide suitable habitat and/or plausible vectors associated with noxious weed colonization:

- Increased light reaching understory areas resulting from canopy reduction across 6005 acres,
- Openings caused by landing construction, 9 miles of route renovation/improvement and 14 miles of new temporary route construction.
- Increased vehicle traffic which could increase, or at least perpetuate, weed infestations along road systems via seed dispersal.

Openings and disturbance provide the greatest opportunity for the establishment of noxious weeds. In an effort to address the potential for project activities to increase the rate of spread of noxious weeds, Project Design Features (PDFs) have been included to decrease the potential spread of weeds associated with the Action Alternatives. PDFs include washing equipment prior to moving it on-site, mulching with certified weed-free straw, and seeding and/or planting newly created openings with native/approved vegetation to reduce the potential establishment of noxious weeds. These PDFs are widely accepted and utilized as Best Management Practices in noxious weed control strategies across the nation (Thompson 2006). Table 1-2 delineates the PDFs and their expected implementation results.

Table 3.9-3 Project Design Features and Expected Implementation Results

Project Design Feature	Result of Implementing Project Design Features
Washing vehicles/equipment	Removes dirt that may contain viable noxious weed seeds, thereby reducing the potential for noxious weed spread
To the maximum extent possible, operate vehicles/equipment during the dry season	Reduces the potential for viable noxious weed seed to be transported and dispersed via mud caked on the undercarriages/tires/tracks of harvest equipment.
Seeding and/or planting newly created openings with native/approved seed.	Introduces native/approved vegetation to the site prior to noxious weed seed recruitment, allowing native/desirable plants an advantageous jump-start in reestablishment, which reduces the potential for noxious weed infestation.
Covering disturbed soil with certified weed-free straw	Reduces the potential for erosion and suppresses potential annual weed invasion by covering soil to prevent soil/seed contact needed for germination (UC-IPM, 2014). When combined with seeding with native/approved species, increases the potential for desirable vegetation to germinate and outcompete noxious weeds.

Implementing the suite of PDFs that reduce the potential spread of noxious weeds associated with the Action Alternatives, pretreating portions of the PA, and using native species for seeding/planting newly disturbed openings is expected to result in a similar potential of noxious weed expansion as associated with the No Action Alternative.

In the long-term (5-100 years), tree canopies would eventually expand and reduce light levels, creating a less desirable growing site, thus discouraging weeds from growing and expanding within treated areas, because populations typically decline as the amount of light reaching the plants diminishes. Consequently, in the long-term, remaining weed populations would be confined to the road prism and adjoining (private) disturbed land as canopy is re-established in treated areas over time.

The effect of implementing Alternative 2 could possibly result in the establishment of new noxious weed populations. Although the *immediate* potential for weed spread would be less with the No Action Alternative than for the Action Alternatives, the potential for the spread of existing noxious weeds and the introduction of new species is considered similar for both Action Alternatives, because of the inclusion and implementation of all PDFs in the Action Alternatives, and the fact that under the No Action Alternative, populations would continue to establish and spread due to seed transport by vehicular traffic, wildlife, and other natural dispersal methods listed in Table 1-1.

Indirect effects associated with noxious weed population enlargement are similar to those mentioned in the No Action Alternative, and are known to include, generally, declines in the palatability or abundance of wildlife forage (Rice et al., 1997), declines in native plant diversity (Forcella and Harvey 1983, Tyser and Key 1988, Williams 1997), reductions in the aesthetic value of the landscape, encroachment upon rare plant populations and their habitats, potential reductions in soil stability and subsequent increases in erosion (Lacey et. al 1989), and an overall decline of ecosystem health.

However, considering implementation of Alternative 2, there are three main reasons why potential weed establishment that might be caused is not expected to result in a detectable effect to overall ecosystem health. First, surveys indicate that a small percentage, 0.06 percent of acreage within the PA units, are affected by noxious weeds. Second, these sites located in units proposed for treatment have been reported during pre-disturbance surveys, and some, depending on how aggressive the species is, have already received treatment in 2016 under Medford District's *Integrated Weed Management Plan and Environmental Assessment OR-110-98-14,* which means that the acreage in the PA affected by noxious weeds is now even closer to 0 percent until ongoing activities listed in Table 3.9-2 would potentially re-introduce weeds into the PA. Third, as mentioned above, Project Design Features have been established to minimize the rate at which project activities might potentially spread noxious weed seed from outside or adjacent sources.

Cumulative Effects

In order to address the cumulative effects of Alternative 2 on the spread of noxious weeds, the condition of non-federal lands must be considered. However, there is limited available or existing data regarding noxious weed occurrence on non-federal lands. Therefore, for purposes of this analysis, BLM assumes that; 1) there is a perpetual source of noxious/invasive weeds on non-federal lands that can spread to federal lands, especially when the land ownership is checkerboarded, as within the PA, and 2) conversely, that noxious weeds are not established on these lands, and therefore there is a need to reduce the risk of spread of noxious weeds from the federal lands to the adjoining non-federal lands. Seeds are spread by the wind, by animal/avian vectors, natural events, and by human activities, in particular through soil attachment to vehicles. BLM's influence over these causes of the spread of noxious weeds is limited to those caused by human activities. Additional human disturbance and traffic would increase the potential for spreading noxious weed establishment, but regardless of human activity, spread of these weeds would continue through natural forces. Thus, the BLM cannot stop the spread of noxious weeds, it may only reduce the risk or rate of spread.

Given the unpredictable vectors for weed spread, such as vehicle usage by private parties, wildlife behavior, and wind currents, it is not possible to quantify with any degree of confidence the rate of weed spread in the future, or even the degree by which that potential would be increased by Alternative 2.

Foreseeable activities within the PA are listed under the No Action Alternative, at the beginning of Chapter 3, and in Appendix D, and are expected to be similar to past and current activities: motor vehicle traffic, recreational use, rural and urban development, timber harvest, road construction, and firewood collection. These types of activities could result in new disturbed sites available for colonization by existing noxious weed populations, and they do offer the possibility of introduction of new noxious weed species to the PA under any alternative, including the No Action Alternative. As stated above, there is no available or existing data concerning the rate of weed spread occurring on either federal or non-federal lands as a consequence of these specific types of activities. Also, as discussed above, there is no information on what, if any, increase in the rate of weed spread Action Alternative 2 would cause, and hence, it is not possible to quantify with any degree of confidence what the incremental effect of Action Alternative 2 on the spread of noxious weeds would be when added to the existing rate of weed spread caused by past, present, and future actions.

PDFs exist to reduce the potential that Action Alternative 2 would contribute to the spread of weed seed and establishment of new populations. PDFs are not intended or expected to completely eliminate any possibility that Action Alternative 2 would contribute to the spread of weed seed and establishment of new populations; however, PDFs ensure that any incremental contribution from Action Alternative 2 to the spread of weeds, when added to the rate of weed spread caused by past, present, and future actions, would be so small as to be incapable of quantification or distinction from background levels.

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

Data collection would not reduce the inherent speculation in predicting incremental effects from Action Alternative 2 on the spread of weeds because of (1) the unpredictable natural factors that largely determine whether weeds would spread after project activities, (2) the unlikelihood that future data collection would be able to detect or measure any difference between background rates of weed spread and the rate of weed spread as affected by Action Alternative 2 and correspondingly reduced by PDFs, and (3) the included PDFs that would reduce, if not eliminate, any project effects on the rate of weed spread that would make the already undetectable effects of Action Alternative 2 even more undetectable. Finally, further data collection on the rate of spread would not alter the PDF techniques already being applied to reduce that rate of spread. It cannot be over emphasized that under the No Action Alternative, noxious weeds are likely to spread over time regardless of whether or not the Pickett West project occurs, and that rate would not be altered to any detectable degree by Action Alternative 2.

Alternative 3

Direct and Indirect Effects

Alternative 3 proposes less ground-based harvesting (more helicopter), and less new temporary route construction as compared to Alternative 2. Although both Action Alternatives increase available light, thereby creating favorable growing environments for noxious weeds, Alternative 3 involves less soil disturbance resulting from heavy machinery. Direct and indirect effects resulting from Alternative 3 would be similar to or less than those discussed in the Alternative 2 section.

Cumulative Effects

Cumulative effects resulting from Alternative 3 are similar in scope and do not exceed those listed under Alternative 2.

3.10 Visual Resources and Recreation

Methodology

- The Visual Resource Management Classes were initially established using Map 10 from the 1995 ROD/RMP.

- GIS was utilized to analyze the interaction of the proposed treatment areas with the Visual Resource Management Classes. Visual Resource Contrast Ratings were utilized to analyze the visual resources. The degree to which a management activity affects the visual quality of a landscape depends on the visual contrast created between a project and the existing landscape. Critical viewpoints known as Key Observation Points (KOPs) are used to gather contrast ratings and are found along commonly traveled routes or observation points. Factors that should be considered in selecting KOPs are; angle of observation, number of viewers, length of time the project is in view, relative project size, season of use, and light conditions (USDI BLM Visual Resource Contrast Rating Manual 8431).

  Eight KOPs were selected in the planning area. Three KOPs were selected along Highway 238 (Williams Highway). Three KOPs were selected along Highway 199 (Redwood Highway). Two KOPs were selected along the Merlin-Galice road. See Figure 3.10-1 for KOP locations.

- Recreation sites, trails, back country byways, existing and suitable wild and scenic rivers, and wilderness study areas were identified using Map 9 and Table 7 from the 1995 ROD/RMP (1995 ROD/RMP, p. 64-65). In addition, Recreation Management Areas were identified using Map G-2 and Table G-2 from the 2016 ROD/RMP (2016 ROD/RMP, p. 262-263).

Assumptions

- Organized and dispersed recreation activities are occurring on all BLM-administered lands and include boating, hiking, horseback riding, mountain biking, sightseeing, hunting, fishing, target practice, dispersed camping, off-highway vehicle use, and opportunities for solitude. There are user created routes in the planning area but densities would be considered low. In addition there are established recreation sites that are in the planning area which are described below in the Affected Environment section.

- The 1995 ROD/RMP requires providing interim protective management for outstanding remarkable values identified on BLM-administered lands along river segments determined to be *eligible* but not studied for inclusion as components of the National Wild and Scenic River System. Both the Rogue River Wild and Recreation river segments are designated river segments and because of this designation are not considered eligible. Four river segments, Big Windy Creek, East Fork Windy Creek, Dulog Creek, and Howard Creek were found to be eligible for potential wild designation. Under interim protective management, all authorized action on BLM-administered lands within the one-half mile wide corridor must have a positive or neutral effects on the identified outstanding remarkable values that resulted in the rivers being found eligible/suitable. The four eligible river segments listed above are outside of the watersheds that make up the Pickett West planning area. The 1995 ROD/RMP direction listed on page 69 applies only to eligible river segment and not designated river segments.

3.10.1 Affected Environment

Visual Resource Management Classes

- The following Visual Resource Management (VRM) Classes exist within the planning area; VRM Class I, VRM Class II, VRM Class III, and VRM Class IV (1995 ROD/RMP p. 70). See Figure 3.10-1.

- Manage VRM I lands for limited management activities. The level of change to the characteristic landscape should be very low and must not attract attention. Changes should repeat the basic elements of form, line, color, texture, and scale found in the predominant natural features of the characteristic landscape. There are 4,745 acres of BLM-administered lands in VRM Class I within the PA.

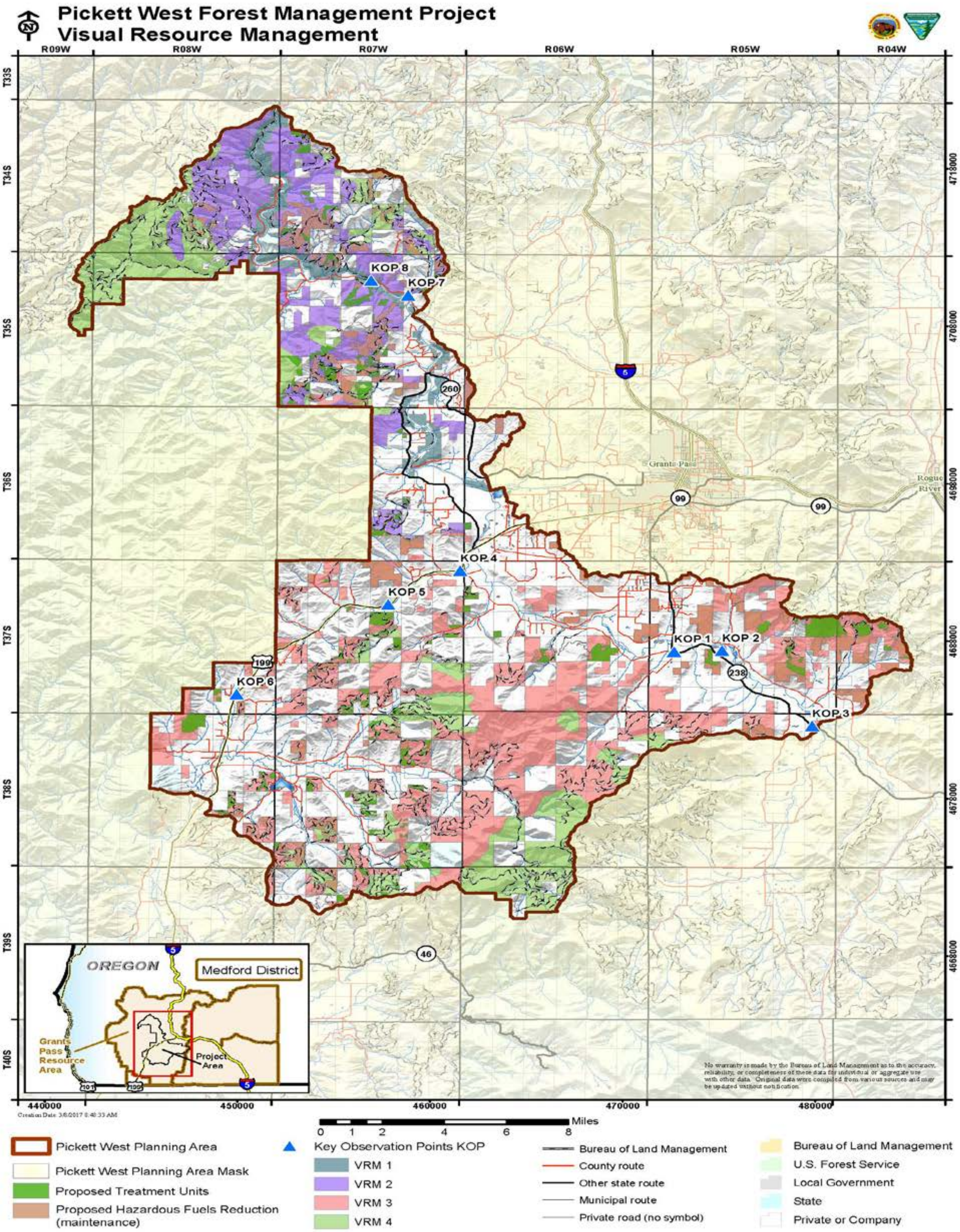
- Manage VRM Class II lands for low levels of change to the characteristic landscape. Management activities may be seen but should not attract the attention of the casual observer.

Changes should repeat the basic elements of form, line, color, texture, and scale found in the predominant natural features of the characteristic landscape. There are 21,154 acres of BLM-administered lands in VRM Class II within the PA.

- Manage VRM Class III lands for moderate levels of change to the characteristic landscape. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements of form, line, color, texture, and scale found in the predominant natural features of the characteristic landscape. There are 44,864 acres of BLM-administered lands in VRM Class III within the PA.

- Manage VRM Class IV lands for moderate levels of change to the characteristic landscape. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the effect of these activities through careful location, minimal disturbance, and should repeat the basic elements of form, line, color, and texture. There are 24,327 acres of BLM-administered lands in VRM Class IV within the PA.

Figure 3.10-1 Pickett West Visual Resource Management Classes and Key Observation Points



Special Recreation Management Areas (SRMAs) within the planning area

- Lake Selmac Loop Trail (Existing) = 443 acres/3 miles
- Stringer Gap Trail
- Round Top Mountain Civilian Conservation Corps Trail (Proposed) = 13,168 acres/5 miles
- Williams-Selma Backcountry Highway = 20 miles
- Manzanita Cave = 20 acres
- Provolt Seed Orchard (Proposed) = 294 acres
- Deer Creek Education/Interpretive Area (Existing) = 41 acres
- Applegate Ridge Trail (Proposed) = 17 miles

Extensive Recreation Management Areas (ERMAs) within the planning area
- Kerby Peak Trail (Existing) = 36 acres/4 miles
- Bolt Mountain Trail (Existing) = 392 acres/3 miles
- Northwest Hills (Proposed) = 2,341 acres
- Mungers Butte (Proposed) = 11,873 acres
- Buckhorn Mountain (Proposed) = 8,206 acres
- Hellgate-Galice Backcountry Byway (Existing) = 256 acres/39 miles
- Eight Dollar Mountain (Existing) = 2,134 acres/0.3 miles
- Quartz Creek OHV Area = 8,344 acres
- Wild Rogue Canyon = 50,451 acres
- Grants Pass Peak = 11,923 acres

Recreation Management Zones (RMZs) are subdivision of SRMAs or ERMAs that further delineate specific recreation opportunities, objectives, and allowable uses (2016 ROD/RMP, p. 259).

Dispersed Recreation
- Dispersed recreation opportunities within the PA include boating, hiking, horseback riding, mountain biking, sightseeing, hunting, fishing, target practice, dispersed camping, Off Highway Vehicle (OHV) use, and opportunities for solitude. Using GIS data, a total of 4 miles of dispersed social hiker trails exist outside of SRMAs and ERMAs. In addition, 18 miles of dispersed social OHV trails exist outside of SRMAs and ERMAs.

3.10.2 Environmental Effects

<u>Alternative 1 – No Action</u>

Direct and Indirect Effects

Outdoor enthusiasts who enjoy the use of the Pickett West planning area for their recreation purposes would continue to use the area undisturbed from any timber sale operations or treatments on public lands. All established recreation sites, dispersed recreation sites, and uses within the PA would remain in their current state under the No Action Alternative.

The proposed Wilderness and Illinois Valley proposal would not experience any direct or indirect effects under the No Action Alternative because no activities would occur on BLM-administered lands.

There would be no treatments to vegetation or associated operations under the No Action Alternative so there would be no change (direct or indirect effects) to the visual resources within the Pickett West PA. Activities on private land would likely occur but would not alter the visual resources on BLM-administered lands.

Cumulative Effects
Under the No Action Alternative no BLM vegetation treatments, associated route, and landing construction associated with Pickett West project would occur. The projects listed in the EA, which are considered in this cumulative effects analysis, are not anticipated to have direct, indirect, or cumulative effects under the No Action Alternative because they are limited in duration and small in scale. The other projects listed would not affect the visual resources in the area because all of those projects would adhere to visual resource standards in the RMP (1995 ROD/RMP, p. 70). All other recreation activities are expected to occur and are not impacted by other BLM proposals. The proposed Wilderness areas would not be altered by the No Action Alternative or any of the present and foreseeable projects expected to occur within the Pickett West PA.

The No Action Alternative is the existing condition within the PA and is described in the General Affected Environment. There would be no alteration to vegetation on BLM-administered lands under the No Action Alternative, therefore there would be no modification to the existing characteristic of the landscape.

<u>Alternative 2</u>

Direct and Indirect Effects

Visual Resource Management Categories
To establish which units were visible from Highway 238, Highway 199, and the Hellgate-Galice Back Country Byway a viewshed analysis was performed. This exercise consists of placing points along a travel route and assigning low, moderate, and high visibility ratings depending on how many points are visible from each unit. Low visibility appears as yellow, moderate visibility appears as the orange, and high visibility appears as red. As seen in Figures 3.10-2 and 3.10-3 below, there are no units which were found to be highly visible from the analyzed routes. A small percentage of units contains portions that are moderately visible. Most units were found to have low visibility, there are no units which are visible in their entirety.

Figure 3.10-2 Pickett West Hellgate-Galice Back Country Byway Viewshed Analysis

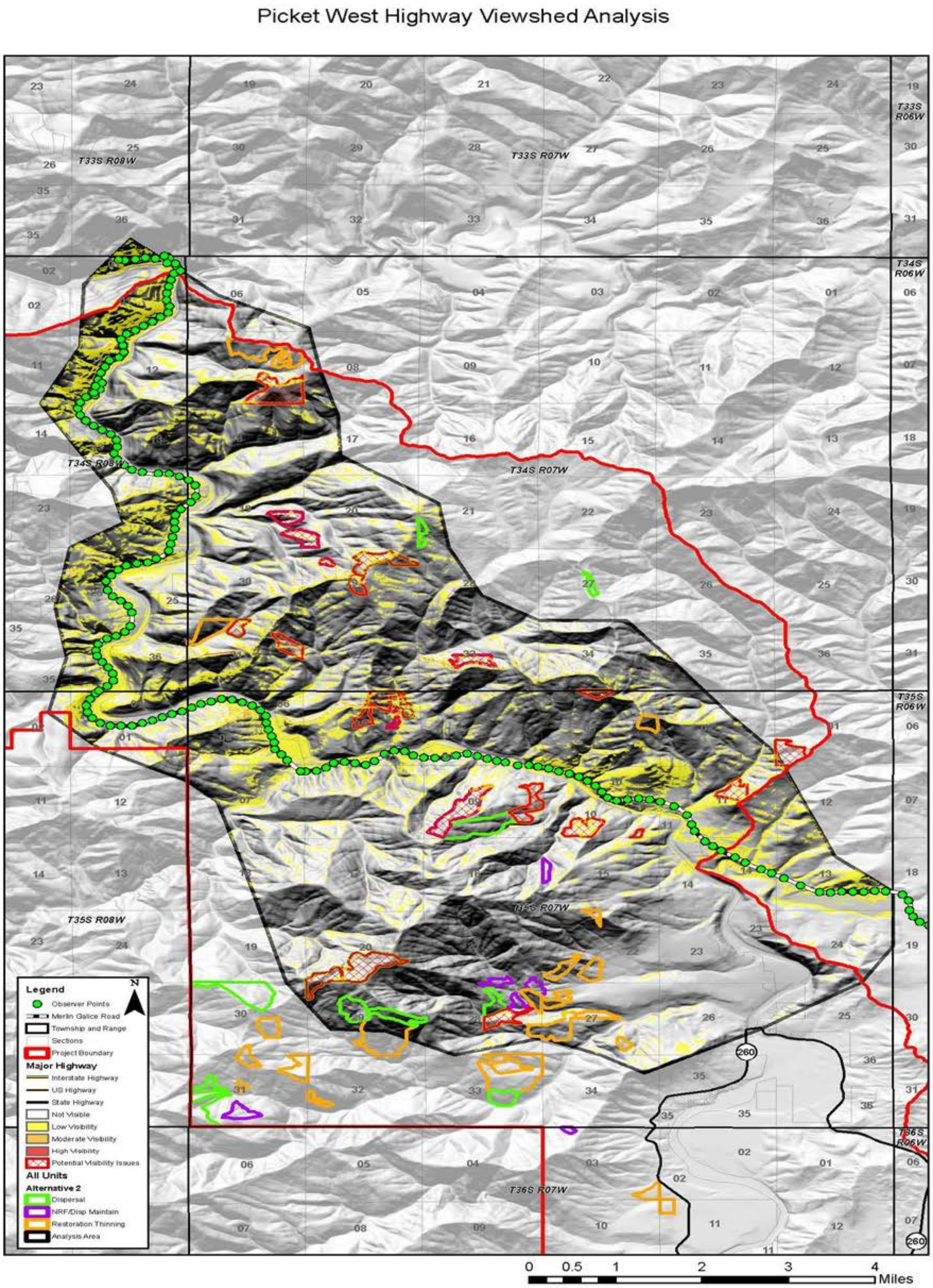
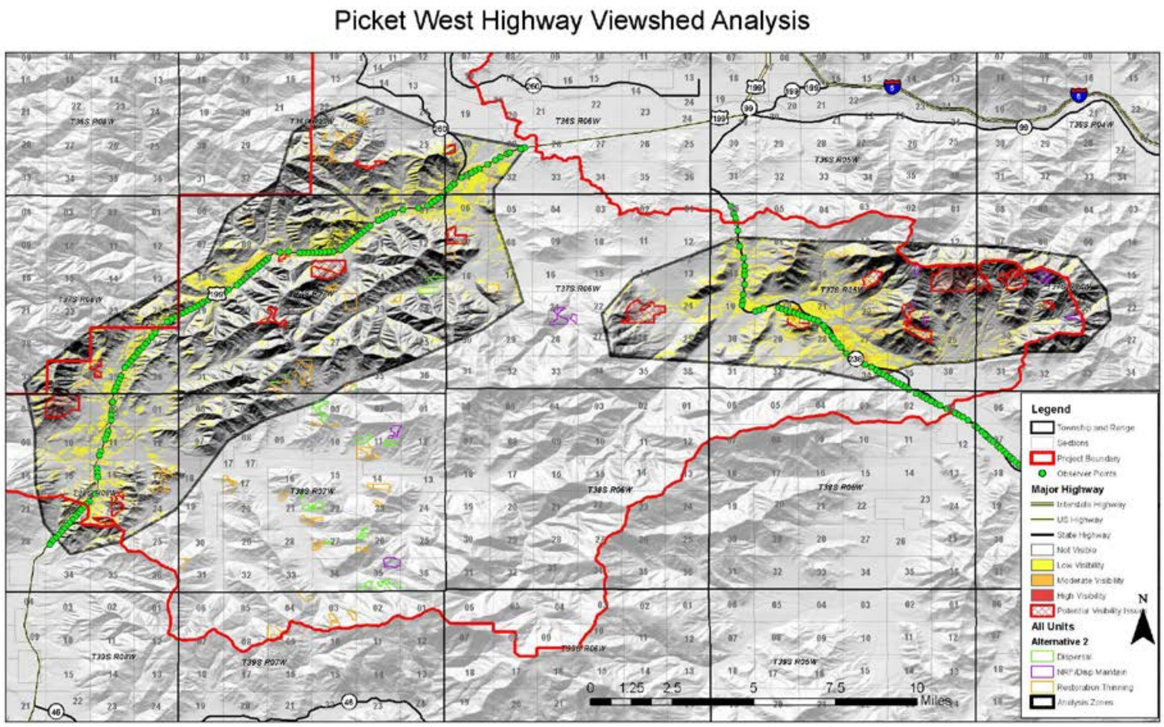


Figure 3.10-3 Pickett West Highway 238 and Highway 199 Viewshed Analysis



VRM Class I

Within the Pickett West PA Visual Resource Management Class I lands are located within the ¼ mile Rogue River Corridor. All proposed treatments, commercial and non-commercial, have been removed from the ¼ mile river corridor. Because all treatments have been removed from this area the Pickett West project would not alter the characteristic of the river corridor. There would be no change to the form, line, color, texture, and scale within the river corridor therefore the existing character of landscape would be preserved. For an explanation of the methodology utilized to eliminate visual effects within the river corridor see Chapter 1.7 Issues and Alternatives Considered but not Analyzed in Detail.

VRM Class II

Within the Pickett West PA Visual Resource Management Class II lands are located adjacent to but outside of the ¼ mile river corridor. Approximately, 1,562 acres within 60 units and are located within VRM Class II lands, see Table 3.10-1 below. The Pickett West project proposes to manage approximately 7.4 percent of the VRM Class II lands within the PA.

Table 3.10-1 Units within Visual Resource Management Class II Lands

Unit Number	Treatment Type*	Acres
1-1	RT	42
10-1	RT	40

Unit Number	Treatment Type*	Acres
10-2	RT	4
11-5	RT	31
15-1	DM_TM	11
19-1	DM_TM	25
20-1	DM_TM	29
20-2	DM_DG	102
21-1	DM_DG	7
21-2	DM_DG	3
21-3	DM_TM	13
22-1	RT	8
22-2	RT	20
22-3	RT	25
23-1	RT	36
27-1	RT	55
27-3	RT	17
27-4	RT	8
27-5	RT	5
27-6	RT	7
27-7	RT	29
27-8	RT	4
27-9	RT	51
28-1	DM_TM	15
28-2	RT	19
28-3	DM_DG	1
28-4	DM_TM	4
28-5	RT	2
28-6	RT	20
29-1	DM_DG	50
29-2	RT	19
29-3	DM_TM	5
29-4	DM_DG	61
29-5	RT	43
3-1	RT	12
3-2	RT	19
3-4	RT	19
30-1	DM_DG	13
30-3	RT	39
31-1	RT	41
31-2	RT	17
31-3	DM_DG	28
31-4	DM_DG	6
31-5	RT	31
31-6	DM_DG	6
31-7	DM_DG	46
31-8	RT	5

Unit Number	Treatment Type*	Acres
31-9	DM_TM	23
33-1	DM_TM	5
35-1	RT	5
35-2	RT	9
5-1	RT	50
5-2	DM_DG	14
5-3	DM_TM	7
7-1	RT	80
7-2	RT	87
9-1	DM_TM	71
9-2	DM_DG	75
9-3	RT	42

**RT = Restoration Thinning; a minimum of 30 percent canopy cover would be retained, DM_TM = Density Management – treat and maintain; between 40 and 60 percent canopy cover would be retained, DM_DG = Density Management – downgrade; between 40 and 60 percent canopy cover would be retained. For a description of the treatment types see Chapter 2.2 Action Alternative 2.*

The analysis contained within the 3.1 Silviculture and 3.2 Fire and Fuels chapters demonstrates the stands proposed for treatment are outside of their Natural Range of Variability. Proposed Restoration Thinning would reduce stand density and fuel loading similar to stands that have an intact fire regime, this treatment could result in stands with a minimum 30 percent canopy cover resulting in a structurally diverse stand that is fire resilient. Density Management treatments accomplish northern spotted owl goals, thinning stands to enhance forest health, stand structure, and function. This type of treatment would result in 40-60 percent canopy cover. Both treatments are expected to return forest stands closer to historic conditions making them more resilient to wildfire disturbance. Since all of the proposed treatments are variations of thinning and no regeneration harvesting is proposed, treatments are expected to maintain canopy cover and the existing characteristic of the landscape. Thinned stands would be more resilient to wildfire which means that in the event of a wildfire on the landscape thinned stands are not expected to succumb to stand replacing events which would further aid in retaining the existing character of the VRM Class II landscape.

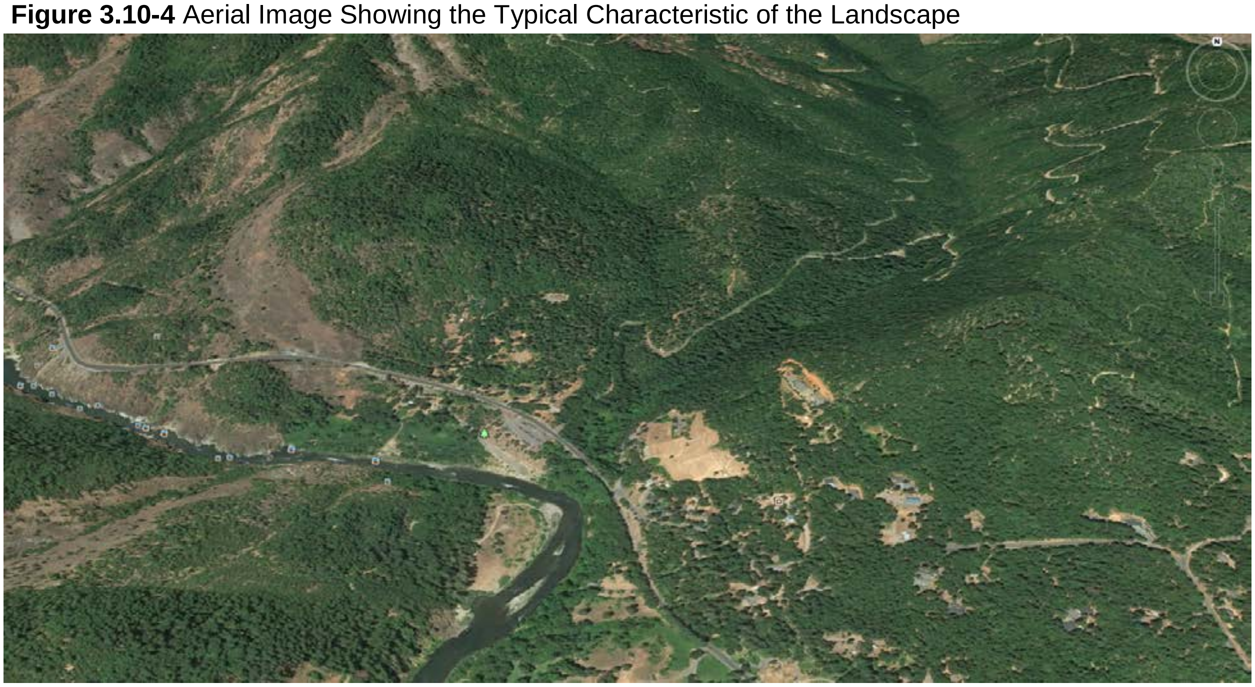
To analyze the direct and indirect effects of the proposed treatments on VMR Class II lands two Key Observation Points (KOPs) were selected along the Hellgate-Galice Back Country Byway. Designation as a backcountry byway does not change how adjacent lands are managed (1995 ROD/RMP, p. 68). Management of adjacent lands would adhere to the VRM Class II requirements. The KOPs selected included the Hog Creek Boat Ramp and the Hellgate Overlook. Both of the KOPs, Hog Creek Boat Ramp (KOP #7) and the Hellgate Overlook (KOP #8) are located in areas that are considered high-use and have high scenic quality. It is assumed that these areas have a continuum of use which ranges from passing by at speeds from 35 to 55 miles per hour, to uses such as picnicking and site seeing which may last from minutes to a span of a few hours. Each user experience is unique. The view from each KOP was analyzed from the aspect of casual observer.

While there are many recreation sites located along the Rogue River Recreation Section Corridor the 2 KOPs listed above were selected because these areas have proposed units in close proximity, they are found along commonly traveled routes, are utilized as scenic overlooks, have a greater number of viewers than other sites, are generally used for greater a length of time, and offer a representative sample of the expected outcomes of the thinning treatments. As seen in Figure 3.10-2 above, a majority of the units are not visible from the Merlin-Galice Back Country Byway or the numerous recreation sites which are accessed from this route. The analysis below is representative of the thinning treatments proposed within the remaining units and are expected to adhere to the management direction for VRM Class II lands. Thinning treatments are expected to produce low levels of change to the characteristic landscape and are not expected to attract the attention of the casual observer. Proposed treatments would repeat the basic elements of form, line, color, texture, and scale found within the predominate natural features of the characteristic landscape as demonstrated below in the VRM analysis.

Within the VRM Class II lands, proposed temporary routes and landings would be placed near ridges but not directly on ridges that are visible from the back country byway or the river corridor. Offsetting these operational features would ensure that management activities do not attract the attention of the casual observer.

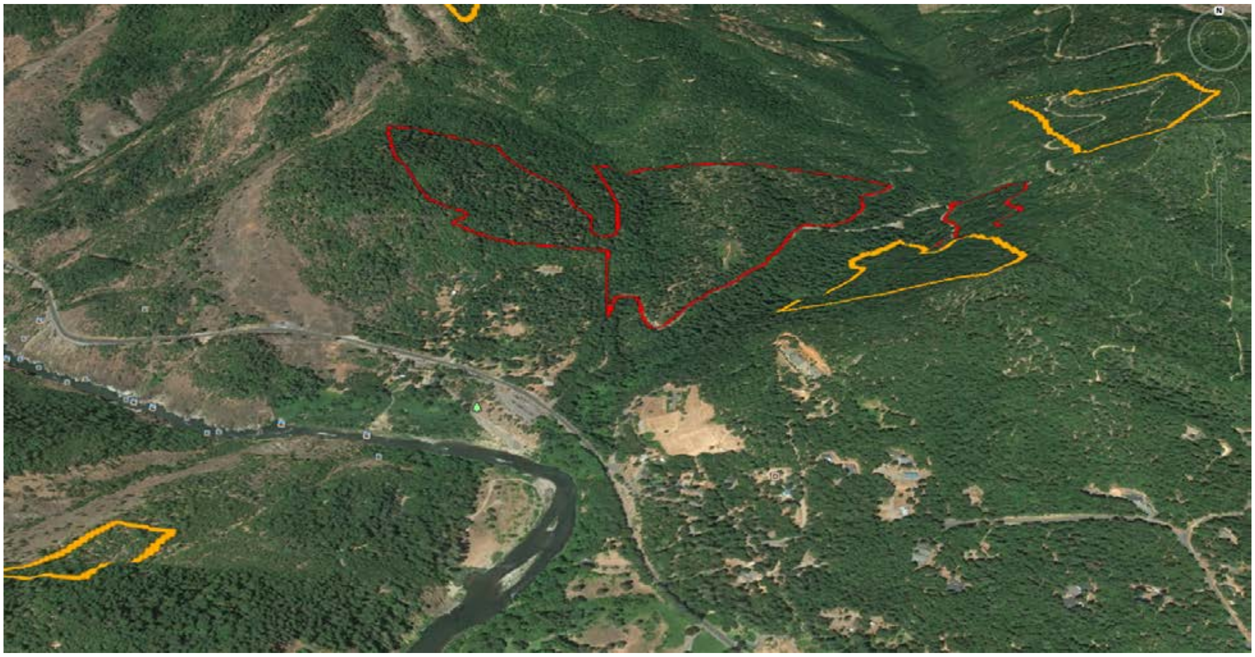
Figure 3.10-4 below illustrates past treatments on the landscape and shows that thinning treatments, similar to what is proposed under Pickett West, meet VRM Class II management direction for low levels of change that are not expected to attract the attention of the casual observer.

Figure 3.10-4 Aerial Image Showing the Typical Characteristic of the Landscape



The small green tree in the lower left center of the image is Hog Creek Boat Ramp.

Figure 3.10-5 Aerial Image Showing Past Treatments and Proposed Treatment Units



Pickett West proposed treatment units are shown in orange. The area in red is a Stratton Hog unit which was treated in 2004. The thinning treatments preformed under the Stratton Hog project are substantially similar to the treatments proposed under the Pickett West project. The aerial image in Figure 3.10-4 demonstrates that proposed thinning treatments would not attract the attention of the casual observer.

Key Observation Point #7 – Hog Creek Boat Ramp

The photos below illustrate the view from KOP #7 and provides a visualization of how proposed thinning treatments may alter the vegetation.

Figure 3.10-6 Photo from KOP # 7 looking southwest - Hog Creek Boat Ramp

Figure 3.10-7 Visualization of treatments at KOP #7 – Hog Creek Boat Ramp

The units that are visible within the figures above are 10-1 and 10-2. Units 10-1 and 10-2 are Restoration Thinning units which would retain a minimum of 30 percent canopy cover.

Empirical data demonstrates that thinning prescriptions would not remove the dominant and co-dominant trees that create the seen forest canopy and the result of the proposed treatments to the casual observer would not drastically alter the basic elements of form, line, color, texture, and scale found within the pre-dominant natural features of the characteristic landscape. The Visual Contrast

Rating Worksheet (Form 8400-4) resulted in a repetition of the existing and variable basic elements of form, line, color, texture, and scale. The proposed thinning treatments as visualized from KOP #7 would not alter the form of the land and would repeat the irregular vertical lines created from the conical shaped conifers seen in the landscape, causing a weak change to the existing character of the landscape.

The Visual Contrast Rating Worksheet resulted in a weak color change to the overall landscape. As visualized on the left and right sides of Figure 3.10-7, slight color alterations are expected which would repeat and retain the hue, value, and chroma which currently exist on the landscape. The vegetation seen on the landscape is dominated by hues of green, from warm light green in the foreground, to cooler dark greens in the background. Thinning treatments would retain the dominant vegetation within a unit, therefore the resulting color of the landscape would be a rearranged. The thinning treatments are not expected to drastically increase the instances of dark colors next to light colors but rather repeat the mosaic of color harmony, which, on this landscape, is an assortment of combinations of green which readily and pleasantly blend with each other. A repetition and rearrangement of the pattern of colors on the landscape would retain the existing character of the landscape.

The Visual Contrast Rating Worksheet resulted in a weak texture change to the overall landscape. KOP #7 contains fine, medium, and coarse grained textures. The vegetative pattern appears sparse, medium, and dense, in areas it is uneven and random, and sometimes it is ordered with a gradation of texture. Because the view from KOP #7 contains so many variations of texture it is expected that thinning treatments would weakly alter the texture when viewed by the casual observer. Thinning treatments would not remove all of the vegetation in an area, rather thinning treatments remove some vegetation. The visualization in Figure 3.10-7 illustrates an anticipated outcome which replicates and contributes to the variation of textures currently present on the landscape.

The proposed thinning treatments that are visible from KOP #7 would result in low levels of change to the characteristics of the landscape. The thinning activities may be seen by a keen observer who is intimately familiar with the views from this location but would not attract the attention of the casual observer. The changes described above would be small compared to the scale of the surrounding landscape. Thinning treatments would repeat the basic elements of form, line, color, texture, and scale found in the predominant natural features of the characteristic landscape.

Key Observation Point # 8 – Hellgate Overlook

The photos below illustrate the view from KOP #8 and provides a visualization of how proposed thinning treatments may alter the vegetation.

Figure 3.10-8 Photo from KOP #8 looking southwest – Hellgate Overlook

Figure 3.10-9 Visualization of treatments at KOP #8 – Hellgate Overlook

The units that are visible within the figures above are 10-1 and 9-3. Units 10-1 and 9-3 are Restoration Thinning units which would retain a minimum of 30 percent canopy cover.

Figure 10.3-10 Photo from KOP #8 looking northwest – Hellgate Overlook

The units that are visible within the Figure 3.10-10 above are 5-1, 5-2 and 5-3. Units 5-1 is a Restoration Thinning unit which would retain a minimum of 30 percent canopy cover. Unit 5-2 and 5-3 are Density Management units which would retain from 40-60 percent canopy cover.

All treatments proposed under this project are thinning treatments. Empirical stand data demonstrates that thinning prescriptions would not remove the dominant and co-dominant trees that create the seen forest canopy. The Visual Contrast Rating Worksheet (Form 8400-4) resulted in a repetition of the existing and variable basic elements of form, line, color, texture, and scale.

The visualization in Figure 3.10-9 and the Visual Contrast Rating Worksheet resulted in no change to the form and scale of the landscape from the proposed thinning treatments. The analysis showed that there would be low levels of change in color and texture, but the change would be small compared to the scale of the surrounding landscape. The Visual Contrast Rating Worksheet indicated a repetition of the basic elements of form, line, color, texture and scale. The proposed thinning treatments may be seen from KOP #8 but are not expected to attract the attention of the casual observer. Low levels of change to the landscape are within the management direction for VRM Class II lands.

The proposed thinning treatments would likely be the most visible within the first three years after implementation, as the tree crowns expand to fill the open space. It is not expected that the visibility would greatly increase during the winter months because the area is populated with evergreen shrubs such as manzanita and madrone, ensuring that the ground remain a green hue, even in winter months. This area experiences greater use during the spring and summer months when outdoor recreation activities increase. Use is considered moderate to low in the winter months, because of the retention of dominant and co-dominant trees, the presences of evergreen shrubs, and the reduced utilization in the winter months, the treatments are not expected to increase in visibility to the casual observer in winter months.

VRM Class III and IV
Visual Resource Management Class III lands are located adjacent to both Highways 238 and 199. There are approximately 4,441 acres within 107 units.

Photos from the KOPs listed below are available in the Administrative Project Record.

<u>Key Observation Points # 1, 2, and 3</u>
KOP #1 is located at the intersection of Highway 238 and Aggregate Avenue in Merlin, Oregon and looks west towards unit 23-6.

KOP #2 is located at approximately 8800 Highway 238 and looks southwest toward unit 20-4.

KOP #3 is located at the intersection of Messinger Road and looks north toward units 13-8, 13-9, 18-1, and 26-7.

<u>Key Observation Points # 4, 5, and 6</u>
KOP #4 is located at the intersection of Old Redwood Highway and Highway 199 and looks southeast towards unit 7-3.

KOP #5 is located at the intersection of Elliot Creek road and Highway 199 and looks slightly southwest towards units 15-3 and 15-4.

KOP #6 is located at near the intersection of Draper Valley road and Highway 199 and looks west toward units 3-5, 35-3 and 35-4.

Following a viewshed analysis and field observations, no KOPs were selected at Lake Selmac. Lake Selmac is located in VRM Class III lands. There are three units 13-3, 13-4, and 17-2 which are located in close proximity to the lake. No KOPs were selected in the area because none of the units are visible from the lake. The landscape around the lake can be characterized as low rolling hills which means that the existing vegetation in the area obscures the views of hillside where commercial thinning treatments are proposed. The closest unit is approximately 600 feet from the lake, this 600 feet offers an adequate buffer to obscure the view of the casual observer. There would be weak changes to the form, line, color, texture, or scale of the landscape as viewed by the casual observer around Lake Selmac, the treatments maybe seen but would not dominate the view of the casual observer.

As described previously, empirical data demonstrates that both Restoration Thinning and Density Management treatments would not remove the dominant and co-dominant trees that create the seen forest canopy. The thinning treatments proposed under the Pickett West project would meet the management guidelines for VRM Class III and IV lands. The proposed thinning treatments would result in low levels of change that would largely retain the existing character of the landscape. The landscape is covered by a variety of vegetation, human development, colors, and textures. Thinning treatments would repeat the basic elements of form, line, color, texture, and scale found in the pre-dominant natural features of the characteristic landscape. The portions of the project units that would be visible from Highway 238 and 199 are thinning treatments and would not result in large scale canopy gaps or openings. Portion of the proposed units would be visible to travelers for a few seconds to a few minutes as they travel between 35 and 55 miles per hour but would not dominate the view of the casual observer. There are numerous existing roads, utility lines, and structures which are present in the characteristic landscape. While the proposed thinning treatments would result in low levels of change in color and texture, the change would be small compared to the scale of the surrounding landscape. Many of the surrounding hillsides contain similar lines from forest management projects, existing roads, power lines, and other man-made facilities.

The project would be the most visible in the first three years after implementation, particularly during the winter months when the ground vegetation is dormant, but is expected to become less visible as the vegetation continues to fill in and become coarse over time. The project would be most visible from KOP #2 where unit 20-4 is directly adjacent to Highway 238. The visual impact would be mitigated by placing a 100-200 foot no-treatment buffer between the unit and the highway. The remaining KOPs are located a considerable distance from the proposed units and the thinning prescriptions would result in low levels of change to the dominant color and texture on the characteristic landscape.

Special Recreation Management Areas (SRMAs)

Lake Selmac Loop Trail is open to timber sales and has proposed units intended for treatment within its boundaries. There would be effects to the recreation experience but not substantial or lasting based on the treatments described such as retaining a minimum 30 percent canopy cover and a relatively short duration of time for treatments. Round Top Mountain CCC Trail has a portion of the area open for timber sale and a portion of the area closed to timber sale. There would be effects to the recreation experience but not substantial or lasting based on the treatments described such as retaining a minimum 30 percent canopy cover and a relatively short duration of time for treatments. Stringer Gap Trail is associated with Bolt Mountain Trail and neither of them have proposed timber sales or fuel treatments within their boundaries. Concerning the Williams-Selma Backcountry Byway, the designation of backcountry byways does not change how adjacent lands are managed (1995 ROD/RMP, p. 68). Manzanita Cave, Provolt Seed Orchard, and Deer Creek Education/Interpretive Area have no identified timber sales or fuel treatments within their boundaries. The Applegate Ridge Trail (ART) is referred to in Chapter 1.7 Issues and Alternatives Considered but not Analyzed in Detail. SRMA users may experience indirect effects during times of operation from increased traffic, dust, and noise but these effects would be temporary and of short duration. To protect the safety of the public, all operations would utilize signage as directed by federal and state Occupational Safety and Health Administration.

Extensive Recreation Management Areas (ERMAs)
Kirby Peak Trail, Bolt Mountain Trail, and Mungers Butte have no fuel or timber units in their proximity. Northwest Hills is open to only fuels treatment which is designed to reduce hazardous fuels and fire hazard. The result could be an improved recreation experience for the recreation user based on a decrease in wildfire potential and more open space to recreate in the understory. Buckhorn Mountain and Eight Dollar Mountain are open to timber sales and have proposed units intended for treatment within their boundaries. There would be effects to the recreation experience but not substantial or lasting based on the treatments described such as retaining a minimum 30 percent canopy cover and a relatively short duration of time for treatments. Hellgate-Galice Backcountry Byway has proposed treatment units adjacent to it and based on the analysis above, the treatments would adhere to VRM Class II objectives and would not alter user experiences. Quartz Creek OHV Area is partly open and closed to timber sales and open to fuels treatment. There would be effects to the recreation experience but not substantial or lasting based on the treatments described such as retaining a minimum 30 percent canopy cover and a relatively short duration of time for treatments. Fuels treatment is designed to reduce hazardous fuels and fire hazard. The result could be an improved recreation experience for the OHV user based on a decrease in wildfire potential and more open space to recreate in the understory. Wild Rogue Canyon is open to timber sales and is discussed in Chapter 1.7 Issues and Alternatives Considered but not Analyzed in Detail under the Oregon and California Land Grant Act of 2015. Grants Pass Peak is open to timber sales and fuels treatment. There would be effects to the recreation experience but not substantial or lasting based on the treatments described such as retaining a minimum 30 percent canopy cover and a relatively short duration of time for treatments. Fuels treatment is designed to reduce hazardous fuels and fire hazard. The result could be an improved recreation experience for the user based on a decrease in wildfire potential and more open space to recreate in the understory. ERMA users may experience indirect effects during times of operation from increased traffic, dust, and noise but these effects would be temporary and of short duration.

Dispersed Recreation
Due to the nature of dispersed recreation uses the BLM is not able to quantify the effects of Alternative 2 on dispersed recreation users within the PA. Similar to the situation described above for SRMAs and ERMAs, users may experience indirect effects during times of operation from increased traffic, dust, and noise but these effects would be temporary and of short duration. Additionally, under Alternative 2 approximately 6,005 acres are proposed for commercial treatments within the 203,459 acre PA leaving approximately 94 percent of the PA available for dispersed recreation activities. There are dispersed recreation opportunities in close proximity to areas planned for

commercial treatment. The impacts of treatments to dispersed recreation would be minimal and temporary.

Cumulative Effects

The past actions and reasonable foreseeable future actions listed in this EA will likely produce noise from chainsaws, helicopters, and heavy equipment associated with various operations but activities would be intermittent and would not dominate the area. Pickett West operations combined with other operations planned in the PA would most likely be noticed by recreationists. However, these sights and sounds would not be a significant impact to the recreation experience since other sights and sounds such as vehicles using public roads, farm equipment operations, and citizens using personal equipment are common, and can be seen and heard as well. It is expected that any effects from the combined actions would affect the mentioned recreation management areas on a short-term temporary basis. The overall impact of the combined actions listed is consistent with existing conditions to the various recreation uses in the planning area.

There are no anticipated direct or indirect effects to Visual Recourse Management Class I, II, III, and IV lands. The analysis demonstrated that there would be no change within VRM Class I lands as no treatments are proposed in areas classified as VRM Class I. The analysis demonstrates that there would be low levels in changes within VRM Class II, III, and IV lands. Proposed thinning activities are expected to be visible to a deliberate observer but would not attract the attention of the casual observer. Changes would repeat the basic elements of form, line, color, texture, and scale found in predominant natural features of the characteristic landscape.

<u>Alternative 3</u>

Direct and Indirect Effects

Visual Resource Management Categories

Under Alternative 3 all proposed treatments are considered "treat and maintain" which means the northern spotted owl habitat currently present would be retained. In general, the thinning treatments proposed under Alternative 3 would remove less dominant and co-dominant trees, retaining canopy cover measurements between 40 and 60 percent. Under Alternative 3 visuals resources would be less effected but would still be in the acceptable range for Visual Resource Management Classes I, II, III and IV.

Direct and Indirect Effects to SRMAs, ERMAs, and Dispersed Recreation

Lake Selmac Loop Trail is open to timber sales and has proposed units intended for treatment within its boundaries. Round Top Mountain CCC Trail has a portion of the area open for timber sale and a portion of the area closed to timber sale. Northwest Hills is open to only fuels treatment which is designed to reduce hazardous fuels and fire hazard. Buckhorn Mountain and Eight Dollar Mountain are open to timber sales and have proposed units intended for treatment within their boundaries. Quartz Creek OHV Area is partly open and closed to timber sales and open to fuels treatment. Grants

Pass Peak is open to timber sales and fuels treatment. Applegate Ridge Trail (ART) is referred to in Chapter 1.7 Issues and Alternatives Considered but not Analyzed in Detail. Wild Rogue Canyon is open to timber sales and is discussed in Chapter 1.7 Issues and Alternatives Considered but not Analyzed in Detail under Oregon and California Land Grant Act of 2015.

There could be effects to the recreation experience but not substantial or lasting based on the treatments described such as retaining 40-60 percent canopy cover and a relatively short duration of time for treatments. The result could be an improved recreation experience for the recreation user based on a decrease in wildfire potential and more open space to recreate in the understory. Recreation users may experience indirect effects during times of operation from increased traffic, dust, and noise but these effects would be temporary and of short duration. There are dispersed recreation opportunities in close proximity to areas planned for commercial treatment. All other ERMAs and SRMAs listed do not have timber sales or fuel treatments.

Cumulative Effects

The past actions and reasonable foreseeable future actions listed in this EA will likely produce noise from chainsaws, helicopters, and heavy equipment associated with various operations but activities will be intermittent and not dominate the area. Pickett West operations combined with other operations planned in the PA would most likely be noticed by recreationists. However these sights and sounds would not be a significant impact to the recreation experience since other sights and sounds such as vehicles using public roads, farm equipment operations, and citizens using personal equipment are common and can be seen and heard as well. It is expected that any effects from the combined actions will affect the mentioned recreation management areas on a short term temporary basis. The overall impact of the combined actions listed is consistent with existing conditions to the various recreation uses in the PA. Alternative 3 may resulted in increased noise from helicopters due to the increase in helicopter yarding operations, however, helicopters are assumed to be unavailable in spring, summer, and fall due to wildfires. This means that helicopter operations often occur during winter months when recreational use is expected to be lower and not negatively impact user experiences.

3.11 Socioeconomics

3.11.1 Affected Environment[12]

The Medford District manages approximately 866,000 acres of public lands located primarily in Jackson and Josephine Counties with small portions in Coos, Douglas, and Curry Counties. The

[12] Unless otherwise noted, the data in this chapter come from the Economic Profile System, an online tool (https://headwaterseconomics.org/tools/economic-profile-system/about/), that compiles data from a number of existing federal sources including the Census Bureau, Bureau of Economic Analysis, and Bureau of Labor Statistics.

socioeconomic planning area for this EA is Josephine County, in which 67 percent of the lands are federal and 29 percent are managed by the BLM.

In 2015, the population in Josephine County was about 85,000, which had grown by 12 percent in the past 15 years. The population was older than that statewide, with a median age of 48, compared to 39 for the State. The County contains lower proportions of Hispanic/Latino residents and higher proportions of white residents than are present statewide.[13] About 7 percent of county residents are Hispanic/Latino, compared to just over 12 percent statewide. About 88 percent of Josephine County residents are white alone (not Hispanic/Latino), compared to 72 percent statewide. The proportion of residents who are American Indians is the same as statewide, at 1.2 percent.

In 2015, per capita income was $22,470, lower than that statewide ($27,684). It is therefore not surprising that the county has a higher proportion of residents living below the poverty level (20 percent) than does the state as a whole (16.5 percent). Given the county's' age and income characteristics, households receive higher proportions of income from social security, lower proportions from labor, higher proportions from non-labor sources and higher proportions from Supplemental Nutrition Assistance Program (SNAP) than residents of Oregon as a whole. About 17 percent of residents age 25 or older have an education level of Bachelor's degree or higher, compared to 31 percent statewide. According to the State of Oregon Employment Department, Josephine County's unemployment rate in 2016 was 5.1 percent and 4.9 percent in Oregon (https://www.qualityinfo.org/rogue-valley).

The State of Oregon Business Development Department conducts economic assessments to determine which counties, cities, communities, or other geographic areas qualify as 'distressed.' Pursuant to Oregon Administrative Rules (OAR) 123-024-0031, the Department defines 'distressed' areas based on indicators that take into account unemployment rates, per capita personal income, change in average covered payroll per worker over 3 years and change in the county's weighted average employment change over 2 years. As of March 2017, the Department identifies as distressed 23 of Oregon's 36 counties, including Josephine (Business Oregon 2017). In 2016, the Oregon Secretary of State identified four counties, including Josephine, whose financial condition may indicate a higher risk of distress than other counties (Oregon Secretary of State 2016). The financial shortfalls for essential services such as law enforcement have been well-publicized in the County, and Commissioners lobbied heavily for increased timber harvests during development of the Western Oregon RMPs.

To compensate counties for foregone property tax payments on former railroad lands owned by the Federal Government, Congress passed the Oregon and California Lands Act of 1937 (O&C Act), under which counties receive 50 percent of the stumpage value of commercial timber harvested and sold from O&C lands. The Federal Government spends 25 percent of the remaining 50 percent in the

[13]The Census Bureau considers race (White, Black, American Indian, Asian, Hawaiian/other Pacific Islander, other, two or more races) independently from ethnicity (Hispanic/Latino or non-Hispanic/Latino). Race and ethnicity Information is self-reported by individuals

counties to help maintain and develop the O&C acres, with the remaining 25 percent going to the US Treasury. With declining timber revenues, the Secure Rural Schools and Community Self-Determination Act was passed to provide funding to counties that was not dependent on current timber revenues. Payments through the Secure Rural Schools (SRS) programs have been plummeting in Josephine (and other) counties, from about $14 million in 2007, to $10 million in 2010, to $5.5 million in 2012 (Western Oregon RMP Final EIS, Table 3-185) and the program has been at constant risk of ending, creating great uncertainty in county budgets. In 2012, SRS payments constituted about 8 percent of Josephine County's revenues and 59 percent of its general fund, both the third highest level among Oregon counties (Western Oregon RMP Final EIS, Table 3-186).

In 2015, 19 percent of jobs were in non-service industries, with the largest shares in manufacturing and construction. Manufacturing jobs increased between 2016-2017. Of the 72 percent of jobs in the service industry sector, the largest shares were in health care and social assistance, retail trade, and accommodation and food services. Over the past year, jobs increased in the professional & business services, private educational & health services, and leisure & hospitality sectors.[14] Just under 9 percent of jobs were in government, a 9 percent drop from 2010. In the past year, county government employment dropped by 70 jobs, continuing a trend as the county struggles to find sources of revenue. According to the State of Oregon Employment Department, of the 2,980 jobs in manufacturing in March 2017, 550 were in wood products, a slight drop from the previous year.[15]

The total timber harvest (from all lands) in Josephine County was 33 million board feet in 2016, creating 1,775 jobs (OFRI 2017b). The percentage of county employment in timber was 5.8 percent. Total timber harvest (both lumber and plywood) for the State of Oregon in the same year was 7.9 billion board feet, with 60,010 jobs created (OFRI 2017a). There has been no shortage of controversy over harvesting in Western Oregon over the past several decades, and some analyses have questioned the assumption that harvest on O&C lands would contribute more to the economic well-being of Oregonians and other Americans than leaving the trees standing (see for example Niemi 2013).[16] In 2014, 24.6 million board feet of commercial timber were harvested from BLM-administered lands in the Medford District the highest amount since 2000 except for a slightly greater level in 2003 (Western Oregon RMP Final EIS, Table 3-143).

The Western Oregon Resource Management Plan Final Environmental Impact Statement (Table 3-175) analyzed the jobs (direct, indirect, and induced) specifically associated with BLM activities. In the Medford District (Jackson and Josephine counties combined), BLM management of recreation produced 425 jobs; livestock grazing produced 40 jobs; timber harvest produced 340 jobs; minerals produced 1 job; agency expenditures produced 454 jobs; and payments to counties/states produced

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[14] https://www.grantspassoregon.gov/DocumentCenter/View/10009
[15] https://www.qualityinfo.org/ed-ceest/?at=1&t1=4121024420~0~0~00000000~2015~or
[16] A critique of this report also is available.
https://defazio.house.gov/sites/defazio.house.gov/files/wysiwyg_uploaded/Technicalpercent20Reviewpercent20ofpercent20Opercent26Cpercent20Economicpercent20Reportpercent20bypercent20Pacificpercent20Riverspercent20Council.pdf

236 jobs. To put these numbers in context, the 1,496 jobs created were about 1percent of total employment in Jackson and Josephine Counties. BLM activities in the Medford District were estimated to create 139 direct timber jobs in 2012, about 3.4 percent of employment in forest products (Table 3-176).

The outdoor recreation industry has become a more important part of the regional economy. The Medford District estimates the economic value of its recreation program at $53 to $70 million, contributing 525 jobs and $15 million in wages. A 2009 report by ECONorthwest estimated the economic activity of river-based recreation on the Rogue River in Josephine County at no less than $30 million annually in total economic output, including $15.4 million in personal income and 445 full and part time jobs. Visitors to the Wild and Scenic Rogue accounted for an estimated three out of every four lodging guests in the Grants Pass - Merlin area during the four-month Wild Rogue permit season (May 15 through October 15). The Western Oregon RMP Final EIS (Table 3-178) estimated the BLM recreation programs contributed 245 direct jobs to recreation-related industries, about 1.5 percent of employment in the recreation sector.

In the dry forests of southern Oregon, fire and the risk to homes, among other effects, is a socioeconomic concern. Josephine County is estimated to have 293 square miles in the Wildland-Urban Interface (WUI), about 35 percent of which contains homes.[17] This compares to about 21 percent of the WUI in the Medford District that has been developed (contains homes). Another way to view fire risk is to look at the percent of the total number of homes in the county that are in the WUI; this number is 33 percent for Josephine County, compared to 17 percent in the Medford District. One measure of wildfire risk to development is the number of acres of forested land where homes have already been built next to public lands; by this measure, Josephine County has the highest risk of all 36 Oregon counties.

Environmental Justice

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations (1994) requires analyses of federal actions to address human health and environmental conditions in minority and low-income communities, and to ensure that disproportionately high and adverse human health or environmental effects on these communities are identified and addressed.

Environmental justice refers to the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. The BLM's Land Use Planning Handbook (BLM H-1601-1) specifies that NEPA documents must identify any proposed actions that

[17] Data from the Economic Profile System, which defines WUI as private forestlands that are within 500 meters of public forestlands, and WUI Area with homes as the square miles of private forest lands within 500 meters of public forestlands that are occupied by homes.

would adversely and disproportionally impact minority populations, low-income communities, and Tribes.

A minority population is present when 50 percent or more of the people in a defined geographic area are minorities, or when the minority population of a defined geographic area is "meaningfully greater" than that of the surrounding geographic area. Neither of these cases was found with regard to the population of Josephine County.

A low-income population is present when there is a readily identifiable set of individuals or group of people (e.g., migrant workers, American Indians) at or below the poverty thresholds or guidelines. They are readily identifiable because they live near the plan/project, or because they experience the same environmental exposure or negative effects from the plan/project.

Josephine County is considered to be an environmental justice population due to its low-income status because it has a high proportion of residents living below the poverty level. Therefore, the Environmental Consequences section will address the impacts of each alternative on this low-income population, with a special consideration of any identified disproportionate, adverse impacts.

3.11.2 Environmental Effects

The Pickett West PA is approximately 203,459 acres, of which the BLM manages approximately 95,088 acres or 47 percent of the PA. As described in Chapter 2, of the BLM-administered acres within the PA the Pickett West project proposes to commercially treat 6,005 acres or 6 percent of the PA, leaving the remaining 89,085 BLM-administered acres or 94 percent of the PA available for multiple-uses which may include but are not limited to recreation opportunities, spiritual ventures, special forest products collection, and mining. The proposed 11,102 acres of fuels hazard reduction treatments would only treat understory material which is less than 8 inches in diameter. These treatments would preclude multiple-use during short duration but would not limited them from following treatments.

Many of the scoping comments addressed issues that are directly or indirectly related to social and economic conditions. One written comment received represented many of the scoping comments and a concern with effects on ecosystem services:

> *Picket West proposed treatments, described as "restoration thinning", "density management", "regeneration harvest" (clearcut) "mortality salvage", "hazardous fuels reduction maintenance", "reduction of competing vegetation", slashing, hand piling, hand pile burning, chipping, biomass removal, understory burning, etc., would reduce productivity due to lost biodiversity, degrade and destroy species habitats, contribute to species extinctions, produce climate change, reduce carbon storage, increase fire hazards, degrade water and destroy our local economy. These timber industry developed and driven prescriptions are at the expense of all other community values. It makes no legal, scientific or*

economic sense to take a timber industry focus in a complex and growing amenity based economy, not to mention global environmental collapse, due to mass species extinctions and climate change.

Similar comments mentioned local economic benefits associated with quality of life, such as making the community more attractive to retirees, home-based entrepreneurs, and other businesses. Some of these comments offered support for the NSA Alternative discussed in Chapter 1.7 as an Alternative Not Analyzed in Detail.

In contrast, a comment from the American Forest Resource Council supported the project's purpose of providing a sustainable supply of timber, encouraging the BLM to take a proactive approach to treating Riparian Reserves seeking opportunities in the Matrix where regeneration harvest would be feasible:

> *"The timber products that the BLM generates are crucial for the long term viability of our membership and the communities they support. Our members also depend heavily on future timber supplies in perpetuity off BLM lands. On the Pickett West project, the lands allocated as Matrix are the only lands where this perpetuity can be depended upon… These benefits can only be realized if the BLM sells their timber products through sales that are economically viable."*

While all agree that Josephine County has severe financial issues, there is disagreement on the path to financial prosperity. The decreases in Secure Rural Schools funding, which was designed to make up for lost revenues in federal timber harvest and O&C funds, have caused nationally-recognized shortfalls in essential community services. The grass-roots movement towards a sustainable economy has support but does not provide the immediate boost in county revenues necessary to fund essential services, and a series of property tax increases have not passed. The proposed commercial harvest levels are expected to be low and the socioeconomic effects limited, but meaningful. As described above, the BLM's contribution to the forest products sector has recently been about 3.4 percent. Each forest management project has additional symbolic as well as actual value to the future of forest management, and the strategy for improving social and economic conditions in local communities.

<u>Alternative 1 – No Action</u>

Although the timber output of each alternative has not been estimated so economic results cannot be analyzed, this alternative would have the least harvest and therefore mean a loss of economic benefits associated with timber sector employment. Advocates for leaving trees in the forest through passive management may support taking no action. This alternative is assumed to pose a greater risk of larger fires, with subsequent greater risk of loss of life, property, and other values such as more intense burning through cultural sites in the event of a wildfire.

<u>Action Alternatives 2 and 3</u>

The Action Alternatives would be expected to have the greater levels of timber harvest than would take place under No Action Alternative. An unspecified number of jobs would be created, with likely greater employment under Alternative 2 compared to Alternative 3, which has a 21 inch diameter restriction within the Matrix and Matrix Adaptive Management Land Use Allocations and no commercial treatments within Riparian Reserves. Given that 50 percent of the revenue from the sale of timber from O&C lands is returned directly to the counties, these payments would also be expected to be lower. Public comments contributed to removing regeneration harvest prescriptions from both alternatives, lowering possible harvest levels. This is a point of conflict that would likely be seen as negative by some and positive by others.

These alternatives are assumed to reduce fire behavior/fire hazard and provide more effective suppression opportunities, particularly within treated units and around values at risk, and would alter the current trend of large-scale high severity fire events. Wildland firefighter and public safety is expected to greatly increase in treated areas and near improved road systems. Direct attack fire suppression strategies and tactics could be used to control fire, resulting in fewer acres burned and less threat to private property, given the relatively large number of homes in the WUI. The fire resilience of the Pickett West PA as a whole is predicted to improve due to the overall reduction in fire hazard within proposed treatment and previous treated units on BLM-administered lands. Regarding cultural resources, reducing fuel loads within the PA reduces the likelihood of a catastrophic fire event, leading to the better management and protection of cultural resources in the long-term.

Based on the evaluation described above in the other resource sections, there are no anticipated effects to natural scenery, recreation, and fisheries contained within the Rogue River Corridor, an important issue to those concerned about ecosystem services. The Pickett West project proposed activities are not expected to preclude the designation of the Rogue Canyon National Recreation Area. There are no activities proposed that are expected to preclude future establishment of the Applegate Ridge Trail. The changes in use levels and the subsequent economic effects are highly speculative and cannot be estimated.

As mentioned in Chapter 1.5.1, the FEIS for the 2016 Western Oregon RMP included projected harvest levels from the Pickett West project when added to projected harvest levels from other projects on the Medford District, concluding that net carbon storage would increase. Although annual greenhouse gas emissions would increase they would remain less than 1 percent of the 2010 statewide greenhouse gas emissions.

Action Alternatives 2 and 3 are also assumed to be better than no action at controlling noxious weeds. A recent report described the significant direct negative economic impacts associated with noxious weeds in the state of Oregon, the additional costs associated if weeds expand to new areas, and the positive return on investment associated with control (The Research Group, LLC, 2014). This report is not specific to the Medford District, but there is assumed to be some economic benefit associated with greater ability to control noxious weeds.

Environmental Justice

Josephine County is considered to be an environmental justice population due to its low-income status because it has a high proportion of residents living below the poverty level. The main way the proposed project could affect this low-income population is the number and type of jobs created. In the Final EIS for the Western Oregon RMPs, the BLM concluded that employment effects would not be disproportionately negative for Josephine County under the Proposed RMP, and in fact employment was estimated to increase from 2012 levels[18]. Because the Pickett West project would involve some type of commercial treatment on only 6,005 of the 89,085 BLM-administered acres in the PA, far lower than the broader, log-term scale analyzed in the FEIS, its effects on low-income populations would be reduced.

The No Action Alternative would result in fewer employment gains in the timber industry than the Action Alternatives, but the exact number of jobs is not known, as is the number of any jobs created or maintained due to the lack of commercial harvest. Similarly, it is not possible to estimate the increases in timber employment associated with the Action Alternatives, nor resulting payments to the county. As a result, there could be a disproportionate, adverse impact to Josephine County as a low-income community, but the magnitude of the effect is not predictable due to uncertainties about the number and type of forest products sector jobs that would be created.

Chapter 4 Preparers, Consultation, and Coordination

4.1 Interdisciplinary Team Members

Table 4.1-1 Interdisciplinary Team (IDT) Members

IDT members	Title	Responsibility
Jason Reilly	Wildlife Biologist	Wildlife/Consultation
Mike Crawford	Fisheries Biologist	Fisheries
Bob Lange	Hydrologist	Hydrology/Water Resources

[18] Coos and Curry Counties (both identified as low-income communities for the purpose of environmental justice) were expected to be disproportionately negatively affected under the Proposed RMP.

IDT members	Title	Responsibility
Dan Stephens	Forester	Harvest System and Road Design
Rachel Showalter and Stacey Johnson	Botanist	Special Status Plants/Noxious Weeds
Mike Main	Fuels Specialist	Fie and Fuels/Air Quality
Andrew Spencer	Silviculturist	Vegetation
Julie Arwood and Pete Meadville	Archaeologist	Cultural Resources
Erica Freemen	Engineer	Road Specifications/Engineering
Jay Wise	Soil Scientist	Soil Compaction and Productivity/Erosion
Todd Neville	Associate Field Manager	Recreation/Visual Resources
Jim Brimble	Associate Field Manager	Port-Orford cedar/Management Representative
Don Ferguson	Public Information Specialist	Public Outreach and Coordination
Scott Hicks	Planning and Environmental Coordinator	Writer/Editor
Ferris Fisher	Planning and Environmental Coordinator	Project Lead/NEPA Writer

4.2 Consultation and Coordination

4.2.1 U.S. Fish and Wildlife Service

The federally threatened northern spotted owl is the only threatened wildlife species in the Pickett West PA. The Medford District prepared a Biological Assessment for Action Alternative 2 as analyzed in the Pickett West Forest Management project EA. The BA was submitted to the USFWS in May 2017. An additional BA will be submitted to the USFWS in January 2018. The Grants Pass Field Manager would not issue a Decision Record for the Pickett West project until the Biological Opinion is received. Following receipt of the BO, both the Biological Assessment and the Biological Opinion would be posted on the BLM's ePlanning internet site at: http://tinyurl.com/ BLMePlanning-PickettWest.

4.2.2 National Marine Fisheries Service

The Pickett West proposed project is within the Rogue Basin and the range of the federally threatened Southern Oregon/Northern California Coasts (SONCC) coho salmon yet would have no effect on coho or critical habitat. Consultation for the Endangered Species Act with the National Marine Fisheries Service is not needed as the Action Alternatives would not affect listed species or their habitat. No consultation is needed under the Magnuson-Stevens Fishery Conservation and Management Act as there is no adverse effect to Essential Fish Habitat for coho and Chinook within the Rogue Basin.

4.2.3 Tribal Coordination

The BLM sent the Pickett West Forest Management project scoping letter to local federally recognized Tribes interested in Medford District BLM proposed projects. The Tribes include the Cow Creek Band of Umpqua Tribes on Indians, the Confederated Tribes of the Grande Ronde Community of Oregon, and the Confederated Tribes of the Siletz Indians of Oregon. These letters invited the Tribes to participate in meetings and or initiate formal consultation. Although no Tribes expressed interest in formal consultation, the BLM will continue to work with individual tribal governments to further identify and address Native American concerns and traditional uses of lands administered by the BLM, including the progress of this project.

4.2.4 State and Local Agency Coordination

The BLM Medford District is party to the *State Protocol between the Oregon-Washington State Director of the Bureau of Land Management and Oregon State Historic Preservation Office* (Protocol). The Protocol provides a streamlined process for complying with Section 106 of the Nation Historic Preservation Act for the proposed project.

There are 3 cultural sites located within the proposed treatment units, these sites have been flagged for avoidance thus there are not expected to be any adverse effects to cultural resource surveys. No new resources were identified as a result of intensive field inventories. Because the Pickett West project was designed to avoid and/or buffer all cultural sites, formal consultation with SHPO was not necessary. No historic properties will be affected by the project and no further review or consultation is required as per the Protocol.

The Josephine County Board Commissioners, the Josephine County Planning Department, the Public Works Department were sent scoping letters requesting input on the Pickett West proposal. They will be sent EA release letters which will also invite them to the subsequently planned field tours.

Chapter 5 References

Agee, J. K. and M. H. Huff. 1986. National Wilderness Research Conference. *Structure and process goals for vegetation in wilderness areas* (pp. 17- 25). Fort Collins, CO.

Agee, J. K. 1993. *Fire ecology of Pacific Northwest forests*. Washington, DC: Island Press

Agee, J. K., 1996. 17^{th} Forest Vegetation Management Conference. *The influence of forest structure on fire behavior* (pp. 52- 68). Anderson, CA.

Agee, J. K., C. S. Wright, N. Williamson, and M. H. Huff. 2002. Foliar moisture content of Pacific Northwest vegetation and its relation to wildland fire behavior. *Forest Ecology Management 167*, 57-66.

Agee, J. K. and C. N. Skinner. 2005. Basic principles of forest fuel reduction treatments. *Forest Ecology and Management 211*, 83-96.

Ager, A. A., M. Buonopane, A. Reger, and M. A. Finney. 2013. Wildfire exposure analysis on the national forests in the Pacific Northwest, USA. *Risk Analysis. 33*(6), 1000-1020.

Alexander, John. 2005. Personal Communication. Executive Director, Klamath Bird Observatory. Ashland, Oregon.

Amaranthus, M. P., D. Page-Dumroese, A. Harvey, E. Cazares, and L. F. Bednar. 1996. *Soil compaction and organic matter affect conifer seedling momnycorrhizal and ectomycorrhizal root tip abundance and diversity*. Research Paper, PNW-RP-494. Portland, OR: U.S. Forest Service.

Ampoorter E., L. Van Nevel, B. De Vos, M. Hermy, and K. Verheyen. 2010. Assessing the effects of initial soil characteristics, machine mass and traffic intensity on forest soil compaction. *Forest Ecology and Management*. *260*(10), 1664-76.

Andrews, P. L., F. A. Heinsch, and L. Schelvan. 2011. *How to generate and interpret fire characteristics charts for surface and crown fire behavior.* General Technical Report RMRS-GTR-253. Fort Collins, CO: U.S. Forest Service.

Anthony, R., & F. Wagner. 1998. *Reanalysis of northern spotted owl habitat use on the Miller Mountain Study Area.* Corvalis, OR: Oregon State University.

Anthony, R. G., E. D. Forsman, A. B. Franklin, D. R. Anderson, K. P. Burnham, G. C. White, C.J. Schwarz, J. D. Nichols, J. E. Hines, G.S. Olson, S. H. Ackers, L. S. Andrews, B. L. Biswell, P. C. Carlson, L. V., Diller, K. M. Dugger, K. E. Fehring, T. L. Fleming, R. P. Gerhardt, S. A. Gremel, R. J. Gutierrez, P. J. Happe, D. R. Herter, J. M. Higley, R. B. Horn, L. L. Irwin, P. J. Losch, J. A.

Reid and S. G. Sovern. 2004. Status and trends in demography of Northern Spotted Owls, 1985-2003. *Wildlife Monograph 163*, 1-48.

Atzet, T. and D. L. Wheeler. 1982. *Historical and ecological perspectives of fire activity in the Klamath Geological Province of the Rogue River and Siskiyou National Forests.* Portland, OR: U.S. Forest Service.

Atzet, T., White, D., McCrimmon, L., Martinez, P., Fong, P., & Randall, V. 1996. *Field guide to the forested plant associations of southwestern Oregon.* Pacific Northwest Region. Portland, OR: USDA Forest Service.

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

Aurell, J. B., K. Gullet, D. Tabor, and N. Yonker. 2016. Emissions for prescribed burning of timber slash piles in Oregon. *Atmospheric Science 150*, 395-406.

Barrett S.W. et al. 2010. *Interagency fire regime condition class (FRCC) guidebook. Version 3.0.* Washington, DC: Office of Government Printing.

Bart, J. 1995. Amount of suitable habitat and viability of northern spotted owls. *Conservation Biology, 9*(4), 943-946.

Bart, J. and Forsman, E. 1992. Dependence of northern spotted owls, Strix occidentalis caurina, on old-growth forests in the western United States. *Biological Conservation, 62*(2), 95-100.

Bell, M. C. 1990. *Fisheries handbook of engineering requirements and biological criteria* (3rd ed.). Portland, OR: U.S. Army Corps of Engineers.

Beschta, R. L. and R. L. Taylor. 1988. Stream temperature increases and land use in a forested Oregon watershed. *Water Resources Bulletin 24* (1). 19-25.

Best, A., L. Zhang, T. McMahon, A. Western, and R. Vertessy. 2003. *A crticial review of paired catchment studies with reference to seasnonal flows and climatic variablity.* Canberra, Australia: Murray-Darling Basin Commission.

Beyer, K. M. and R. T. Golightly. 1996. Distribution of pacific fisher and other forest carnivores in coastal northwestern California. Unpublished report. Arcata, CA: Wildlife Department, Humboldt State University.

Bilby, R. E. and J. W. Ward. 1989. Changes in characteristics and function of woody debris with increasing size of streams in western Washington. *Transactions of the American Fisheries Society 118*, 368-378.

Bingham, B. and B. Noon. 1997. Mitigation of habitat “take”: Application to habitat conservation planning. *Conservation Biology 11*(1), 127-139.

Bjornn, T. C. and D. W. Reiser. 1991. Habitat requirements of salmonids in streams. *Influences of forest and rangeland management on salmonid fishes and their habitats* (pp. 83-118). Bethesda, MD: American Fisheries Society.

Bradford, K. and T. Hsiao, T. 1982. Physiological responses to moderate water stress. In O. N. Lange, C. Osmond, & H. Zeigler (Eds.), *Encyclopedia of Plant Physiology* (Vol. 12B, pp. 265-364). Berlin, Germany: Springer-Verlag.

Brais S. and C. Camire. 1998. Soil compaction induced by careful logging in the claybelt region of northwestern Quebec (Canada). *Canadian Journal of Soil Science. 78*(1), 197-206.

Brenda, L. E., S. Litschert, G. Reeves, and R. Pabst. 2015. Thinning and in-stream wood recruitment in riparian second growth forests in coastal Oregon and the use of buffers and tree tipping as mitigation. *Journal of Forest Research*, 821-836.

Brosofske, K. D., J. Chen, R. J. Naiman, and J. F. Franklin. 1997. Harvesting effects on microclimate gradients from small streams to uplands in western Washington. *Ecological Applications 7*(4), 1188-1200.

Brown, J. K. 1995. Proceedings of the Society of American Foresters 1994 Annual Meeting. *Fire regimes and their relevance to ecosystem management*. Bethesda, MD: Society of American Foresters.

Brown, R. T., J. K. Agee, and J. F. Franklin. 2004. Forest restoration and fire: Principles in the context of place. *Conservation Biology 18*(4), 903-912.

Buchanan, J. B. 2004. Managing habitat for dispersing northern spotted owls: Are the current management strategies adequate? *Wildlife Society Bulletin 32*(4), 1333-1345.

Budesa, Bob 2006. Personal Communication, Medford district BLM noxious weed coordinator (retired), February 6.

Business Oregon. 2017. *Distressed areas in Oregon*. Retrieved from http://www.oregon4biz.com/Publications/Distressed-List. Accessed March 13, 2017.

Calkin, D. E., J. D. Cohen, M. A. Finney, and M. P. Thompson. 2014. How risk management can prevent future wildfire disasters in the wildland-urban interface. *Proceedings of the National Academy of Sciences 11*(2), 746-751.

Calkin, D. E., M. P. Thompson, and M. A. Finney. 2015. Negative consequences of positive feedbacks in US wildfire management. *Forest Ecosystems 2*(9), 1-10.

Carey, A. B., J. A. Reid and S. P. Horton. 1990. Spotted owl home range and habitat use in southern Oregon Coast Ranges. *The Journal of Wildlife Management 54*(1), 11-17.

Carey, A. B. 1991. *The biology of arboreal rodents in Douglas-fir forests*. General Technical Report PNW-GTR-276. Olympia, WA: U. S. Forest Service.

Carey, G. 2013. *Annual review of Fritillaria gentneri on BLM lands: 2013 report*. Medford, OR: Bureau of Land Management.

Cocking, M. I., Varner, J. M., Sherriff, R. L. 2011. California black oak responses to fire severity and native conifer encroachment in the Klamath Mountains. *Forest Ecology and Management 270*, 25–34.

Cole, E. K., M. D. Pope, and R. G. Anthony. 1997. Effects of road management on movement and survival of Roosevelt elk. *Journal of Wildlife Management 61*, 1115-1126.

Colombaroli, D. and D. G. Gavin. 2010. Highly episodic fire and erosion regime over the past 2,000 years in the Siskiyou Mountains, Oregon. *Proceedings of the National Academy of Sciences 107*(44), 18909-18914.

Courtney, S., J. Blakesley, R. Bigley, M. Cody, J. Dumbacher, R. Fleischer, et al. 2004. *Scientific evaluation of the status of the northern spotted owl.* Portland, OR: Sustainable Ecosystems Institute.

Clark, D. A. 2007. *Demographic and habitat selection of northern spotted owls in post-fire landscapes of southwestern Oregon*. (Master's Thesis), Oregon State University, Corvallis, OR.

Cristea, N. and J. Janisch. 2007. *Modeling the effects of riparian buffer width on effective shade and stream temperature.* Olympia, WA: Washington State Department of Ecology.

Curtis, R. 1982. A simple index of stand density for Douglas-fir. *Forest Science 28*(1), 92-94.

Cushman, K. and R. Huff. 2007. *Conservation assessment for fungi included in Forest Service regions 5 and 6 sensitive and BLM California, Oregon and Washington special status species program.* Retrieved May 13, 2015, from Interagency Special Status/Sensitive Species Program (ISSSSP): http://www.fs.fed.us/r6/sfpnw/issssp/planning-documents/assessments.shtml.

Dahlberg, A. 2002. Effects of fire on ectomycorrhizal fungi in fennoscandian boreal forests. *Silva Fennica 36* (1), 69-80.

Dahlberg, A. and J. Stenlid. 1995. Spatiotemporal patterns in ectomychorrhizal populations. *Canadian Journal of Botany 73*(Supplement 1), S1222-S1230.

Davis, R., K. Dugger, S. Mohoric, L. Evers, and W. Aney. 2011. *Northwest forest plan-the first 15 years (1994-2008): Status and trends of northern spotted owl populations and habitats.* Portland, OR: U. S. Forest Service.

DeLuca T. H. and K. L. Zouhar. 2000. Effects of selection harvest and prescribed fire on the soil nitrogen status of ponderosa pine forests. *Forest Ecology and Management 138*(1), 263-71.

DOC. 2014. National Marine Fisheries Service. *Final recovery plan for the southern Oregon/northern California coast evolutionarily significant unit of Coho salmon (Oncorhynchus kisutch).* Arcata, CA: National Marine Fisheries Service.

Drew, T. J. and J. W. Flewelling. 1979. Stand density management: an alternative approach and its application to douglas-fir plantations. *Forest Science 25*(3), 518-532.

Dugger, K., F. Wagner, R. Anthony, and G. Olson. 2005. The relationship between habitat characteristics and demographic performance of northern spotted owls in southern Oregon. *The Condor 107*(4), 863-878.

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

Dugger, K., M. E. D. Forsman, A. B. Franklin, R. J. Davis, G. C. White, C. J. Schwarz, K. P. Burnham, J. D. Nichols, J. E. Hines, C. B. Yackulic, P. F.Doherty, Jr., L. Bailey, D. A. Clark, S. H. Ackers, L. S. Andrews, B. Augustine, B. L. Biswell, J. Blakesley, P. C. Carlson, M. J. Clement, L. V. Diller, E. M. Glenn, A. Green, S. A. Gremel, D. R. Herter, J. M. Higley, J. Hobson, R. B. Horn, K. P. Huyvaert, C. McCafferty, T. McDonald, K. McDonnell, G. S. Olson, J. A. Reid, J. Rockweit, V. Ruiz, J. Saenz, and S. G. Sovern. 2016. The effects of habitat, climate and barred owls on long-term demography of northern spotted owls. *The Condor 118*(1), 57-116.

Dyrness, C. 1967. Soil surface conditions following skyline logging. *USDA Forest Service Research Note PNW-55.* Portland, OR: U.S. Forest Service

ECONorthwest. 2009. *Regional economic impacts of recreation on the wild and scenic Rouge River*. Eugene, OR: ECONorthwest.

Ernst, L. and W. Knapp. 1985. *Forest stand density and stocking: concepts, terms, and the use of stocking guides.* Washington, DC: U. S. Forest Service

Federal Register. 1999. *Designated critical habitat; central California Coast and Southern Oregon/Northern California Coasts Coho Salmon. Agency: National Marine Fisheries Service, national Oceanic and Atmospheric Administration, Commerce. Action: Final Rule and correction. Vol 64: 86: 24049-24062*. Washington, DC: Government Printing Office.

Federal Register. 2003. *Endangered and threatened wildlife and plants; 90-day finding for a petition to list a distinct population segment of the fisher in its westcoast range and endangered and to designate critical habitat. Agency: Fish and Wildlife Service, Interior. Action: Notice of 90-day petition finding and initiation of status review. Vol 68: 132: 41169-41174.* Washington, DC: Government Printing Office.

Federal Register. 2004. *Endangered and threatened wildlife and plants; 12-month finding for a petition to list the west coast distinct population segment of the fisher (Martes pennant). Agency:*

Fish and Wildlife Service, Interior. Action: Notice of 12-month petition finding. Vol 69: 68: 18770-18792. Washington, DC: Government Printing Office.

Federal Register. 2005. *Endangered and threatened species: Final listing determinations for 16 ESUs of West Coast salmon, and final 4(d) protective regulations for threatened salmonid ESUs. Agency: National Marine Fisheries Service, National Oceanic and Atmospheric Administration, Commerce. Action: Final Rule. Vol 70: 123: 37160-37204*. Washington, DC: Government Printing Office.

Federal Register. 2007. *Endangered and Threatened Wildlife and Plants; Removing the Bald Eagle in the Lower 48 States From the List of Endangered and Threatened Wildlife. Agency: Fish and Wildlife Service, Interior. Action: Final Rule. Vol 72: 130: 37346-37372*. Washington, DC: Government Printing Office.

Federal Register. 2012. *Endangered and threatened wildlife and plants; Designation of revised critical habitat for the northern spotted owl. Agency: Fish and Wildlife Service, Interior. Action: Final Rule. Vol 77: 233: 71876-72068*. Washington, DC: Government Printing Office.

Federal Register. 2014. *Endangered and threatened wildlife and plants; Threatened species status for west coast distinct population segment of fisher. Agency: Fish and Wildlife Service, Interior. Action: Proposed Rule. Vol 79: 194: 60419-60443*. Washington, DC: Government Printing Office.

Forcella, F. and S. J. Harvey. 1983. Eurasian weed investation in western Montana in relation to vegetation and disturbance. *Madroño 30*(2), 102-109.

Forest Ecosystem Management Assessment Team (FEMAT). 1993. *Forest ecosystem management: an ecological, economic and social assessment*. Portland, OR: Government Printing Office.

Forsman, D. E., E. C. Meslow, and H. M. Wigh. 1984. Distribution and Biology of the Spotted Owl in Oregon. *Wildlife Monographs 87*: 3-64.

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

Forsman, E. D., R. G. Anthony, E. C. Meslow, and C. J. Zabel. 2004. Diets and foraging behavior of northern spotted owls in Oregon. *Journal of Raptor Research 38*(3):214-230.

Forsman, E., R. Anthony, K. Dugger, E. Glenn, A. Franklin, G. White, Schwarz, K. P. Burnham, D. R. Anderson, J. D. Nichols, J. E. Hines, J. B. Lint, R. J. Davis, S. H. Ackers, L. S. Andrews, B. L. Biswell, P. C. Carlson, L. V. Diller, S. A. Gremel, D. R. Herter, J. M. Higley, R. B. Horn, J. A. Reid, J. Rockweit, J. P. Schaberl, T. J. Snetsinger, and S.G. Sovern. 2011a. Population demography of northern spotted owls. *Studies in Avian Biology 40*, 1-106.

Forsman, E. D., J. A. Reid, S. M. Flannagan, J. S. Mowdy, and A. L. Price. 2011b. *Demographic characterisitics of northern spotted owls (Strix occidentalis) on the tyee density study area, Roseburg Oregon: 1985-2011*. Roseburg, OR: Bureau of Land Management.

Foster, S. C., C. H. Stein, and K. K. Jones. 2001. *A guide to interpreting stream survey reports*. Portland, OR: Oregon Department of Fish and Wildlife.

Franklin, A., D. Anderson, R. Gutierrez, and K. Burnham. 2000. Climate, habitat quality, and fitness of northern spotted owl populations in northwestern California. *Ecological Monographs, 70*(4), 539-590.

Franklin, J. 1992. Scientific basis for new perspectives in forests and streams. In R. Naiman (Ed.), *Watershed Management: Balancing Sustainability and Environmental Change* (pp. 25-72). New York, NY: Springer-Verlag New York.

Franklin, J. F., T. A. Spies, R. Van Pelt, A. B. Carey, D. A. Thornburgh, D. R. Bert, D. B. Lindenmayer, M. E. Marmon, W. S. Keeton, D. C. Shaw, K. Bible, and J. Chen. 2002. Disturbances and structural development of natural forest ecosystems with silvicultural implications, using Douglas-fir forests as an example. *Forest Ecology and Management 155*, 399-423.

Franklin, J. F. and J. K. Agee. 2003. Foraging a science-based national forest fire policy. *Issues in Science and Technology 20*(1), 59-66.

Franklin, J., R. Mitchell, R., and B. Palik. 2007. *Natural disturbance and stand development principles for ecological forestry*. Northern Research Station. Newtown Square, PA: U. S. Forest Service.

Frissell, C. A. 2013. *Aquatic resource protections in the northwest forest plan: Evaluating potential consequences of proposed riparian reserve reductions for clean water, streams and fish.* Corvallis, OR: Coast Range Association.

Furniss, M. J., T. D. Roelofs, and C. S. Yee. 1991. Road construction and maintenance *Influences of Forest and Rangeland Management on Salmonid Fishes and Their Habitats. American Fisheries Society Special Publication 19*, 297-232.

Furniss, M., S. Flanagan, and B. McFadin. 2013. *Hydrologically-connected roads: An indicator of the influence of roads on chronic sedimentation, surface water hydrology, and exposure to toxic chemicals.* Stream Systems Technology Center. Fort Collins, CO: U. S. Forest Service.

Garcia, A., M. Esperanza, and R. Font. 2003. Comparison between product yields in the pyrolysis and combustion of different refuse. *Journal of Analytical and Applied Pyrolysis 68-69*, 577-598.

Goheen, E. M., and D. J. Goheen. 2014. *Status of sugar and western white pines on federal forest lands in southwestern Oregon: Inventory query and natural stand survey results.* Portland, OR: U. S. Forest Service.

Gomez A., R. F. Powers, M. J. Singer, and W. R. Horwath. 2002. Soil compaction effects on growth of young ponderosa pine following litter removal in California's Sierra Nevada. *Soil Science Society of America Journal 66*(4), 1334-43.

Gordon, M. 2012. *Phaeocollybia persistence in project areas.* Unpublished report written under BLM contract L11PX02048. Medford, OR: Bureau of Land Management.

Graham, R. T., S. M. McCaffrey, and T. B. Jain. 2004. *Science basis for changing forest structure to modify wildfire behavior and severity*. General Technical Report. RMRS-GTR-120. Fort Collins, CO: U.S. Forest Service.

Grant, G. E., S. L. Lewis, F. J. Swanson, J. H. Cissel, and J. J. McDonnell. 2008. *Effects of forest Practices on peak flows and consequent channel response: A state-of-science report for western Oregon and Washington.* Portland, OR: U. S. Forest Service.

Gray, D. J. 1985. *The Takelma and their Athapascan kin: An ethnographic systhesis of southwestern Oregon* (Master's Thesis) (pp. 56-65). Oregon State University, Corvalis, OR.

Gray, D. J. 1987. *The Takelma and their Athapascan kin: A new ethnographic systhesis for the upper Rogue River area of southwestern Oregon* (pp. 30-34). Eugene, OR: University of Oregon.

Gratson, M. W. and C. Whitman. 2000. Road closures and density and success of elk hunters in Idaho. *Wildlife Society Bulletin 28*, 302-310.

Grigal, D. F. 2000. Effects of extensive forest management on soil productivity. *Forest Ecology and Management 138*(1), 167-85.

Grinspoon, E., D. Jaworski, R. Phillips. 2015. *Northwest forest plan-The first 20 years [1994-2013]: Socioeconomic monitoring*. Portland OR: U. S. Forest Service.

Gucinski, H., M. Furniss, R. Ziemer, and M. Brookes. 2001. *Forest roads: A synthesis of scientific information.* Portland, OR: Government Printing Office.

Gutierrez, R., M. Cody, S. Courtney, and D. Kennedy. 2004. Assessment of the potential threat of the northern barred owl. In S. Courtney, J. Blakesley, R. Bigley, M. Cody, J. Cumbacher, R. Fleischer, et al. (eds), *Scientific evaluation of the status of the Northern Spotted Owl* (pp. 7-1-7-51). Portland, OR: Sustainable Ecosystems Institute.

Hagar, Joan and Shay Howlin. 2001. Songbird Community Response to Thinning of Young Douglas-fir Stands in the Oregon Cascades - Third Year Post-treatment Results for the Willamette National Forest, Young Stand Thinning and Diversity Study. Department of Forest Science, OSU.

Hamer, T. E., D. L. Hays, C. M. Senger, and E. D. Forsman. 2001. Diets of northern barred owls and northern spotted owls in an area of sympatry. *Journal of Raptor Research 35*(63), 221-227.

Hann, D. 2003. *Organon User Manual Edition 7.0.* Corvallis, OR: Oregon State University.

Hann, D. and J. Scrivani. 1987. *Dominant height growth and site index equations for Douglas-fir and ponderosa pine in southwest Oregon.* Corvallis, OR: Oregon State University.

Hann, D. and C. Wang. 1990. *Mortality equations for individual trees in the mixed conifer zone of southwest Oregon.* Corvallis, OR: Oregon State University.

Hann, W.J. and D. L. Bunnell. 2001. Fire and land management planning and implementation across multiple scales. *International Journal of Wildland Fire 10*, 389-403.

Hansen, A., T. Spies, J. Swanson, and J. Ohmann. 1991. Conserving biodiversity in managed forests, lessons from natural forests. *BioScience 41*(6), 382-392.

Hardy, C. C., K. M. Schmidt, J. P. Menakis, and R. N. Sampson. 2001. Spatial data for national fire planning and fuel management. *International Journal of Wildland Fire 10*, 353-372.

Harr, R. D., W. C. Harper, J. T. Krygier, and F. S. Hsieh. 1975. Changes in storm hydrographs after road building and clear-cutting in the Oregon Coast Range. *Water Resources Research*, *2*(3), 436-444.

Harrington, C. A., S. D. Roberts, and L. C. Brodie. 2005. Tree and understory responses to variable-density thinning in western Washington. In C. E. Peterson and D. A. Maguire (Eds.) *Balancing Ecosystem Values: Innovative Experiments for Sustainable Forestry*. General Technical Report PNW-GTR-635 (pp. 97-106). Olympia, WA: U. S. Forest Service.

Harris, P. and R. Cranston. 1979. An economic evaluation of control methods for diffuse and spotted knapweed in western Canada. *Canadian Journal of Plant Science 59*, 375-382.

Haugo, R., C. Zanger, T. DeMeo, C. Ringo, A. Shlisky, K. Blankenship, M. Simpson, K. Mellen-McLean, J. Kertis, and M. Stern. 2015. A new approach to evaluate forest structure restoration needs across Oregon and Washington, USA. *Forest Ecology and Management 335*: 37-50. http://www.sciencedirect.com/science/article/pii/S0378112714005519

Havlick, D. G. 2002. *No place distant: Roads and motorized recreation on America's public lands.* Washington, DC: Island Press.

Hawkins, A. E. 2009. *Native forest pathogens may facilitate persistence of Douglas-fir in old-growth forests of northwestern California.* Arcata, CA: Humbolt State University.

Hayes, J. P., S. S. Chan, W. H. Emmingham, J. C. Tappeiner, L. D. Kellog, and J. D. Bailey. 1997. Wildlife responses to thinning young forests in the Pacific Northwest. *Journal of Forestry 95*(8).

Hayes, S. B., D. J. Leptich, and P. Zager. 2002. Proximate factors affecting male elk hunting mortality in northern Idaho. *Journal of Wildlife Management 66*, 491-499.

Hessberg, P. F., J. K. Agee, and J. F. Franklin. 2005. Dry forests and wildland fires of the inland Northwest USA: Contrasting the landscape ecology of the pre-settlement and modern eras. *Forest Ecology and Management 211*, 117–139.

Hessberg, P. F., T. A. Spies, D. A. Perry, C. N. Skinner, A. H. Taylor, P. M. Brown, S. L. Stephens, A. J. Larson, D. J. Churchill, N. A. Povak, P. H. Singleton, B. McComb, W. J. Zielinksi, B. M. Collins, R. B. Salter, J. J. Keane, J. F. Franklin, and G. Riegel. 2016. Tamm Review: Management of mixed-severity fire regime forests in Oregon, Washington, and Northern California. *Forest Ecology and Management 366*(1–2), 221–250. http://www.sciencedirect.com/science/article/pii/S0378112705000587

Hessl, A. E. 2004. Drought and Pacific decadal oscillation linked to fire occurrence in the inland Pacific Northwest. *Ecological Applications 14*(2), 425-442.

Higuera P. E., J. T. Abatzoglou, J. S. Littell, and P. Morgan. 2015. The changing strength and nature of fire-climate relationships in the northern Rocky Mountains, U.S.A., 1902-2008. *PLoS ONE 10*(6), 1-21.

Hollen, B., R. Horn, P. Caldwell, R. Crutchley, K. Fukuda, T. Kaufmann, C. Larson, and H. Wise. 2015. *Demographic characteristics of northern spotted owls (strix occidentalis caurina) in the Klamath Mountain Province of Oregon, 1990-2014*. Portland OR: Bureau of Land Management.

Hseu Z. Y., H. Tsai, H. C. His, and Y. C. Chen. 2007. Weathering sequences of clay minerals in soils along a serpentinitic toposequence. *Clays and Clay Minerals 55*(4), 389-401.

Huff, M. H. and J. K. Agee. 2000. *The role of prescribed fire in restoring ecosystem health and diversity in Southwest Oregon: Part 1, ecosystem conditions.* Report to Pacific Northwest Research Station Director's Office—Northwest Forest Plan Issue. Portland, OR: U.S. Forest Service.

Huff, R., Van Norman, K., Hughes, C., Davis, R, and K. Mellen-McLean. 2012. *Survey protocol for the red tree vole, version 3.0.* Portland OR: U. S. Forest Service and Bureau of Land Management.

Huff, R. and S. Godwin. 2016. *Survey protocol for great gray owl (Strix nebulosa) within the range of the northwest forest plan, Version 4.0*. Portland, OR: Government Printing Office.

Huffman E. L., L. H. MacDonald, and J. D. Stednick. 2001. Strength and persistence of fire-induced soil hydrophobicity under ponderosa and lodgepole pine, Colorado Front Range. *Hydrological Processes 15*(15), 2877-92.

Hunter, M. 1995. Residual trees as biological legacies. *Communique Number 2. Cascade Center for Ecosystem Management*, 27.

ICS (Interagency Coordinating Subcommittee). 2013. *Section 7 of the Endangered Species Act (ESA) (streamlining agreement) for the effects of riparian forest management and restoration on salmonid fishes and their habitats for northwest Oregon*. Bureau of Land Management/ U.S. Forest Service/U.S. Fish and Wildlife Service/National Oceanic and Atmospheric Administration Memorandum.

Janes, Stewart W. 2003. "Bird Populations on the Panther Gap Timber Sale, 1994-2003: Short and Long term Response to Commercial Thinning." Technical Report submitted to Medford BLM.

Jefferson, A. J. 2011. Seasonal versus transient snow and the elevation dependence of climate sensitivity in maritime mountainous regions. *Geophysical Research Letters 38*(L16402), 1-7.

Jennings, T. N., J. E. Smith, C. Kermit Jr., E. W. Sulzman, D. McKay, B. A. Caldwell, and S. Beldin. 2011. Imapct of postfire logging on bacterial and fungal communitites and soil biogeochemistry in a mixed-conifer forest in central Oregon. *Springer Science + Business Media B.V. Plant Soil 350*, 393-411.

Johnson, J., and K. Franklin. 2009. *Restoration of federal forests in the Pacific Northwest: strategies and management implications.* Corvallis, OR: Oregon State University.

Johnson D. W. and P. S. Curtis. 2001. Effects of forest management on soil C and N storage: Meta-analysis. *Forest Ecology and Management 140*(2), 227-38.

Johnson T, J. Butcher, D. Deb, M. Faizullabhoy, P. Hummel, J. Kittle, S. McGinnis, L. O. Mearns, D. Nover, A. Parker, S. Sakar, R. Srinivasan, P. Tuppad, M. Warren, C. Weaver, and J. Witt.2015. Modeling streamflow and water quality sensitivity to climate change and urban development in 20 watersheds. *Journal of the American Water Resources Association*,1-21.

Jones, J. A., G. E. Grant. 1996. Peak flow responses to clear-cutting and roads in small and large basins, western Cascades, Oregon. *Water Resources Research 32*(4), 959-974.

Jones, J., F. Swanson, B. Wemple, and K. Snyder. 1999. Effects of roads on hydrology, geomorphology, and disturbance patches in stream networks. *Conservation Biology 14*(1), 76-85.

Kattelmann, R. 1996. *Hydrology and water resources. Sierra Nevada Ecosystem Project: Final report to Congress, vol.II, assessments and scientific basis for management options.* Centers for Water and Wildland Resources (pp. 855-920). Davis, CA: University of California.

Kauffman, J. B. 2004. Death rides the forest: perceptions of fire, land use, and ecological restoration of western forests. *Conservation Biology 18*(4), 878-882. http://dx.doi.org/10.1111/j.1523-1739.2004.545_1.x

Keane, R. E., P. F. Hessburg, P. B. Landres, and F. J. Swanson. 2009. The use of historical range and variability (HRV) in landscape management. *Forest Ecology and Management. 258*, 1025-1037.

Kelly, E., E. Forsman, and R. Anthony. 2003. Are barred owls displacing spotted owls? *Condor, 105*(1), 45-53.

Kramer, G. 1999. *Mining in southwestern Oregon: A historical context statement.* Medford, OR: Bureau of Land Management.

Kramer, P. and J. Kozlowski. 1979. *Physiology of woody plants.* Orlando, FL: Academic Press.

Kranabetter, J., and T. Wylie. 1998. Ecotomycorrhizal community structure across forest openings on naturally regenerated western hemlock seedlings. *Canadian Journal of Botany 78*, 189-196.

K. S. Wild v. U. S. Bureau of Land Management. Case Number 06-3076-PA. Order and Judgment. 2007.

Lacey, J. R., C. B. Marlow, and J. R. Lane. 1989. Influence of spotted knapweed (Centaurea maculosa) on surface runoff and sediment yield. *Weed Technology 3*, 627-631.

LaLande, J. 1995. *An environment history of the Little Applegate River watershed: Jackson County, Oregon*. (pp. 5-6). Medford, OR: U.S. Forest Service.

Landfire: LANDFIRE Fire Regime Groups. 2012. U.S. Department of Interior, Geological Survey. http://www.landfire.gov/geoareasmaps/2012/CONUS_FRG_c12.pdf [2016. Accessed October 4, 2016.

Landfire, 2014, Fire Behavior Fuel Models, Landfire 1.4.0, U.S. Department of the Interior, Geological Survey. http://landfire.cr.usgs.gov/viewer/. Accessed 1 March 2017.

Landfire, 2014, Fire Regime Groups, Landfire 1.4.0, U.S. Department of the Interior, Geological Survey. http://landfire.cr.usgs.gov/viewer/. Accessed 1 March 2017.

Latham, P and J. Tappeiner. 2002. Response of old-growth conifers to reduction in stand density in western Oregon forests. *Tree Physiology 22*, 137-146.

Leege, T. 1984. *Guidelines for evaluating and managing summer elk habitat in northern Idaho, Wildlife Bulletin 11.* Boise, ID: Idaho Department of Fish and Game.

Leptich, D. J. and P. Pager. 1991. Road access management effects on elk mortality and population dynamics. *Proceedings Elk Vulnerability Symposium* (pp. 126-131). Bozeman, MT: Montana State University.

Lewis, J. C., D. W. Stinson. 1998. *Washington state status report for the fisher.* Olympia, WA: Washington Department of Fish and Wildlife.

Lint, J., B. Noon, R. Anthony, E. Forsman, M. Raphael, M. Collopy, E. Starkey. 1999. *Northern spotted owl effectiveness monitoring plan for the northwest forest plan*. Gen. Tech. Rep. PNW-GTR-440. Portland, OR: U. S. Forest Service.

Lint, J. 2005. *Northwest forest plan—the first 10 years (1994-2003): Status and trends of northern spotted owl populations and habitat. Final report*. Portland OR: Forest Service.

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

Long, J. N. and T. W. Daniel. 1990. Assessment of growing stock in uneven-aged stands. *Western Journal of Applied Forestry 5*(3), 93-96.

Luce, C. and T. Black. 1999. Sediment production from forest roads in western Oregon. *Water Resources Research 35*(8), 2561-2570.

Luce, C. and T. Black. 2001. Spatial and temporal patterns in erosion from forest roads. In M. Wigmosta, & S. Burges (eds.). *Land Use and Watersheds: Human Influence on Hydrology and Geomorphology in Urban and Forest Areas - Water Science and Application 2* (pp. 165-178). Washington, DC: American Geophysical Union.

Luoma, D. L., J. L. Eberhart, R. Molina, and M. P. Amaranthus. 2004. Response of ectomycorrhizal fungus sporocarp production to varying levels and patterns of green tree retention. *Forest Ecology and Management 202*, 337-354.

Luoma, D., C. A. Stockdale, R. Molina, and J. L. Eberhart. 2006. The spatial influence of Psudotsuga menziesii retention trees on ectomycorrhiza diversity. *Canadian Journal of Forest Research 36*, 2561-2573.

MacDonald, L. and D. Coe. 2008. Road sediment production and delivery; processes and management. *Proceedings of the First World Landslide Forum, November 18-21, 2008.* (pp. 385-388). Tokyo, Japan: United Nations University.

Mackie, R. S. 1997. *Trading beyond the mountains: The British fur trade in the Pacific 1793-1843* (pp. 1-35). Vancover, BC: University of British Columbia Press.

Manning, T., J. C. Hagar, and B. C. McComb. 2012. Thinning of young Douglas-fir forests decreases density of northern flying squirrels in Oregon Cascades. *Forest Ecology and Management 264*, 115-124.

May, C. and R. Greswell. 2003. Large wood recruitment and redistribution in headwater streams in the southern Oregon Coast Range, U.S.A. *Canadian Journal of Forest Research 33*(8), 1352-1362.

McCorquodale, S. M., R. Wiseman, and C. L. Marcum. 2003. Survival and harvest vulnerability of elk in the Cascade Range of Washington. *Journal of Wildlife Management 67*, 248-257.

McDade, M., F. Swanson. W. McKee, J. Franklin, and J. Van Sickle. 1990. Source distances for coarse woody debris entering small streams in western Oregon and Washington. *Canadian Journal of Forest Research, 20*(3), 326-330.

McIver, J. D. and L. Starr (technical eds.) 2000. *Environmental effects of postfire logging: literature review and annotated bibliography*. General Technical Report PNW-GTR-486. Portland, OR: U.S. Forest Service.

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

McIver J. D., S. L. Stephens, J. K. Agee, J. Barbour, R. E. Boerner, C. B. Edminster, K. L. Erickson, K. L. Farris, C. J. Fettig, C. E. Fiedler, and S. Haase. 2013. Ecological effects of alternative fuel-reduction treatments: highlights of the National Fire and Fire Surrogate study (FFS). *International Journal of Wildland Fire 22*(1), 63-82.

Megahan, W. 1974. *Erosion over time on severely disturbed granitic soils: A model.* Ogden, UT: U. S. Forest Service.

Metlen, K., D. Olson, and D. Borgias. 2011. *Forensic forestry: History lessons for a resilient future.* Portland, OR: The Nature Conservancy.

Metlen, K. L., D. Borgias, A. Jones, G. McKinley, D. Olson, E. Reilly, and C. Zanger. 2015. *Rogue Basin cohesive forest restoration strategy: A collaborative vision for resilient landscapes and fire adapted communities v.1*. Portland, OR: The Nature Conservancy.

Meyer, J., L. Irwin, and M. Boyce. 1998. Influence of habitat abundance and fragmentation on northern spotted owls in western Oregon. *Wildlife Monographs, 139*, 1-51.

Miller, B. 1989. *Dispersal of juvenile northern spotted owls in western Oregon.* Corvallis, OR: Oregon State University.

Miller, M. and B. Emmingham. 2001. Can selection thinning convert even-age Douglas-fir stands to uneven-age structures? *Western Journal of Applied Forestry 16*(1), 35-43.

Montgomery, D. R., G. E. Grant, and K. Sullivan. 1995. Watershed analysis as aframework for implementing ecosystem management. *Water Resources Bulletin 31*(3), 369-386.

Montgomery, D. R. and J. M. Buffington. 1997. Channel-reach morphology in mountain drainage basins. *Geological Society of America Bulletin 109*(5), 596-611.

Moore, J. R., S. J. Mitchell, D. A. Maguire, and C. P. Quine. 2003. International Conference Wind Effects on Trees. *Wind damage in alternative silvicultural systems: Review and synthesis of previous studies*. (pp. 1-8). Karlsruhe, Germany: University of Karlsruhe.

Moseley, C. and M. Nielsen-Pincus. 2009. *Economic impact and job creation from forest and watershed restoration: a preliminary assessment.* Institute for a Sustainable Environment, Ecosystem Workforce Program Volume Briefing Paper #14. Eugene, OR: University of Oregon.

Mote, P., D. Canning, D. Fluharty, R. Francis, J. Frankilin, A. Hamlet, M. Hershman, M. Holmberg, K. G. Ideker, W. Keeton, D. Lettenmaier, R. Leung, N Mantua, E. Miles, B. Noble, H. Parandvash, D. W. Peterson, A. Snover, and S. Willard. 2003a. *Impacts of climate variability and change in the Pacific Northwest*. Seattle, WA: The JISAO Climate Impacts Group.

Mote, P., E. A. Parson, A. F. Hamlet, W.S. Keeton, D. Lettenmaier, N. Mantua, E. L. Miles, D. W. Peterson, D. L. Peterson, R. Slaughter, and A. K. Snover. 2003b. Preparing for climatic change: The water, salmon, and forests of the Pacific Northwest. *Climatic Change 61*, 45-88.

Murphy, M. and K. Koski. 1989. Input and depletion of woody debris in Alaska streams and implications for streamside management. *North American Journal of Fisheries Management 9*, 427-436.

Myers, S. T. 2015. *Flora of Oregon, volume 1: Pteridophytes, gymnosperms, and monocots.* Fort Worth, TX: Botanical Research Institute of Texas.

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

National Wildlife Coordinating Group, Fuels Management Group. 2014. *Interagency prescribed fire planning and implementation procedure guide – PMS 484*. Boise, ID: National Wildfire Coordinating Group.

Niemi, E. 2013. *Economic value of goods and services produced by the O&C lands with and without industrial logging*. Portland, OR: Pacific Rivers Council.

North, M., P. Stine, K. O'Hara, W. Zielinski, and S. Stephens. 2009. *An ecosystem management strategy for sierran mixed-conifer forests*. General Technical Report PSW-GTR-220. Albany, CA: U.S. Forest Service.

ODA (Oregon Department of Agriculture). 2013. Noxious weed control program. Noxious weed policy and classification system.

ODA. (Oregon Department of Agriculture). 2013. Noxious Weed Control Program. Noxious Weed Policy and Classification System. www.oregon.gov/ODA/PLANT/WEEDS. Retrieved April 1, 2014.

ODA. (Oregon Department of Agriculture). 2016. Forest Practices Act. Oregon Department of Forestry. https://www.oregon.gov/ODF/Working/Pages/FPA.aspx.

ODA. (Oregon Department of Agriculture). 2015. ODA Plant Division, Noxious Weed Control. Retrieved April 28, 2015, from http://www.oregon.gov/ODA/shared/Documents/Publications/Weeds/NoxiousWeedPolicyClassification.pdf.

ODEQ. (Oregon Department of Environmental Quality). 2003. *Aerial surveys in the Umpqua River basin: Thermal infrared and color videography.* Corvallis, OR: Watershed Sciences.

ODEQ. (Oregon Department of Environmental Quality). 2004. *Draft Rogue basin riparian condition assessment report.* Medford, OR: Oregon Department of Environmental Quality.

ODEQ. (Oregon Department of Environmental Quality). 2008. *Rogue River Basin TMDL.* Medford, OR: Oregon Department of Environmental Quality.

ODEQ. (Oregon Department of Environmental Quality). 2010. *Oregon's 2010 Integrated Report. 303(d) List.* Portland, OR: Oregon Department of Environmental Quality.

OFRI. (Oregon Forest Resources Institute). 2017a. *Jackson County*. Retrieved from: http://knowyourforest.org/sites/default/files/documents/OFRI_JacksonCounty_DIGITAL.pdf.

OFRI. (Oregon Forest Resources Institute). 2017b. *Josephine County*. Retrieved from: http://knowyourforest.org/sites/default/files/documents/OFRI_JosephineCounty_DIGITAL.pdf.

Oki, D. S., R. H. Wolff, and J. A. Perreault, 2006. *Effects of surface-water diversion and ground-water withdrawal on streamflow and habitat, Punaluu Stream, Oahu, Hawaii.* Reston, VA: US Geological Survey.

Oliver, C. D. and B. C. Larson. 1996. *Forest stand dynamics: Update edition.* Hoboken, NJ: John Wiley and Sons.

Oliver, W., G. Ferrell, and J. C. Tappeiner. 1996. Density management of Sierra forests. *Summary of the Sierra Nevada Ecosystem Project Report, Final Report to Congress* (pp. 1-7). Davis, CA: University of California.

Olson, G., E. Glenn, R. Anthony, E. Forsman, J. Reid, P. Loschl, and W. J. Ripple. 2004. Modeling demographic performance of northern spotted owls relative to forest habitat in Oregon. *Journal of Wildlife Management, 68*(4), 1039-1053.

Olson, G., R. Anthony, E. Forsman, S. Ackers, P. Loschl, J. Reid, K. M. Dugger, E. M. Glenn, and W. J. Ripple. 2005. Modeling of site occupancy dynamics for northern spotted owls, with emphasis on the effects of barred owls. *Journal of Wildlife Management 69*(3), 918-932.

Omi, P. N. and E. Martinson. 2002. *Effect of fuels treatment on wildfire severity: Final report.* Fort Collins, CO: Western Forest Fire Research Center.

Oregon Secretary of State. 2016. *Oregon's counties: 2016 financial condition review.* Retrieved from: http://sos.oregon.gov/audits/Documents/2016-11.pdf. Accessed March 13, 2017.

Oregon State University. 2015. Fir, Douglas and true-laminated root rot. *PNW Plant Disease Management Handbook*. http://pnwhandbooks.org/plantdisease/fir-douglas-and-true-laminated-root-rot.

Orr, E. and W. Orr. 2009. *Oregon Fossils*. (2nd ed) (p.84). Corvallis, OR: Oregon State University Press.

Perkins, J. 2000. *Land cover at northern spotted owl nest and non-nest sites, east-central Coast Ranges, Oregon.* (Master's Thesis). Oregon State University, Corvallis, OR.

Perry, D. 1994. *Forest Ecosystems.* Baltimore, MD: The Johns Hopkins University Press.

Perry, D. A., P. F. Hessburg, C. N. Skinner, T. A Spies, S. L. Stephens, A. H. Taylor, J. F. Franklin, B. McComb, and G. Riegel. 2011. The ecology of mixed severity fire regimes in Washington, Oregon, and Northern California. *Forest Ecology and Management 262*, 703-717.

Perry, T. D. and J. A. Jones. 2016. Summer streamflow deficits from regenerating Douglas-fir forest in the Pacific Northwest, USA. *Ecohydrology.* 1-13.

Peterson, D. L., M. C. Johnson, J. K. Agee, T. B. Jain, D. McKenzie, and E. D. Reinhardt. 2003. Fuels planning: Managing forest structure to reduce fire hazard. *Second International Wildland Fire Ecology and Fire Management Congress and Fifth Symposium on Fire and Forest Meteorology*. Boston, MA: American Meteorological Society. Online: https://ams.confex.com/ams/FIRE2003/webprogram/Paper74459.html

Peterson, D. L.; J. K. Agee, G. H. Aplet, D. P. Dykstra, R. T. Graham, J. F. Lehmkuhl, D. S. Pilliod, D. F. Potts, R. F. Powers, and J. D. Stuart. 2009. *Effects of timber harvest following wildfire in western North America*. General Technical Report PNW-GTR-776. Portland, OR: U.S. Forest Service.

Pollet, J. and P. N. Omi. 1999. Effect of thinning and prescribed burning on wildfire severity in ponderosa pine forests. *Proceedings from the 1999 Joint Fire Science Conference and Workshop Crossing the Millennium: Integrating Spatial Technologies and Ecological Principles for a New Age in Fire Management*. http://jfsp.nifc.gov/conferenceproc/index.htm

Pollet, J. and P. N. Omi. 2002. Effects of thinning and prescribed burning on crown fire severity in ponderosa pine forests. *Journal of Wildland Fire 11*, 1-10.

Powell, R. A. and W. J. Zielinski. 1994. Fisher. *The scientific basis for conserving forest carnivores: American marten, fisher, lynx, and wolverine*. Pp. 38-73. Fort Collins, CO: U.S. Forest Service.

Powers, R. F. 2006. Long-term Soil productivity: Genesis of the concept and principles behind the program. *Canadian Journal of Forest Research 36*(3), 519-28.

Ramp, L. and N. V. Peterson. 2006. *Bulletin 100: Geology and mineral resources of Josephine County Oregon* (pp. 15-23). Portland, OR: Department of Geology and Mineral Industries.

Rashin, E. B., C. J. Clishe, A. T. Loch, and M J. Bell. 2006. Effectiveness of timber harvest practices for controlling sediment related water quality impacts. *Journal of the American Water Resources Association 42*, 1307-1327.

Rebain, S. A. 2010. *The fire and fuels extension to the forest vegetation simulator: Updated model documentation*. Internal Report. Fort Collins, CO: U.S. Forest Service.

Reid, L. M. 1981. *Sediment production from gravel-surfaced forest roads, Clearwater basin, Washginton.* (Master's Thesis). University of Washington, Seattle, WA.

Reid, L. and T. Dunne. 1984. Sediment production from forest road surfaces. *Water Resources Research, 20*(11), 1753-1761.

Reindhardt, E.D. and N.L. Crookston. 2003. *The fire and fuels extension to the forest vegetation simulator*. General Technical Report RMRS-GTR-116. Fort Collins, CO: U.S. Forest Service.

Reinhardt, E. D., R. E. Keane, D. E. Calkin, and J. D. Cohen. 2008. Objectives and considerations for wildland fuel treatment in forested ecosystems of the interior western United States. *Forest Ecology and Management 256*, 1997-2006. http://dx.doi.org/10.1016/j.foreco.2008.09.016

Reiter, M., R. E. Bilby, S. Beech, and J. Heffner. 2015. Stream temperature patterns over 35 years in a managed forest of western Washington. *Journal of the American Water Resources Association*, 1-18.

Rice, P. M., J. C. Toney, D. J. Bedunah, and C. E. Carlson. 1997. Elk winter forage enhancement by herbicide control of spotted knapweed. *Wildlife Society Bulletin 25*(2), 627-633.

Ripple, W. J. 1994. Historic spatial patterns of old forests in Western Oregon. *Journal of Forestry*, 45-49.

Roberts, S. D. and C. A. Harrington. 2008. Individual tree growth response to variable-density thinning in coastal Pacific Northwest forests. *Forest Ecology and Management 255*, 2771-2781.

Roloff, G. J., S. P. Mealey, and J. D. Bailey. 2012. Comparative hazard assessment for protected species in a fire-prone landscape. *Forest Ecology and Management 277*, 1-10.

Rosenberg, D. K. and K. S. McKelvey. 1999. Estimation of habitat selection for central-place foraging animals. *Journal of Wildlife Management 63*(3):1028-1038.

Rosenfeld, J., M. Porter, and E. Parkinson. 2000. Habitat factors affecting the abundance and distribution of juvenile cutthroat (Oncorhynchus clarki) and coho salmon (Oncorhynchus kisutch). *Canadian Journal of Fisheries and Aquatic Sciences 57*, 766-774.

Rosgen, D. 1996. *Applied river morphology*. Pagosa Springs, CO: Wildland Hydrology.

Rowland, M. M., M. J. Wisdom, B. K. Johnson, and M. A. Penninger, 2005. Effects of roads on elk: Implications for management in forested ecosystems. *2004 Transactions of the North American Wildlife and Natural Resources Conference* (pp. 42-52). Lawrence, KS: Alliance Communications Group.

Ryan, K. C., E. E. Knapp, and J. M. Varner. 2013. Prescribed fire in North American forests and woodlands: history, current practice, and challenges. *Frontiers in Ecology and the Environment 11*, 15-24. http://dx.doi.org/10.1890/120329

Sauer, J.R., J.E. Hines, and J. Fallon. 2004. The North American Breeding Bird Survey, Results and Analysis 1966-2003. Version 2004.1. USGS Patuxent Wildlife Center Laurel, Maryland.

Schilling, J., K. Dugger, and R. Anthony. 2013. Survival and home-range size of northern spotted owls in Southwestern Oregon. *Journal of Raptor Research*, *47*(1), 1-14.

Schmidt, K. M., J. P. Menakis, C. C. Hardy, W. J. Hann, and D. L. Bunnell. 2002. *Development of coarse-scale spatial data for wildland fire and fuel management*. General Technical Report, RMRS-GTR-87. Forts Collins, CO: U.S. Forest Service.

Scott, J. H. and R. E. Burgan. 2005. *Standard fire behavior fuel models: a comprehensive set for use with Rothermel's surface fire spread model*. General Technical Report RMRS-GTR-153. Fort Collins, CO: U.S. Forest Service.

Scott, J. H., M. P. Thompson, and D. E. Calkin. 2013. *A wildfire risk assessment framework for land and resource management*. General Technical Report RMRS-GTR-315. Fort Collins, CO: U.S. Forest Service.

Sensenig, T. S. 2002. *Development, fire history and current and past growth, of old growth and young growth forest stands in the Cascade, Siskiyou and Mid-Coast Mountains of Southwestern Oregon*. (Unpublished doctoral dissertation). Oregon State University, Corvalis, OR.

Sensenig, T., J. D. Bailey, and J. C. Tappeiner. 2013. Stand development, fire and growth of old-growth and young forests in southwestern Oregon, USA. *Forest Ecology and Management*, 96-109.

Siegel, R. B., and D. F. DeSante. 2003. Bird communities in thinned versus unthinned Sierran mixed conifer stands. Wilson Bulletin 115**:**155–165.

Sierra Nevada Ecosystem Project (SNEP). 1996. *Summary of the Sierra Nevada Ecosystem Project report* (pp. 61-71). Davis, CA: University of California, Centers for Water and Wildland Resources.

Siskiyou BioSurvey. 2013. *Annual review of Fritillaria genneri on BLM lands 2013 report: Monitoring of 57 sites conducted on Medford district BLM April-May 2013.* Eagle Point, OR: Siskiyou BioSurvey.

Sleeter, B. M. and J. P. Calzia, 2013. *Klamath Mountains ecoregion*. U.S. Geological Survey. http://landcovertrends.usgs.gov/west/eco78Report.html

Smith, J., D. McKay, C. Niwa, W. Thies, G. Brenner, and J. Spatafora. 2004. Short-term effects of seasonal prescribed burning on the ectomychorrizal fungi community and fine root biomass in ponderosa pine stands in the Blue Mountains of Oregon. *Canadian Journal of Forest Research 34*, 2477-2491.

Solis, D. M. and R. J. Gutierrez. 1991. Summer habitat ecology of northern spotted owls in northwestern California. *The Condor 92*(3), 739-748.

Spies, T. A. and J. F. Franklin. 1990. *The structure of natural young, mature, and old-growth Douglas-fir forests in Oregon and Washington*. General Technical Report PNW-GTR-285. Corvallis, OR: U.S. Forest Service

Spies, T. A., H. A. Miles, A. Youngblood, and S. Hummel. 2006. Conserving Old-Growth Forest Diversity in Disturbance-Prone Landscapes. *Conservation Biology 20*(2), 351-362.

Stendell, E., T. Horton, and T. Bruns. 1999. Early effects of prescribed fire on the structure of the ectomycorrhizal fungus community in a Sierra Nevada ponderosa pine forest. *Mycological Research 103*, 1353-1359.

Stepp, D. 2001. *Cultural resource inventory report for the king wolf project area, Josephine County, Oregon* (p. 5). Medford, OR: Bureau of Land Management.

Stone, D. 2007. *Species Fact Sheet for Peltigera pacifica.* Portland: U. S. Forest Service and Bureau of Land Management.

Stone, D. 2012. *Species Fact Sheet for Chaenotheca ferruginea.* Portland: U. S. Forest Service and Bureau of Land Management.

Stone, D. and R. Huff. 2012. *Species Fact Sheet for Chaenotheca chrysocephala.* Portland: U. S. Forest Service and Bureau of Land Management.

Stone, D., J. Christy, and R. Huff. 2010. *Species Fact Sheet for Leptogium teretiusculum.* Portland: U. S. Forest Service and Bureau of Land Management.

Stone, D., J. Christy, and R. Huff. 2011. *Species Fact Sheet for Leptogium rivale.* Portland: U. S. Forest Service and Bureau of Land Management.

Swanson, F. J. and C. T. Dyrness. 1975. Impact of clear-cutting and road construction on soil erosion by landslides in the western Cascade Range, Oregon. *Geology 3*(7), 393-6.

Swanston, D. N. 1991. Natural Processes. In W. Meehan (Ed.), *Influences of forest and rangeland management on salmonid fishes and their habitats* (pp. 139-179). Bethesda, MD: American Fisheries Society.

Swanston, D. and F. Swanson. 1976. Timber harvesting, mass erosion, and steepland forest geomorphology in the Pacific Northwest. In D. Coates (Ed.), *Geomorphology and Engineering* (pp. 199-221). Stroudsburg, PA: Dowden, Hutchinson, and Ross, Inc.

Swindle, K., W. Ripple, E. Meslow, and D. Schafer. 1999. Old-forest distribution around spotted owl nests in the central Cascade Mountains, Oregon. *Journal of Wildlife Management, 63*(4), 1212-1221.

Tappeiner, J. C., D. Huffman, D. Marshall, T. A. Spies, and J. D. Bailey. 1997. Density, ages, and growth rates in old-growth and young-growth forests in coastal Oregon. *Canadian Journal of Forest Research 27*: 638-648.

Tappeiner, J. C., D. A. Maguire, and T. B. Harrington. 2007. *Silviculture and ecology of western U.S. Forests*. Corvallis, OR: Oregon State University Press.

Taylor, A. H. and C. N. Skinner. 1998. Fire history and landscape dynamics in a late-successional reserve, Klamath Mountains, California, USA. *Forest Ecology and Management 111*(2-3), 285-301.

Taylor, A. and C. N. Skinner. 2003. Spatial patterns and controls on historical fire regimes and forest structure in the Klamath Mountains. *Ecological Applications 13*(3), 704-719.

Tews, J., U. Brose, V. Grimm, K. Tielbörger, M. Wichmann, M. Schwager, and F. Jeltsch. 2004. Animal species diversity driven by habitat heterogeneity/diversity: The importance of keystone structures. *Journal of Biogeography 31*(1), 79-92.

The Research Group, LLC. 2014. *Econmic impact from noxious weeds in Oregon.* Salem, OR: Oregon Department of Agriculture.

Theis, W. and R. Sturrock. 1995. *Laminated root rot in western North America.* Portland, OR: U. S. Forest Service.

Thomas, J., J. Forsman, J. Lint, E. Meslow, B. Noon, and J. Verner. 1990. *A conservation strategy for the northern spotted owl: report of the interagency scientific committee to address the conservation of the northern spotted owl.* Portland, OR: Government Printing Office.

Thomas, R. B. and W. F. Megahan. 1998. Peak flow responses to clear-cutting and roads in smlaa and large basins, western Cascades, Oregon: A second opinion. *Water Resources Research 34*(12), 3393-3403.

Thomas, T. L. and J. K. Agee. 1986. Prescribed fire effects on mixed forest structure at Crater Lake, Oregon. *Canadian Journal of Forest Research 16*, 1082-1087.

Thompson, Todd 2006. Personal Communication, Oreon State Ofiice Restoration Coordinator, February 6.

Truex, R. L. W. J. Zielinski, R. T. Golightly, R. H. Barrett, and S. M. Wisely. 1998. *A meta-analysis of regional variation in fisher morphology, demography, and habitat ecology in California*. Sacramento, CA: California Department of Fish and Game

Tveskov, M. 2006. *The archeology of the western Cascades of southwestern Oregon* (pp. 12-14). Ashland, OR: Southern Oregon University.

Tyser, R. W. and C. H. Key. 1988. Spotted knapweed in natural area fescue grasslands an ecological assessment. *Northwest Science 62*(4), 151.

Unsworth, J. W., L. Kuck, M. D. Scott, and E. O. Garton. 1993. Elk mortality in the Clearwater drainage of northcentral Idaho. *Journal of Wildlife Management 57*, 495-502.

USDA. 1993. National Resource Conservation Service. *Soil Survey of Jackson County, Oregon*. Portland, OR: Government Printing Office.

USDA. 2016. U.S. Forest Service, Forest Health Protection; Washington Department of Natural Resources, Resource Protection Division, Forest Health; and Oregon Department of Forestry, Forest Health Management. *Aerial detection survey*. Accessed October 2016. http://www.fs.usda.gov/detail/r6/forest-grasslandhealth/insects-diseases/?cid=fsbdev2_027406

USDA/DOC/USDI. 2005. U.S. Forest Service/National Marine Fisheries Service/Bureau of Land Management/U.S. Fish and Wildlife Service. *Analytical process for developing biological assessments for federal actions affecting fish with the northwest fire plan area*. Portland, OR: Government Printing Office.

USDA/USDI. 1994a. U.S. Forest Service/Bureau of Land Management. *Final supplemental environment impact statement on management of habitat for late-successional and old-growth forest related species within the range of the northern spotted owl*. Portland, OR: Government Printing Office.

USDA/USDI. 1994b. U.S. Forest Service/Bureau of Land Management. *ROD for amendments to USFS and BLM planning documents within the range of the northern spotted owl and standards and guidelines for management of habitat for late-successional and old-growth forest related species within the range of the NSO*. Portland, OR: Government Printing Office.

USDA/USDI. 1994c. U.S. Forest Service/Bureau of Land Management. *Final supplemental environmental impact statement on management of habitat for late-successional and old-growth forest related species within the range of the northern spotted owl*. Portland, OR: Government Printing Office.

USDA/USDI. 1995. U.S. Forest Service/Bureau of Land Management. *Standards and guidelines: Attachment A to the record of decision for amendments to Forest Service and Bureau of Land Management planning documents within the range of the northern spotted owl.* Portland, OR: Government Printing Office.

USDA/USDI. 2000. U.S. Forest Service/Bureau of Land Management. *Final supplemental environmental impact statement for amendments to the survey and manage, protection buffer, and other mitigation measures standards and guidelines, volume 1.* Portland, OR: Government Printing Office.

USDA/USDI. 2000a. Management recommendations for the red tree vole, *Arborimus longicaudus*, version 2.0. *BLM Instruction Memorandum No. OR-2000-086*. Portland, OR: Government Printing Office.

USDA/USDI. 2001. U.S. Forest Service/Bureau of Land Management. *Record of decision and standards and guidelines for amendments to the survey and manage, protection buffer and other mitigation measures standards and guidelines*. Portland, OR: Government Printing Office.

USDA/USDI. 2004a. U.S. Forest Service/Bureau of Land Management. *BLM-information bulletin OR-2004-121*, p. 5. Portland, OR: Oregon/Washington State Office-Bureau of Land Management.

USDA/USDI. 2004b. U.S. Forest Service/Bureau of Land Management. *Record of decision to remove or modify the survey and manage mitigation measure standards and guidelines*. Portland, OR: Government Printing Office.

USDA/USDI. 2004c. U.S. Forest Service/Bureau of Land Management. *Final supplemental environmental impact statement to remove or modify the survey and manage mitigation measure standards and guidelines*. Portland, OR: Government Printing Office.

USDA/USDI. 2004d. U.S. Forest Service/Bureau of Land Management/U.S. Fish and Wildlife Service. *Survey Protocol for the great grey owl within the range of the northwest forest plan, version 3.0*. Portland, OR: Government Printing Office.

USDA/USDI. 2005. U.S. Forest Service/Bureau of Land Management/U.S. Fish and Wildlife Service. *Water quality restoration plan: Southern Oregon coastal basin: Applegate subbasin*. Portland, OR: Government Printing Office.

USDA/USDI. 2007. U.S. Forest Service/Bureau of Land Management. *Final supplement to the 2004 supplemental environmental impact statement to remove or modify the survey and manage mitigation measure standards and guidelines*. Portland, OR: Government Printing Office.

USDA/USDI. 2012a. U.S. Forest Service/Bureau of Land Management. *Northwest forest plan temperature (TMDL) implementation strategy. Evaluation of the northwest forest plan aquatic conservation strategy*. Portland, OR: Government Printing Office.

USDA/USDI. 2012b. U.S. Forest Service/Bureau of Land Management. *Survey and manage category B fungi equivalent-effort survey protocol v.1. Retreived May 13, 2015 from:* http://www.blm.gov/or/plans/surveyandmanage/files/sp-fu-catB-equiv-effort-2012.pdf.

USDA/USDI. 2012c. U.S. Forest Service/Bureau of Land Management. *Conservation assessment for great gray owl (Strix nebulosa).* Portland, OR: Government Printing Office.

USDA/USDI. 2013. U.S. Forest Service/Bureau of Land Management/U.S. Fish and Wildlife Service. *Recovery plan implementation: Interim recovery action 10*. Medford, OR: U.S. Forest Service/Bureau of Land Management.

USDI. 1985. Bureau of Land Management. *Northwest area noxious weed control program EIS*. Portland, OR: Governmnet Printing Office.

USDI. 1986a. Bureau of Land Management. *Timber production capability classification handbook (H-5251).* Washington DC: Bureau of Land Management.

USDI. 1986b. Bureau of Land Management. *Visual Resource Contrast Rating handbook (H-8431).* Washington DC: Bureau of Land Management.

USDI. 1990. Bureau of Land Management. *Oregon-Washington special status species policy*. Instruction memorandum No. OR-91-57. Portland, OR: Oregon/Washington State Office-Bureau of Land Management.

USDI. 1992. Bureau of Land Management. *Evaluation report for Crooks Creek old growth area of critical environmental concern*. Medford, OR: Government Printing Office

USDI. 1994. Bureau of Land Management. *Medford district PRMP EIS. Medford district proposed record resource management plan environmental impact statement*. Portland, OR: Government Printing Office.

USDI. 1995. Bureau of Land Management. *Medford district record of decision and resource management plan*. Portland, OR: Government Printing Office

USDI. 1996. Bureau of Land Management. *Cheney/Slate watershed analysis*. Medford, OR: Medford District Office.

USDI. 1997. Bureau of Land Management. *Deer Creek watershed Analysis*. Medford, OR: Medford District Office.

USDI. 1998a. Bureau of Land Management. *A watershed analysis and management plan for BLM lands within the ginger springs recharge area.* Medford, OR: Medford District Office.

USDI. 1998b. Bureau of Land Management. *Rogue-Grants Pass watershed analysis*. Medford, OR: Medford District Office.

USDI. 1999a. Bureau of Land Management. *Grave Creek watershed analysis*. Medford, OR: Medford District Office.

USDI. 1999b. Bureau of Land Management. *Rogue-Recreation Section watershed analysis*. Medford, OR: Medford District Office.

USDI. 1999c. Bureau of Land Management. *Lower big butte watershed analysis*. Medford, OR: Medford District Office.

USDI. 1999d. Bureau of Land Management. *Trail creek watershed analysis*. Medford, OR: Medford District Office.

USDI. 2000. Bureau of Land Management. *Murphy watershed analysis*. Medford, OR: Medford District Office.

USDI. 2003. U.S. Fish and Wildlife Service. *Recovery Plan for Fritillaria gentneri (Genter's fritillary)*. Portland, OR: U.S. Fish and Wildlife Service.

USDI. 2004a. Bureau of Land Management. *Implementation of special status species policies for the former survey and manage species*. Portland, OR: Oregon/Washington State Office.

USDI. 2004b. U.S. Fish and Wildlife Service. *Northern spotted owl. Five-year review: Summary and evaluation*. Portland, OR: U.S. Fish and Wildlife Service.

USDI. 2005a. Bureau of Land Management. *Water quality restoration plan: Southern Oregon coastal basin, Applegate subbasin*. Medford, OR: Medford District Office.

USDI. 2005b. Bureau of Land Management. *Analysis of the management situation*. Portland, OR: Oregon/Washington State Office.

USDI. 2006. U.S. Fish and Wildlife Service. *Draft recovery plan for listed species of the Rogue Valley vernal pool and Illinois Valley wet meadow ecosystem.* Portland, OR: U.S. Fish and Wildlife Service.

USDI. 2007a. Bureau of Land Management. *Sucker Creek watershed analysis*. Medford, OR: Medford District Office.

USDI. 2007b. U. S. Fish and Wildlife Service. *National bald eagle management guidelines*. Washington DC: U. S. Fish and Wildlife Service.

USDI Fish and Wildlife Service. 2008. Birds of Conservation Concern. Division of Migratory Bird Management, Arlington, VA. http://migratorybirds.fw.gov/reports/bcc2008.pdf

USDI. 2008a. Bureau of Land Management. *Biological assessment FY 2009-2013 programmatic assessment for activities that may affect the listed endangered plant species Genter's fritillary, Cook's lomatium, McDonald's rockcress, and large-flowered wolly meadowfoam*. Medford, OR: Medford District Office.

USDI. 2008b. Bureau of Land Management. *Bureau of Land Management Manual 6840- Special Status Species Management*. Washington DC: Bureau of Land Management.

USDI. 2008c. Bureau of Land Management. *Final environmental impact statement for the revision of the resources management plans of the western Oregon Bureau of Land Management*. Portland, OR: Government Printing Office.

USDI. 2008d. U.S. Fish and Wildlife Service. *Letter of concurrence, effects of proposed FY 2009-2013 forest management activities on federally listed species and designated critical habitat*. Roseburg, OR: U.S. Fish and Wildlife Service.

USDI. 2008e. Bureau of Land Management. *Bureau of Land Management Manual1790-1- BLM National Environmental Policy Act Handbook*. Washington DC: Bureau of Land Management.

USDI. 2011a. U.S. Fish and Wildlife Service. *Revised recovery plan for the northern spotted owl (Strix occidentalis caurina)*. Portland, OR: U.S. Fish and Wildlife Service.

USDI. 2011b. Bureau of Land Management. *Water quality restoration plan: Hellgate Canyon-Rogue River watershed HUC 1710031002.* Medford, OR: Bureau of Land Management.

USDI. 2011b. Bureau of Land Management. *Water quality restoration plan: Deer Creek watershed HUC 1710031105.* Medford, OR: Bureau of Land Management.

USDI. 2012. U.S. Fish and Wildlife Service. *2011 NSO survey protocol – 2012 revision. Protocol for surveying proposed management activities that may impact northern spotted owls.* Portland, OR: U.S. Fish and Wildlife Service.

USDI. 2013a. Bureau of Land Management. *Biological assessment: Assessment of activities that may affect the listed endangered plant species Genter's fritillary, Cook's lomatium, McDonald's rockcress, and large-flowered wolly meadowfoam on BLM, Medford district and Cascade Siskiyou National Monument*. Medford, OR: Medford District Office.

USDI. 2013b. U.S. Fish and Wildlife Service. *Experimental removal of barred owls to benefit threatened northern spotted owls: Final Environmental Impact Statement.* Portland, OR: U.S. Fish and Wildlife Service.

USDI. 2014a. Bureau of Land Management. *Biological Assessment: Assessment of activities that may affect the federal listed plant species, Gentner's fritillary, Cook's lomatium, and large-flowered wolly meadowfoam, on Bureau of Land Management, Medford District and Cascade Siskiyou National Monument*. Medford, OR: Medford District Office.

USDI. 2014b. U.S. Fish and Wildlife Service. *Informal consultation the Medford district Bureau of Land Management's proposed activities on federally listed plant species and designated critical habitat (FWS reference #01EOFW00-2014-I-0013).* Roseburg, OR: U.S. Fish and Wildlife Service.

USDI. 2014c. U.S. Fish and Wildlife Service. *Letter of concurrence – Informal consultation on the Medford district Bureau of Land Management's proposed activities on federally listed plant species and designated critical habitat.* Roseburg, OR: U.S. Fish and Wildlife Service.

USDI. 2014d. Bureau of Land Management. *Additional direction regarding the survey and manage mitigation measure as a result of court ruling in Conservation Northwest et al v. Bonnie et al., case no. 08-1067-jcc (W. D. Wash.)*. Instruction memorandum No. OR-2014-037. Portland, OR: Oregon/Washington State Office-Bureau of Land Management.

USDI. 2015a. Bureau of Land Management/U.S. Fish and Wildlife Service. *Conservation agreement for Genter's fritillary (Fritillaria gentneri) in southwestern Oregon*. Medford, OR: Bureau of Land Management.

USDI. 2015b. Bureau of Land Management. *Final Oregon and Washington state director's special status species list*. Portland, OR: Oregon/Washington State Office.

USDI. 2015c. U.S. Fish and Wildlife Service. *Species fact sheet Gentner's fritillary (Fritillaria gentneri).* Retrieved May 5, 201, from: http://www.fws.gov/oregonfwo/Species/Data/GentnersFritillary/

USDI. 2015d. Bureau of Land Management. *Final environmental impact statement for the revision of the resources management plans of the western Oregon Bureau of Land Management*. Portland, OR: Government Printing Office.

USDI. 2016a. Bureau of Land Management. *Geographic biotic observations (GeoBOB) database*. Portland, OR: Oregon/Washington State Office.

USDI. 2016b. Bureau of Land Management. *Southwestern Oregon record of decision and resource management plan*. Portland, OR: Government Printing Office.

USDI. 2016c. Bureau of Land Management. *Forest product sale procedure handbook series update.* Instruction memorandum No. OR-2017-017. Portland, OR: Oregon/Washington State Office-Bureau of Land Management.

USDI. 2016d. Bureau of Land Management. *Guide for planning and implementing vegetation management projects.* Medford, OR: Bureau of Land Management.

USDI. 2017. Bureau of Land Management. *Medford District Recreation Profile.* Retrieved from: https://eplanning.blm.gov/epl-front-office/projects/lup/57902/88402/105791/Medford_prof.pdf.

Van Lanen, N., A. Franklin, K. Huyvaert, R. Reiser II, and P. Carlson. 2011. Who hits and hoots at whom? Potential for interference competition between barred and northern spotted owls. *Biological Conservation 144*(9), 2194-2201.

Van Pelt, R. 2008. *Identifying old trees and forests in eastern Washington.* Olympia, WA: Washington State Department of Natural Resources.

Van Riper III, C., J. J. Fontaine, and J. W. Van Wagtendonk. 2013. Great gray owls in Yosemite National Park: On the importance of food, forest structure, and human disturbance. *Natural Areas Journal 33,* 286-295.

Van Sickle, J., and S. Gregory. 1990. Modeling inputs of large woody debris to streams from falling trees. *Canadian Journal of Forest Research 20*(10), 1593-1601.

Van Wagtendonk, J. W. 1996. Use of a deterministic fire growth model to test fuels treatments. *Sierra Nevada ecosystem project: Final report to Congress, vol. II, assessments and scientific basis for management options*. pp. 1156-1166. Davis, CA: University of California, Centers for Water and Wildland Resources.

Wagner, F. and R. Anthony. 1998. *Reanalysis of Northern Spotted Owl Habitat Use on the Miller Mountain Study Area. Identification And Evaluation Of Northern Spotted Owl Habitat In Managed Forests Of Southwestern Oregon And The Development Of Silvicultural Systems For Managing Such Habitat*. Medford, OR: Bureau of Land Management.

Ward, Jr., J. P., R. J. Gutierrez, and B. R. Noon. 1998. Habitat selection by northern spotted owls: The consequences of prey selection and distribution. *The Condor 100*(1), 79-92.

Ward, K., R. Helliwell, and R. Huff. 2010. *Species fact sheet for Chaenotheca subroscida.* Portland: U. S. Forest Service and Bureau of Land Management.

Washington State University Extension. 1999. *A primer for timber harvesting.* Pullman, WA: Washington State University.

Watershed Professionals Network. 2001. *Oregon watershed assessment manual, Appendix A--Ecoregion descriptions.* Salem, OR: Oregon Watershed Enhancement Board.

Weathers, W. W., P. J. Hodumand, and J. A. Blakesley. 2001. Thermal ecology and ecological energetics of California spotted owls. *The Condor 103*:678-690.

Weatherspoon, C. P. and C. N. Skinner. 1995. Height: Diameter ratios and stability relationships for northern Rocky Mountain Tree Species. *Forest Science 41*(3), 430-451.

Weber, K. T., C. L. Marcum, M. G. Burcham, and L. J. Lyon. 2000. Landscape influences on elk vulnerability to hunting. *Intermountain Journal of Science 6*, 86-94.

Wemple, B. C., J. A. Jones, and G. E. Grant. 1996. Channel network extension by logging roads in two basins, western Cascades, Oregon. *Water Resources Bulletin 32*(6), 1-13.

Wemple, B. C. and J. A. Jones. 2003. Runoff production on forest roads in a steep, mountain catchment. *Water Resources Bulletin 39*(8), 1-17.

Wertz, T. L., A. Blumton, and L. E. Erickson. 2004. Conflict resolution by adaptive management: Moving elk where they want to go. *Proceedings 2001 Western States and Provinces Deer and Elk Workshop.* pp. 59-66. Salem, OR: Oregon Department of Fish and Wildlife.

Wiens, D., R. Anthony, E. Forsman, S. Graham, and M. Fuller. 2007. *Competitive interactions between northern spotted owls and barred owls in western Oregon: 2007 progress report.* Reston, VA: U.S. Geological Society.

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

Wiens, J. D. 2012. *Competitive interactions and resource partitioning between northern spotted owls and barred owls in western Oregon*. Doctoral Dissertation. Oregon State University: Corvallis, OR.

Wiens, J., R. Anthony, and E. Forsman. 2014. Competitive interactions and resource partitioning between northern spotted owls and barred owls in western Oregon. *Wildlife Monographs 185*(1), 1-50.

Williams, T. 1997. Killer Weeds. *Audubon* (March-April): 24-31.

Wilson, T. M. 2010. *Limiting factors for northern flying squirrels (Glaucomys sabrinus) in the Pacific Northwest: a spatio-temporal analysis*. (Unpublished doctoral dissertation). p. 219. Union Institute & University: Cincinnati, OH.

Wolman, M. G. 1954. A method of sampling coarse river-bed material. *Transactions American Geophysical Union 35*(6), 951-956.

Wonn, H. T. and L. L. O’Hara. 2001. An assessment of factors associated with damage to tree crowns from the 1987 wildfires in Northern California. *Western Journal of Applied Forestry 16*(2), 87-94.

Worthington, N. P. and G. R. Staebler. 1961. *Commercial thinning of Douglas-fir in the Pacific Northwest*. Technical Bulletin No. 1230. Washington, DC: U.S. Government Printing Office.

Wrobel, C. and T. Reinhart. 2003. *Review of potential air emissions from burning polyethylene plastic sheeting with piled forest debris*. Seattle, WA. US Forest Service.

Yackulic, C., J. Reid, J. Nichols, J. Hines, R. Davis, and E. Forsman. 2014. The roles of competition and habitat in the dynamics of populations and species distributions. *Ecology, 95*(2), pp. 265-279.

Zabel, C. J., K. McKelvey, and J. P Ward, Jr. 1995. Influence of primary prey on home-range size and habitat-use patterns of norther spotted owls (Strix occidentalis caurina). *Canadian Journal of Zoology 73*, 433-439.

Zabel, C., J. Dunk, H. Stauffer, L. Roberts, B. Mulder, and A. Wright. 2003. Northern spotted owl habitat models for research and management application in California (USA). *Ecological Applications 13*(4), 1027-1040.

Ziemer, R. R. 1981. Storm Flow Response to Road Building and Partial Cutting In Small Streams of Northern California. *Water Resources Research, 17*(4), 907-917.

Appendix A Glossary

Note: These terms are defined in relation to their use in the Bureau of Land Management Road Best Management Practices.

Bed Load: Coarse sediment particles with a relatively fast settling rate that move by sliding, rolling or bouncing along the streambed in response to higher stream flows.

Commercial Use: The primary purpose for development and use of the BLM road system is access for forest management activities and the transportation of forest products. Commercial use of BLM's road system typically includes log hauling and aggregate hauling and is authorized by either 1) perpetual reciprocal right-of-way agreements between the United States and private timberland owners, or 2) BLM timber sale contracts.

Cross Drain Culvert: Culverts strategically installed to pass ditch runoff or drain seeps and springs, safely under the road prism. (Often referred to as relief culverts).

Crown: The center of the road being higher than the outer edges, creating a nearly flat A-shape with a normal cross slope of ½" to ¾" per foot.

Culvert: Enclosed channels of various materials and shapes designed to convey stream or ditch water under and away from the roadway.

Cutbank Gouging: A problematic practice during grading and ditch cleaning operations where the road maintenance equipment cuts into the toe of a stable bank and creates a vertical surface thereby destabilizing the bank .

Durable Rock Surfacing: Durability is an indicator of the relative quality or competence of an aggregate to resist abrasion, impact or grinding to produce clay-like fines when subjected to commercial hauling. Durable rock surfacing will support commercial timber or rock haul in the winter with a minimal level of fines produced due to wear.

Decompact: The use of tools and/or machinery to reduce the soils bulk density in order to restore beneficial physical, chemical, and biological soil properties.

Dry Season: An annually variable period of time, starting after spring rains cease and when hillslope subsurface flow declines; drying intermittent streams and roadside ditches. Generally June through October, but may start or end earlier depending on seasonal precipitation influences.

Effective Depth of Decompaction: The depth to which the soil is tilled or loosened to provide infiltration capacity that is near to the adjacent undisturbed forest floor. Measured depth is from road surface to bottom of evidence of platey soil or increased bulk density that impedes water transmission.

Energy Dissipater: Any device or installation of material used to reduce the energy of flowing water.

Geotextile: A geosynthetic fabric or textile manufactured from synthetic plastic polymers, not biodegradable, in woven or non-woven types, and used for various purposes ranging from reinforcement and separation to drainage filtration and sediment control.

Grade Break: A long, gradual break in grade on a road with a relatively gradual downhill slope that improves drainage. Grade breaks limit water flow by decreasing concentration and velocity from a reduced area of road section.

High Sediment Producing Roads: Roads whose physical characteristics and rights of way vegetation, in combination with precipitation in the watershed and traffic result in high erosion rates.

Insloping: Constructing and maintaining the entire surface of the road toward the cutslope side of the road.

Lead-off Ditch: A formed channel that diverts ditch water away from the road, usually angled in the direction of water flow and placed at locations to empty into vegetative filtering areas.

Low Volume Road: A road that is functionally classified as a resource road and has a design average daily traffic volume of 20 vehicles per day or less.

Mitigation: The act of reducing or eliminating an adverse environmental impact.

ODFW in stream work period: Oregon Department of Fish and Wildlife designated guidelines that identify periods of time for in-water work that would have the least impact on important fish, wildlife and habitat resources. Work periods are established to avoid the vulnerable life stages of fish including migration, spawning and rearing. Work periods are established for the named stream, all upstream tributaries, and associated lakes within a watershed.

Outsloping: Constructing and maintaining the entire surface of the road toward the fillslope side of the road.

Renovation: Consists of work done to an existing road, restoring it to its original design standard.

Resource Road: Roads that provide a point of access to public lands and connect with local or collector roads.

Riparian Management Area: The areas along watercourses, lakes and wetlands which are primarily managed specifically for protection of aquatic and riparian dependent beneficial uses under Resource Management Plans.

Sediment: Fine particles of inorganic and /or organic matter carried by water.

Shotgun Culverts: Ditch relief or stream culverts where the outlet extends beyond the natural ground line.

Storm-proof: Roads having a self-maintaining condition, allowing unimpeded flows at channel crossings and surface conditions that reduce chronic sediment input to stream channels.

Temporary Route: A short-term use road authorized for the development of a project that has a finite lifespan, e.g., a timber sale spur road. Temporary roads are not part of the permanent designated transportation network and must be reclaimed when their intended purpose has been fulfilled.

Turbidity: The cloudiness exhibited by water carrying sediment. The degree to which suspended sediment interferes with light passage through water.

Underdrain: Culverts installed to convey water from springs, and seeps encountered during road construction, under the road.

Waters of the State: Includes lakes, bays, ponds, impounding reservoirs, springs, wells, rivers, streams, creeks, estuaries, marshes, inlets, canals, the Pacific Ocean within the territorial limits of the State of Oregon and all other bodies of surface or underground waters, natural or artificial, inland or coastal, fresh or salt, public or private which are wholly or partially within or bordering the State or within its jurisdiction. ORS § 468B.005(10).

Wetland: Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions, as defined by the 1972 Federal Clean Water Act. These wetlands generally meet the jurisdictional wetland criteria.

Wet Season: An annually variable period of time, starting after precipitation amounts saturate soils. This occurs after the onset of fairly continuous fall rains which result in seasonal runoff in ephemeral and intermittent stream channels and from the road surface and ditches. Generally October 15 through May 15, but could start or end earlier depending on seasonal precipitation influences.

Appendix B Scoping Comments

The BLM is required to respond to substantive comments submitted during scoping (40 CFR § 1503.4). The National Environmental Policy Act Handbook (section 6.9.2.1, p. 66) describes substantive comments as doing one or more of the following: 1) question, with reasonable basis, the accuracy of the information contained within the EA, 2) question the adequacy of the methodology for, or assumptions used in the analysis, 3) present new information relevant to the analysis, 4) present reasonable alternatives other than those described in the EA, or 5) cause changes or revisions in one or more of the alternatives. The Environmental Assessment only considered and responded to substantive comments (BLM Manual, National Environmental Policy Handbook, 2008). Comments are considered non-substantive if they: 1) express favor for or against the Action Alternative without reason, 2) agree or disagree with BLM policy or resource decisions without justification or supporting data, 3) don't pertain to the Planning Area or the Action Alternatives, or 4) take the form of vague, open-ended questions.

During the analysis substantive comments received during scoping were considered in one of the following ways: 1) comments may have been incorporated into the design of the project, 2) comments may have been mitigated through project design features, 3) comments may be responded to in this Appendix, and 4) comments may be discussed in the Issues and Alternatives Not Analyzed in Detail section. For a detailed explanation of the scoping process for the Pickett West project see Chapter 1.6.1: Scoping. All comments received during scoping are cataloged and are contained within the Administrative Record.

1) **Topic Statement:** *Please treat the fuels on BLM land next to me to help protect my property from wildfire.*

Comment Summary: Fuels and fire hazard mitigation treatments are necessary in the wildland-urban interface. BLM should prioritize fuels treatments next to private property over treatments in more remote areas. Fuels treatments to protect private property are only effective adjacent to areas of concern.

BLM Response: BLM prioritizes fuels treatment areas to gain the most likely strategic advantage in controlling wildfire. Areas such as ridgelines and near roads would be given a higher priority for treatment than areas adjacent to private property.

BLM cooperates with Oregon Department of Forestry's Firewise Communities, which encourages local solutions for safety by involving homeowners in taking individual responsibility for preparing their homes from the risk of wildfire. Firewise is a key component of Fire Adapted Communities – a collaborative approach that connects all those who play a role in wildfire education, planning, and action with comprehensive resources to help reduce risk

2) **Topic Statement:** *Logging and altering the forest canopy increase fire danger.*

Comment Summary: Removing the shade of the canopy increases the temperature and decreases the relative humidity on the forest floor. Logging slash and natural debris will dry out earlier in the fire season. Increased sunlight creates increased shrub growth, resulting in a more flammable forest. Larger, older trees are more fire-resistant and should be retained.

BLM Response: Timber stands in the planning area have deviated from the historic Natural Range of Variability (NRV) in structure and development due to a lack of disturbance from fire. Restoration thinning and density management treatments with associated fuels treatments are designed to emulate this missing disturbance. These silvicultural approaches will be used where the purpose is to reduce stand density and fuel loadings, increase vigor, and reduce insect and disease mortality similar to levels found in stands that have an intact fire regime, which can also be described as a historically typical pattern of fire intensity and frequency. Analysis shows that treatments will decrease fire hazard by reducing surface fuels and ladder fuels, potentially decreasing the risk of wildfire climbing into the crowns of trees.

A short-term increase of fine fuels deposited on the forest floor would result in an immediate increase in fire hazard until activity fuels are treated. BLM proposes activity fuels treatments that would reduce this immediate deposition of fuels as described in Chapter 2.4, project design features and best management practices, and the Fire and Fuels analysis in Chapter 3.2.

Selection harvest has been the most prominent management approach observed in the PA, accounting for about one third of the BLM-administered lands. This approach generally refers to the overstory removal of some of the dominant trees in a stand to release the understory trees. In the PA this practice, along with fire suppression, effectively shifted the tree species diversity towards more dominance of shade tolerant Douglas-fir over pine species. This change, converted late seral open and closed canopy forests into mid seral closed canopy forest, as average tree diameters decreased, and the lack of regular disturbance allowed dense regeneration to persist in light limited settings. It is necessary to increase the amount of light reaching the forest floor to favor the growth of shade-intolerant species such as pine.

3) **Topic Statement:** *Regeneration harvest should not be conducted.*

Comment summary: Regeneration harvest, where openings are created with the intent of starting a new young stand of trees, increases fuels hazard by removing large, fire-resistant trees. The resulting stand of young trees is more susceptible to fire.

BLM Response: Regeneration harvesting is an issue considered but not analyzed in detail. For more information see Chapter 1.7.

4) **Topic Statement:** *The EA must address climate change.*

Comment summary: The issue of rapid climate change was not in wide discussion when the 1994 FEIS was completed. The Picket West Environmental Assessment should contain a current analysis of the project's effect on climate change.

BLM Response: The 2016 Final Environmental Impact Statement (FEIS) analyzed the effects of timber harvesting, prescribed burning, and livestock grazing on greenhouse gas emissions and carbon storage, and the potential impacts of climate change on major plan objectives. Analysis contained within the FEIS represents current understanding of the relationships between proposed management activities, climate change, carbon storage, and greenhouse gas emissions. The analysis in the Pickett West EA tiers to the 2015 Final Environmental Impact Statement (FEIS) carbon and greenhouse gas analysis. The EA concluded that the Pickett West project would not exceed the outputs expected in the analysis contained in the FEIS, and thus is not expected to influence climate change. The analysis in the FEIS anticipated that all forest management Action Alternatives would favor the long-term storage of carbon. As mentioned in Chapter 1, the FEIS for the 2016 Western Oregon RMP included projected harvest levels from the Pickett West project, when added to projected harvest levels from other projects on the Medford District, concluding that net carbon storage would increase. Although annual greenhouse gas emissions would increase, they would remain less than 1 percent of the statewide greenhouse gas emissions. See Chapter 1.7 for more information.

5) **Topic Statement:** *There is higher value in carbon storage than in timber production.*

Comment Summary: BLM should calculate the value of carbon storage in timber stands considered for harvest and compare this with the value of timber production. Carbon sequestration is a higher value than timber production. Logging would release carbon and exacerbate climate change.

BLM Response: The 2015 FEIS addresses carbon storage as increasing under the Action Alternatives. Carbon removed from the forest will persist as lumber or other forest products, and regrowth of the forest will sequester additional carbon.

6) **Topic Statement:** *BLM's computer models are incorrect*.

Comment Summary: Models are overly optimistic and overestimate growth and response to thinning. The models also do not account accurately for the wind-thrown trees that occur in a stand following logging.

BLM Response: The BLM and the United States Forest Service support the ORGANON tree growth model developed by Oregon State University College of Forestry, and the Forest Vegetation Simulator (FVS) developed by the United States Forest Service. These models are utilized across the Pacific Northwest and have been found to be effective and accurate. The silvicultural prescriptions for each stand were designed to retain additional forest canopy to account of instances of wind-throw and inadvertent damage from logging.

7) **Topic Statement:** *BLM's fire hazard modeling is incorrect.*

Comment Summary: Modeling based on fire regime and condition class may not accurately predict hazard. BLM lacks long-term monitoring data regarding additional hazard from shrub development after logging. BLM must also address the immediate short-term hazard from untreated logging debris.

BLM Response: Fire regime and condition class are reliable sources of information to model predicted fire hazard and fire behavior. The Pickett West project proposes density management and restoration thinning treatments. All treatment would maintain at least between 30% and 60% canopy cover. The intent of thinning is to open canopies enough to encourage regeneration of shade-intolerant pine species with the long-term goal of facilitating complex open late seral habitat conditions.

All treatment units are assessed for follow-up fuels treatment, and treatments are conducted as soon as practical following logging.

8) **Topic Statement:** *BLM should prioritize treatments in young, previously entered stands over un-entered stands.*

Comment Summary: Thinning previously logged and replanted areas is a better use of BLM's time and limited operational capability than logging in areas that have not previously been logged.

BLM Response: The majority of stands proposed for management in Pickett West have undergone some form of harvest in the past as discussed in the Silviculture analysis 3.1, additionally the entire project area has been altered due to the effects of fire suppression as shown in the Fire and Fuels analysis in Chapter 3.2. The BLM manages plantations through the young stand development program that operates under different NEPA documents than this EA. The BLM assesses and gathers data on stands to understand the necessary treatments to achieve the requirements of the land use allocation where that stand occurs. Only stands that warrant treatment based on site-specific assessments are proposed for treatment.

9) **Topic Statement:** *The EA should address long-term snag (standing dead tree) recruitment in the project area.*

Comment Summary: Logging removes too many snags and future snags, leaving a deficit.

BLM Response: This project includes several project design features (project design features, Chapter 2 pages 49, 83 and 84) that are designed to minimize project impacts to snags, such as: "All existing snags would be retained from cutting unless they pose a safety hazard, in which case they would be left on the ground as coarse woody debris (CWD) in the unit." Although project implementation could impact a small number of snags on a unit-by-unit basis, the majority of existing snags in any given treatment area would remain post-harvest. The Pickett West project proposes to commercially treat at maximum 6.2% of the BLM-administered lands within the Planning Area and a large amount of snags would remain unaltered across the untreated areas (93.8%) of the PA.

The increasing incidence of insect-caused mortality and other natural processes such as fire ensure an adequate future supply of snags across the planning area. All treatments are limited to thinnings and will leave as many snags as operationally feasible.

10) **Topic Statement:** *The EA must disclose the number of trees greater than 30" diameter at breast height to be removed in the project.*

Comment Summary: To adequately inform the decision maker, the number of trees greater than 30" diameter at breast height selected for harvest must be disclosed.

BLM Response: The EA discloses the number of trees to be retained under the guidance of the Northwest Forest Plan and 1995 ROD/RMP. The EA then analyzes for effects to the potentially affected resources (Silviculture Chapter 3.1). Numbers of trees to be cut or retained by relevant size classes are not finalized until actual units are selected for harvest and layout and cruising occurs. Identification of the number of trees by size class is not necessary for analysis of a project that manages forest stands, not individual trees. The EA disclose other relevant metrics such as basal area to be removed or retained, project design features to protect critical resources, and stand densities to allow the decision maker to reach a reasoned and informed decision (Appendix F and I).

11) **Topic Statement:** *Restoration thinning strategies are appropriate and important for managing Late Successional Reserves.*

Comment Summary: This comment is intended to encourage active timber management to develop and maintain late successional characteristics in Late Successional Reserves.

BLM Response: There are no proposed treatments in Late Successional Reserves under the Pickett West proposal. The scoping letter addressed this potential, but subsequent analysis indicated that BLM could not complete the required survey and inventory work in Late Successional Reserves allowing for timely implementation of the project.

12) **Topic Statement:** *Logging to prevent insect infestation is not effective or justified.*

Comment Summary: The Purpose and Need statement refers to flat-headed fir borer proliferation as a reason for the Pickett West proposal. Logging does not prevent insect infestation, and can weaken a stand making it even more vulnerable to insects.

BLM Response: The objective of treatments is not to prevent or prohibit flat headed fir borer mortality, but to reduce the impact of potential future mortality. The proposed treatments would increase stand vigor and health by reducing competition and allowing for more growing space per tree. Additionally, proposed treatments would increase the diversity of tree species by retaining and promoting shade intolerant trees species such as Ponderosa and Sugar pine that are not impacted by flat headed fir borer. While the harvest of insect and disease mortality may occur, it would be incidental to the proposed treatments. Please see Chapter 1.2.

13) **Topic Statement:** *BLM should leave more coarse woody debris on the ground.*

Comment Summary: Large material not suitable for saw wood is sometimes removed to debris piles for disposal in order to lessen fuel loading. It would be more valuable if left on site to provide water storage and soil nutrients.

BLM Response: The Pickett West project contains a PDF that directs large logs that are yarded to a landing and then found to be undesirable as a commercial product ("cull logs") to be redistributed back into units, based on a fuel loading review by a Fuels Specialist. Additionally, the treatments proposed are all thinning and would only partially harvest stands, ensuring future sources of coarse woody debris (CWD). To the greatest extent possible, CWD already within units would be retained and protected from disturbance.

14) **Topic Statement:** *Thinning timber stands weakens the stand, does not improve resiliency and favors insect infestations.*

Comment Summary: BLM thinning does not have the effect on the thinned stand that the BLM is intending in employing this strategy. Thinning actually results in a weakened, less vigorous and less resilient forest.

BLM Response: The analysis contained within the EA does not support the opinion of the commenter. Historic conditions within the dry forests were more resilient to fire disturbance than current conditions, in large part because frequent fire was present on the landscape (Brown et al. 2004, Hessburg and Agee 2003, North et al. 2009). Therefore, to measure dry forest fire resilience at the landscape scale, the BLM quantified the departure of current vegetation structure and landscape composition patterns from a set of reference conditions that represent the historic range of variability (Barrett et al. 2010, Keane et al. 2009). In this approach, less departure from reference conditions represents greater fire resiliency. Restoration thinning and density management would enhance species diversity, reduce the existing fire hazard, and promote fire resiliency. Treatments would reduce ladder fuels and the risk to older trees from wildfire and competition, while favoring more fire and drought tolerant tree species. Thinning treatments would reduce torching and crowning potential by increasing crown base height and reduce canopy bulk density. For more information see chapters 3.1 Silviculture, 3.2 Fire and Fuels, and 2.2 Alternative 2.

15) Topic Statement: *The Pickett West project should implement individual tree diameter and age harvest limits*.

Comment Summary: In order to favor larger, older trees for retention, BLM should place an upper diameter limit for trees designated for harvest.

BLM Response: An upper diameter limit of 21” DBH was considered and analyzed in this EA, and the tree marking guides for this project direct the retention of large conifers exhibiting an “old growth form”. As discussed in the Silviculture report, the impact of diameter restrictions applied regardless of current condition is that the ability to influence species diversity is reduced, the economic viability is reduced and the stand complexity in terms of canopy layers and structures is reduced by removing only small trees.

16) Topic Statement: *BLM should consider Critical Habitat Units (CHU) for regeneration harvest.*

Comment Summary: Regeneration harvest should be considered, and could be conducted without negatively affecting Northern Spotted Owl habitat suitability.

BLM Response: Among other objectives, the purpose and need for proposed treatments in the Pickett West project is to produce wood volume at the present time, increase conifer growth rates for wood volume production in the future, and maintain/improve tree vigor of retained conifers and other vegetation while managing northern spotted owl habitat. As such, regeneration harvest was considered in CHU, however the 2016 Southwestern Oregon RMP interim guidelines for project development under the 1995 RMP made clear that regeneration harvest could not be conducted in areas that were proposed as “Late Successional Reserve” in the 2016 RMP. The majority of the CHU in the project was proposed as “Late Successional Reserve” in the 2016 RMP. Approximately 90% of the BLM-managed lands considered in the Pickett West project are in LSRs, and were eliminated from consideration.

Although the Revised Recovery Plan for the Northern Spotted Owl (USFWS 2011) discusses active management in the context of dry forest restoration, the interdisciplinary team believes that regeneration harvest is inconsistent with the direction provided in both the Revised Recovery Plan for the Northern Spotted Owl and the 2012 Critical Habitat Rule. This is because the objective of regeneration harvest is not founded in ecological objectives, but rather forest production and sustained yield. These types of objectives are not congruent with ecological restoration of dry forest systems.

17) **Topic Statement**: *BLM should not practice the agricultural model of forest management. Only the Natural Selection Alternative (NSA) should be considered.*

Comment Summary: Treating any BLM lands primarily for timber production is not a correct approach. All BLM lands considered for timber production should only be treated under the Natural Selection Alternative, which advocates cutting only those trees that nature is eliminating from the stand through natural selection.

BLM Response: The BLM is directed by the Oregon and California Railroad Revested Lands Act (O&C Act) to produce a sustainable supply of timber. Limiting harvest to dead and dying trees would not reflect the annual productive capacity for O&C lands. Because the harvest of dead and dying trees would be inherently unpredictable, the NSA would not support sustained yield due to the fluctuation and unpredictability from year to year.

18) **Topic Statement:** *The Oregon and California Railroad Revested Lands Act (O&C Act) is outdated.*

Comment Summary: Many social, legal and environmental factors have changed since the Act became law in 1937. The scientific, economic and social validity of the Act are questionable.

BLM Response: The O&C Act remains the foundation of forest management on Western Oregon BLM-administered lands. Changes in law would require an Act of Congress.

19) **Topic Statement:** *O&C lands should be managed for timber production including regeneration harvest.*

Comment Summary: Lands classified as “Matrix” lands under the Northwest Forest Plan should be managed for sustainable harvest using regeneration strategies to provide for future timber production.

BLM Response: Regeneration strategies are applied when stands have achieved a series of metrics. The data collected on stands in the Planning Area did not warrant regeneration harvest based on a combination of age, growth, structural characteristics, or the 2016 RMP interim guidelines for managing forests under the 1995 RMP.

20) **Topic Statement:** *Logging increases unauthorized off-highway vehicle (OHV) use.*

Comment Summary: OHV users take advantage of openings and log skidding trails to create user-built OHV routes, contributing to erosion, fire risk, theft of forest products, trash dumping and trespass on private property.

BLM Response: To reduce the risk of increased OHV disturbance following harvest activities, the BLM crafted project design features that direct mitigation. Examples include implementing actions such as fully decommissioning all temporary routes, blocking and placing material at the entrance of skid trails and temporary routes to discourage the development of OHV routes. If unauthorized OHV use is identified within harvest units, vegetation would be pulled back over skid trails upon project completion, when possible, to minimize OHV use of the area.

21) **Topic Statement:** *Logging degrades my view and property value and the tourism draw of public lands.*

BLM Response: This project is designed to adhere to the management direction for Visual Resource Management class I, II, III and IV lands. These designations allow differing amounts of modification to the characteristics of the landscape. They are designed to maintain the form, line, color, texture and scale of the characteristic landscape as viewed by the casual observer. Thinning stands to a maximum of 30% canopy cover would not drastically alter the visual resources within the planning area. Please see Chapter 3.10 for a detailed description of visual resource analysis.

22) **Topic Statement***: Logging unnecessarily damages human relationships with the forest*.

Comment Summary: The degradation of our many human relationships with the forest must be disclosed in the EA to properly inform the decision-maker as required by NEPA. Lands administered by the BLM must provide for multiple uses, not just timber harvest. Use for recreation, spiritual renewal, wildlife observation and other personal preferences are precluded by industrial activity. Logging will change the character of my favorite BLM lands near my home and impact the enjoyment I take from the land.

BLM Response: The Federal Land Policy and Management Act of 1976 defines the BLM's organization and provides the basic policy guidance for the BLM's management of public lands. Section 302 directs the Secretary of the Interior to manage public lands under the principle of multiple-use.

The treatments proposed under the Pickett West project would preclude multiple-use during short durations of active operations on small portions of BLM-administered lands where active management is proposed. The Pickett West planning area (PA) is approximately 203,459 acres, of which the BLM manages approximately 95,088 acres or 47% of the PA. Of the BLM-administered acres within the PA, the Pickett West project proposes to commercially treat 6,005 acres or 6% of the PA, leaving the remaining 89,085 BLM-administered acres or 94% of the BLM-administered lands within the PA available for multiple-uses, which may include but are not limited to recreation opportunities, spiritual ventures, special forest products collection, and mining.

The proposed 11,102 acres of fuels hazard reduction treatments would treat understory material less than 8 inches in diameter. These treatments would preclude multiple-use for short durations but would not limit multiple-use activities following treatments.

Treatments are expected to sustain and improve forest condition in the long-term, ensuring forests will be sustained into the future for relationships and products.

23) Topic Statement: *BLM should collaborate with the community in developing alternatives, especially in the Applegate Adaptive Management Area (AMA).*

Comment Summary: There is an expectation that treatments within the AMA will be planned in collaboration with the local community. It is stated that the BLM's AMA guidelines mandate "collaborative" planning. Concerned members of the public wish to participate "at the table" with resource specialists in developing alternatives.

BLM Response: The 1995 Northwest Forest Plan designated ten Adaptive Management Areas (AMAs) across western Oregon, which include the Applegate AMA occurring within the Pickett West planning area. The Applegate AMA Guide was developed to assist in furthering technical and social objectives (AMA Guide, p. 5). The Adaptive Management Area Guide is not intended to be a vehicle for documenting in-place management decisions. No change in land allocations or in land management standards and guidelines is made by the AMA guide and it is not a decision making document (Guide, p. 5).

The Pickett West project went above and beyond what the National Environmental Policy Act requires during public scoping periods for an Environmental Assessment (EA, Chapter 1.6). The BLM intensively received input from hundreds of interested community members within the Pickett West planning area, including those within the AMA. BLM conducted ongoing communication with neighbors and other interested persons to solicit input during formal scoping, and in the months that followed closing of the formal scoping period. A management strategy was received specifically from The Applegate Neighborhood Network and others in the Applegate Valley. The BLM incorporated this input by developing Alternative 3, while still meeting the Purpose and Need of the project. This Alternative proposed no new temporary route construction, no commercial treatment within Riparian Reserves and modified prescriptions within northern spotted owl critical habitat (EA,

p. 56). The BLM satisfied the intent of the AMA approach of meeting project goals but not being bound by prescriptive standards and guidelines (Guide, p. 5). Furthermore the RMP directs certain objectives be met in those AMAs as was described and is being accomplished in the EA, p. 9. Those objectives have been met by the Pickett West project and there will be further opportunities for interested community members to participate in the planning process such as the EA comment period and the various field trips, prior to a final decision being made on the project.

24) Topic Statement: *The proliferation of cannabis cultivation requires analysis in an EIS.*

Comment Summary: Cannabis cultivation is creating a great demand for ground water for irrigation, closing access to public lands previously enjoyed across private property, and bringing more people into the forest interface, which increases fire risk. These unanticipated environmental and social effects were not adequately analyzed in the 1994 FEIS.

BLM Response: BLM does not regulate cannabis cultivation, which is illegal on BLM-managed lands. Water use on private property, and public access across private property in order to access public land are not controlled by the BLM.

25) Topic Statement: *The EA must include an Individual, Clumps and Openings (ICO) alternative.*

Comment Summary: The concept of planning harvests through a strategy of leaving individual trees, managing clumps of trees and creating openings is supported by the environmental community and should be incorporated in the alternatives.

BLM Response: The ICO method has been reviewed and is one of many implementation tools that is useful for achieving a spatially heterogeneous stand. Prescriptions and marking guides proposed in this project are also designed to result in a spatially heterogeneous stand while considering the importance of species diversity promotion.

26) Topic Statement: *The EA must address "significant forest fragmentation" in the cumulative effects analysis of logging on private land.*

Comment Summary: The continuity and integrity of Northern Spotted Owl (NSO) habitat will be fragmented by high-impact forest management on private land in the PA. The effects of logging on other non-BLM lands in the PA must be considered in addition to the effects of BLM activity.

BLM Response: Harvesting on private lands is addressed in the cumulative effects analysis. Appendix D lists projects to be considered in the cumulative effects analysis. The EA concluded the Action Alternatives are not expected to have direct, indirect, and cumulative effects. For example, the analysis showed that the loss of habitat on private lands should not prohibit NSOs from dispersing across the PA because spotted owls have been found to regularly disperse through the highly fragmented forest landscapes that are typical of the mountain ranges in western Oregon and Washington (Forsman et al. 2002).

27) Topic Statement: *Old growth stands must be inventoried.*

Comment Summary: The BLM needs to do old growth inventories for the 5th field watershed to be compliant with the Northwest Forest Plan (NWFP).

BLM Response: The Northwest Forest Plan directs the following, "Landscape areas where little late-successional forests persists should be managed to retain late-successional patches. This standard and guideline will be applied in fifth field watersheds in which federal forest lands are currently comprised of 15 percent or less late-successional forests."

For the Pickett West project the BLM identified stands with ages greater than 80 years old for the three watersheds which the PA overlaps. The 80 year age was utilized for this assessment because this is the age when stands in the PA generally begin to structurally differentiate. For the Deer Creek watershed which totals 30,200 acres approximately 22,356 acres or 74 percent of the BLM-administered lands are greater than 80 years old. For the Lower Applegate River watershed which totals 27,004 acres approximately 20,262 acres or 75 percent of the BLM-administered lands are greater than 80 years old. For the Hellgate Canyon-Rogue River watershed which totals 38,112 acres approximately 30,177 acres or 79 percent of the BLM-administered lands are greater than 80 years old.

28) Topic Statement: *The Planning Area is too large.*

Comment Summary: The planning area (PA) is too large and complex to analyze in a single Environmental Assessment (EA). The planning area should be divided into four smaller, less complex segments.

BLM Response: There is no numerical limit to the size of a PA. While the PA is large, the BLM proposes to commercially treat a total of six percent of the PA.

29) Topic Statement: *An Environmental Impact Statement (EIS) is required.*

Comment Summary: The proposed project will have significant impacts to local, regional and global communities. The scope and scale and anticipated adverse effects to the local economy and potential tourist industry require an EIS. The presence of threatened and endangered fish in and downstream of proposed harvest units requires consideration in an EIS.

BLM Response: BLM must complete an Environmental Assessment in order to determine if there are significant impacts to the quality of the human environment beyond those analyzed in the 1995

ROD/RMP and the 2016 ROD/RMP. This analysis will allow the decision maker to determine whether to issue a Finding of No Significant Impact (FONSI) or to prepare an EIS.

30) Topic Statement: *The Purpose and Need is too narrow.*

Comment Summary: The purpose and need for the project is too narrow and must be broadened to include recreation development and economic stability for communities.

BLM Response: The NEPA handbook recommends Purpose and Need statements to be brief, unambiguous, and as specific as possible. The Purpose and Need statement was designed to conform to existing decisions, policies, regulation and law. The commenter is expressing their preference for the management of BLM-administered lands, which differs from the direction in the RMPs.

31) Topic Statement: *Not enough specific information was included in the Scoping Notice*.

Comment Summary: BLM should provide specific information in the Scoping Notice about each unit considered for logging, including stems/acre, average diameter of trees on site, and basal area occupied by trees.

BLM Response: Detail of this level was not known until the EA was completed.

32) Topic Statement: *BLM must comply with the Water Quality Restoration Plan for Cheney and Murphy Creeks in the Pickett West project and incorporate relevant Watershed Analyses in the Pickett West Project.*

Comment Summary: These previously published documents should be considered in the EA.

BLM Response: Best Management Practices are methods, measures or practices incorporated into the project to meet the requirements of the Clean Water Act of 1972 as amended. The strategy for managing and controlling nonpoint source water pollution from BLM-administered lands in the State of Oregon is outlined in the 2001 Memorandum of Understanding between the State of Oregon DEQ and BLM. The Memorandum of Understanding specifies that the BLM would implement site-specific Best Management Practices as specified in Management Objectives, standards, guidelines, design features, and mitigation developed in either: Resource Management Plans, Resource Management Plans amendments, project level plans, and Water Quality Restoration Plans (WQRP) to meet applicable water quality standards.

There are four Water Quality Restoration Plans (WQRPs) that cover the federally-administered lands in the PA. They are the McMullin WQRP (USDI 2005a) and Deer Creek WQRP (USDI 2011c) for the Illinois subbasin, the Hellgate-Rogue WQRP (USDI 2011b) for the Lower Rogue subbasin, and the Applegate WQRP (USDA/USDI 2005) for the Applegate subbasin. Specific recommendations for forest management includes implementing silvicultural treatments designed to promote hardwoods and conifers, and to minimize sedimentation with good road management.

The proposed treatments are designed to develop multiple canopy layers, increase species diversity, and increase the vigor of conifers and hardwoods. Road maintenance activities associated with timber sales decrease the likelihood of road failures due to erosion which can decrease sedimentation within the planning area.

There are five Watershed Analysis (WA) documents that cover portions of the PA. The Deer Creek WA is in the Illinois subbasin, the Cheney-Slate, Murphy and Applegate WAs are in the Applegate subbasin, and the Hellgate Canyon – Rogue River watershed in the Lower Rogue. These documents were utilized in the analysis for the Pickett West project as documented on pages 197 to 199, 205 and 339.

33) **Topic Statement:** *BLM should address and private land in the planning area*.

BLM Response: **Comment Summary:** The effects of logging on other non-BLM lands in the PA must be considered in addition to the effects of BLM activity.

BLM Response: Please see Appendix D for a list of projects to be considered in the cumulative effects analysis. Logging on County and private land is regulated by the Oregon Forest Practices Act, and the analysis within the EA concluded that BLM's proposed actions would not contribute effects exceeding thresholds considered in determining significance.

34) **Topic Statement:** *The BLM should exclude certain specific parcels from forest management because I use these lands for other preferred activities.*

Comment Summary: Individuals and groups expressed a preference that certain parcels be excluded from the project because there is greater personal value in non-harvest uses.

BLM Response: As detailed in the response to comment # 22, on the BLM-administered acres within the planning area, the Pickett West project proposes to commercially treat 6,005 acres or 6% of the PA, leaving the remaining 89,085 BLM-administered acres or 94% of the BLM-administered lands within the PA available for multiple-uses.

35) **Topic Statement:** *My road and my use of the road will be damaged by log truck traffic.*

Comment Summary: The roads I use are maintained for a lighter traffic load than logging will create. I don't want to compete with log trucks on the roads I use.

BLM Response: The Pickett West project is expected to maintain the health and safety of the public by utilizing signs during all forest operations as directed by federal and state Occupational Safety and

Health Administration (EA, p. 291). Road maintenance activities associated with timber sale decrease the likelihood of road failures due to erosion (EA, p. 59) and removes vegetation along roadsides to improve sight distance for travel (EA, p. 57). Proposed maintenance activities are anticipated to improve the roads within the PA making them safer for use by private entities and the public (EA, p. 31).

36) Topic Statement: *Build the West Applegate Ridge Trail (West ART).*

Comment Summary: BLM should analyze for, approve and build the West ART as part of the Pickett West project.

BLM Response: Construction of new recreational projects was not included in the Purpose and Need for the project. BLM is aware of the proposed route of the trail and will utilize project design features in designing landscape treatments that would not foreclose future development of the proposed route. Please see the Chapter 1.7 for more information.

37) Topic Statement: *Logging can damage mushroom habitat and harvestable crop.*

C**omment Summary:** We have long enjoyed a local patch of Matsutake mushrooms on public land managed by the BLM. We believe that logging in this area will lessen the abundance of this mushroom and impact our harvest.

BLM response: Lands designated as Matrix are reserved for timber harvest. The BLM surveys for special status fungi species and where found they are buffered from disturbance.

The proposed Pickett West project area comprises an extremely small portion of potential Matsutake habitat within the planning area. Mushroom response to disturbance varies greatly depending on species, timber harvest intensity, and site productivity.

38) Topic Statement: *Logging on public land adjacent to my property might damage my property.*

Comment Summary: Logging operations might cut or damage trees on my private property, and could damage the source and pipeline for my domestic water supply.

BLM Response: Timber sale boundaries are carefully located and marked, and timber sale operations are carefully monitored. BLM will employ project design features to protect valid water rights and granted rights-of-way for water supply lines.

39) Topic Statement: *Treatments should not degrade NSO habitat.*

Comment Summary: Logging could create significant impacts to NSO nesting, roosting and forage habitat.

BLM Response: The P&N of this project is an attempt to balance the BLM's statutory requirement to produce a sustainable supply of timber as well as contribute to the recovery of federally listed species. While it is true that this project would downgrade or remove a small percentage (6.2%) of the total available NRF habitat within the planning area, these treatments are proposed in locations that are not expected to develop and sustain high quality NSO habitat (i.e. low RHS value, southerly aspects and upper slopes and ridges). Treatments in these areas are designed to emphasize creating spatial heterogeneity and increased species and structural diversity that ultimately work to provide long-term stand resilience. The Revised Recovery Plan for the NSO (2011) offers the following guidance: "encourage and initiate active management actions that restore, enhance, and promote development of high value habitat, consistent with broader ecological restoration goals." The downgrade of NSO habitat is appropriate in some circumstances, considering the long term stand objective and stand trajectory. In the event that NRF habitat is proposed for downgrade or removal, this project would avoid the incidental take of NSOs and any decision issued from this EA would have a valid Biological Opinion that would support the BLM's determination that the project would not cause incidental take of NSO pairs or resident singles.

Treatments are designed to increase forest and tree resiliency, making them more resistant to catastrophic wildfire. All proposed treatments retain structural components that would benefit NSO habitat in the long run. The EA is developed in consultation with the USFWS. The Service manages the NSO population and consults with BLM regarding NSO habitat.

40) Topic Statement*: BLM actions should favor pollinators and their habitat.*

Comment Summary: BLM should maintain and enhance areas with abundant native flowering forbs for pollinator habitat and protection.

BLM Response: According to BLM Special Status Species Management (USDI 2004a), only Sensitive species, including Threatened, Endangered, and Candidate species are required to be addressed in NEPA documents. All Sensitive species were considered and evaluated for this project, and only those that could be impacted by the Action Alternatives are discussed in more detail. Appendix E includes a Table of all the current Special Status Species that occur on the Grants Pass Field Office management area and a brief description of why a more detailed analysis is not required.

BLM surveys for special status plants and detected populations are protected. Any temporary roads are seeded with native plants and mulched with weed-free straw. Treatments that create openings in the forest canopy and deliver more sunlight to the ground generally favor native flowering plants.

Restoration Thinning and Understory Reduction treatments would restore the vegetative composition of the treated areas to conditions more reflective of the historic Natural Range of Variability, moving closed canopy forests to open canopy forests. This would provide increased levels of light to reach the forest floor and allow for many native forbs and grasses that pollinator's relay on to return to these stands.

41) **Topic Statement:** *BLM should protect mistletoe-infected trees.*

Comment Summary: Logging trees with dwarf mistletoe infestations removes these valuable components from current and potential NSO habitat.

BLM Response: Treatments proposed in this project are not designed to sterilize stands from mistletoe; trees with structurally complex features such as dead or broken tops and large branches are important components of wildlife habitat, and are retained in the timber marking guidelines. Trees with these characteristics may also have mistletoe infections**.**

42) **Topic Statement:** *Baseline data for NSO habitat is inaccurate due to previous degradation of habitat in other projects.*

Comment Summary: The commenter cites an example where habitat value as measured by canopy retention was degraded beyond the BLM's stated retention targets for a specific logging unit. Subsequent post-harvest monitoring revealed the error. The remaining suitable habitat in the planning area (the "baseline") would therefore be less than expected.

BLM Response: All existing habitat within the PA was categorized into one of the three categories of NSO habitat. The habitat values were derived from two sources. In areas that do not have proposed commercial treatments, habitat values were obtained from a BLM GIS (Geographical Information Systems) dataset representing NSO habitat values across BLM lands. In areas that are proposed for commercial treatments, BLM wildlife technicians and biologists conducted field visits to further identify and delineate the habitat values within those areas. BLM surveys each unit on the ground, so where commercial treatments are proposed the habitat classifications are very accurate. There are small errors in the baseline, but these are of little consequence overall because the sum of the errors represents less than one percent of the overall planning area.

43) **Topic Statement:** *It would be more effective to remove the northern spotted owls (NSO's) competitors than to focus on habitat protection.*

Comment Summary: Much of BLM's analysis when planning land management activities centers on protecting the nesting, forage, dispersal and home range of the NSO, as regulated by the US Fish and Wildlife Service in compliance with the Endangered Species Act. Preserving NSO populations would be better served by removing the NSO's chief competitor, the barred owl.

BLM Response: There is an experimental program underway administered by the USFWS to remove barred owl populations to benefit NSOs. Decisions regarding the management of wildlife populations are the responsibility of the USFWS. The BLM manages habitat with the input of the USFWS.

44) **Topic Statement:** *Auctioning timber to large corporations has negative economic impacts.*

Comment Summary: Small-scale, locally owned logging companies would employ more people over a longer term. Large corporations practice short-term extraction and short-term jobs. BLM must analyze the economic effects of large, short-term versus small, longer term operations.

BLM Response: Any qualified bidder may bid on a BLM timber sale. A bidder or purchaser of a timber sale must be: an individual who is a citizen of the United States, a partnership composed wholly of citizens, an unincorporated association of citizens, or a corporation authorized in the State in which the timber is located. A bidder must submit a deposit in advance, as required by CFR § 5441.1-1. Small Business Administration (SBA) companies have an advantage during SBA set-aside sales.

Locally owned logging companies are not precluded from bidding or purchasing BLM timber sales. If the above CFR requirements are met any qualified bidder, large or small, may bid or purchase BLM timber at auction.

The analysis contained within the EA assumes that any qualified bidder may purchase a BLM timber sale therefore there is no need to analyze the effects of large or small scale bidders because either has equal access to participate in the auction so long as they meet the definition above as a qualified bidder.

45) **Topic Statement:** *Recreation is of higher economic value than logging.*

Comment Summary: There is a greater long-term sustainable economic value in managing BLM lands for recreation and tourism than for timber production.

BLM Response: Land use allocations defined in the 1995 ROD/RMP and the 2016 ROD/RMP direct the type of management that occurs on BLM-administered lands. There are various allocations for managed lands including Matrix (the harvest land base), Late Successional Reserves, Special Recreation Management Areas, and Extensive Recreation Management Areas which guide the type of activities that are conducted. Both recreation and timber production are economic drivers on BLM-managed lands in the Planning Area. Development of and economic gain from these industries are not seen as mutually exclusive in this project. Commercial treatments of the type proposed, although they can change the Recreation Opportunity Spectrum Class, are compatible with recreational and other forest uses; the Western Oregon RMP identified many places where designation of Special Recreation Management Areas would not conflict with sustained-yield timber harvest (see Table 3-122, Western Oregon FEIS). The proposed project is not considering regeneration harvest or clearcuts, which would likely have the greatest effect on some types of experiences.

46) **Topic Statement:** *BLM's analysis of the economic value of timber harvest is flawed.*

Comment Summary: Several economists are cited who refute BLM's economic analysis and state the economic benefits are overestimated.

BLM Response: The analysis referred to was that conducted for the Western Oregon RMPs, which is not relevant because a comparable scale of analysis is not being conducted for this EA. The specifics of any resulting timber sales are not known at this time, so a quantitative economic analysis is not possible.

Appendix C Aquatic Conservation Strategy Consistency Review

"The Aquatic Conservation Strategy was developed to restore and maintain the ecological health of watersheds and aquatic ecosystems contained within them on public lands. The strategy would protect salmon and steelhead habitat on federal lands managed by the Forest Service and Bureau of Land Management within the range of the Pacific Ocean anadromy" (1995 Medford District RMP p. 22).

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

This ACS consistency analysis evaluates the Pickett West Forest Management project on BLM-administered lands.

Analysis of the Four Components of the ACS:

Riparian Reserves: The proposed project is consistent with the actions and directions within Riparian Reserves as described in the 2016 Southwest Oregon Medford District RMP. The Action Alternatives would result in thinning and understory treatments to promote forest health and the development of large woody debris (LWD) within Riparian Reserves outside the Inner Riparian Zone. Thinning in the Outer Riparian Zone is designed to expedite the development of late successional, multi-story habitat conditions and restore the species composition and structural diversity of the plant communities, needed to achieve ACS and Riparian Reserve objectives (Medford RMP, pp. 22 and 26). Riparian Reserves within the proposed units are currently dominated by Douglas-fir and some hardwoods. Most riparian stands are lacking large wood debris, downed logs, and large tree structure. Thinning in the dense Outer Riparian Zone would reduce competition on the retained trees for light, nutrients, water and growing space, allowing trees to develop larger canopies, display better vigor and put on diameter growth faster than if left untreated.

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

2. Key Watershed: The Pickett West planning area contains Taylor Creek a Tier 1 Key Watershed (RMP, p. 22-23) which provides refugia crucial for maintaining and recovering habitat for at-risk stocks of anadromous salmonids and resident fish species. These refugia include areas of high quality habitat and areas of degraded habitat. Key watersheds overlay other Land Use Allocations and place additional management requirements and/or priorities on these Land Use Allocations.

3. Watershed Analysis: The BLM completed the Cheney Slate Watershed Analysis in 1996, Deer Creek in 1997, Grave Creek in 1999, Rogue-Grants Pass in 1998, Rogue-Recreation Section in 1999, Murphy in 2000, and Sucker Creek in 2007. The proposed activities follow the guidance contained in these Watershed Analyses.

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

The Watershed Analyses discussed restricting road construction or considering alternatives to constructing new roads in sensitive soil areas. Permanent road construction is not proposed under the Pickett West Forest Management project. Sensitive Category 1 soils are protected through site-specific Project Design Features. Many of the roads in the planning area are not public roads and are under reciprocal right-of-way agreements with private landowners because of the checkerboard ownership pattern. The BLM does not have the option to close these roads due to the reciprocal right-of-way agreements.

4. Watershed Restoration: Though the Pickett West Forest Management project is not an aquatic watershed restoration project, it would aid in the improvement of watershed health through the following proposed activities: thinning and activity fuels reduction in the Inner and Outer Riparian Zones.

<u>Analysis of the Pickett West Forest Management project for consistency with the Aquatic Conservation Strategy objectives:</u>

The ACS gives direction to maintain and restore ecosystem health at watershed and landscape scales. For the purposes of this analysis the watershed scale will be discussed in terms of site and project scale and will be at the HUC 12 and 14 watersheds scale. The landscape scale will be at the HUC 10 watershed level.

Appropriate consideration of potential cumulative effects is a critical element in determining a project's consistency with the ACS. The minimal effects at the HUC 14 scale would not reach a magnitude detectable at the HUC 12 or HUC 10 scales. Because there would be no detectable cumulative effects caused by the Action Alternatives, cumulative effects will not be discussed in the individual ACS objectives.

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

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

<u>Riparian Reserves</u>
One key component of watershed and landscape scale features needed for the protection of aquatic systems is Riparian Reserves. Riparian Reserves would be maintained at the site and watershed levels in the short and long-term. Riparian vegetation treatments (thinning) in the Outer Riparian Zone would enhance riparian characteristics. Riparian thinning would result in a reduction in stand densities and would allow for the development of late successional riparian characteristics. One of these characteristics is multi-level canopy cover which helps to maintain cool water temperatures. Late successional characteristics in riparian areas also include downed coarse woody debris and large woody debris (LWD) which increases channel complexity, and diverse species composition which provides a variety of chemical and biological inputs to streams. Riparian thinning would also reduce the spread of disease and the risk of a high intensity or severity fire in Riparian Reserves. Such a fire could result in tree mortality and a reduction in shade, which could negatively affect fish habitat by causing an increase in water temperature, a reduction in future recruitment of LWD, and an increase in soil erosion and sediment entering streams.

<u>Roads</u>
The project would include some temporary route construction and existing temporary route renovation/reconstruction to facilitate thinning operations. These routes would be fully decommissioned after use. This action would not lead to stream sedimentation due to the predominately ridgetop location of these routes which are hydrologically disconnected.

Best Management Practices and Project Design Features are expected to minimize sediment routing to streams through restrictions on ditch blading, use of cross drains, and the use of temporary sediment control measures. A small amount of sediment may enter streams without fish habitat during log haul and existing road maintenance where roads are hydrologically connected. All sediment producing actions would result in negligible sediment inputs which would not be observable or distinguishable from background levels. Sediment would not be expected to enter fish-bearing streams as a result of haul or maintenance of haul roads, with dry condition haul, well-vegetated ditch lines, properly functioning cross drains, and existing filter strips, or sediment barriers installed, where needed, to prevent sediment delivery into fish-bearing streams.

This project would not increase the number of permanent roads within these sub-watersheds, since permanent road building is not part of the proposed project. Road density would not significantly change during the use of temporary routes (See Chapter 3.5 Hydrology).

<u>Peak Flows</u>
The Action Alternatives would not affect the timing, magnitude, duration, and spatial distribution of peak, high, and low flows. See Chapter 3.5 Hydrology, for more information.

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

The spatial and temporal connectivity within and between watersheds would be maintained in the short and long-term at the site and landscape scales. Chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species would be maintained.

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

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

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

Water quality necessary to support healthy riparian, aquatic and wetland ecosystems would be maintained. Water quality would remain within the range that maintains biological, physical, and the chemical integrity of streams (See Chapter 3.5 Hydrology).

Harvesting, yarding, landing construction and rehabilitation, temporary route construction and reconstruction (including route decommissioning), road renovation/improvement, road maintenance hauling, and fuel treatments would have no effect on Southern Oregon Northern California Coast (SONCC) coho salmon (ESA-Threatened), coho critical habitat (CCH), or any other fish habitat. There are fifteen haul road segments where BLM-maintained roads cross over coho bearing streams. Sediment would not be expected to enter CCH or other fish habitat as a result of haul or maintenance of haul roads, with dry condition haul, well-vegetated ditch lines, properly functioning cross drains, and existing filter strips, or sediment barriers installed, where needed, to prevent sediment delivery into fish-bearing streams.

Slight increases in turbidity may occur in the short-term in localized areas as a result of road use activities near streams without fish habitat. Best Management Practices would be implemented to minimize the amount and duration of sediment entering these stream channels. Such increases in turbidity would not measurably alter the biological, physical, or chemical integrity of streams. Aquatic and riparian dependent species' survival, growth, reproduction, and migration would be maintained.

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

The sediment regimes under which aquatic ecosystems evolved would be maintained at the site and landscape scales in the short and long-terms. Some of the proposed activities such as road reconstruction and road maintenance would reduce sediment input in the short and long-term. Streams within the planning area evolved with sediment input. Sediment input can result from natural disturbances such as landslides, slumps, wildfires, bank erosion, and channel scour.

<u>Road Related Activities</u>

Dry condition haul on proposed routes would result in negligible amounts of sediment entering streams without fish habitat because the roads are either bituminous surface treatment or crushed aggregate (rocked) or are hydrologically disconnected.

Dry condition hauling on proposed routes could result in sediment entering stream channels without fish habitat, but because of Project Design Features the amount would be minimal. Sediment would not be expected to enter CCH or fish-bearing streams as a result of haul or maintenance of haul roads, with dry condition haul, well-vegetated ditch lines, properly functioning cross drains, and existing filter strips, or sediment barriers installed, where needed, to prevent sediment delivery into CCH and fish-bearing streams.

Changes in channel embeddedness, interstitial spaces, and pool depth would not be measurable. Road maintenance would result in a minimal amount of sediment reaching stream channels without CCH or other fish habitat. Increased sediment levels from road maintenance would not be detectable above background levels, and sediment input would be undetectable and short-term. Changes in embeddedness, interstitial spaces, and pool depth would not be measurable.

Harvest Activities
All other soil disturbing activities are located outside the Inner Riparian Zone, and would be implemented using Best Management Practices that minimize the quantity and transport of soil erosion. Since the width of the Inner Riparian Zone is designed to filter out sediment produced during upslope activities that are implemented using Best Management Practices and site specific Project Design Features for hydrologically connected units, these activities would not result in any sediment entering streams (See Chapter 3.5 Hydrology).

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

The Pickett West Forest Management project would not affect the timing, magnitude, duration, and spatial distribution of peak, high, and low flows (See Chapter 3.5 Hydrology).

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

The timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands would not be affected by any of the proposed activities. Wetlands are buffered by 25 feet and no vegetation treatment is proposed in these areas.

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

The species composition and structural diversity of plant communities in riparian areas would be maintained at the site and landscape scales in the short and long-term. Vegetation treatments proposed for the Action Alternatives were designed to enhance riparian conditions in the short and long-term. Plant communities in riparian areas would be maintained and enhanced through silvicultural prescriptions and no treatment buffers in order to provide for adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.

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

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

CONCLUSION:

Based on this analysis at both the site and landscape scales of the proposed activities in the Pickett West Forest Management project, it was determined that the actions are consistent with the nine objectives and the four components of the ACS. This determination was based on the small spatial and temporal disturbances associated with the proposed activities, and the implementation of Best Management Practices and Project Design Features.

Appendix D Activities Considered in the Cumulative Effects Analysis

An assessment was performed to determine which projects would be considered in the cumulative effects analysis for the Pickett West project. Each Chapter 3 resource analysis determined if any of the projects below, when considering the effects of Alternatives 1, 2 or 3 would have a cumulative effect. Cumulative effects resulting from the alternatives proposed in this project, if any, are described in the resource sections of Chapter 3.

Project	Location	Acres/Miles/Area	Comments
Past Actions			
Wildfires	Planning Area (PA)	1900-1940 = 22,800 acres 1940-1980 = 2,002 acres 1980-present = 8,918 acres	1900 – Many acres of low intensity fire with minimal fire suppression 1940 – Very few fires due to fire suppression 1980 – Few, high intensity fires due to past fire suppression
Past Harvest	PA	1940-1989 = 43,878 1990-Present = 6,659	1940 – Most timber harvest during this period was characterized as clearcuts, regeneration harvest, and selective cuts 1990 – Less acres of clearcuts, regeneration harvests, and selection cuts. Thinning was the typical treatment during this time period.
Hazardous Fuels /Young Stand Management	PA	15,000	Acres treated within the PA since 1990. General description: Thinning of understory material generally less than 8 DBH. May include lop and scatter, hand pile, hand pile burn, under burning.

Project	Location	Acres/Miles/Area	Comments
Crooks Creek and Limestone Caves Mineral Withdraw	Portions of T37S-R6W-31 T37S-R7W-35and36 T38S-R6W-4,5,6,7,8,9 T39S-R8W-11 T39S-R8W-14	Approximately 3,680	The proposed withdraw of two related non-contiguous parcels from mineral leasing, geothermal leasing, and disposal. This proposal was not signed by the Secretary of the Interior as of February 2017. This proposal expired and the area is again open for leasing and disposal under the Materials Act of 1947. No proposals for extraction have been received.
Brimstone Fire Timber Salvage	T34S-R7W-27	11 acres	The Brimstone Fire Salvage Decision Record authorized post fire salvage on 137 acres of BLM-administered land. 11 acres of fir salvage occurred with the Pickett West planning area. This project adhered to BMPs and PDFs which limited soil compaction and productivity levels to within RMP thresholds, maintained adequate snags and course woody debris. Post-harvest decommissioning was conducted on areas of exposed soil.
Present Actions			
Cheney Slate Timber Sale	T37S-R5W-14 and 23 T37S-R7W-5, 13, and 19	140 acres	All harvest operations on this project are complete and are considered within the baseline of the planning area. There are approximately 2 miles of road maintenance that need to be conducted to close out the timber sale. These activities may include clearing material from ditches and slash disposal.
Section 13 Mining Plan of Operation EA	T37S-R6W-13 Murphy	18 acres of BLM managed lands	Quarry expansion project adjacent to the already operational Copeland Quarry. Proposal includes 7 acres for quarry expansion, 11 acres of buffer. EA comment period 3/21-4/20. Decision likely in summer/fall of 2017.
Stray Dog Mining Plan of Operation	T35S-R8W-03	Approximately 3.4 acres of BLM managed lands	Proposed mining/excavation of 3.4 acres. The EA for this project was released and the comment period is closed. The Decision for this project will not be issued until consultation for fish is completed with the National Marine Fisheries Service.
California Oregon Broadcasting Inc. (COBi) Right-of-Way	T36S-R5W-27 Mt. Baldy	Less than 1 acre	Expansion of existing commination site. Proposal is to install a 120’ communication tower, install a 32x32 concrete pad, relocate propane tank, expand existing equipment building, expand existing fence, and re-run power supply.

Project	Location	Acres/Miles/Area	Comments
Hazardous Fuels /Young Stand Management (YSM)	PA	Williams ~ 300 acres of fuels treatments Cheney ~ 100 acres of fuels treatments ~500 acres/year of YSM	Work expected to occur in 2017 and 2018 only. Estimates for Williams and Cheney Slate under burning activities which may occur within the PA.
Recreational Activities	PA		Dispersed recreation activities: Hunting, hiking, shooting, Special Forest Products collection
Medford District Insect and Disease Mortality Salvage for Safety Categorical Exclusion	PA	Trees along BLM roadsides or adjacent to developed facilities/private property	Hazard tree felling and removal associated with insect and disease mortality. Depending on LUA, trees would either be left on site as down woody material or removed; removed trees would be used for habitat restoration projects such as large woody debris placement in streams, improvement of recreational areas, bridge or trail construction, or sold as firewood or commercial timber.
Medford District Road and Pump Chance Routine Maintenance Categorical Exclusion	PA	Within the right-of-way of 5,000 Medford District Managed road miles.	Routine road maintenance may include: 1) maintenance and improvement of the road surface to minimize off-site sedimentation; 2) repair and maintenance of drainage structures to prevent road damage; and 3) road repair to prevent large-scale road damage from storm events. Routine Pump Chance maintenance may include: 1) sediment deposited in the water impoundments reduces storage capacity; 2) growth of brush impedes access by fire engines, water tenders and helicopter buckets; and 3) growth of trees and brush on water impoundment retaining walls/dikes may cause a breach with resultant loss of waterholding capacity.
Foreseeable Actions			
Applegate Ridge Trail System	PA	Approximately 21 miles	Proposed trail system that would connect Jacksonville Forest Park Trails with Grants Pass Cathedral Hills Trail Systems. The Pickett West analysis considered the 21 miles contained within the PA.

Project	Location	Acres/Miles/Area	Comments
Private Industrial Forest Lands	PA	4,002 acres total	There are approximately 10 private industrial land owners (including Josephine County and the State of Oregon) within the PA who collectively manage approximately 32,276 acres. Within 2 years it is anticipated that approximately 4,000 acres will be harvested under Oregon Forest Practices Act requirements.
Waters Creek In-stream restoration project	T37S-R7W-08 Tax lot 100	¼ mile	Placement of large log structures within Waters Creek to improve in-stream habitat for aquatic species.
East West Junction Timber Sale	T39S-R7W-08, 20, and 21 T39S-R8W-34 T40S-R8W-03, 05, and 09	106 acres	86 acres of Variable Density thinning units retaining 40-60 percent canopy cover. 20 acres of Variable Retention Harvest retaining 25-30 percent canopy cover.
Reciprocal Right-of-Way (RROW) Permits	PA		Allows RROW holders to use, maintain, and construct roads, landings, yarding wedges, and secure tail holds for the purpose of forest management on lands managed by the Medford District BLM. These types of requests are common throughout the PA but the exact locations of the activities are unknown until a request is received.

Appendix E Special Status Species

Table Headings and Letter Code Definitions

Species: Grouped alphabetically by taxon.

Status: lists the Oregon BLM Program codes as follows:

Oregon BLM Codes:
FT - USFW Threatened - likely to become endangered species within the foreseeable future
FC - USFW Candidate - proposed and being reviewed for listing as threatened or endangered

BSEN - Bureau Sensitive (BLM) - eligible for addition to Federal Notice of Review, and known in advance of official publication. Generally these species are restricted in range and have natural or human caused threats to their survival.
BSTR - Bureau Strategic Species (BLM) - not presently eligible for official federal or state status, but of concern which may at a minimum need protection or mitigation in BLM activities.

Range: indicates yes or no, if the breeding range overlaps with the Grants Pass Resource Area. If not within the range, both presence and basic conclusion are not applicable (N/A). For invertebrates in which there is inadequate data to determine ranges, 'U' is used for unknown.

Presence: indicates 'P' if a species is known to occur in the project area, 'S' suspected to occur based on known sites adjacent to the project area, or suitable breeding habitat exists, 'U' uncertain that the species occurs within the project area based on insufficient data, 'A' absent from the project area based on no known sites and/or no suitable breeding habitat within the project area, and 'T' possibly transitory species utilizing habitats within the project area during migration.

Basic Conclusion: describes the facts, context and intensity to provide the rationale for the conclusion of the Action Alternatives on the species and its habitat.

Table E-1 Special Status Species in the Grants Pass Field Office Management Area

SPECIAL STATUS SPECIES IN THE GRANTS FIELD OFFICE MANAGEMENT AREA				
SPECIES	**STATUS**	**RANGE (Y/N)**	**PRESENCE**	**PROJECT SPECIFIC COMMENTS/ BASIC CONCLUSIONS**
Birds: Bureau Sensitive & Bureau Strategic				
American peregrine falcon	BSEN	Y	P	Proposed activities impacts have been addressed in detail in the Chapter 3.3.
Bald eagle	BSEN	Y	P	Proposed activities impacts have been addressed in detail in the Chapter 3.3.
Lewis' woodpecker	BSEN	Y	S	Potential habitat exists within and adjacent to the PA. Project activities would not adversely affect this species at the landscape scale as adequate levels of snags would be retained (Chapter 2.4) post treatment.
Marbled Murrelet	FT	Y	A	This species does not occur in the Project Area.
Northern spotted owl	FT	Y	P	Proposed activities impacts have been addressed in detail in the Chapter 3.3.
Purple martin	BSEN	Y	A	No habitat within the PA.
Streaked Horned Lark	FT	Y	A	No habitat within the PA.
Tri-colored Blackbird	BSEN	Y	A	No habitat within the PA.
White-headed	BSEN	Y	U	Potential habitat exists within and adjacent to

SPECIAL STATUS SPECIES IN THE GRANTS FIELD OFFICE MANAGEMENT AREA				
SPECIES	**STATUS**	**RANGE (Y/N)**	**PRESENCE**	**PROJECT SPECIFIC COMMENTS/ BASIC CONCLUSIONS**
woodpecker				the project area. Project activities would not adversely affect this species at the landscape scale as adequate levels of snags would be retained (Chapter 2.4) post treatment.
White-tailed kite	BSEN	Y	A	No habitat within the PA.
Amphibians: Bureau Sensitive & Bureau Strategic				
Black salamander	BSEN	N	N/A	Project is outside of range. No known sites.
Foothill yellow-legged Frog	BSEN	Y	P	Project activities would not affect this species if present in the project area. No actions in primary habitat (Chapter 2.4).
Oregon Spotted frog	BSEN	N	N/A	Project is outside of range. No known sites.
Siskiyou Mt. salamander	BSEN	N	A	Project is outside of range. No known sites.
Reptiles: Bureau Sensitive & Bureau Strategic				
Northwestern pond turtle	BSEN	Y	S	Suspected within the watershed at large water sources (Applegate and Rogue Rivers, Lake Selmac and other water bodies across PA), but not expected to occur in any areas proposed for treatment.
Mammals: Bureau Sensitive & Bureau Strategic; Federal Candidate				
Fisher	FC	Y	P	Proposed activities impacts have been addressed in detail in the Chapter 3.3.
Fringed myotis	BSEN	Y	S	Potential habitat exists within and adjacent to the project area. Project activities would not adversely affect this species at the landscape scale as adequate levels of snags would be retained (Chapter 2.4) post treatment.
Pacific pallid bat	BSEN	Y	U	Adequate potential habitat exists within and adjacent to the project area. Project activities would not adversely affect this species at the landscape scale as adequate levels of snags would be retained (Chapter 2.4) post treatment.
Townsend's big-eared bat	BSEN	Y	S	Project activities should not affect maternity or hibernacula areas.

SPECIAL STATUS SPECIES IN THE GRANTS FIELD OFFICE MANAGEMENT AREA				
SPECIES	**STATUS**	**RANGE (Y/N)**	**PRESENCE**	**PROJECT SPECIFIC COMMENTS/ BASIC CONCLUSIONS**
Invertebrates: Bureau Sensitive & Bureau Strategic				
Chase sideband snail	BSEN	N	A	No known sites in PA.
Coronis Fritillary	BSEN	Y	S	No known sites in project area. Habitat is limited in PA. Project activities would not affect this species if present in the project area. No actions in primary habitat.
Evening fieldslug	BSEN	N	A	No known sites in PA.
Franklin's Bumblebee	BSEN	Y	A	No known sites in project area. Project activities would not affect this species habitat.
Johnson's Hairstreak	BSEN	Y	U	No known sites in project area. Project activities would not adversely affect this species at the landscape scale
Mardon skipper butterfly	FC	N	N/A	Project is outside of range. No known sites in PA.
Oregon shoulderband snail	BSEN	Y	A	No known sites in PA. Project activities would not affect this species if present in the project area. No actions in primary habitat.
Scale lanx snail	BSEN	N	N/A	Project is outside of range. No known sites in PA.
Siskiyou hesperian snail	BSEN	N	N/A	Project is outside of range. No known sites in PA.
Siskiyou short-horned grasshopper	BSEN	N	N/A	Project is outside of range. No known sites in PA.
Travelling sideband snail	BSEN	N	N/A	Project is outside of range. No known sites in PA.
Vernal pool fairy shrimp	FT	N	N/A	Project is outside of range. No known sites in PA.

MIGRATORY BIRDS

Land Birds (Neotropical Migrants and Year-Round residents)

Land birds use a wide variety of habitats, including late-successional forests, riparian areas, brush in recovering clear-cuts, and small trees in developing stands. Some birds, such as the olive-sided Flycatcher, use residual canopy trees for perching and forage over adjacent clear-cuts. Many land birds are associated with deciduous shrubs and trees in early-successional habitats (e.g., Rufous hummingbirds). All neotropical migrants go to Central or South America each year. They are addressed here due to widespread concern regarding downward population trends and habitat declines. Neotropical birds, as a group, are not on BLM's list of special status species.

BLM has issued interim guidance for meeting BLM's responsibilities under the Migratory Bird Treaty Act and Executive Order (EO) 13186. Both the Act and the EO promote the conservation of migratory bird populations. The interim guidance was transmitted through BLM Instruction Memorandum (IM) No. 2008-050. The IM relies on two lists prepared by the USFWS in determining which species are to receive special attention in land management activities; the lists are *Bird Species of Conservation Concern* (BCC) found in various Bird Conservation Regions and *Game Birds Below Desired Condition* (GBBDC). In December, 2008, the USFWS Service released The Birds of Conservation Concern 2008. This publication identifies species, subspecies, and populations of migratory and non-migratory birds in need of additional conservation actions, updating the April 2008 Birds of Conservation Concern List. Medford District BLM biologists conferred with local bird groups and knowledgeable individuals to identify which birds on the list in our region (Bird Conservation Region 5, USFWS Region 1) are present within Medford District BLM lands. Table F-2 below displays a list of the Migratory Birds of Conservation Concern (BOCC) and Game Birds below Desired Condition (GBBDC) in the Grants Pass Field Office Management Area that are known or likely to be present in the Pickett West Project PA and could be affected by the Action Alternatives.

Land Birds Effects from Vegetation Management

Due to the variety of land-bird habitat requirements, any action that changes or removes vegetation used by one species may benefit another. Species requiring dense cover and forage that have benefited from lack of fire and dense understories could be adversely affected by thinning treatments designed to reduce vegetation density. Due to habitat removal, songbird composition and abundance in treated stands could be reduced for approximately 25 to 40 years (Janes 2003; Hagar et al., 2001; Siegel et al., 2003).

Untreated late-successional forest habitat would continue to provide adequate hiding cover, foraging, and nesting habitat within the PA for birds that use older forests. Habitat for birds that use early seral habitat would increase as a result of the small gap openings in thinning treatments. Species, such as the Rufous Hummingbird, which use nectar producing plants would benefit from the increase in forbs and flowering shrubs that would occur post treatment. This increase would continue until the tree canopy recovers and shades out these plants, which would occur in approximately 25 to 40 years.

There would be no complete removal of any type of potential bird habitat under Action Alternatives. Treatments would maintain key habitat features, which would minimize impacts within the Planning Area. Some individual birds may be displaced during project activities. However, untreated areas adjacent to the treatment areas would provide refuge and nesting habitat, minimizing short-term loss of habitat. In treated stands, riparian areas not receiving treatment would also serve as refugia in proposed harvest units. Activities occurring during active nesting periods could cause some nests to fail. However, seasonal restrictions in place to protect other species (NSO, Bald Eagle, and Peregrine Falcon) would provide additional protection from disturbance during project activities near these sites.

Treatments occurring during the critical nesting periods for most species may cause some nests to fail. However, the failure of a nest during one nesting season would not be expected to reduce the persistence of any bird species in the watershed because sufficient habitat of all types would be retained throughout the Planning Area to support the wide diversity of bird species in the area. Additionally, a Memorandum of Understanding (MOU) was signed between the USFWS and the BLM in April, 2010, which identified strategies to avoid or minimize adverse impacts on migratory birds. The Pickett West Project would follow these guidelines where feasible to reduce the impacts to migratory birds. For example, many of the PDFs listed to mitigate effects to some species, such as seasonal restrictions, would also benefit migratory birds.

Summary and Conclusions

Partners in Flight support the eco-regional scale, as appropriate, for analyzing bird populations (http://www.partnersinflight.org/description.cfm). The potential failure or loss of some nests would not be measurable at the regional scale because of the small scope of the project in relationship to the regional scale. Therefore, under the Proposed Action, populations in the region would be unaffected**.** Breeding bird surveys in the Southern Pacific Rainforest Physiographic Region (which includes western Oregon) indicate that songbirds are declining. The exact cause of these declines is still unclear, but issues associated with their winter grounds (Central and South America) are suspected to be an important factor (Sauer et al. 2004; Alexander 2005).

Table F-2 Birds of Conservation Concern and Game Birds Below Desired Condition

SPECIES	STATUS	Project within RANGE (Y/N)	Project Status 1/ Not Present 2/ Not Affected 3/ Affected	Comments Regarding Status
American peregrine falcon	BOCC	Y	Not Affected	Proposed activities impacts have been addressed in detail in the Chapter 3.3.
Bald eagle	BOCC	Y	Not Affected	Proposed activities impacts have been addressed in detail in the Chapter 3.3.
Band tailed pigeon	GBBDC	Y	Not Affected	Adequate potential habitat exists within and adjacent to the Project Area. Beneficial effects from the creation of

Table F-2 Birds of Conservation Concern and Game Birds Below Desired Condition				
SPECIES	**STATUS**	**Project within RANGE (Y/N)**	**Project Status 1/ Not Present 2/ Not Affected 3/ Affected**	**Comments Regarding Status**
				additional openings through Restoration Thinning and small gap openings in Density Management units. Proposed activities impacts are inconsequential to individuals and/or habitat at the Planning Area scale.
Mourning dove	GBBDC	Y	Not Affected	Adequate potential habitat exists within and adjacent to the Project Area. Ground disturbance from treatment activities and prescribed fire would stimulate growth of shrubs and herbaceous plants. Proposed activities impacts are inconsequential to individuals and/or habitat at the Planning Area scale.
Olive sided flycatcher	BOCC	Y	Not Affected	Adequate levels of snags would be retained. Adequate potential habitat exists within and adjacent to the Project Area. Beneficial effects from the creation of additional openings through Restoration Thinning and small gap openings in Density Management treatments because they forage in open areas. Proposed activities impacts are inconsequential to individuals and/or habitat at the Planning Area scale.
Purple finch	BOCC	Y	Not Affected	Adequate potential habitat exists within and adjacent to the Project Area. Proposed activities impacts are inconsequential to individuals and/or habitat at the Planning Area scale.
Rufous Hummingbird	BOCC	Y	Not Affected	Ground disturbance from treatment activities and prescribed fire would stimulate growth of shrubs and herbaceous plants. Adequate potential habitat exists within and adjacent to the Project Area. Proposed activities impacts

Table F-2 Birds of Conservation Concern and Game Birds Below Desired Condition				
SPECIES	**STATUS**	**Project within RANGE (Y/N)**	**Project Status 1/ Not Present 2/ Not Affected 3/ Affected**	**Comments Regarding Status**
				are inconsequential to individuals and/or habitat at the Planning Area scale.

BOCC – Birds of Conservation Concern *GBBDC – Game Birds Below Desired Condition*

Appendix F Silvicultural Prescription

<u>MARKING GUIDELINES: UNIT SPECIIFIC MODIFICATIONS MAY OCCUR</u>

- General Objectives
  - Enhance residual tree vigor and promote stand resiliency
  - Develop within stand species diversity and structural complexity.
  - Protect large old growth trees with complex forms that are important for wildlife
  - Reduce fuel loadings that exacerbate high severity fire risk
- Use leave-tree marking color <u>Orange</u>, references to "leave" require leave tree marking. The leave-tree paint shall be clearly visible from all sides of the tree.
- All leave trees are to be tallied in four inch diameter classes.
- Only conifers that meet minimum merchantability specifications, oaks over 10 inches DBH as well as other hardwoods over 20 inches DBH will be counted towards basal area targets.
- A 20 Basal Area Factor (BAF) is recommended when marking and for self-inspections. Basal area ranges are provided on the following page for individual units. When the leave trees are pines or oaks, the lower end of the scale is to be used, when the leave trees are Douglas fir, the higher end of the scale is to be used. Stocking targets are unit level averages; high levels of variability are desired so the Basal area should vary throughout the unit.
- Leave Tree Criteria:
  - Avoid evenly spacing trees when marking; cluster trees (not skips and gaps) wherever possible while following the criteria below.
  - Leave all Black and White Oak species over 10 inches DBH and all Hardwoods over 20 inches DBH; these hardwoods <u>do</u> count towards residual basal area targets.
  - Leave all large conifers exhibiting an "Old Growth" form.
  - Leave all snags over 20 inches DBH. These may be removed during operations if necessary for safety purposes.
  - Tree culturing: For all healthy Pine species greater than 16 inches DBH and Oak species greater than 16 inches DBH, remove all Douglas fir less than 30" DBH within twice the dripline (approximately 25-50 feet) of the pine or oak tree being cultured.

  - Overall health, size and vigor are as important as species preference. For example a healthy Douglas fir with a live crown ratio over 50 percent should be retained over a comparable sized, unhealthy pine tree with less than 20 percent live crown ratio. In general, conifer species retention preference is as follows:
    1. Ponderosa Pine (PP)
    2. Incense Cedar (IC)
    3. Sugar Pine (SP)
    4. Douglas Fir (DF)
  - A thin from below approach is to be applied when meeting the basal area requirements, however some larger Douglas fir may be removed if they show poor live crown ratios (less than 30 percent) and lack "Old Growth" characteristics as long as the nearby trees have live crown ratios greater are in a relatively healthier condition.
  - Avoid leaving conifers with height to diameter ratios greater than 80:1 (example: a 12 inch DBH Douglas fir greater than 80 feet in height) unless needed for residual stocking.
  - Avoid leaving individual conifers with one-sided crowns, cut or leave all trees with intermingled crowns in order to meet the desired stocking targets.

<u>Restoration Thinning</u>

- General Objectives: Reduce stand density and fuel loadings, increase vigor, and reduce insect and disease mortality similar to levels found in stands that have an intact fire regime in place. The desired condition is an open growing, structurally diverse stand with reduced fuel loadings.
- <u>Basal Area should range from 70-140 ft2/ac across the unit</u>
  - Stocking should be at the lower end of the range when removing Douglas fir from around Pine and oak species and higher where clusters of healthy Douglas fir are retained.
  - Openings of up to 2.5 acres may be created (not to exceed 30 percent of the unit total) to allow for pine and oak regeneration. Individual old growth Douglas fir, pines and oaks should be retained in openings and the above basal area targets still apply at scale of the unit.

<u>Density Management- Northern Spotted Owl Dispersal Enhancement</u>

- General Objectives: NSO dispersal habitat maintenance is the short term and habitat improvement is the longer term objective by improving individual tree vigor, overall stand health and developing complex structures including standing and down dead wood while maintaining species diversity. Canopy cover must be maintained at an average across the unit greater than 40 percent.
- <u>Basal Area may range from 100-140 ft2/ac across the unit</u>
  - Stocking should be at the lower end of the range in areas where leave trees are under 20 inches DBH, or have large, fully formed crowns (approximately 50 percent live crown ratio and greater) and at the higher end of the range where leave trees are 20 inches or greater, or the crowns are sparse and poorly formed (approximately 30 percent or less).

- Openings <1 acre may be created to stimulate the understory. Individual old growth Douglas fir, pines and oaks should be retained in openings; basal area targets still apply.

Density Management- Northern Spotted Owl Nesting, Roosting-Foraging Enhancement

- General Objectives: NSO nesting, roosting and foraging habitat maintenance is the short term and habitat improvement is the longer term objective by improving individual tree vigor, overall stand health and developing complex structures including standing and down dead wood while maintaining species diversity. Canopy cover must be maintained at an average across the unit of greater than 60 percent.
- Basal Area may range from 150-240 ft2/ac across the unit
  - Stocking should be at the lower end of the range in areas where leave trees are under 20 inches DBH, or have large, fully formed crowns (approximately 50 percent live crown ratio and greater) and at the higher end of the range where leave trees are 20 inches or greater, or the crowns are sparse and poorly formed (approximately 30 percent or less).
  - Openings <1 acre may be created to stimulate the understory. Individual old growth Douglas fir, pines and oaks should be retained in openings; basal area targets still apply.

Table F-1 Stand attributes of proposed units in the Pickett West planning area.

Unit	Acres	Basal Area ft^2/ac[19] *(Standard Deviation)*	Canopy Cover [20] (Percent)	Lorey's Stand Height[21] (Feet)	Quadratic Mean Diameter [22] (Inches)	Trees per Acre (TPA)[23]	Approximate SDI[24]
13-4	47	188 *(66)*	89	90	15	146	289
13-3	49	185 *(45)*	92	89	15	158	297
15-1	11	177 *(44)*	92	93	15	143	289
7-3	101	218 *(62)*	96	102	16	149	328
17-1	41	249 *(45)*	98	107	17	160	362
20-4	85	187 *(72)*	87	91	16	152	308
10-2	4	108 *(48)*	72	64	13	123	180
14-2	42	180 *(64)*	93	93	16	139	283
9-5	60	210 *(82)*	93	102	17	135	307
9-4	16	223 *(42)*	94	104	17	169	377
35-3	35	144 *(49)*	84	75	14	144	234
35-4	16	148 *(54)*	83	78	14	135	232

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[19] Rogue Valley lidar derived basal area (sqft/ac) for all live hardwood and softwood trees over 6.5" dbh. Mapped at 75' raster resolution. Developed from 2012 Oregon Lidar Consortium data for the Rogue Valley area. 238 ground plots used to develop the regression: LBA_hs_6in = (1.9594 + 0.02497 * Elevmean + 0.01794 * PC_all_1st) ^3 + 8.72 where: Elevmean = mean height above ground of all lidar returns above 1 m. PC_all_1st = (# of all returns above 2 m) / (Total # of 1st returns).

[20] Rogue Valley lidar percent overstory cover computed using 1st returns only. Overstory threshold height was 2 m above ground. PC_1st = (# of 1st returns above 2 m) / (Total # of 1st returns)Mapped at 75' raster resolution. Developed from 2012 Oregon Lidar Consortium data for the Rogue Valley area. Computed with USDA Forest Service FUSION software V3.01: McGaughey, R.J. (2010). FUSION/LDV: Software for LIDAR Data Analysis and Visualization. United States Department of Agriculture, Forest Service, Pacific Northwest Research Station. 154p. (http://forsys.cfr.washington.edu/fusion/fusionlatest.html, accessed April 2015).

[21] Rogue Valley lidar derived Lorey's total tree height (feet) for all live hardwood and softwood trees over 6.5" dbh. Mapped at 75' raster resolution. Developed from 2012 Oregon Lidar Consortium data for the Rogue Valley area. 238 ground plots used to develop regression:LLOR_hs_6in = 12.44 + 0.9234 * ElevP80where: Elevmean = mean height above ground of all lidar returns above 1 m. Elevstdv = standard deviation of height above ground of all lidar returns above 1 m. Elev80 = 80th percentile height above ground of all lidar returns above 1 m.

[22] Rogue Valley lidar derived quadratic mean DBH (inches) for all live hardwood and softwood trees over 6.5" dbh. Mapped at 75' raster resolution. Developed from 2012 Oregon Lidar Consortium data for the Rogue Valley area. 238 ground plots used to develop regression: LQMD_hs_6in = exp (2.057 + 0.01191 * ElevP80 - 0.00004947 * ElevP80 * PC_1st) * 1.0262where: Elev80 = 80th percentile height above ground of all lidar returns above 1 m. PC_1st = (# of 1st returns above 2 m) / (Total # of 1st returns).

[23] Rogue Valley Lidar derived tree density (tpa) for all live hardwood and softwood trees over 6.5" dbh. Mapped at 75' raster resolution. Developed from 2012 Oregon Lidar Consortium data for the Rogue Valley area. 238 ground plots used to develop regression:LDEN_hs_6in = (1.3692 - 0.01924 * Elevmean + 0.03623 * PC_1st + 3.6888 * CRR)^3 + 6.11where: Elevmean = mean height above ground of all lidar returns above 1 m. PC_1st = (# of 1st returns above 2 m) / (Total # of 1st returns). CRR=(Elevmean - Elevmin) / (Elevmax – Elevmin)

[24] SDI values were developed using Reineke's equation, [$SDI= TPA (D_q/10)^{1.605}$] where TPA is the number of trees per acre, and D_q is quadratic mean diameter in inches. The source was the above listed Rogue Valley Lidar. Based on comparisons of Lidar to Stand Exam Data, all Lidar derived SDIs are underestimated because trees under 6.5" DBH are not accounted for in the Rogue Valley Lidar products.

Unit	Acres	Basal Area ft²/ac[19] *(Standard Deviation)*	Canopy Cover [20] (Percent)	Lorey's Stand Height[21] (Feet)	Quadratic Mean Diameter [22] (Inches)	Trees per Acre (TPA)[23]	Approximate SDI[24]
15-3	137	178 *(51)*	88	89	15	152	295
27-4	9	191 *(52)*	83	105	18	126	315
5-4	15	204 *(47)*	92	97	16	152	319
3-11	23	233 *(88)*	91	111	18	136	359
31-11	25	191 *(55)*	95	88	15	160	296
23-1	36	181 *(48)*	92	89	15	148	284
10-1	40	164 *(43)*	89	84	14	158	285
3-5	285	205 *(48)*	92	97	16	145	305
27-5	5	138 *(86)*	77	72	14	118	194
22-1	8	97 *(41)*	69	65	13	104	160
22-3	25	156 *(39)*	87	83	14	149	267
11-5	31	201 *(57)*	88	107	18	124	313
27-3	18	149 *(41)*	82	86	15	132	259
22-2	20	156 *(59)*	82	87	15	126	249
3-3	4	225 *(62)*	89	116	19	117	326
3-4	19	143 *(36)*	85	77	14	140	236
26-7	95	133 *(56)*	80	73	13	131	211
15-11	93	143 *(69)*	83	73	13	143	230
27-6	7	249 *(100)*	85	116	19	119	335
27-7	29	194 *(57)*	94	90	15	158	299
27-8	4	182 *(55)*	94	84	14	152	269
11-6	15	210 *(62)*	85	105	17	144	347
30-3	39	184 *(51)*	93	83	14	161	284
9-2	75	225 *(46)*	91	110	18	134	338
31-4	18	169 *(75)*	84	87	15	134	258
30-1	80	191 *(77)*	89	96	16	133	290
3-2	19	184 *(29)*	95	87	14	172	310
31-5	31	163 *(47)*	93	89	15	136	263
30-2	26	156 *(50)*	86	85	15	140	259
31-3	28	169 *(44)*	78	102	18	106	272
31-2	17	205 *(54)*	81	114	19	109	313
31-1	41	208 *(54)*	89	105	17	132	314
23-6	267	189 *(61)*	92	86	15	162	298
3-9	15	213 *(105)*	82	113	19	108	308
9-3	43	179 *(50)*	84	94	16	135	285
5-1	50	155 *(55)*	75	94	17	109	253
5-3	7	226 *(65)*	84	122	21	98	315

Unit	Acres	Basal Area ft²/ac[19] *(Standard Deviation)*	Canopy Cover [20] (Percent)	Lorey's Stand Height[21] (Feet)	Quadratic Mean Diameter [22] (Inches)	Trees per Acre (TPA)[23]	Approximate SDI[24]
22-4	79	242 *(59)*	95	107	17	149	354
17-2	65	206 *(59)*	93	98	16	148	315
7-5	36	256 *(68)*	96	115	18	141	366
15-6	6	228 *(38)*	87	113	19	140	378
15-5	6	174 *(44)*	85	89	15	151	297
15-7	13	170 *(32)*	84	93	16	140	292
23-7	55	125 *(48)*	82	67	13	140	209
33-8	85	192 *(55)*	93	92	15	153	302
21-4	43	207 *(73)*	91	105	17	128	307
13-1	48	200 *(49)*	96	94	15	155	304
3-7	11	159 *(42)*	89	79	14	150	253
11-1	92	246 *(75)*	93	113	18	144	369
11-7	34	142 *(41)*	92	68	13	178	259
27-13	3	306 *(68)*	97	125	19	147	426
26-4	7	210 *(23)*	99	93	15	190	358
26-3	7	275 *(59)*	97	117	18	156	406
27-14	9	235 *(49)*	96	105	17	162	366
4-1	45	219 *(69)*	93	105	17	136	321
21-8	24	213 *(58)*	93	103	17	144	324
27-12	15	281 *(59)*	96	119	19	144	386
21-12	28	198 *(71)*	91	95	16	145	302
11-3	36	303 *(75)*	93	138	22	128	450
22-5	12	273 *(88)*	94	134	21	118	400
23-5	9	234 *(64)*	94	109	17	140	340
1-1	42	137 *(48)*	77	81	15	118	218
27-1	55	172 *(60)*	85	92	16	131	273
7-1	80	203 *(56)*	93	97	16	149	313
14-5	24	121 *(35)*	79	71	13	141	226
21-13	25	162 *(39)*	92	75	13	177	278
18-2	7	94 *(41)*	60	70	14	86	149
13-8	470	162 *(62)*	84	85	15	137	259
19-1	25	206 *(48)*	95	96	16	150	308
33-1	25	190 *(70)*	88	103	17	127	306
31-7	46	200 *(54)*	92	99	16	138	299
31-6	18	136 *(53)*	80	80	14	117	211
35-9	59	210 *(52)*	96	93	15	162	312
35-11	51	231 *(94)*	92	109	18	131	335

Unit	Acres	Basal Area ft²/ac[19] *(Standard Deviation)*	Canopy Cover [20] (Percent)	Lorey's Stand Height[21] (Feet)	Quadratic Mean Diameter [22] (Inches)	Trees per Acre (TPA)[23]	Approximate SDI[24]
27-2	9	149 *(42)*	85	88	15	128	257
21-7	16	154 *(35)*	92	74	13	178	282
31-9	23	164 *(53)*	86	95	16	120	261
20-1	29	236 *(41)*	97	103	16	169	370
35-10	46	209 *(71)*	95	94	15	151	304
21-3	13	185 *(51)*	89	93	16	140	285
31-8	5	192 *(63)*	91	107	18	124	309
20-2	113	219 *(70)*	91	105	17	140	331
18-1	153	136 *(64)*	78	79	15	117	217
13-9	83	116 *(43)*	80	63	12	147	208
13-7	6	122 *(53)*	79	68	13	122	187
7-2	87	273 *(71)*	96	118	18	146	391
17-5	50	187 *(94)*	78	96	17	116	267
11-9	19	166 *(55)*	89	82	14	153	265
13-2	35	217 *(47)*	96	97	16	166	340
21-5	13	219 *(66)*	92	108	18	130	319
29-5	118	157 *(58)*	84	85	15	127	239
23-9	15	161 *(50)*	90	80	14	149	257
29-2	19	153 *(37)*	82	85	15	136	262
29-3	5	288 *(58)*	93	129	20	131	407
3-1	12	178 *(41)*	91	94	16	140	286
26-2	14	342 *(84)*	94	140	22	124	448
26-1	5	297 *(88)*	92	123	20	131	384
21-6	61	170 *(40)*	96	75	13	176	273
20-5	24	176 *(79)*	86	87	15	140	275
21-9	3	341 *(80)*	94	143	22	126	463
21-1	7	189 *(44)*	93	92	15	151	296
29-1	50	215 *(63)*	92	100	16	154	338
21-2	3	192 *(49)*	76	112	19	102	296
32-1	10	145 *(68)*	77	79	14	116	204
3-10	22	216 *(99)*	82	121	21	98	321
5-2	14	196 *(67)*	82	105	18	117	299
9-1	71	276 *(79)*	91	125	20	129	400
28-6	20	122 *(40)*	80	69	13	135	207
28-5	31	141 *(54)*	82	77	14	132	226
28-1	15	163 *(42)*	88	87	15	131	252
28-3	24	161 *(62)*	82	83	15	134	243

Unit	Acres	Basal Area ft²/ac[19] *(Standard Deviation)*	Canopy Cover [20] (Percent)	Lorey's Stand Height[21] (Feet)	Quadratic Mean Diameter [22] (Inches)	Trees per Acre (TPA)[23]	Approximate SDI[24]
28-4	15	179 *(60)*	83	93	16	122	258
29-4	70	190 *(59)*	91	92	15	148	291
33-2	121	171 *(52)*	81	96	17	119	272
33-3	27	193 *(54)*	91	98	16	135	291
23-8	9	136 *(26)*	91	68	13	169	246
15-4	91	194 *(41)*	96	88	15	173	314
33-5	85	191 *(54)*	91	94	16	143	292
33-7	7	206 *(48)*	94	97	16	151	311
34-3	22	150 *(49)*	91	75	13	149	239
34-2	19	147 *(37)*	93	73	13	172	261
3-8	3	224 *(59)*	96	100	16	142	301
3-6	54	225 *(81)*	89	106	17	129	316
23-3	40	134 *(52)*	76	83	15	107	208
23-4	76	148 *(60)*	81	80	14	132	236
14-1	9	210 *(62)*	95	96	16	148	306
21-10	18	266 *(90)*	93	120	19	136	381
21-11	25	226 *(68)*	94	102	17	149	332
33-6	5	187 *(59)*	94	87	15	144	262
33-4	2	246 *(55)*	93	111	18	132	330
27-9	104	193 *(55)*	93	89	15	156	295
35-2	9	186 *(42)*	94	86	14	174	311
35-1	14	196 *(50)*	92	93	15	154	310
23-2	14	211 *(62)*	97	101	16	147	323
28-2	19	131 *(47)*	79	75	14	121	205

Appendix G Port-Orford Cedar Risk Key

Port Orford Cedar Risk Key Analysis for the Pickett West Project - Grants Pass RA
(Risk Key is from Alternative 2 of the FSEIS for Management of Port Orford Cedar in Southwest Oregon 1/2004)

4/30/17
chart 1 of 13

	QUESTION	FUELS UNIT and ASSOCIATED ROADS																			
		ROUND BULL 17-1	STRINGER 11-1	MCMULLIN 5-1B	ANDERSON WEST 23-4	NORTH MURPHY 15B	PICKETT SNAKE FRT-22-2A	ROUND BULL 3B	PICKETT SNAKE FRT-15-5B	BLUE DRAPER 31-2	MAPLE SYRUP 31.006	BARE NELSON 3-7	ROUND PRAIRIE 4.002	GALICE COMPLEX 4	MAPLE SYRUP FMZ29	ROUND BULL 35-1B	MAPLE SYRUP 29-30	MAPLE SYRUP 29.007A	PICKETT SNAKE 30	STEWART ROAD 5	NORTH MURPHY 17-18 FMZ
1a.	Are there uninfected POC within, near[1], or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1b.	Are there uninfected POC within, near[1], or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurable contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1c.	Is the activity area within an uninfested 7th field watershed[2] as defined in Alternative 6	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
		If the answer to all three questions, 1a, 1b, and 1c, is no, then risk is low and no POC management practices would be required.																			
	If the answer to any of the three questions is yes, continue.																				
2.	Will the proposed project introduce appreciable additional risk[3] of infection to these uninfected POC?	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	If yes, apply management practices from the list below [within FSEIS] to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfected POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through practicable and cost-effective treatments or design changes, the project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.	n/a	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*

1 - In questions 1a and 1b, "near" generally means within 25 to 50 feet downslope or 25 feet upslope from management activity areas, access roads, or haul routes; farther for drainage features; 100 to 200 feet in streams.

2 - Uninfested 7th field watersheds are listed on Table A12-2 [*of FSEIS*] as those with at least 100 acres of POC stands, are at least 50% federal ownership, and are free of PL except within the lowermost 2 acres of the drainage.

3 - Appreciable additional risk does not mean "any risk." It means that a reasonable person would recognize risk, additional to existing uncontrollable risk, to believe mitigation is warranted and would make a cost-effective or important difference (see Risk Key Definitions and Examples for further discussion.)

Port Orford Cedar Risk Key Analysis for the Pickett West Project - Grants Pass RA

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

	QUESTION	FUELS UNIT and ASSOCIATED ROADS																			
		SCOTTISH VERBAS 31-2B	ROUND BULL 21.123A	MCMULLIN 29-5	BARE NELSON 4-6	JILLANA 5	ANDERSON WEST 25-3	COPPER DRIVE 1	NORTH MURPHY 15A	PICKETT SNAKE FRT 29-9	ROUND BULL 3-2	ANDERSON WEST 25-1	RICH AND ROCKY 34-14	RICH AND ROCKY 34-1A	RICH AND ROCKY 27-18	MIDWAY 1	MCMULLIN 29-4B	PICKETT AGAIN fir Lim	STRINGER 3-1	NORTH MURPHY 21A	STRATTON HOG 11-4B
1a.	Are there uninfected POC within, near[1], or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1b.	Are there uninfected POC within, near[1], or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurable contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1c.	Is the activity area within an uninfested 7[th] field watershed[2] as defined in Alternative 6	no	no	no	no	no	no	no	no	no	no	no	yes*	yes*	yes*	no	no	no	no	no	no
		If the answer to all three questions, 1a, 1b, and 1c, is no, then risk is low and no POC management practices would be required.																			
	If the answer to any of the three questions is yes, continue.																				
2.	Will the proposed project introduce appreciable additional risk[3] of infection to these uninfected POC?	---	---	---	---	---	---	---	---	---	---	---	no	no	no	---	---	---	---	---	---
	If yes, apply management practices from the list below [within FSEIS] to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfected POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through practicable and cost-effective treatments or design changes, the project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	*project scheduling*	*project scheduling*	*project scheduling*	n/a	n/a	n/a	n/a	n/a	n/a

1 - In questions 1a and 1b, "near" generally means within 25 to 50 feet downslope or 25 feet upslope from management activity areas, access roads, or haul routes; farther for drainage features; 100 to 200 feet in streams.

2 - Uninfested 7th field watersheds are listed on Table A12-2 [*of FSEIS*] as those with at least 100 acres of POC stands, are at least 50% federal ownership, and are free of PL except within the lowermost 2 acres of the drainage.

3 - Appreciable additional risk does not mean "any risk." It means that a reasonable person would recognize risk, additional to existing uncontrollable risk, to believe mitigation is warranted and would make a cost-effective or important difference (see Risk Key Definitions and Examples for further discussion.)

* - The unit or a portion is in an uninfested 7th field watershed as mapped for the EIS. While the uninfested 7th field watershed contains no mapped POC (healthy or diseased), an adjacent uninfested 7th field watershed does contain a mapped population of healthy POC. Roads extending beyond HFRm units enter the 7th field watershed with the mapped healthy POC. While it is not required treatments would be scheduled to reduce the risk of possible infection.

Port Orford Cedar Risk Key Analysis for the Pickett West Project - Grants Pass RA

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

	QUESTION	FUELS UNIT and ASSOCIATED ROADS																			
		DEER MOM 11-4	NORTH MURPHY 20	STRATTON HOG 3	BOARD SHANTY 9	PICKETT SNAKE 27-5A	SCOTTISH VERBAS 31-2G	SHINEY QUEEN 23-5AB	PICKETT SNAKE 28-B	STRATTON HOG 21	MAPLE SYRUP 30-005	DEER MOM 31-1	ROUND BULL 21.123C	NORTH MURPHY 19B	STRATTON HOG 1-5	FISH HATCHERY 2	GRAYS CREEK 1	STRATTON HOG 27-6	SCOTTISH VERBASCUM 2D	NEW HOPE 1	RICH AND ROCKY 27-11
1a.	Are there uninfected POC within, near[1], or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1b.	Are there uninfected POC within, near[1], or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurable contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1c.	Is the activity area within an uninfested 7th field watershed[2] as defined in Alternative 6	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	yes*
		If the answer to all three questions, 1a, 1b, and 1c, is no, then risk is low and no POC management practices would be required.																			
	If the answer to any of the three questions is yes, continue.																				
2.	Will the proposed project introduce appreciable additional risk[3] of infection to these uninfected POC?	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	no
	If yes, apply management practices from the list below [within FSEIS] to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfected POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through practicable and cost-effective treatments or design changes, the project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	*project scheduling*

1 - In questions 1a and 1b, "near" generally means within 25 to 50 feet downslope or 25 feet upslope from management activity areas, access roads, or haul routes; farther for drainage features; 100 to 200 feet in streams.

2 - Uninfested 7th field watersheds are listed on Table A12-2 [*of FSEIS*] as those with at least 100 acres of POC stands, are at least 50% federal ownership, and are free of PL except within the lowermost 2 acres of the drainage.

3 - Appreciable additional risk does not mean "any risk." It means that a reasonable person would recognize risk, additional to existing uncontrollable risk, to believe mitigation is warranted and would make a cost-effective or important difference (see Risk Key Definitions and Examples for further discussion.)

* - The unit or a portion is in an uninfested 7th field watershed as mapped for the EIS. While the uninfested 7th field watershed contains no mapped POC (healthy or diseased), an adjacent uninfested 7th field watershed does contain a mapped population of healthy POC. Roads extending beyond HFRm units enter the 7th field watershed with the mapped healthy POC. While it is not required treatments would be scheduled to reduce the risk of possible infection.

	QUESTION	FUELS UNIT and ASSOCIATED ROADS																			
		RICH AND ROCKY 27-11B	RICH AND ROCKY 27-3B	RICH AND ROCKY 27-1	MAPLE SYRUP 31.4	PICKETT SNAKE 26	STRATTON HOG 35-10	MCMULLIN 5-1A	NORTH MURPHY 29A	ROUND BULL 15-3A	PICKETT SNAKE FRT-22-27	MCMULLIN 29-1	MAPLE SYRUP 29-3AS	MCMULLIN 29-8	ROUND BULL 3-3C	PICKETT SNAKE PS 29-8A	PICKETT SNAKE TBRIDGE	QUARTER MOON 5-1	SAVAGE PASS 1	MCMULLIN 25-3	PICKETT SNAKE 28-A
1a.	Are there uninfected POC within, near[1], or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1b.	Are there uninfected POC within, near[1], or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurable contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1c.	Is the activity area within an uninfested 7[th] field watershed[2] as defined in Alternative 6	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
		If the answer to all three questions, 1a, 1b, and 1c, is no, then risk is low and no POC management practices would be required.																			
	If the answer to any of the three questions is yes, continue.																				
2.	Will the proposed project introduce appreciable additional risk[3] of infection to these uninfected POC?	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	If yes, apply management practices from the list below [within FSEIS] to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfected POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through practicable and cost-effective treatments or design changes, the project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

1 - In questions 1a and 1b, "near" generally means within 25 to 50 feet downslope or 25 feet upslope from management activity areas, access roads, or haul routes; farther for drainage features; 100 to 200 feet in streams.

2 - Uninfested 7th field watersheds are listed on Table A12-2 [*of FSEIS*] as those with at least 100 acres of POC stands, are at least 50% federal ownership, and are free of PL except within the lowermost 2 acres of the drainage.

3 - Appreciable additional risk does not mean "any risk." It means that a reasonable person would recognize risk, additional to existing uncontrollable risk, to believe mitigation is warranted and would make a cost-effective or important difference (see Risk Key Definitions and Examples for further discussion.)

Port Orford Cedar Risk Key Analysis for the Pickett West Project - Grants Pass RA

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

	QUESTION	FUELS UNIT and ASSOCIATED ROADS																			
		DEER MOM 29-2D	SPRECHT 1	STRATTON HOG 1-1	NORTH MURPHY 23-26	TALL TIMBER 11-6	STRATTON HOG 11-4A	CHENEY SLATE 23-5	STRATTON HOG 21-15	STRATTON HOG 22-1	STRATTON HOG 33-20	MAPLE SYRUP 29.007C	SCOTTISH VERBAS 2-D	MAPLE SYRUP 5.7	MAPLE SYRUP 5.1	MAPLE SYRUP 30.3	MCMULLIN CREEK 005	MCMULLIN 31-25	MAPLE SYRUP 25-1	JAYNES DR 1	NORTH MURPHY 26-3
1a.	Are there uninfected POC within, near[1], or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1b.	Are there uninfected POC within, near[1], or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurable contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1c.	Is the activity area within an uninfested 7th field watershed[2] as defined in Alternative 6	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
		If the answer to all three questions, 1a, 1b, and 1c, is no, then risk is low and no POC management practices would be required.																			
	If the answer to any of the three questions is yes, continue.																				
2.	Will the proposed project introduce appreciable additional risk[3] of infection to these uninfected POC?	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	If yes, apply management practices from the list below [within FSEIS] to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfected POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through practicable and cost-effective treatments or design changes, the project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

1 - In questions 1a and 1b, "near" generally means within 25 to 50 feet downslope or 25 feet upslope from management activity areas, access roads, or haul routes; farther for drainage features; 100 to 200 feet in streams.

2 - Uninfested 7th field watersheds are listed on Table A12-2 [*of FSEIS*] as those with at least 100 acres of POC stands, are at least 50% federal ownership, and are free of PL except within the lowermost 2 acres of the drainage.

3 - Appreciable additional risk does not mean "any risk." It means that a reasonable person would recognize risk, additional to existing uncontrollable risk, to believe mitigation is warranted and would make a cost-effective or important difference (see Risk Key Definitions and Examples for further discussion.)

Port Orford Cedar Risk Key Analysis for the Pickett West Project - Grants Pass RA

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

	QUESTION	FUELS UNIT and ASSOCIATED ROADS																			
		PICKETT OVER 27-3	ANDERSON WEST 23-6	PICKETT SNAKE FRT-29-8C	STRATTON HOG 27-12	MAPLE SYRUP 29-3B	PICKETT SNAKE FRT-22-2D	MAPLE SYRUP 31-009	PICKETT OVER 27-5	PICKETT OVER 27-5A1	PICKETT OVER 27-5A2	MAPLE SYRUP 5-006B	STRATTON HOG 33	ANDERSON WEST 35.2003	FISH HATCHERY 1	GRIFFIN 2-5A	STRATTON HOG 27-5	ANGORA CREEK 15	RICH AND ROCKY 27-19	MAPLE SYRUP 31.3	MCMULLIN 29-6B
1a.	Are there uninfected POC within, near[1], or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1b.	Are there uninfected POC within, near[1], or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurable contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1c.	Is the activity area within an uninfested 7[th] field watershed[2] as defined in Alternative 6	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	yes*	no	no
		If the answer to all three questions, 1a, 1b, and 1c, is no, then risk is low and no POC management practices would be required.																			
	If the answer to any of the three questions is yes, continue.																				
2.	Will the proposed project introduce appreciable additional risk[3] of infection to these uninfected POC?	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	no	---	---
	If yes, apply management practices from the list below [within FSEIS] to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfected POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through practicable and cost-effective treatments or design changes, the project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	*project scheduling*	n/a	n/a

1 - In questions 1a and 1b, "near" generally means within 25 to 50 feet downslope or 25 feet upslope from management activity areas, access roads, or haul routes; farther for drainage features; 100 to 200 feet in streams.

2 - Uninfested 7th field watersheds are listed on Table A12-2 [*of FSEIS*] as those with at least 100 acres of POC stands, are at least 50% federal ownership, and are free of PL except within the lowermost 2 acres of the drainage.

3 - Appreciable additional risk does not mean "any risk." It means that a reasonable person would recognize risk, additional to existing uncontrollable risk, to believe mitigation is warranted and would make a cost-effective or important difference (see Risk Key Definitions and Examples for further discussion.)

* - The unit or a portion is in an uninfested 7th field watershed as mapped for the EIS. While the uninfested 7th field watershed contains no mapped POC (healthy or diseased), an adjacent uninfested 7th field watershed does contain a mapped population of healthy POC. Roads extending beyond HFRm units enter the 7th field watershed with the mapped healthy POC. While it is not required treatments would be scheduled to reduce the risk of possible infection.

Port Orford Cedar Risk Key Analysis for the Pickett West Project - Grants Pass RA

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

	QUESTION		FUELS UNIT and ASSOCIATED ROADS																			
			PICKETT OVER 31-8B	MAPLE SYRUP 29-2	OLD LITTLE GRAYBACK 5-9	NORTH MURPHY 19D	NORTH MURPHY 19A	DEER SELMAC 25-2	MCMULLIN 5-9	MCMULLIN 31-7	STRATTON HOG 21-1	CROOKED BUCK L 31	MAPLE SYRUP 29-006A	MAPLE SYRUP 29-011A	MAPLE SYRUP 5.003B	PICKETT SNAKE 21	DEER NORTH 7-11	PICKETT SNAKE FRT 29-8B	RICH AND ROCKY 27-10	MAPLE SYRUP 30-2	MCMULLIN 5-8	MCMULLIN 29-6A
1a.	Are there uninfected POC within, near[1], or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives?		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1b.	Are there uninfected POC within, near[1], or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurable contributes to meeting land and resource management plan objectives?		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1c.	Is the activity area within an uninfested 7[th] field watershed[2] as defined in Alternative 6		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	yes*	no	no	no
			If the answer to all three questions, 1a, 1b, and 1c, is no, then risk is low and no POC management practices would be required.																			
	If the answer to any of the three questions is yes, continue.																					
2.	Will the proposed project introduce appreciable additional risk[3] of infection to these uninfected POC?		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	no	---	---	---
	If yes, apply management practices from the list below [within FSEIS] to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfected POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through practicable and cost-effective treatments or design changes, the project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	*project scheduling*	n/a	n/a	n/a

1 - In questions 1a and 1b, "near" generally means within 25 to 50 feet downslope or 25 feet upslope from management activity areas, access roads, or haul routes; farther for drainage features; 100 to 200 feet in streams.

2 - Uninfested 7th field watersheds are listed on Table A12-2 [*of FSEIS*] as those with at least 100 acres of POC stands, are at least 50% federal ownership, and are free of PL except within the lowermost 2 acres of the drainage.

3 - Appreciable additional risk does not mean "any risk." It means that a reasonable person would recognize risk, additional to existing uncontrollable risk, to believe mitigation is warranted and would make a cost-effective or important difference (see Risk Key Definitions and Examples for further discussion.)

* - The unit or a portion is in an uninfested 7th field watershed as mapped for the EIS. While the uninfested 7th field watershed contains no mapped POC (healthy or diseased), an adjacent uninfested 7th field watershed does contain a mapped population of healthy POC. Roads extending beyond HFRm units enter the 7th field watershed with the mapped healthy POC. While it is not required treatments would be scheduled to reduce the risk of possible infection.

Port Orford Cedar Risk Key Analysis for the Pickett West Project - Grants Pass RA

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

	QUESTION	FUELS UNIT and ASSOCIATED ROADS																			
		MAPLE SYRUP 31.2	PICKETT OVER 31-8A	ROUND BULL 21-1	MAPLE SYRUP 30.1	PICKETT OVER 27-6B	NORTH MURPHY 19C	DEER MOM 7-1	PICKETT SNAKE FRT 33-6	MAPLE SYRUP 29.011	PICKETT SNAKE FRT-33-1	PICKETT SNAKE FRT-22-2B	ROUND BULL 21-2	QUARTER MOON 33-1E	STRATTON HOG 27-7	BOARD SHANTY FMZ2	MAPLE SYRUP 29.3N	MCMULLIN 29-2A	LUCKY POT 6	NORTH MURPHY 17.029	PICKETT SNAKE 33
1a.	Are there uninfected POC within, near[1], or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1b.	Are there uninfected POC within, near[1], or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurable contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1c.	Is the activity area within an uninfested 7[th] field watershed[2] as defined in Alternative 6	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
		If the answer to all three questions, 1a, 1b, and 1c, is no, then risk is low and no POC management practices would be required.																			
	If the answer to any of the three questions is yes, continue.																				
2.	Will the proposed project introduce appreciable additional risk[3] of infection to these uninfected POC?	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	If yes, apply management practices from the list below [within FSEIS] to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfected POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through practicable and cost-effective treatments or design changes, the project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

1 - In questions 1a and 1b, "near" generally means within 25 to 50 feet downslope or 25 feet upslope from management activity areas, access roads, or haul routes; farther for drainage features; 100 to 200 feet in streams.

2 - Uninfested 7th field watersheds are listed on Table A12-2 [*of FSEIS*] as those with at least 100 acres of POC stands, are at least 50% federal ownership, and are free of PL except within the lowermost 2 acres of the drainage.

3 - Appreciable additional risk does not mean "any risk." It means that a reasonable person would recognize risk, additional to existing uncontrollable risk, to believe mitigation is warranted and would make a cost-effective or important difference (see Risk Key Definitions and Examples for further discussion.)

Port Orford Cedar Risk Key Analysis for the Pickett West Project - Grants Pass RA

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

	QUESTION		FUELS UNIT and ASSOCIATED ROADS																			
			MAPLE SYRUP 5-9	PICKETT OVER 27-6C	DEER MOM 29-2B	ROUND BULL 21.123B	NORTH MURPHY 9-1A	SHINEY QUEEN 23-9	WILDROSE RIA 1	STRATTON HOG 27	STRATTON HOG 1	CHENEY SLATE 23-1	RICH AND ROCKY 27-2	STRATTON HOG 15	MAPLE SYRUP 31.5	PINNON 2	STRATTON HOG 33-18	TALL TIMBER 21-7	MCMULLIN 31-18A	ROUND BULL 3A	MCMULLIN 25-18	BOARD SHANTY FMZ1
1a.	Are there uninfected POC within, near[1], or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives?		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1b.	Are there uninfected POC within, near[1], or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurable contributes to meeting land and resource management plan objectives?		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1c.	Is the activity area within an uninfested 7[th] field watershed[2] as defined in Alternative 6		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
			If the answer to all three questions, 1a, 1b, and 1c, is no, then risk is low and no POC management practices would be required.																			
	If the answer to any of the three questions is yes, continue.																					
2.	Will the proposed project introduce appreciable additional risk[3] of infection to these uninfected POC?		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	If yes, apply management practices from the list below [within FSEIS] to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfected POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through practicable and cost-effective treatments or design changes, the project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

1 - In questions 1a and 1b, "near" generally means within 25 to 50 feet downslope or 25 feet upslope from management activity areas, access roads, or haul routes; farther for drainage features; 100 to 200 feet in streams.

2 - Uninfested 7th field watersheds are listed on Table A12-2 [*of FSEIS*] as those with at least 100 acres of POC stands, are at least 50% federal ownership, and are free of PL except within the lowermost 2 acres of the drainage.

3 - Appreciable additional risk does not mean "any risk." It means that a reasonable person would recognize risk, additional to existing uncontrollable risk, to believe mitigation is warranted and would make a cost-effective or important difference (see Risk Key Definitions and Examples for further discussion.)

Port Orford Cedar Risk Key Analysis for the Pickett West Project - Grants Pass RA

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

	QUESTION	FUELS UNIT and ASSOCIATED ROADS																			
		NORTH MURPHY 11+14	NORTH MURPHY 24	MCMULLIN 29-2B	MCMULLIN 25-2	NORTH MURPHY 15	BLUE DRAPER 23-1	HOG REMAINS 2	STRATTON HOG 1-3	MAPLE SYRUP 31.003	NORTH MURPHY 23	PICKETT SNAKE RIA34	STRATTON HOG 35-19	MCMULLIN 29-12	PICKETT SNAKE 31B	RICH AND ROCKY 27-3A	RICH AND ROCKY 27-3B	BUCKHORN SOUTH 20A1	PICKETT OVER 39-9	NORTH MURPHY 14A	NORTH MURPHY 9-1B
1a.	Are there uninfected POC within, near[1], or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1b.	Are there uninfected POC within, near[1], or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurable contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1c.	Is the activity area within an uninfested 7[th] field watershed[2] as defined in Alternative 6	no	no	no	no	no	no	no	no	no	no	no	no	no	no	yes*	yes	no	no	no	no
		If the answer to all three questions, 1a, 1b, and 1c, is no, then risk is low and no POC management practices would be required.																			
	If the answer to any of the three questions is yes, continue.																				
2.	Will the proposed project introduce appreciable additional risk[3] of infection to these uninfected POC?	---	---	---	---	---	---	---	---	---	---	---	---	---	---	no	no	---	---	---	---
	If yes, apply management practices from the list below [within FSEIS] to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfected POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through practicable and cost-effective treatments or design changes, the project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	*project scheduling*	n/a	n/a	n/a	n/a	n/a

1 - In questions 1a and 1b, "near" generally means within 25 to 50 feet downslope or 25 feet upslope from management activity areas, access roads, or haul routes; farther for drainage features; 100 to 200 feet in streams.

2 - Uninfested 7th field watersheds are listed on Table A12-2 [*of FSEIS*] as those with at least 100 acres of POC stands, are at least 50% federal ownership, and are free of PL except within the lowermost 2 acres of the drainage.

3 - Appreciable additional risk does not mean "any risk." It means that a reasonable person would recognize risk, additional to existing uncontrollable risk, to believe mitigation is warranted and would make a cost-effective or important difference (see Risk Key Definitions and Examples for further discussion.)

* - The unit or a portion is in an uninfested 7th field watershed as mapped for the EIS. While the uninfested 7th field watershed contains no mapped POC (healthy or diseased), an adjacent uninfested 7th field watershed does contain a mapped population of healthy POC. Roads extending beyond HFRm units enter the 7th field watershed with the mapped healthy POC. While it is not required treatments would be scheduled to reduce the risk of possible infection.

Port Orford Cedar Risk Key Analysis for the Pickett West Project - Grants Pass RA

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

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	QUESTION	FUELS UNIT and ASSOCIATED ROADS																			
		PICKETT SNAKE 9	TALL TIMBER 11-3	SLATE KNIGHT 5-8	MCMULLIN 29-6	STRATTON HOG 27-2	DRY WHITE 15-1	ROUND PRAIRIE 3	NORTH MURPHY RIA31A	ROUND BULL 27-1	CROOKED CEDAR 3-2A	AVFD 9 1	DEER MOM 7-2	NORTH MURPHY RIA26	NORTH MURPHY 24A	LUCKY POT 13	LUCKY POT 9	MCMULLIN 29-4A	DEER MOM 29-2A	NORTH MURPHY 29-31	CROOKED CEDAR 3-1A
1a.	Are there uninfected POC within, near[1], or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1b.	Are there uninfected POC within, near[1], or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurable contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1c.	Is the activity area within an uninfested 7th field watershed[2] as defined in Alternative 6	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
		If the answer to all three questions, 1a, 1b, and 1c, is no, then risk is low and no POC management practices would be required.																			
	If the answer to any of the three questions is yes, continue.																				
2.	Will the proposed project introduce appreciable additional risk[3] of infection to these uninfected POC?	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	If yes, apply management practices from the list below [within FSEIS] to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfected POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through practicable and cost-effective treatments or design changes, the project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

1 - In questions 1a and 1b, "near" generally means within 25 to 50 feet downslope or 25 feet upslope from management activity areas, access roads, or haul routes; farther for drainage features; 100 to 200 feet in streams.

2 - Uninfested 7th field watersheds are listed on Table A12-2 [*of FSEIS*] as those with at least 100 acres of POC stands, are at least 50% federal ownership, and are free of PL except within the lowermost 2 acres of the drainage.

3 - Appreciable additional risk does not mean "any risk." It means that a reasonable person would recognize risk, additional to existing uncontrollable risk, to believe mitigation is warranted and would make a cost-effective or important difference (see Risk Key Definitions and Examples for further discussion.)

Port Orford Cedar Risk Key Analysis for the Pickett West Project - Grants Pass RA

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

	QUESTION		DERRY TRESPASS 3-5	PICKETT SNAKE 15	THOMPSON CREEK 4	MCMULLIN CREEK 5-6	SLATE CR 7-2	CROOKED CEDAR 9-1	TALL TIMBER 7-5B	SLATE KNIGHT 1-1	HOT LOFT 15-3	CROOKED CEDAR 3-3A	CROOKED CEDAR 11-1B	PARADISE GREENTREE N 14-1	MAPLE SYRUP 31-30	MAPLE SYRUP 29.007	MAPLE SYRUP 5.003A	MAPLE SYRUP 5-10	PICKETT SNAKE 28-C	ROUND BULL 35-134A	ROUND BULL 15-3B	NORTH MURPHY 23.26
			FUELS UNIT and ASSOCIATED ROADS																			
1a.	Are there uninfected POC within, near[1], or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives?		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1b.	Are there uninfected POC within, near[1], or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurable contributes to meeting land and resource management plan objectives?		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1c.	Is the activity area within an uninfested 7[th] field watershed[2] as defined in Alternative 6		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
			If the answer to all three questions, 1a, 1b, and 1c, is no, then risk is low and no POC management practices would be required.																			
	If the answer to any of the three questions is yes, continue.																					
2.	Will the proposed project introduce appreciable additional risk[3] of infection to these uninfected POC?		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	If yes, apply management practices from the list below [within FSEIS] to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfected POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through practicable and cost-effective treatments or design changes, the project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

1 - In questions 1a and 1b, "near" generally means within 25 to 50 feet downslope or 25 feet upslope from management activity areas, access roads, or haul routes; farther for drainage features; 100 to 200 feet in streams.

2 - Uninfested 7th field watersheds are listed on Table A12-2 [*of FSEIS*] as those with at least 100 acres of POC stands, are at least 50% federal ownership, and are free of PL except within the lowermost 2 acres of the drainage.

3 - Appreciable additional risk does not mean "any risk." It means that a reasonable person would recognize risk, additional to existing uncontrollable risk, to believe mitigation is warranted and would make a cost-effective or important difference (see Risk Key Definitions and Examples for further discussion.)

Port Orford Cedar Risk Key Analysis for the Pickett West Project - Grants Pass RA

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

	QUESTION	FUELS UNIT and ASSOCIATED ROADS: NORTH MURPHY 14	NORTH MURPHY 11.14.15	NORTH MURPHY 13-8.9	NORTH MURPHY 21	MAPLE SYRUP M-29-31	MAPLE SYRUP 30-013A	PICKETT SNAKE FRT 22-1	RICH AND ROCKY 27-19A	RICH AND ROCKY 34-3D	RICH AND ROCKY 34-3A	RICH AND ROCKY 34-3B	NORTH APPLEGATE 17	CHENEY SLATE 19-1A	WILLIAMS 3-3	WILLIAMS 3-6	WILLIAMS 3-6A	WILLIAMS 3-6B	WILLIAMS 3-8	WILLIAMS 3-4	CHENEY SLATE 31
1a.	Are there uninfected POC within, near[1], or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1b.	Are there uninfected POC within, near[1], or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurable contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1c.	Is the activity area within an uninfested 7[th] field watershed[2] as defined in Alternative 6	no	no	no	no	no	no	no	yes*	yes*	yes*	yes*	no	yes*	no	no	no	no	no	no	no
		If the answer to all three questions, 1a, 1b, and 1c, is no, then risk is low and no POC management practices would be required.																			
	If the answer to any of the three questions is yes, continue.																				
2.	Will the proposed project introduce appreciable additional risk[3] of infection to these uninfected POC?	---	---	---	---	---	---	---	no	no	no	no	---	no	---	---	---	---	---	---	---
	If yes, apply management practices from the list below [within FSEIS] to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfected POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through practicable and cost-effective treatments or design changes, the project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	*project scheduling*	*project scheduling*	*project scheduling*	*project scheduling*	n/a	*project scheduling*	n/a	n/a	n/a	n/a	n/a	n/a	n/a

1 - In questions 1a and 1b, "near" generally means within 25 to 50 feet downslope or 25 feet upslope from management activity areas, access roads, or haul routes; farther for drainage features; 100 to 200 feet in streams.

2 - Uninfested 7th field watersheds are listed on Table A12-2 [*of FSEIS*] as those with at least 100 acres of POC stands, are at least 50% federal ownership, and are free of PL except within the lowermost 2 acres of the drainage.

3 - Appreciable additional risk does not mean "any risk." It means that a reasonable person would recognize risk, additional to existing uncontrollable risk, to believe mitigation is warranted and would make a cost-effective or important difference (see Risk Key Definitions and Examples for further discussion.)

* - The unit or a portion is in an uninfested 7th field watershed as mapped for the EIS. While the uninfested 7th field watershed contains no mapped POC (healthy or diseased), an adjacent uninfested 7th field watershed does contain a mapped population of healthy POC. Roads extending beyond HFRm units enter the 7th field watershed with the mapped healthy POC. While it is not required treatments would be scheduled to reduce the risk of possible infection.

Port Orford Cedar Risk Key Analysis for the Pickett West Project - Grants Pass RA

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

	QUESTION	HARVEST UNIT																			
		Pickett Hog 7-1	Pickett Hog 7-2	Pickett Hog 19-1	Pickett Hog 20-1	Pickett Hog 21-1	Pickett Hog 21-2	Hog Stew 27-2	Pickett Hog 29-2	Pickett Hog 29-3	Pickett Hog 29-1	Pickett Hog 31-3	Pickett Hog 31-2	Pickett Hog 31-1	Hog Stew 33-1	Hog Stew 1-1	Pickett Hog 3-2	Pickett Hog 3-1	Hog Stew 5-1	Hog Stew 5-3	Hog Stew 5-2
1a.	Are there uninfected POC within, near[1], or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1b.	Are there uninfected POC within, near[1], or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurable contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1c.	Is the activity area within an uninfested 7th field watershed[2] as defined in Alternative 6	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
		If the answer to all three questions, 1a, 1b, and 1c, is no, then risk is low and no POC management practices would be required.																			
	If the answer to any of the three questions is yes, continue.																				
2.	Will the proposed project introduce appreciable additional risk[3] of infection to these uninfected POC?	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	If yes, apply management practices from the list below [within FSEIS] to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfected POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through practicable and cost-effective treatments or design changes, the project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

1 - In questions 1a and 1b, "near" generally means within 25 to 50 feet downslope or 25 feet upslope from management activity areas, access roads, or haul routes; farther for drainage features; 100 to 200 feet in streams.

2 - Uninfested 7th field watersheds are listed on Table A12-2 [*of FSEIS*] as those with at least 100 acres of POC stands, are at least 50% federal ownership, and are free of PL except within the lowermost 2 acres of the drainage.

3 - Appreciable additional risk does not mean "any risk." It means that a reasonable person would recognize risk, additional to existing uncontrollable risk, to believe mitigation is warranted and would make a cost-effective or important difference (see Risk Key Definitions and Examples for further discussion.)

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Port Orford Cedar Risk Key Analysis for the Pickett West Project - Grants Pass RA

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

	QUESTION	HARVEST UNIT																			
		Pickett Hog 9-2	Pickett Hog 9-3	Pickett Hog 9-1	Pickett Hog 10-2	Pickett Hog 10-1	Hog Stew 11-5	Pickett Hog 15-1	Pickett Hog 20-2	Pickett Hog 22-1	Pickett Hog 22-3	Pickett Hog 22-2	Pickett Hog 27-4	Pickett Hog 27-3	Pickett Hog 27-1	Pickett Hog 21-3	Pickett Hog 28-6	Pickett Hog 28-5	Pickett Hog 28-1	Pickett Hog 28-3	Pickett Hog 28-4
1a.	Are there uninfected POC within, near[1], or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1b.	Are there uninfected POC within, near[1], or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurable contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1c.	Is the activity area within an uninfested 7th field watershed[2] as defined in Alternative 6	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
		If the answer to all three questions, 1a, 1b, and 1c, is no, then risk is low and no POC management practices would be required.																			
	If the answer to any of the three questions is yes, continue.																				
2.	Will the proposed project introduce appreciable additional risk[3] of infection to these uninfected POC?	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	If yes, apply management practices from the list below [within FSEIS] to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfected POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through practicable and cost-effective treatments or design changes, the project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

1 - In questions 1a and 1b, "near" generally means within 25 to 50 feet downslope or 25 feet upslope from management activity areas, access roads, or haul routes; farther for drainage features; 100 to 200 feet in streams.

2 - Uninfested 7th field watersheds are listed on Table A12-2 [*of FSEIS*] as those with at least 100 acres of POC stands, are at least 50% federal ownership, and are free of PL except within the lowermost 2 acres of the drainage.

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Port Orford Cedar Risk Key Analysis for the Pickett West Project - Grants Pass RA

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

	QUESTION	HARVEST UNIT																			
		Pickett Hog 28-2	Pickett Hog 29-5	Pickett Hog 29-4	Pickett Hog 31-4	Pickett Hog 30-1	Pickett Hog 30-2	Pickett Hog 31-5	Pickett Hog 31-7	Pickett Hog 31-6	Pickett Hog 31-9	Pickett Hog 31-8	Pickett Hog 32-1	Pickett Hog 33-2	Pickett Hog 33-3	Deer Slate 30-3	Pickett Hog 3-3	Pickett Hog 3-4	Pickett Hog 11-6	Deer Slate 23-1	Deer Slate 27-5
1a.	Are there uninfected POC within, near[1], or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1b.	Are there uninfected POC within, near[1], or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurable contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1c.	Is the activity area within an uninfested 7th field watershed[2] as defined in Alternative 6	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
		If the answer to all three questions, 1a, 1b, and 1c, is no, then risk is low and no POC management practices would be required.																			
	If the answer to any of the three questions is yes, continue.																				
2.	Will the proposed project introduce appreciable additional risk[3] of infection to these uninfected POC?	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	If yes, apply management practices from the list below [within FSEIS] to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfected POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through practicable and cost-effective treatments or design changes, the project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

1 - In questions 1a and 1b, "near" generally means within 25 to 50 feet downslope or 25 feet upslope from management activity areas, access roads, or haul routes; farther for drainage features; 100 to 200 feet in streams.

2 - Uninfested 7th field watersheds are listed on Table A12-2 [*of FSEIS*] as those with at least 100 acres of POC stands, are at least 50% federal ownership, and are free of PL except within the lowermost 2 acres of the drainage.

3 - Appreciable additional risk does not mean "any risk." It means that a reasonable person would recognize risk, additional to existing uncontrollable risk, to believe mitigation is warranted and would make a cost-effective or important difference (see Risk Key Definitions and Examples for further discussion.)

Port Orford Cedar Risk Key Analysis for the Pickett West Project - Grants Pass RA

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

	QUESTION		HARVEST UNIT																			
			Deer Slate 27-6	Deer Slate 27-7	Deer Slate 27-8	Deer Slate 27-9	Deer Slate 35-2	Deer Slate 35-1	Deer Slate 18-1	Deer Slate 17-5	Deer Slate 18-2	Deer Slate 13-9	Deer Slate 20-5	Deer Slate 21-13	Deer Slate 13-8	Deer Slate 13-7	Deer Slate 14-5	Deer Slate 15-11	Deer Slate 20-4	Deer Slate 23-7	Deer Slate 23-9	Deer Slate 23-8
1a.	Are there uninfected POC within, near[1], or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives?		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1b.	Are there uninfected POC within, near[1], or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurable contributes to meeting land and resource management plan objectives?		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1c.	Is the activity area within an uninfested 7[th] field watershed[2] as defined in Alternative 6		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
			If the answer to all three questions, 1a, 1b, and 1c, is no, then risk is low and no POC management practices would be required.																			
	If the answer to any of the three questions is yes, continue.																					
2.	Will the proposed project introduce appreciable additional risk[3] of infection to these uninfected POC?		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	If yes, apply management practices from the list below [within FSEIS] to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfected POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through practicable and cost-effective treatments or design changes, the project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

1 - In questions 1a and 1b, "near" generally means within 25 to 50 feet downslope or 25 feet upslope from management activity areas, access roads, or haul routes; farther for drainage features; 100 to 200 feet in streams.

2 - Uninfested 7th field watersheds are listed on Table A12-2 [*of FSEIS*] as those with at least 100 acres of POC stands, are at least 50% federal ownership, and are free of PL except within the lowermost 2 acres of the drainage.

3 - Appreciable additional risk does not mean "any risk." It means that a reasonable person would recognize risk, additional to existing uncontrollable risk, to believe mitigation is warranted and would make a cost-effective or important difference (see Risk Key Definitions and Examples for further discussion.)

4/30/17

Port Orford Cedar Risk Key Analysis for the Pickett West Project - Grants Pass RA

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

	QUESTION	HARVEST UNIT																			
		Deer Slate 26-7	Deer Slate 7-3	Deer Slate 7-5	Deer Slate 17-1	Deer Slate 21-7	Deer Slate 21-6	Deer Slate 23-6	Deer Slate 5-4	Deer Slate 9-4	Deer Slate 13-2	Deer Stew 13-1	Deer Slate 15-3	Deer Slate 15-6	Deer Slate 15-5	Deer Slate 15-7	Deer Slate 15-4	Deer Slate 21-4	Deer Slate 21-5	Deer Slate 22-4	Deer Slate 23-2
1a.	Are there uninfected POC within, near[1], or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1b.	Are there uninfected POC within, near[1], or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurable contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1c.	Is the activity area within an uninfested 7[th] field watershed[2] as defined in Alternative 6	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
		If the answer to all three questions, 1a, 1b, and 1c, is no, then risk is low and no POC management practices would be required.																			
	If the answer to any of the three questions is yes, continue.																				
2.	Will the proposed project introduce appreciable additional risk[3] of infection to these uninfected POC?	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	If yes, apply management practices from the list below [within FSEIS] to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfected POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through practicable and cost-effective treatments or design changes, the project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

1 - In questions 1a and 1b, "near" generally means within 25 to 50 feet downslope or 25 feet upslope from management activity areas, access roads, or haul routes; farther for drainage features; 100 to 200 feet in streams.

2 - Uninfested 7th field watersheds are listed on Table A12-2 [*of FSEIS*] as those with at least 100 acres of POC stands, are at least 50% federal ownership, and are free of PL except within the lowermost 2 acres of the drainage.

3 - Appreciable additional risk does not mean "any risk." It means that a reasonable person would recognize risk, additional to existing uncontrollable risk, to believe mitigation is warranted and would make a cost-effective or important difference (see Risk Key Definitions and Examples for further discussion.)

Port Orford Cedar Risk Key Analysis for the Pickett West Project - Grants Pass RA

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

	QUESTION	HARVEST UNIT																			
		Deer Slate 33-8	Deer Slate 33-5	Deer Slate 33-7	Deer Slate 33-6	Deer Slate 33-4	Deer Slate 34-3	Deer Slate 34-2	Deer Slate 35-3	Deer Slate 35-4	Deer Slate 3-7	Deer Slate 3-8	Deer Slate 3-6	Deer Slate 11-1	Deer Slate 11-7	Deer Slate 11-3	Deer Slate 11-9	Deer Slate 14-2	Deer Slate 14-1	Deer Slate 17-2	Deer Slate 21-8
1a.	Are there uninfected POC within, near[1], or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1b.	Are there uninfected POC within, near[1], or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurable contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1c.	Is the activity area within an uninfested 7th field watershed[2] as defined in Alternative 6	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
		If the answer to all three questions, 1a, 1b, and 1c, is no, then risk is low and no POC management practices would be required.																			
	If the answer to any of the three questions is yes, continue.																				
2.	Will the proposed project introduce appreciable additional risk[3] of infection to these uninfected POC?	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	If yes, apply management practices from the list below [within FSEIS] to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfected POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through practicable and cost-effective treatments or design changes, the project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

1 - In questions 1a and 1b, "near" generally means within 25 to 50 feet downslope or 25 feet upslope from management activity areas, access roads, or haul routes; farther for drainage features; 100 to 200 feet in streams.

2 - Uninfested 7th field watersheds are listed on Table A12-2 [*of FSEIS*] as those with at least 100 acres of POC stands, are at least 50% federal ownership, and are free of PL except within the lowermost 2 acres of the drainage.

3 - Appreciable additional risk does not mean "any risk." It means that a reasonable person would recognize risk, additional to existing uncontrollable risk, to believe mitigation is warranted and would make a cost-effective or important difference (see Risk Key Definitions and Examples for further discussion.)

	QUESTION	HARVEST UNIT																			
		Deer Slate 21-12	Deer Slate 21-9	Deer Slate 22-5	Deer Slate 21-10	Deer Slate 21-11	Deer Slate 23-5	Deer Slate 26-4	Deer Slate 26-3	Deer Slate 26-2	Deer Slate 26-1	Deer Slate 27-13	Deer Slate 27-14	Deer Slate 27-12	Deer Slate 31-11	Deer Slate 35-9	Deer Slate 35-11	Deer Slate 35-10	Deer Slate 3-5	Deer Slate 13-4	Deer Slate 13-3
1a.	Are there uninfected POC within, near[1], or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1b.	Are there uninfected POC within, near[1], or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurable contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1c.	Is the activity area within an uninfested 7th field watershed[2] as defined in Alternative 6	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
		If the answer to all three questions, 1a, 1b, and 1c, is no, then risk is low and no POC management practices would be required.																			
	If the answer to any of the three questions is yes, continue.																				
2.	Will the proposed project introduce appreciable additional risk[3] of infection to these uninfected POC?	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	If yes, apply management practices from the list below [within FSEIS] to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfected POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through practicable and cost-effective treatments or design changes, the project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

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

Port Orford Cedar Risk Key Analysis for the Pickett West Project - Grants Pass RA

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

	QUESTION	HARVEST UNIT						
		Deer Slate 23-3	Deer Slate 23-4	Deer Slate 3-11	Deer Slate 3-9	Deer Slate 3-10	Deer Slate 4-1	Deer Slate 9-5
1a.	Are there uninfected POC within, near[1], or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no
1b.	Are there uninfected POC within, near[1], or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurable contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no
1c.	Is the activity area within an uninfested 7[th] field watershed[2] as defined in Alternative 6	no	no	no	no	no	no	no
		If the answer to all three questions, 1a, 1b, and 1c, is no, then risk is low and no POC management practices would be required.						
	If the answer to any of the three questions is yes, continue.							
2.	Will the proposed project introduce appreciable additional risk[3] of infection to these uninfected POC?	---	---	---	---	---	---	---
	If yes, apply management practices from the list below [within FSEIS] to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfected POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through practicable and cost-effective treatments or design changes, the project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.	n/a	n/a	n/a	n/a	n/a	n/a	n/a

1 - In questions 1a and 1b, "near" generally means within 25 to 50 feet downslope or 25 feet upslope from management activity areas, access roads, or haul routes; farther for drainage features; 100 to 200 feet in streams.

2 - Uninfested 7th field watersheds are listed on Table A12-2 [*of FSEIS*] as those with at least 100 acres of POC stands, are at least 50% federal ownership, and are free of PL except within the lowermost 2 acres of the drainage.

3 - Appreciable additional risk does not mean "any risk." It means that a reasonable person would recognize risk, additional to existing uncontrollable risk, to believe mitigation is warranted and would make a cost-effective or important difference (see Risk Key Definitions and Examples for further discussion.)

Port Orford Cedar Risk Key Analysis for the Pickett West Project - Grants Pass RA

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

	QUESTION	Roads, Temp Routes, Tractor Swings, Operator Spurs, and Associated Landings																			
		35-7-11	35-7-11.1	35-7-1	35-7-1.4	35-7-1.5	35-7-1.6	35-7-1.1	TR 1-1A	TR 11-5	TS 1-1	TS 1-1B	OS 1-1	Merlin Road	Galice Road	34-7-26.1	TR 3-1-A	TR 3-1-B	35-7-3	TR 3-2	34-7-27.3
1a.	Are there uninfected POC within, near[1], or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1b.	Are there uninfected POC within, near[1], or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurable contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1c.	Is the activity area within an uninfested 7[th] field watershed[2] as defined in Alternative 6	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
		If the answer to all three questions, 1a, 1b, and 1c, is no, then risk is low and no POC management practices would be required.																			
	If the answer to any of the three questions is yes, continue.																				
2.	Will the proposed project introduce appreciable additional risk[3] of infection to these uninfected POC?	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	If yes, apply management practices from the list below [within FSEIS] to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfected POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through practicable and cost-effective treatments or design changes, the project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

1 - In questions 1a and 1b, "near" generally means within 25 to 50 feet downslope or 25 feet upslope from management activity areas, access roads, or haul routes; farther for drainage features; 100 to 200 feet in streams.

2 - Uninfested 7th field watersheds are listed on Table A12-2 [*of FSEIS*] as those with at least 100 acres of POC stands, are at least 50% federal ownership, and are free of PL except within the lowermost 2 acres of the drainage.

3 - Appreciable additional risk does not mean "any risk." It means that a reasonable person would recognize risk, additional to existing uncontrollable risk, to believe mitigation is warranted and would make a cost-effective or important difference (see Risk Key Definitions and Examples for further discussion.)

Port Orford Cedar Risk Key Analysis for the Pickett West Project - Grants Pass RA

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

	QUESTION		Roads, Temp Routes, Tractor Swings, Operator Spurs, and Associated Landings																			
			34-7-22	34-7-21.4	34-7-28	TR 21-1	34-7-21.6	TR 29-1-A	TR 29-1-B	TR 29-1-C	TR 29-1-D	35-7-4.1	34-7-33	34-7-33.1	35-7-4.2	35-7-5	34-7-32	TR 5-1-A	TR 5-1-B	34-7-30	34-7-30.2	TR 31-1
1a.	Are there uninfected POC within, near[1], or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives?		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1b.	Are there uninfected POC within, near[1], or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurable contributes to meeting land and resource management plan objectives?		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1c.	Is the activity area within an uninfested 7[th] field watershed[2] as defined in Alternative 6		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
			If the answer to all three questions, 1a, 1b, and 1c, is no, then risk is low and no POC management practices would be required.																			
	If the answer to any of the three questions is yes, continue.																					
2.	Will the proposed project introduce appreciable additional risk[3] of infection to these uninfected POC?		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	If yes, apply management practices from the list below [within FSEIS] to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfected POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through practicable and cost-effective treatments or design changes, the project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

1 - In questions 1a and 1b, "near" generally means within 25 to 50 feet downslope or 25 feet upslope from management activity areas, access roads, or haul routes; farther for drainage features; 100 to 200 feet in streams.

2 - Uninfested 7th field watersheds are listed on Table A12-2 [*of FSEIS*] as those with at least 100 acres of POC stands, are at least 50% federal ownership, and are free of PL except within the lowermost 2 acres of the drainage.

3 - Appreciable additional risk does not mean "any risk." It means that a reasonable person would recognize risk, additional to existing uncontrollable risk, to believe mitigation is warranted and would make a cost-effective or important difference (see Risk Key Definitions and Examples for further discussion.)

Port Orford Cedar Risk Key Analysis for the Pickett West Project - Grants Pass RA

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

	QUESTION		34-7-3.1	TR 7-2-A	TR 7-2-B	34-7-7.1	34-7-7	34-7-7.2	TR 7-1-A	34-7-3	34-7-2	Grave Creek Road	Lower Wolf Creek Road	Lower Grave Creek Road	Leland Road	35-7-4	35-7-5.1	35-7-16	TS 9-2	OS 9-2	35-7-15	35-7-22.1
			Roads, Temp Routes, Tractor Swings, Operator Spurs, and Associated Landings																			
1a.	Are there uninfected POC within, near[1], or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives?		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1b.	Are there uninfected POC within, near[1], or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurable contributes to meeting land and resource management plan objectives?		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1c.	Is the activity area within an uninfested 7[th] field watershed[2] as defined in Alternative 6		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
			If the answer to all three questions, 1a, 1b, and 1c, is no, then risk is low and no POC management practices would be required.																			
	If the answer to any of the three questions is yes, continue.																					
2.	Will the proposed project introduce appreciable additional risk[3] of infection to these uninfected POC?		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	If yes, apply management practices from the list below [within FSEIS] to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfected POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through practicable and cost-effective treatments or design changes, the project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

1 - In questions 1a and 1b, "near" generally means within 25 to 50 feet downslope or 25 feet upslope from management activity areas, access roads, or haul routes; farther for drainage features; 100 to 200 feet in streams.

2 - Uninfested 7th field watersheds are listed on Table A12-2 [*of FSEIS*] as those with at least 100 acres of POC stands, are at least 50% federal ownership, and are free of PL except within the lowermost 2 acres of the drainage.

3 - Appreciable additional risk does not mean "any risk." It means that a reasonable person would recognize risk, additional to existing uncontrollable risk, to believe mitigation is warranted and would make a cost-effective or important difference (see Risk Key Definitions and Examples for further discussion.)

Port Orford Cedar Risk Key Analysis for the Pickett West Project - Grants Pass RA

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

	QUESTION		Roads, Temp Routes, Tractor Swings, Operator Spurs, and Associated Landings																			
			35-7-15.1	35-7-23	TR 10-1	35-7-27.3	35-7-22	TS 22-3	TS 28-6	TS 28-1	35-7-27.5	35-7-27.4	West Pickett Creek Road	Pickett Creek Road	35-7-27	35-7-27.2	35-7-27.7	35-7-27.8	TR 27-1-A	TR 27-1-B	TR 28-5-A	TR 28-5-B
1a.	Are there uninfected POC within, near[1], or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives?		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1b.	Are there uninfected POC within, near[1], or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurable contributes to meeting land and resource management plan objectives?		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1c.	Is the activity area within an uninfested 7[th] field watershed[2] as defined in Alternative 6		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
			If the answer to all three questions, 1a, 1b, and 1c, is no, then risk is low and no POC management practices would be required.																			
	If the answer to any of the three questions is yes, continue.																					
2.	Will the proposed project introduce appreciable additional risk[3] of infection to these uninfected POC?		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	If yes, apply management practices from the list below [within FSEIS] to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfected POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through practicable and cost-effective treatments or design changes, the project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

1 - In questions 1a and 1b, "near" generally means within 25 to 50 feet downslope or 25 feet upslope from management activity areas, access roads, or haul routes; farther for drainage features; 100 to 200 feet in streams.

2 - Uninfested 7th field watersheds are listed on Table A12-2 [*of FSEIS*] as those with at least 100 acres of POC stands, are at least 50% federal ownership, and are free of PL except within the lowermost 2 acres of the drainage.

3 - Appreciable additional risk does not mean "any risk." It means that a reasonable person would recognize risk, additional to existing uncontrollable risk, to believe mitigation is warranted and would make a cost-effective or important difference (see Risk Key Definitions and Examples for further discussion.)

Port Orford Cedar Risk Key Analysis for the Pickett West Project - Grants Pass RA

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

	QUESTION	Roads, Temp Routes, Tractor Swings, Operator Spurs, and Associated Landings																				
			35-7-27.1	35-7-33.4	TR 33-3	TR 33-2-A	35-7-33.5	TR 33-2-B	35-7-29	TR 29-5	35-7-28	35-7-29.6	TR 29-4-A	35-7-29.1	TR 29-4-B	TR 20-2-A	35-7-20	OS 20-2-A	OS 20-2-B	TR 20-2-C	TR 20-2-B	35-7-33.1
1a.	Are there uninfected POC within, near[1], or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives?		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1b.	Are there uninfected POC within, near[1], or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurable contributes to meeting land and resource management plan objectives?		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1c.	Is the activity area within an uninfested 7th field watershed[2] as defined in Alternative 6		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
			If the answer to all three questions, 1a, 1b, and 1c, is no, then risk is low and no POC management practices would be required.																			
	If the answer to any of the three questions is yes, continue.																					
2.	Will the proposed project introduce appreciable additional risk[3] of infection to these uninfected POC?		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	If yes, apply management practices from the list below [within FSEIS] to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfected POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through practicable and cost-effective treatments or design changes, the project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

1 - In questions 1a and 1b, "near" generally means within 25 to 50 feet downslope or 25 feet upslope from management activity areas, access roads, or haul routes; farther for drainage features; 100 to 200 feet in streams.

2 - Uninfested 7th field watersheds are listed on Table A12-2 [*of FSEIS*] as those with at least 100 acres of POC stands, are at least 50% federal ownership, and are free of PL except within the lowermost 2 acres of the drainage.

3 - Appreciable additional risk does not mean "any risk." It means that a reasonable person would recognize risk, additional to existing uncontrollable risk, to believe mitigation is warranted and would make a cost-effective or important difference (see Risk Key Definitions and Examples for further discussion.)

Port Orford Cedar Risk Key Analysis for the Pickett West Project - Grants Pass RA

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

	QUESTION		Roads, Temp Routes, Tractor Swings, Operator Spurs, and Associated Landings																			
			TS 31-8	TR 31-5-A	TR 31-5-B	TR 31-5-C	TR 32-1	TR 30-2-A	TR 30-2-B	TR 31-6	River Banks Road	Griffin Road	36-7-11	TR 3-4	Savage Creek Road	37-5-1	TR 15-11	37-5-13	TR 13-8	37-4-18.3	37-4-4.1	TR 18-1-A
1a.	Are there uninfected POC within, near[1], or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives?		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1b.	Are there uninfected POC within, near[1], or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurable contributes to meeting land and resource management plan objectives?		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1c.	Is the activity area within an uninfested 7th field watershed[2] as defined in Alternative 6		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
			If the answer to all three questions, 1a, 1b, and 1c, is no, then risk is low and no POC management practices would be required.																			
	If the answer to any of the three questions is yes, continue.																					
2.	Will the proposed project introduce appreciable additional risk[3] of infection to these uninfected POC?		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	If yes, apply management practices from the list below [within FSEIS] to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfected POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through practicable and cost-effective treatments or design changes, the project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

1 - In questions 1a and 1b, "near" generally means within 25 to 50 feet downslope or 25 feet upslope from management activity areas, access roads, or haul routes; farther for drainage features; 100 to 200 feet in streams.

2 - Uninfested 7th field watersheds are listed on Table A12-2 [*of FSEIS*] as those with at least 100 acres of POC stands, are at least 50% federal ownership, and are free of PL except within the lowermost 2 acres of the drainage.

3 - Appreciable additional risk does not mean "any risk." It means that a reasonable person would recognize risk, additional to existing uncontrollable risk, to believe mitigation is warranted and would make a cost-effective or important difference (see Risk Key Definitions and Examples for further discussion.)

Port Orford Cedar Risk Key Analysis for the Pickett West Project - Grants Pass RA

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

	QUESTION		Roads, Temp Routes, Tractor Swings, Operator Spurs, and Associated Landings																			
			37-4-17.3	TR 18-1-B	TR 13-9	OS 13-9	37-5-25	TR 17-5	37-4-17.4	37-4-9.1	37-4-17.2	37-4-21.4	TR 20-5	37-4-15	37-4-21.2	TS 21-13	37-4-28.4	37-4-28	37-4-27.4	37-4-27.1	37-4-22	Right Fk Foots Creek Road
1a.	Are there uninfected POC within, near[1], or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives?		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1b.	Are there uninfected POC within, near[1], or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurable contributes to meeting land and resource management plan objectives?		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1c.	Is the activity area within an uninfested 7th field watershed[2] as defined in Alternative 6		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
			If the answer to all three questions, 1a, 1b, and 1c, is no, then risk is low and no POC management practices would be required.																			
	If the answer to any of the three questions is yes, continue.																					
2.	Will the proposed project introduce appreciable additional risk[3] of infection to these uninfected POC?		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	If yes, apply management practices from the list below [within FSEIS] to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfected POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through practicable and cost-effective treatments or design changes, the project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

1 - In questions 1a and 1b, "near" generally means within 25 to 50 feet downslope or 25 feet upslope from management activity areas, access roads, or haul routes; farther for drainage features; 100 to 200 feet in streams.

2 - Uninfested 7th field watersheds are listed on Table A12-2 [*of FSEIS*] as those with at least 100 acres of POC stands, are at least 50% federal ownership, and are free of PL except within the lowermost 2 acres of the drainage.

3 - Appreciable additional risk does not mean "any risk." It means that a reasonable person would recognize risk, additional to existing uncontrollable risk, to believe mitigation is warranted and would make a cost-effective or important difference (see Risk Key Definitions and Examples for further discussion.)

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

	QUESTION		Foots Creek Road	Birdseye Creek Road	37-5-14	37-5-14.2	37-5-23.1	Williams Highway 238	P37-5-21	Southside Road	TR 23-6	37-6-15	37-6-22.1	37-6-14	37-6-22	New Hope Road	37-6-28	TR 17-1	37-6-17	Fir Canyon Road	Cheney Creek Road	TR 13-2
			Roads, Temp Routes, Tractor Swings, Operator Spurs, and Associated Landings																			
1a.	Are there uninfected POC within, near[1], or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives?		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1b.	Are there uninfected POC within, near[1], or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurable contributes to meeting land and resource management plan objectives?		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1c.	Is the activity area within an uninfested 7[th] field watershed[2] as defined in Alternative 6		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
			If the answer to all three questions, 1a, 1b, and 1c, is no, then risk is low and no POC management practices would be required.																			
	If the answer to any of the three questions is yes, continue.																					
2.	Will the proposed project introduce appreciable additional risk[3] of infection to these uninfected POC?		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	If yes, apply management practices from the list below [within FSEIS] to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfected POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through practicable and cost-effective treatments or design changes, the project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

1 - In questions 1a and 1b, "near" generally means within 25 to 50 feet downslope or 25 feet upslope from management activity areas, access roads, or haul routes; farther for drainage features; 100 to 200 feet in streams.

2 - Uninfested 7th field watersheds are listed on Table A12-2 [*of FSEIS*] as those with at least 100 acres of POC stands, are at least 50% federal ownership, and are free of PL except within the lowermost 2 acres of the drainage.

3 - Appreciable additional risk does not mean "any risk." It means that a reasonable person would recognize risk, additional to existing uncontrollable risk, to believe mitigation is warranted and would make a cost-effective or important difference (see Risk Key Definitions and Examples for further discussion.)

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

	QUESTION	Roads, Temp Routes, Tractor Swings, Operator Spurs, and Associated Landings																			
		OS 13-2	37-7-13	37-7-13.1	Old Redwood Highway	37-6-6	TS 7-3	37-6-7	TR 7-3	36-7-25	Crickett Lane	Yearly Way	Weekly Drive	Daily Lane	Marcy Loop	River Banks Road (260)	Dutcher Creek Road	36-7-22	36-7-23	TR 23-1	36-7-27
1a.	Are there uninfected POC within, near[1], or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1b.	Are there uninfected POC within, near[1], or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurable contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1c.	Is the activity area within an uninfested 7th field watershed[2] as defined in Alternative 6	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
		If the answer to all three questions, 1a, 1b, and 1c, is no, then risk is low and no POC management practices would be required.																			
	If the answer to any of the three questions is yes, continue.																				
2.	Will the proposed project introduce appreciable additional risk[3] of infection to these uninfected POC?	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	If yes, apply management practices from the list below [within FSEIS] to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfected POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through practicable and cost-effective treatments or design changes, the project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

1 - In questions 1a and 1b, "near" generally means within 25 to 50 feet downslope or 25 feet upslope from management activity areas, access roads, or haul routes; farther for drainage features; 100 to 200 feet in streams.

2 - Uninfested 7th field watersheds are listed on Table A12-2 [*of FSEIS*] as those with at least 100 acres of POC stands, are at least 50% federal ownership, and are free of PL except within the lowermost 2 acres of the drainage.

3 - Appreciable additional risk does not mean "any risk." It means that a reasonable person would recognize risk, additional to existing uncontrollable risk, to believe mitigation is warranted and would make a cost-effective or important difference (see Risk Key Definitions and Examples for further discussion.)

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	QUESTION		36-7-27.1	TS 27-8	TS 27-7	36-7-27.3	TR 35-1	TR 35-2	36-7-27.2	TR 27-9-A	TR 27-9-B	TR 27-9-C	36-7-33	NF-620	NF-018	NF-2200	Waters Creek Road	37-7-10	37-7-15.2	37-7-15.4	37-7-16.2	37-7-16
			Roads, Temp Routes, Tractor Swings, Operator Spurs, and Associated Landings																			
1a.	Are there uninfected POC within, near[1], or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives?		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1b.	Are there uninfected POC within, near[1], or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurable contributes to meeting land and resource management plan objectives?		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1c.	Is the activity area within an uninfested 7th field watershed[2] as defined in Alternative 6		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
			If the answer to all three questions, 1a, 1b, and 1c, is no, then risk is low and no POC management practices would be required.																			
	If the answer to any of the three questions is yes, continue.																					
2.	Will the proposed project introduce appreciable additional risk[3] of infection to these uninfected POC?		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	If yes, apply management practices from the list below [within FSEIS] to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfected POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through practicable and cost-effective treatments or design changes, the project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

1 - In questions 1a and 1b, "near" generally means within 25 to 50 feet downslope or 25 feet upslope from management activity areas, access roads, or haul routes; farther for drainage features; 100 to 200 feet in streams.

2 - Uninfested 7th field watersheds are listed on Table A12-2 [*of FSEIS*] as those with at least 100 acres of POC stands, are at least 50% federal ownership, and are free of PL except within the lowermost 2 acres of the drainage.

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	QUESTION		TR 15-4-B	TR 15-4-A	37-7-15.3	TR 15-3	37-7-15	TR 21-4	37-7-21.4	37-7-21.2	TR 7-5-B	TR 7-5-A	37-7-14	Mooney Mountain Road	37-7-22	37-7-27.3	37-8-35.1	Circle W Drive	Corral Drive	Clear Creek Road	Pine Tree Way	38-8-2
			Roads, Temp Routes, Tractor Swings, Operator Spurs, and Associated Landings																			
1a.	Are there uninfected POC within, near[1], or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives?		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1b.	Are there uninfected POC within, near[1], or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurable contributes to meeting land and resource management plan objectives?		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1c.	Is the activity area within an uninfested 7[th] field watershed[2] as defined in Alternative 6		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
			If the answer to all three questions, 1a, 1b, and 1c, is no, then risk is low and no POC management practices would be required.																			
	If the answer to any of the three questions is yes, continue.																					
2.	Will the proposed project introduce appreciable additional risk[3] of infection to these uninfected POC?		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	If yes, apply management practices from the list below [within FSEIS] to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfected POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through practicable and cost-effective treatments or design changes, the project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

1 - In questions 1a and 1b, "near" generally means within 25 to 50 feet downslope or 25 feet upslope from management activity areas, access roads, or haul routes; farther for drainage features; 100 to 200 feet in streams.

2 - Uninfested 7th field watersheds are listed on Table A12-2 [*of FSEIS*] as those with at least 100 acres of POC stands, are at least 50% federal ownership, and are free of PL except within the lowermost 2 acres of the drainage.

3 - Appreciable additional risk does not mean "any risk." It means that a reasonable person would recognize risk, additional to existing uncontrollable risk, to believe mitigation is warranted and would make a cost-effective or important difference (see Risk Key Definitions and Examples for further discussion.)

Port Orford Cedar Risk Key Analysis for the Pickett West Project - Grants Pass RA

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

	QUESTION		Roads, Temp Routes, Tractor Swings, Operator Spurs, and Associated Landings																			
			TR 3-5-D	38-8-3	TR 3-5-A	TR 3-5-B	TS 3-5	TR 3-5-C	Deer Creek Road	Crooks Creek Road	37-7-34.1	TR 33-8-A	37-7-33	TR 33-8-B	37-7-33.1	37-7-33.4	TR 33-8-C	37-7-33.2	37-7-33.3	OS 33-5-A	OS 33-5-B	37-7-34
1a.	Are there uninfected POC within, near[1], or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives?		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1b.	Are there uninfected POC within, near[1], or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurable contributes to meeting land and resource management plan objectives?		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1c.	Is the activity area within an uninfested 7th field watershed[2] as defined in Alternative 6		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
			If the answer to all three questions, 1a, 1b, and 1c, is no, then risk is low and no POC management practices would be required.																			
	If the answer to any of the three questions is yes, continue.																					
2.	Will the proposed project introduce appreciable additional risk[3] of infection to these uninfected POC?		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	If yes, apply management practices from the list below [within FSEIS] to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfected POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through practicable and cost-effective treatments or design changes, the project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

1 - In questions 1a and 1b, "near" generally means within 25 to 50 feet downslope or 25 feet upslope from management activity areas, access roads, or haul routes; farther for drainage features; 100 to 200 feet in streams.

2 - Uninfested 7th field watersheds are listed on Table A12-2 [*of FSEIS*] as those with at least 100 acres of POC stands, are at least 50% federal ownership, and are free of PL except within the lowermost 2 acres of the drainage.

3 - Appreciable additional risk does not mean "any risk." It means that a reasonable person would recognize risk, additional to existing uncontrollable risk, to believe mitigation is warranted and would make a cost-effective or important difference (see Risk Key Definitions and Examples for further discussion.)

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

	QUESTION		37-7-35.5	TS 34-3	38-7-3	38-7-3.1	38-7-3.2	38-7-15	38-7-11.4	OS 11-11	38-7-11	38-7-11.2	TS 11-7	OS 11-7	TR 3-8	Lakeshore Drive	Dryden Road	38-7-16	38-7-15.2	38-7-22.1	TS 21-11	Thompson Creek Road
			Roads, Temp Routes, Tractor Swings, Operator Spurs, and Associated Landings																			
1a.	Are there uninfected POC within, near[1], or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives?		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1b.	Are there uninfected POC within, near[1], or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurable contributes to meeting land and resource management plan objectives?		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1c.	Is the activity area within an uninfested 7th field watershed[2] as defined in Alternative 6		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
			If the answer to all three questions, 1a, 1b, and 1c, is no, then risk is low and no POC management practices would be required.																			
	If the answer to any of the three questions is yes, continue.																					
2.	Will the proposed project introduce appreciable additional risk[3] of infection to these uninfected POC?		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	If yes, apply management practices from the list below [within FSEIS] to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfected POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through practicable and cost-effective treatments or design changes, the project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

1 - In questions 1a and 1b, "near" generally means within 25 to 50 feet downslope or 25 feet upslope from management activity areas, access roads, or haul routes; farther for drainage features; 100 to 200 feet in streams.

2 - Uninfested 7th field watersheds are listed on Table A12-2 [*of FSEIS*] as those with at least 100 acres of POC stands, are at least 50% federal ownership, and are free of PL except within the lowermost 2 acres of the drainage.

3 - Appreciable additional risk does not mean "any risk." It means that a reasonable person would recognize risk, additional to existing uncontrollable risk, to believe mitigation is warranted and would make a cost-effective or important difference (see Risk Key Definitions and Examples for further discussion.)

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

	QUESTION	Roads, Temp Routes, Tractor Swings, Operator Spurs, and Associated Landings																			
		38-7-21.2	38-7-21.3	38-7-22	TR 21-12	38-7-21.4	38-7-21.5	TS 21-8	38-7-17	TR 17-2-A	38-7-17.1	TR 17-2-B	38-7-27.2	38-7-13	38-6-18	38-7-26	38-7-23.3	38-7-25.3	38-7-26.1	TS 26-2	38-7-35
1a.	Are there uninfected POC within, near[1], or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1b.	Are there uninfected POC within, near[1], or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurable contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1c.	Is the activity area within an uninfested 7[th] field watershed[2] as defined in Alternative 6	no	no	no	no	no	no	no	no	no	no	no	no	yes**	yes**	no	no	no	no	no	no
		If the answer to all three questions, 1a, 1b, and 1c, is no, then risk is low and no POC management practices would be required.																			
	If the answer to any of the three questions is yes, continue.																				
2.	Will the proposed project introduce appreciable additional risk[3] of infection to these uninfected POC?	---	---	---	---	---	---	---	---	---	---	---	---	no	no	---	---	---	---	---	---
	If yes, apply management practices from the list below [within FSEIS] to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfected POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through practicable and cost-effective treatments or design changes, the project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

1 - In questions 1a and 1b, "near" generally means within 25 to 50 feet downslope or 25 feet upslope from management activity areas, access roads, or haul routes; farther for drainage features; 100 to 200 feet in streams.

2 - Uninfested 7th field watersheds are listed on Table A12-2 [*of FSEIS*] as those with at least 100 acres of POC stands, are at least 50% federal ownership, and are free of PL except within the lowermost 2 acres of the drainage.

3 - Appreciable additional risk does not mean "any risk." It means that a reasonable person would recognize risk, additional to existing uncontrollable risk, to believe mitigation is warranted and would make a cost-effective or important difference (see Risk Key Definitions and Examples for further discussion.)

** - A segment of the road is in an uninfested 7th field watershed as mapped for the EIS. The road is surfaced and there are no mapped populations of POC (healthy or diseased) beyond where the road goes through the 7th field watershed.

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

	QUESTION		Roads, Temp Routes, Tractor Swings, Operator Spurs, and Associated Landings																			
			TS 35-9	38-7-35.1	TR 35-9	38-7-34	38-7-27	39-7-3	39-7-2	TR 35-10	TS 35-1-A	TS 35-1-B	39-7-3.3	39-7-3.2	39-7-9.1	39-7-3.4	39-7-3.7	39-7-3.6	TR 3-11	38-7-33	39-7-4.1	TS 4-1
1a.	Are there uninfected POC within, near[1], or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives?		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1b.	Are there uninfected POC within, near[1], or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurable contributes to meeting land and resource management plan objectives?		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1c.	Is the activity area within an uninfested 7^{th} field watershed[2] as defined in Alternative 6		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
			If the answer to all three questions, 1a, 1b, and 1c, is no, then risk is low and no POC management practices would be required.																			
	If the answer to any of the three questions is yes, continue.																					
2.	Will the proposed project introduce appreciable additional risk[3] of infection to these uninfected POC?		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	If yes, apply management practices from the list below [within FSEIS] to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfected POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through practicable and cost-effective treatments or design changes, the project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

1 - In questions 1a and 1b, "near" generally means within 25 to 50 feet downslope or 25 feet upslope from management activity areas, access roads, or haul routes; farther for drainage features; 100 to 200 feet in streams.

2 - Uninfested 7th field watersheds are listed on Table A12-2 [*of FSEIS*] as those with at least 100 acres of POC stands, are at least 50% federal ownership, and are free of PL except within the lowermost 2 acres of the drainage.

3 - Appreciable additional risk does not mean "any risk." It means that a reasonable person would recognize risk, additional to existing uncontrollable risk, to believe mitigation is warranted and would make a cost-effective or important difference (see Risk Key Definitions and Examples for further discussion.)

	QUESTION		Roads, Temp Routes, Tractor Swings, Operator Spurs, and Associated Landings																			
			39-7-9.3	39-7-4.2	TR 4-1	39-7-9.2	TR 9-5A	39-7-9.6	39-7-9.7	39-7-21	McMullen Creek Road	38-7-19	39-8-3	38-7-31.4	TR 31-11	38-7-31	39-7-8.3	TR 9-5-B	39-7-8.4	39-7-8	39-7-8.1	38-7-31.2
1a.	Are there uninfected POC within, near[1], or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives?		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1b.	Are there uninfected POC within, near[1], or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurable contributes to meeting land and resource management plan objectives?		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1c.	Is the activity area within an uninfested 7th field watershed[2] as defined in Alternative 6		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
			If the answer to all three questions, 1a, 1b, and 1c, is no, then risk is low and no POC management practices would be required.																			
	If the answer to any of the three questions is yes, continue.																					
2.	Will the proposed project introduce appreciable additional risk[3] of infection to these uninfected POC?		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	If yes, apply management practices from the list below [within FSEIS] to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfected POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through practicable and cost-effective treatments or design changes, the project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

1 - In questions 1a and 1b, "near" generally means within 25 to 50 feet downslope or 25 feet upslope from management activity areas, access roads, or haul routes; farther for drainage features; 100 to 200 feet in streams.

2 - Uninfested 7th field watersheds are listed on Table A12-2 [*of FSEIS*] as those with at least 100 acres of POC stands, are at least 50% federal ownership, and are free of PL except within the lowermost 2 acres of the drainage.

3 - Appreciable additional risk does not mean "any risk." It means that a reasonable person would recognize risk, additional to existing uncontrollable risk, to believe mitigation is warranted and would make a cost-effective or important difference (see Risk Key Definitions and Examples for further discussion.)

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

	QUESTION	Roads, Temp Routes, Tractor Swings, Operator Spurs, and Associated Landings																				
			Reeves Creek Road	38-8-13	38-8-13.4	TR 13-4-B	TR 13-4-A	38-8-13.1	TS 13-3	38-8-27	38-8-23	TR 23-3-B	TR 23-3-A	38-8-23.1	38-8-23.5	TR 23-4	38-8-23.6	34-7-27	34-7-29.2	34-7-34.1	35-7-28.1	TR HELI-A
1a.	Are there uninfected POC within, near[1], or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives?		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1b.	Are there uninfected POC within, near[1], or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurable contributes to meeting land and resource management plan objectives?		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1c.	Is the activity area within an uninfested 7[th] field watershed[2] as defined in Alternative 6		no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
			If the answer to all three questions, 1a, 1b, and 1c, is no, then risk is low and no POC management practices would be required.																			
	If the answer to any of the three questions is yes, continue.																					
2.	Will the proposed project introduce appreciable additional risk[3] of infection to these uninfected POC?		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	If yes, apply management practices from the list below [within FSEIS] to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfected POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through practicable and cost-effective treatments or design changes, the project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

1 - In questions 1a and 1b, "near" generally means within 25 to 50 feet downslope or 25 feet upslope from management activity areas, access roads, or haul routes; farther for drainage features; 100 to 200 feet in streams.

2 - Uninfested 7th field watersheds are listed on Table A12-2 [*of FSEIS*] as those with at least 100 acres of POC stands, are at least 50% federal ownership, and are free of PL except within the lowermost 2 acres of the drainage.

3 - Appreciable additional risk does not mean "any risk." It means that a reasonable person would recognize risk, additional to existing uncontrollable risk, to believe mitigation is warranted and would make a cost-effective or important difference (see Risk Key Definitions and Examples for further discussion.)

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

	QUESTION	Roads, Temp Routes, Tractor Swings, Operator Spurs, and Associated Landings																		
		35-7-8	37-4-4	37-4-18.2	37-5-14.1	37-6-22.2	38-7-3.4	38-7-17.2	38-7-23.1	38-7-26.2	TR 7-1-B	TR 1-1-B	TR 22-1	TR 22-4	OS 23-1-A	OS 23-1-B	TR 35-1	OS 21-5-A	OS 21-5-B	TR 3-8
1a.	Are there uninfected POC within, near[1], or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1b.	Are there uninfected POC within, near[1], or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurable contributes to meeting land and resource management plan objectives?	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
1c.	Is the activity area within an uninfested 7[th] field watershed[2] as defined in Alternative 6	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
		If the answer to all three questions, 1a, 1b, and 1c, is no, then risk is low and no POC management practices would be required.																		
	If the answer to any of the three questions is yes, continue.																			
2.	Will the proposed project introduce appreciable additional risk[3] of infection to these uninfected POC?	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	If yes, apply management practices from the list below [within FSEIS] to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfected POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through practicable and cost-effective treatments or design changes, the project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

1 - In questions 1a and 1b, "near" generally means within 25 to 50 feet downslope or 25 feet upslope from management activity areas, access roads, or haul routes; farther for drainage features; 100 to 200 feet in streams.

2 - Uninfested 7th field watersheds are listed on Table A12-2 [*of FSEIS*] as those with at least 100 acres of POC stands, are at least 50% federal ownership, and are free of PL except within the lowermost 2 acres of the drainage.

3 - Appreciable additional risk does not mean "any risk." It means that a reasonable person would recognize risk, additional to existing uncontrollable risk, to believe mitigation is warranted and would make a cost-effective or important difference (see Risk Key Definitions and Examples for further discussion.)

Note: Pickett West units, roads, temp routes, tractor swings, operator spurs, and associated landings were assessed for the need for POC measures through two methods, on a unit by unit basis as well as visually on a map.

Appendix H Road Work and Use Table

Road Work Activities	Road Number/Unit Access	Surface Type	All weather Surfacing Present	Alternative 2 Miles	Alternative 2 Season of Use	Alternative 3 Miles	Alternative 3 Season of Use
New Temporary Route Construction **(Fully decommission after use: Block, rip, water bar, seed and mulch)** **All season use authorized if adequate crushed rock surface applied. If not use would be restricted to the in stream work window, generally July 1st to September 15th.*	TR-7-1-A / 7-1	Natural	None	0.052	In Stream*	N/A	N/A
	TR-7-1-B / 7-1	Natural	None	0.039	In Stream*	N/A	N/A
	TR-7-2-A / 7-2	Natural	None	0.575	In Stream*	N/A	N/A
	TR-7-2-B / 7-2	Natural	None	0.065	In Stream*	N/A	N/A
	TR 21-1 / 21-1	Natural	None	0.098	In Stream*	N/A	N/A
	TR 29-1-A / 29-2	Natural	None	0.160	In Stream*	N/A	N/A
	TR 29-1-C / 29-1	Natural	None	0.038	In Stream*	N/A	N/A
	TR 29-1-D / 29-1	Natural	None	0.039	In Stream*	N/A	N/A
	TR 31-1 / 31-1	Natural	None	0.279	In Stream*	N/A	N/A
	TR 5-1-A / 5-1	Natural	None	0.289	In Stream*	N/A	N/A
	TR 5-1-B / 5-1	Natural	None	0.281	In Stream*	N/A	N/A
	TR 1-1-A / 1-1	Natural	None	0.087	In Stream*	N/A	N/A
	TR 1-1-B / 1-1	Natural	None	0.042	In Stream*	N/A	N/A
	OS 1-1 / 1-1	Natural	None	0.026	In Stream*	N/A	N/A
	TR 3-1-A / 3-1	Natural	None	0.098	In Stream*	N/A	N/A
	TR 3-1-B / 3-1	Natural	None	0.043	In Stream*	N/A	N/A
	TR 3-2 / 3-2	Natural	None	0.192	In Stream*	N/A	N/A
	OS 9-2 / 9-2	Natural	None	0.024	In Stream*	N/A	N/A
	TR 10-1 / 10-1	Natural	None	0.544	In Stream*	N/A	N/A
	TR 20-2-A / 20-2	Natural	None	0.108	In Stream*	N/A	N/A
	TR 20-2-B / 20-2	Natural	None	0.043	In Stream*	N/A	N/A
	OS 20-2-A / 20-2	Natural	None	0.035	In Stream*	N/A	N/A
	OS 20-2-B / 20-2	Natural	None	0.028	In Stream*	N/A	N/A
	TR 22-1 / 22-1	Natural	None	0.053	In Stream*	N/A	N/A
	TR 27-1-A / 27-1	Natural	None	0.054	In Stream*	N/A	N/A
	TR 28-5-A / 28-5	Natural	None	0.041	In Stream*	N/A	N/A
	TR HELI-A / HELI-A	Natural	None	0.065	In Stream*	N/A	N/A
	TR 29-4-B / 29-4	Natural	None	0.123	In Stream*	N/A	N/A
	TR 30-2-B / 30-2	Natural	None	0.066	In Stream*	N/A	N/A
	TR 31-5-A / 31-5	Natural	None	0.128	In Stream*	N/A	N/A
	TR 31-5-B / 31-5	Natural	None	0.074	In Stream*	N/A	N/A
	TR 31-5-C / 31-5	Natural	None	0.244	In Stream*	N/A	N/A

Road Work Activities	Road Number/Unit Access	Surface Type	All weather Surfacing Present	Alternative 2 Miles	Alternative 2 Season of Use	Alternative 3 Miles	Alternative 3 Season of Use
	TR 31-6 / 31-6	Natural	None	0.390	In Stream*	N/A	N/A
	TR 33-2-A / 33-2	Natural	None	0.154	In Stream*	N/A	N/A
	TR 33-2-B / 33-2	Natural	None	0.085	In Stream*	N/A	N/A
	TR 33-3 / 33-3	Natural	None	0.095	In Stream*	N/A	N/A
	TR 3-4 / 3-4	Natural	None	0.126	In Stream*	N/A	N/A
	OS 23-1-A / 23-1	Natural	None	0.025	In Stream*	N/A	N/A
	OS 23-1-B / 23-1	Natural	None	0.026	In Stream*	N/A	N/A
	TR 27-9-A / 27-9	Natural	None	0.350	In Stream*	N/A	N/A
	TR 27-9-B / 27-9	Natural	None	0.067	In Stream*	N/A	N/A
	TR 27-9-C / 27-9	Natural	None	0.130	In Stream*	N/A	N/A
	TR 35-1 / 35-1	Natural	None	0.263	In Stream*	N/A	N/A
	TR 17-5 / 17-5	Natural	None	0.117	In Stream*	N/A	N/A
	TR 18-1-B / 18-1	Natural	None	0.039	In Stream*	N/A	N/A
	TR 13-9 / 13-9	Natural	None	0.188	In Stream*	N/A	N/A
	OS 13-9 / 13-9	Natural	None	0.018	In Stream*	N/A	N/A
	TR 20-5 / 20-5	Natural	None	0.396	In Stream*	N/A	N/A
	TR 13-8 / 13-8	Natural	None	0.891	In Stream*	N/A	N/A
	TR 15-11 / 15-11	Natural	None	0.844	In Stream*	N/A	N/A
	TR 7-3 / 7-3	Natural	None	0.096	In Stream*	N/A	N/A
	TR 17-1 / 17-1	Natural	None	0.076	In Stream*	N/A	N/A
	TR 23-6 / 23-6	Natural	None	1.046	In Stream*	N/A	N/A
	TR 7-5-A / 7-5	Natural	None	0.332	In Stream*	N/A	N/A
	TR 7-5-B / 7-5	Natural	None	0.377	In Stream*	N/A	N/A
	OS 13-2 / 13-2	Natural	None	0.019	In Stream*	N/A	N/A
	OS 21-5-A / 21-5	Natural	None	0.027	In Stream*	N/A	N/A
	OS 21-5-B / 21-5	Natural	None	0.023	In Stream*	N/A	N/A
	TR 22-4 / 22-4	Natural	None	0.062	In Stream*	N/A	N/A
	TR 33-8-A / 33-8	Natural	None	0.072	In Stream*	N/A	N/A
	TR 33-8-B / 33-8	Natural	None	0.120	In Stream*	N/A	N/A
	OS 33-5-A / 33-5	Natural	None	0.022	In Stream*	N/A	N/A
	OS 33-5-B / 33-5	Natural	None	0.028	In Stream*	N/A	N/A
	TR 3-5-A / 3-5	Natural	None	0.110	In Stream*	N/A	N/A
	TR 3-8 / 3-8	Natural	None	0.067	In Stream*	N/A	N/A

Road Work Activities	Road Number/Unit Access	Surface Type	All weather Surfacing Present	Alternative 2 Miles	Alternative 2 Season of Use	Alternative 3 Miles	Alternative 3 Season of Use
	OS 11-11 / 11-1	Natural	None	0.028	In Stream*	N/A	N/A
	TR 17-2-A / 17-2	Natural	None	0.040	In Stream*	N/A	N/A
	TR 17-2-B / 17-2	Natural	None	0.050	In Stream*	N/A	N/A
	TR 31-11 / 31-11	Natural	None	0.200	In Stream*	N/A	N/A
	TR 35-10 / 35-10	Natural	None	0.083	In Stream*	N/A	N/A
	TR 35-9 / 35-9	Natural	None	0.042	In Stream*	N/A	N/A
	TR 3-5-B / 3-5	Natural	None	0.650	In Stream*	N/A	N/A
	TR 3-5-C / 3-5	Natural	None	0.406	In Stream*	N/A	N/A
	TR 3-5-D / 3-5	Natural	None	0.156	In Stream*	N/A	N/A
	TR 13-4-A / 13-4	Natural	None	0.085	In Stream*	N/A	N/A
	TR 13-4-B / 13-4	Natural	None	0.101	In Stream*	N/A	N/A
	TR 23-3-A / 23-3	Natural	None	0.140	In Stream*	N/A	N/A
	TR 23-3-B / 23-3	Natural	None	0.144	In Stream*	N/A	N/A
	TR 23-4 / 23-4	Natural	None	0.051	In Stream*	N/A	N/A
	TR 4-1 / 4-1	Natural	None	0.110	In Stream*	N/A	N/A
	TR 9-5-A / 9-5	Natural	None	0.151	In Stream*	N/A	N/A
	TR 9-5-B / 9-5	Natural	None	0.136	In Stream*	N/A	N/A
	TR 3-11 / 3-11	Natural	None	0.161	In Stream*	N/A	N/A
Existing Temporary Route Renovation/Reconstruction **(Fully decommission after use: Block, rip, water bar, seed and mulch)** **All season use authorized if adequate crushed rock surface applied. If not use would be restricted to the in stream work window, generally July 1st to September 15th.*	TR-7-2-A / 7-2	Natural	None	0.097	In Stream*	0.097	In Stream*
	TR 29-1-A / 29-1	Natural	None	0.206	In Stream*	0.206	In Stream*
	TR 29-1-B / 29-1	Natural	None	0.291	In Stream*	0.084	In Stream*
	TR 1-1-A / 1-1	Natural	None	0.058	In Stream*	N/A	N/A
	TR 11-5 / 11-5	Natural	None	0.362	In Stream*	0.362	In Stream*
	TR 20-2-C / 20-2	Natural	None	0.239	In Stream*	0.239	In Stream*
	TR 28-5-A / 28-5	Natural	None	0.095	In Stream*	0.095	In Stream*
	TR 28-5-B / 28-5	Natural	None	0.076	In Stream*	0.076	In Stream*
	TR 27-1-B / 27-1	Natural	None	0.222	In Stream*	0.222	In Stream*
	TR 29-4-A / 29-4	Natural	None	0.472	In Stream*	0.472	In Stream*
	TR 32-1 / 32-1	Natural	None	0.292	In Stream*	0.292	In Stream*
	TR 30-2-A / 30-2 & 31-4	Natural	None	0.924	In Stream*	0.924	In Stream*
	TR 23-1 / 23-1	Natural	None	0.317	In Stream*	0.317	In Stream*

Road Work Activities	Road Number/Unit Access	Surface Type	All weather Surfacing Present	Alternative 2 Miles	Alternative 2 Season of Use	Alternative 3 Miles	Alternative 3 Season of Use
	TR 35-2 / 35-2	Natural	None	0.227	In Stream*	0.227	In Stream*
	TR 18-1-A / 18-1	Natural	None	0.236	In Stream*	N/A	N/A
	TR 18-1-B / 18-1	Natural	None	0.104	In Stream*	0.104	In Stream*
	TR 13-9 / 13-9	Natural	None	0.611	In Stream*	0.611	In Stream*
	TR 17-1 / 17-1	Natural	None	0.383	In Stream*	0.383	In Stream*
	TR 13-2 / 13-2	Natural	None	0.226	In Stream*	0.226	In Stream*
	TR 15-4-A / 15-4	Natural	None	0.185	In Stream*	0.185	In Stream*
	TR 15-4-B / 15-4	Natural	None	0.088	In Stream*	0.088	In Stream*
	TR 15-3 / 15-3	Natural	None	0.141	In Stream*	0.141	In Stream*
	TR 21-4 / 21-4	Natural	None	0.358	In Stream*	0.358	In Stream*
	TR 33-8-B / 33-8	Natural	None	0.137	In Stream*	0.137	In Stream*
	TR 33-8-C / 33-8	Natural	None	0.428	In Stream*	0.428	In Stream*
	TR 3-8 / 3-8	Natural	None	0.146	In Stream*	N/A	N/A
	OS 11-7 / 11-7	Natural	None	0.034	In Stream*	N/A	N/A
	TR 21-12 / 21-12	Natural	None	0.225	In Stream*	0.225	In Stream*
	TR 35-9 / 35-9	Natural	None	0.273	In Stream*	N/A	N/A
	TR 3-5-D / 3-5	Natural	None	1.095	In Stream*	N/A	N/A
Maintenance & Haul **All season use authorized if adequate crushed rock surface applied. If not use would be restricted to the in stream work window, generally July 1st to September 15th.*	34-7-2.0, A	Aggregate	Yes	0.59	All Season	0.59	All Season
	34-7-3.0, A1-A2	Aggregate	Yes	2.05	All Season	2.05	All Season
	34-7-3.1, A-F	Aggregate	Yes	6.24	All Season	6.24	All Season
	34-7-7.1	Aggregate	Yes	0.94	All Season	0.94	All Season
	34-7-7.2	Natural	No	0.15	In Stream*	0.15	In Stream*
	34-7-21.4, A	Aggregate	Yes	0.29	All Season	0.29	All Season
	34-7-21.4, B-C	Natural	No	0.63	In Stream*	0.63	In Stream*
	34-7-21.6, A-C	Aggregate	Yes	2.86	All Season	2.86	All Season
	34-7-22.0, A-C	Aggregate	Yes	1.52	All Season	1.52	All Season
	34-7-26.1, A-C1	Aggregate	Yes	1.25	All Season	1.25	All Season
	34-7-26.1, C2-E	Natural	No	1.76	In Stream*	1.76	In Stream*
	34-7-28.0	Natural	No	1.15	In Stream*	1.15	In Stream*
	34-7-29.2	Natural	No	2.13	In Stream*	1.15	In Stream*
	34-7-30.0	Natural	No	0.59	In Stream*	0.59	In Stream*
	34-7-30.1	Natural	No	0.10	In Stream*	0.10	In Stream*

Road Work Activities	Road Number/Unit Access	Surface Type	All weather Surfacing Present	Alternative 2 Miles	Alternative 2 Season of Use	Alternative 3 Miles	Alternative 3 Season of Use
	34-7-30.2	Natural	No	0.27	In Stream*	0.27	In Stream*
	34-7-32.0	Natural	No	0.14	In Stream*	0.14	In Stream*
	34-7-33.0, A	Aggregate	Yes	1.22	All Season	1.22	All Season
	34-7-33.1	Natural	No	0.68	In Stream*	0.68	In Stream*
	34-7-34.1	Natural	No	0.49	In Stream*	0.49	In Stream*
	35-7-1.0, A	Natural	No	0.46	In Stream*	0.46	In Stream*
	35-7-1.4	Natural	No	0.49	In Stream*	0.49	In Stream*
	35-7-1.5	Natural	No	0.49	In Stream*	0.49	In Stream*
	35-7-1.6	Natural	No	0.36	In Stream*	0.36	In Stream*
	35-7-3.0	Natural	No	0.12	In Stream*	0.08	In Stream*
	35-7-4.1, A	Bituminous	Yes	1.57	All Season	1.57	All Season
	35-7-4.1, B	Aggregate	Yes	0.92	All Season	0.92	All Season
	35-7-4.2, A-D	Aggregate	Yes	3.31	All Season	3.31	All Season
	35-7-4.2, E-H	Natural	No	4.39	In Stream*	4.39	In Stream*
	35-7-5.0, A	Natural	No	0.52	In Stream*	0.52	In Stream*
	35-7-5.0, B-C	Natural	No	0.54	In Stream*	0.54	In Stream*
	35-7-5.1, A-B	Aggregate	Yes	1.45	All Season	1.45	All Season
	35-7-11.0, A-C1	Bituminous	Yes	6.52	All Season	6.52	All Season
	35-7-11.0, C2	Aggregate	Yes	0.30	All Season	0.30	All Season
	35-7-11.1, A-C	Aggregate	Yes	2.81	All Season	2.81	All Season
	35-7-15.0, A-D	Natural	No	2.04	In Stream*	2.04	In Stream*
	35-7-15.1, A	Natural	No	0.31	In Stream*	0.31	In Stream*
	35-7-16.0	Natural	No	3.31	In Stream*	3.31	In Stream*
	35-7-20.0, A	Aggregate	Yes	0.56	All Season	0.56	All Season
	35-7-22.0	Natural	No	0.18	In Stream*	0.18	In Stream*
	35-7-22.1	Natural	No	1.05	In Stream*	1.05	In Stream*
	35-7-23.0	Natural	No	0.65	In Stream*	0.65	In Stream*
	35-7-27.0, A-B	Bituminous	Yes	1.44	All Season	1.44	All Season
	35-7-27.0, C-F	Aggregate	Yes	4.70	All Season	4.70	All Season
	35-7-27.1	Aggregate	Yes	0.75	All Season	0.75	All Season
	35-7-27.2, A	Aggregate	Yes	0.41	All Season	0.41	All Season
	35-7-27.2, B	Natural	No	0.44	In Stream*	0.44	In Stream*
	35-7-27.3, A	Aggregate	Yes	0.42	All Season	0.42	All Season

Road Work Activities	Road Number/Unit Access	Surface Type	All weather Surfacing Present	Alternative 2 Miles	Alternative 2 Season of Use	Alternative 3 Miles	Alternative 3 Season of Use
	35-7-27.3, B	Natural	No	2.75	In Stream*	2.75	In Stream*
	35-7-27.5, D	Natural	No	0.05	In Stream*	0.05	In Stream*
	35-7-27.7, A	Aggregate	Yes	1.04	All Season	1.04	All Season
	35-7-27.7, B-C	Natural	No	0.22	In Stream*	0.22	In Stream*
	35-7-27.8	Aggregate	Yes	0.40	All Season	0.40	All Season
	35-7-28.0, A-C	Aggregate	Yes	1.60	All Season	1.60	All Season
	35-7-28.1	Natural	No	0.10	In Stream*	0.10	In Stream*
	35-7-29.0, A	Bituminous	Yes	0.92	All Season	0.92	All Season
	35-7-29.1	Aggregate	Yes	0.24	All Season	0.24	All Season
	35-7-29.6	Aggregate	Yes	0.13	All Season	0.13	All Season
	35-7-33.1, A-C	Aggregate	Yes	3.05	All Season	3.05	All Season
	35-7-33.4	Aggregate	Yes	1.06	All Season	1.06	All Season
	35-7-33.5	Aggregate	Yes	0.49	All Season	0.49	All Season
	35-7-8.0	Natural	No	0.18	In Stream*	0.18	In Stream*
	36-7-11.0, A	Aggregate	Yes	0.15	All Season	0.15	All Season
	36-7-22.0, A-D	Natural	No	4.43	In Stream*	4.43	In Stream*
	36-7-23.0	Aggregate	Yes	0.91	All Season	0.91	All Season
	36-7-25.0	Natural	No	0.74	In Stream*	0.74	In Stream*
	34-7-27.0	Natural	No	2.66	In Stream*	2.66	In Stream*
	36-7-27.1	Natural	No	0.15	In Stream*	0.15	In Stream*
	36-7-27.2	Natural	No	0.94	In Stream*	0.94	In Stream*
	36-7-27.3	Natural	No	0.06	In Stream*	0.06	In Stream*
	36-7-33.0	Natural	No	2.23	In Stream*	2.23	In Stream*
	37-4-4.0, A	Aggregate	Yes	0.12	All Season	0.12	All Season
	37-4-4.1, A-E	Aggregate	Yes	4.82	All Season	4.82	All Season
	37-4-9.1, A1-A3	Aggregate	Yes	0.77	All Season	0.77	All Season
	37-4-15.0, A-C2	Aggregate	Yes	3.20	All Season	2.95	All Season
	37-4-15.0, C3	Natural	No	0.30	In Stream*	N/A	N/A
	37-4-17.2, A	Natural	No	0.84	In Stream*	0.84	In Stream*
	37-4-17.3, A-B	Natural	No	2.23	In Stream*	1.65	In Stream*
	37-4-17.4	Natural	No	0.21	In Stream*	0.21	In Stream*
	37-4-18.2	Natural	No	0.02	In Stream*	0.02	In Stream*
	37-4-21.4, A	Natural	No	0.87	In Stream*	N/A	N/A

Road Work Activities	Road Number/Unit Access	Surface Type	All weather Surfacing Present	Alternative 2 Miles	Alternative 2 Season of Use	Alternative 3 Miles	Alternative 3 Season of Use
	37-4-22.0, A1-B1	Aggregate	Yes	1.44	All Season	1.44	All Season
	37-4-27.1, A	Aggregate	Yes	0.82	All Season	0.82	All Season
	37-4-27.4, A1	Aggregate	Yes	0.10	All Season	0.10	All Season
	37-4-27.4, A2-B	Natural	No	0.24	In Stream*	0.24	In Stream*
	37-4-28.0	Natural	No	0.78	In Stream*	0.78	In Stream*
	37-4-28.4	Natural	No	0.17	In Stream*	0.17	In Stream*
	37-5-1.0, A-B1	Bituminous	Yes	1.28	All Season	1.28	All Season
	37-5-1.0, B2-H	Aggregate	Yes	5.45	All Season	5.45	All Season
	37-5-14.0, A-C	Aggregate	Yes	1.78	All Season	1.78	All Season
	37-5-14.1, A	Natural	No	0.02	In Stream*	0.02	In Stream*
	37-5-14.2	Natural	No	0.21	In Stream*	0.21	In Stream*
	37-5-23.1	Natural	No	0.92	In Stream*	0.92	In Stream*
	37-5-25.0, B	Natural	No	0.56	In Stream*	0.56	In Stream*
	37-6-6.0	Aggregate	Yes	0.97	All Season	0.97	All Season
	37-6-7.0	Aggregate	Yes	0.72	All Season	0.72	All Season
	37-6-14.0, C-D	Natural	No	0.37	In Stream*	0.37	In Stream*
	37-6-15.0, A-C	Natural	No	2.04	In Stream*	2.04	In Stream*
	37-6-17.0	Natural	No	0.06	In Stream*	0.06	In Stream*
	37-6-22.0	Natural	No	2.68	In Stream*	2.68	In Stream*
	37-6-22.1	Natural	No	0.45	In Stream*	0.45	In Stream*
	37-6-22.2	Natural	No	0.17	In Stream*	0.17	In Stream*
	37-6-28.0	Natural	No	0.95	In Stream*	0.95	In Stream*
	37-7-10.0, A-D	Aggregate	Yes	4.38	All Season	4.38	All Season
	37-7-13.0, A-B	Aggregate	Yes	0.91	All Season	0.91	All Season
	37-7-13.1	Natural	No	0.50	In Stream*	0.50	In Stream*
	37-7-14.0, A-D	Natural	No	3.05	In Stream*	2.76	In Stream*
	37-7-15.0	Natural	No	0.35	In Stream*	0.35	In Stream*
	37-7-15.2	Natural	No	0.37	In Stream*	0.37	In Stream*
	37-7-15.3	Aggregate	Yes	0.48	All Season	0.48	All Season
	37-7-15.4, A	Aggregate	Yes	0.26	All Season	0.26	All Season
	37-7-15.4, B	Natural	No	1.16	In Stream*	1.16	In Stream*
	37-7-16.0	Natural	No	0.52	In Stream*	0.52	In Stream*
	37-7-16.2	Natural	No	1.08	In Stream*	1.08	In Stream*

Road Work Activities	Road Number/Unit Access	Surface Type	All weather Surfacing Present	Alternative 2 Miles	Alternative 2 Season of Use	Alternative 3 Miles	Alternative 3 Season of Use
	37-7-21.4, A1	Aggregate	Yes	0.62	All Season	0.62	All Season
	37-7-22.0	Natural	No	0.42	In Stream*	0.42	In Stream*
	37-7-27.3	Natural	No	1.45	In Stream*	1.45	In Stream*
	37-7-33.0, A	Aggregate	Yes	0.25	All Season	0.25	All Season
	37-7-33.0, B	Natural	No	0.37	In Stream*	0.37	In Stream*
	37-7-33.1	Aggregate	Yes	1.03	All Season	1.03	All Season
	37-7-33.2, A	Aggregate	Yes	0.24	All Season	0.24	All Season
	37-7-33.2, B	Natural	No	0.20	In Stream*	0.20	In Stream*
	37-7-33.3	Aggregate	Yes	0.31	All Season	0.31	All Season
	37-7-33.4	Aggregate	Yes	0.05	All Season	0.05	All Season
	37-7-34.0, A	Bituminous	Yes	0.45	All Season	0.45	All Season
	37-7-34.0, B	Aggregate	Yes	1.52	All Season	1.52	All Season
	37-7-34.1, A-C	Aggregate	Yes	3.49	All Season	3.49	All Season
	37-7-35.5	Aggregate	Yes	1.53	All Season	1.53	All Season
	37-8-35.1	Natural	No	0.35	In Stream*	0.35	In Stream*
	38-6-18.0, A-B2	Bituminous	Yes	2.16	All Season	N/A	N/A
	38-6-18.0, C1	Aggregate	Yes	0.26	All Season	N/A	N/A
	38-7-3.0	Aggregate	Yes	0.57	All Season	0.57	All Season
	38-7-3.1, A	Aggregate	Yes	0.13	All Season	0.13	All Season
	38-7-3.2	Aggregate	Yes	1.98	All Season	1.98	All Season
	38-7-3.4	Natural	No	0.29	In Stream*	0.29	In Stream*
	38-7-11.0, A1-B2	Aggregate	Yes	4.35	All Season	4.35	All Season
	38-7-11.2	Natural	No	0.95	In Stream*	0.95	In Stream*
	38-7-11.4	Natural	No	0.49	In Stream*	0.49	In Stream*
	38-7-13.0, A	Bituminous	Yes	0.54	All Season	N/A	N/A
	38-7-15.0	Natural	No	0.85	In Stream*	0.85	In Stream*
	38-7-15.2, A	Aggregate	Yes	0.47	All Season	0.47	All Season
	38-7-15.2, B	Natural	No	0.39	In Stream*	0.39	In Stream*
	38-7-16.0, A-B	Aggregate	Yes	3.54	All Season	3.54	All Season
	38-7-17.0, A	Aggregate	Yes	0.96	All Season	0.96	All Season
	38-7-17.1	Natural	No	0.47	In Stream*	0.47	In Stream*
	38-7-17.2	Natural	No	0.18	In Stream*	0.18	In Stream*
	38-7-19.0, A-C	Bituminous	Yes	1.69	All Season	1.69	All Season

Road Work Activities	Road Number/Unit Access	Surface Type	All weather Surfacing Present	Alternative 2 Miles	Alternative 2 Season of Use	Alternative 3 Miles	Alternative 3 Season of Use
	38-7-19.0, D-E	Aggregate	Yes	0.24	All Season	0.24	All Season
	38-7-21.2, A-B	Aggregate	Yes	2.11	All Season	2.11	All Season
	38-7-21.3	Aggregate	Yes	0.56	All Season	0.56	All Season
	38-7-21.4	Aggregate	Yes	0.48	All Season	0.48	All Season
	38-7-21.5	Aggregate	Yes	1.27	All Season	1.27	All Season
	38-7-22.0	Aggregate	Yes	0.11	All Season	0.11	All Season
	38-7-22.1	Natural	No	0.05	In Stream*	0.05	In Stream*
	38-7-23.1, A	Aggregate	Yes	0.57	All Season	N/A	N/A
	38-7-23.3	Natural	No	0.90	In Stream*	N/A	N/A
	38-7-25.3, A-C	Aggregate	Yes	1.65	All Season	N/A	N/A
	38-7-25.3, D-E	Natural	No	0.90	In Stream*	N/A	N/A
	38-7-26.0, A-B	Aggregate	Yes	1.73	All Season	N/A	N/A
	38-7-26.1	Natural	No	0.79	In Stream*	N/A	N/A
	38-7-26.2	Natural	No	0.17	In Stream*	N/A	N/A
	38-7-27.0, A-C	Bituminous	Yes	2.79	All Season	2.79	All Season
	38-7-27.2	Natural	No	0.17	In Stream*	0.17	In Stream*
	38-7-31.0, A-B	Aggregate	Yes	1.91	All Season	1.91	All Season
	38-7-31.0, C-D	Natural	No	1.94	In Stream*	1.94	In Stream*
	38-7-31.2	Natural	No	0.91	In Stream*	0.91	In Stream*
	38-7-31.4	Natural	No	0.99	In Stream*	0.99	In Stream*
	38-7-33.0, A-B	Natural	No	1.29	In Stream*	1.29	In Stream*
	38-7-34.0, B	Bituminous	Yes	1.27	All Season	1.27	All Season
	38-7-34.0, C	Aggregate	Yes	0.34	All Season	0.34	All Season
	38-7-35.0, A-B	Natural	No	0.20	In Stream*	N/A	N/A
	38-7-35.1	Natural	No	0.19	In Stream*	N/A	N/A
	38-8-2.0	Natural	No	0.50	In Stream*	0.50	In Stream*
	38-8-3.0	Natural	No	1.42	In Stream*	1.42	In Stream*
	38-8-13.0	Aggregate	Yes	0.49	All Season	0.49	All Season
	38-8-13.1	Natural	No	1.05	In Stream*	1.05	In Stream*
	38-8-13.4	Aggregate	Yes	0.35	All Season	0.35	All Season
	38-8-23.0	Aggregate	Yes	0.63	All Season	0.63	All Season
	38-8-23.1	Natural	No	0.12	In Stream*	0.12	In Stream*
	38-8-23.5	Aggregate	Yes	0.29	All Season	0.29	All Season

Road Work Activities	Road Number/Unit Access	Surface Type	All weather Surfacing Present	Alternative 2 Miles	Alternative 2 Season of Use	Alternative 3 Miles	Alternative 3 Season of Use
	38-8-23.6	Natural	No	0.24	In Stream*	0.24	In Stream*
	38-8-27.0	Aggregate	Yes	3.45	All Season	3.45	All Season
	39-7-2.0	Natural	No	0.77	In Stream*	0.77	In Stream*
	39-7-3.0, A-B	Aggregate	Yes	2.16	All Season	2.16	All Season
	39-7-3.4, A	Natural	No	1.00	In Stream*	1.00	In Stream*
	39-7-3.4, B-C	Natural	No	1.43	In Stream*	1.43	In Stream*
	39-7-3.6, A	Aggregate	Yes	0.95	All Season	0.95	All Season
	39-7-3.6, B	Natural	No	0.38	In Stream*	0.38	In Stream*
	39-7-3.7	Natural	No	0.17	In Stream*	0.17	In Stream*
	39-7-4.1, A-B	Natural	No	0.52	In Stream*	0.52	In Stream*
	39-7-4.2	Natural	No	0.53	In Stream*	0.53	In Stream*
	39-7-8.0, A-C	Natural	No	0.90	In Stream*	0.90	In Stream*
	39-7-8.1	Natural	No	0.32	In Stream*	0.32	In Stream*
	39-7-8.3	Natural	No	1.28	In Stream*	1.28	In Stream*
	39-7-8.4, A-C	Natural	No	0.39	In Stream*	0.39	In Stream*
	39-7-9.1, A	Aggregate	Yes	1.49	All Season	1.49	All Season
	39-7-9.1, B	Natural	No	0.23	In Stream*	0.23	In Stream*
	39-7-9.2	Aggregate	Yes	2.69	All Season	2.69	All Season
	39-7-9.3	Aggregate	Yes	0.53	All Season	0.53	All Season
	39-7-9.6	Aggregate	Yes	0.54	All Season	0.54	All Season
	39-7-21.0, A-C	Bituminous	Yes	3.29	All Season	3.29	All Season
	39-8-3.0, E	Aggregate	Yes	1.13	All Season	1.13	All Season
	NF-018	Natural	No	2.15	In Stream*	2.15	In Stream*
	NF-2200	Natural	No	0.61	In Stream*	0.61	In Stream*
	NF-620	Bituminous	Yes	1.18	All Season	1.18	All Season
	P37-5-21.0	Aggregate	Yes	0.44	All Season	0.44	All Season

Appendix I Commercial Treatment Unit Summary Table

Township Range Section	Unit Number	Age	Acres	Alternative 2 RX	Minimum Canopy Cover Percent After Harvest	Harvest Systems	Alternative 3 RX	Minimum Canopy Cover Percent After Harvest	Harvest Systems	Riparian Reserve Acres	Inner Riparian Zones Acres	Outer Riparian Zone Acres	Botany*
34-7-7	7-1	170	80	RT	30	69T/11C	DM/TM	40/60	66T/14C	10.7	3.3	7.4	--
34-7-7	7-2	150	87	RT	30	4T/83C	DM/TM	40/60	4T/83C	6.1	4.0	2.1	1-DERA5
34-7-19	19-1	60	25	DM/TM	40/60	25H	DM/TM	40/60	25H	6.8	1.6	5.2	--
34-7-20	20-1	50	29	DM/TM	40/60	29H	DM/TM	40/60	29H	5.5	3.1	2.4	--
34-7-21	21-1	160	7	DM/DG	40	2T/5C	DM/TM	40/60	2T/5C	0.0	0.0	0.0	--
34-7-21	21-2	160	3	DM/DG	40	2C/1T	DM/TM	40/60	2C/1T	0.0	0.0	0.0	--
34-7-27	27-2	170	9	DM/DG	40	9T	DM/TM	40/60	9T	0.0	0.0	0.0	1-CHFE7
34-7-29	29-1	170	50	DM/DG	40	7T/43C	DM/TM	40/60	7T/43C	0.0	0.0	0.0	--
34-7-29	29-2	50	19	RT	30	19C	DM/TM	40/60	19C	0.0	0.0	0.0	--
34-7-29	29-3	110	5	DM/TM	40/60	5H	DM/TM	40/60	5H	3.4	1.9	1.6	--
34-7-31	31-1	60	41	RT	30	41C	DM/TM	40/60	41C	8.1	3.0	5.1	--
34-7-31	31-2	50	17	DM/DG	40	4T/13C	DM/TM	40/60	4T/13C	7.3	3.2	4.1	--
34-7-31	31-3	140	28	RT	30	28H	DM/TM	40/60	28H	10.5	3.2	7.3	1-RHTR4
34-7-33	33-1	150	25	DM/TM	40/60	25C	DM/TM	40/60	25C	13.1	5.4	7.7	--
35-7-1	1-1	60	42	RT	30	3T/39C	DM/TM	40/60	3T/39C	19.4	7.0	12.3	--
35-7-3	3-1	70	12	RT	30	3T/9C	DM/TM	40/60	3T/9C	0.0	0.0	0.0	--
35-7-3	3-2	100	19	RT	30	19C	DM/TM	40/60	19H	0.0	0.0	0.0	2-DEIN12
35-7-5	5-1	50	50	RT	30	8T/42C	DM/TM	40/60	8T/42C	15.4	4.1	11.2	--
35-7-5	5-2	50	14	DM/DG	40	14C	DM/TM	40/60	14C	12.2	5.5	6.7	--
35-7-5	5-3	50	7	DM/TM	40/60	7C	DM/TM	40/60	7C	7.2	2.8	4.5	--
35-7-9	9-1	190	71	DM/TM	40/60	71H	DM/TM	40/60	71H	10.6	6.0	4.5	--
35-7-9	9-2	190	75	DM/DG	40	8T/26C/41H	DM/TM	40/60	8T/26C/41H	22.6	9.5	13.0	1-CHFE7 1-CHSU14 1-RARU6
35-7-9	9-3	190	43	RT	30	43H	DM/TM	40/60	43H	27.9	11.3	16.6	1-CAHO12 3-CHFE7 1-PICA13
35-7-10	10-1	230	40	RT	30	40C	RT	30	40H	18.7	4.4	14.3	3-DERA5 1-SPFL8
35-7-10	10-2	140	4	RT	30	4H	RT	30	4H	4.2	1.4	2.8	--
35-7-11	11-5	150	31	RT	30	29C/2T	RT	30	29C/2T	15.3	6.4	8.9	2-CHSU14 2-CYFA 2-CYMO2
35-7-15	15-1	160	11	DM/TM	40/60	11T	DM/TM	40/60	11T	2.3	0.1	2.2	--
35-7-20	20-2	150	113	DM/DG	40	17H/19T/77C	DM/TM	40/60	17H/19T/77C	18.7	3.9	14.9	2-DEIN12 1-SEMO5
35-7-21	21-3	150	13	DM/TM	40/60	13H	DM/TM	40/60	13H	4.0	1.1	2.9	1-CHFE7 1-DEIN12
35-7-22	22-1	160	8	RT	30	4C/4T	RT	30	4C/4T	5.3	0.9	4.4	1-DEIN12
35-7-22	22-2	160	20	RT	30	13C/7T	DM/TM	40/60	13C/7T	12.3	3.5	8.8	--
35-7-22	22-3	160	25	RT	30	2C/23T	RT	30	2C/23T	9.2	3.2	5.9	--
35-7-27	27-1	150	55	RT	30	14C/41T	DM/TM	40/60	14C/41T	15.6	3.2	12.4	2-LOST3 12-SOLE3
35-7-27	27-3	150	18	RT	30	18T	RT	30	18T	10.2	1.1	9.1	5-SOLE3
35-7-27	27-4	110	9	RT	30	9T	RT	30	9T	0.0	0.0	0.0	--
35-7-27	28-6	150	20	RT	30	16T/4C	RT	30	16T/4C	6.1	1.2	4.9	1-DERA5 1-SOLE3

Township Range Section	Unit Number	Age	Acres	Alternative 2 RX	Minimum Canopy Cover Percent After Harvest	Harvest Systems	Alternative 3 RX	Minimum Canopy Cover Percent After Harvest	Harvest Systems	Riparian Reserve Acres	Inner Riparian Zones Acres	Outer Riparian Zone Acres	Botany*
35-7-28	28-1	150	15	DM/TM	40/60	11C/4T	DM/TM	40/60	11H/4T	4.4	0.7	3.7	--
35-7-28	28-2	150	19	RT	30	19C	DM/TM	40/60	19H	7.4	3.7	3.7	1-CYFA
35-7-28	28-3	150	24	DM/DG	40	24H	DM/TM	40/60	24H	11.2	3.3	7.9	1-CHFE7 1-CHCH14
35-7-28	28-4	150	15	DM/TM	40/60	8H/7C	DM/TM	40/60	8H/7C	10.0	3.8	6.2	1-CAHO12
35-7-28	28-5	150	31	RT	30	15C/16T	DM/TM	40/60	15C/16T	15.2	4.4	10.8	1-FRGE 1-CYMO2 1-CYFA 2-CAHO12
35-7-29	29-4	160	70	DM/DG	40	11T/59C	DM/TM	40/60	11T/59C	20.7	5.2	15.5	3-DEIN12 2-SEMO5
35-7-29	29-5	160	118	RT	30	118C	DM/TM	40/60	118C	47.9	22.6	25.3	--
35-7-30	30-1	140	80	DM/DG	40	80H	DM/TM	40/60	80H	6.3	1.5	4.7	1-CHCH14 1-PYDE
35-7-30	30-2	90	26	RT	30	1T/25C	DM/TM	40/60	1T/25C	9.7	1.8	7.9	1-PHKA5 1-PHOL
35-7-31	31-4	100	18	RT	30	5H/4C/9T	DM/TM	40/60	4C/5H/9T	3.2	0.5	2.7	--
35-7-31	31-5	170	31	RT	30	16T/15C	DM/TM	40/60	6H/9C/16T	1.9	0.1	1.9	--
35-7-31	31-6	170	18	DM/DG	40	14C/4T	DM/TM	40/60	3T/15H	8.8	4.2	4.6	--
35-7-31	31-7	80	46	DM/DG	40	44H/1T/1C	DM/TM	40/60	1C/1T/44H	7.0	4.3	2.7	1-CHFE7 1-PHCA40 1-PHPI5 2-RARU5
35-7-31	31-8	190	5	RT	30	2C/3T	RT	30	2H/1C/1T	0.9	0.1	0.8	1-DERA5 1-RAST5
35-7-31	31-9	190	23	DM/TM	40/60	5T/18H	DM/TM	40/60	5T/18H	2.1	0.0	2.1	1-CHFE7 2-PHAT3 1-RHTR4 1-DERA5
35-7-32	32-1	190	10	RT	30	4C/4H/2T	DM/TM	40/60	8H/2T	4.6	1.0	3.7	--
35-7-33	33-2	150	121	RT	30	75T/5C/41H	DM/TM	40/60	72T/49H	16.0	6.0	10.0	1-RARU6 1-CHSU14
35-7-33	33-3	90	27	DM/DG	40	3T/24C	DM/TM	40/60	3T/24C	20.9	6.3	14.5	1-CHCH14 1-CHSU14 2-DEIN12 2-DERA5 1-LETE15 1-SOLE3
36-6-30	30-3	150	39	RT	30	39H	RT	30	39H	24.2	9.7	14.5	--
36-7-3	3-3	120	4	DM/TM	40/60	4H	DM/TM	40/60	4H	0.0	0.0	0.0	--
36-7-3	3-4	170	19	RT	30	19T	RT	30	19T	3.7	1.1	2.6	1-CHSU14 1-LIALG
36-7-11	11-6	130	15	RT	30	15T	RT	30	15T	1.5	0.6	0.9	1-CHFE7
36-7-23	23-1	180	36	RT	30	25C/1H/10T	RT	30	26C/10T	9.5	2.2	7.3	1-CHFE7 1-CHSU14 6-DERA5 1-GAAT2 1-RHTR4 1-TRVE8
36-7-27	27-5	150	5	RT	30	4C/1T	RT	30	4C/1T	0.0	0.0	0.0	--

Township Range Section	Unit Number	Age	Acres	Alternative 2 RX	Minimum Canopy Cover Percent After Harvest	Harvest Systems	Alternative 3 RX	Minimum Canopy Cover Percent After Harvest	Harvest Systems	Riparian Reserve Acres	Inner Riparian Zones Acres	Outer Riparian Zone Acres	Botany*
36-7-27	27-6	150	7	RT	30	7C	RT	30	7C	1.1	0.0	1.1	--
36-7-27	27-7	170	29	RT	30	19C/10T	RT	30	19C/10T	5.1	2.5	2.6	--
36-7-27	27-8	170	4	RT	30	2C/2T	RT	30	2C/2T	1.4	0.1	1.3	--
36-7-27	27-9	150	104	RT	30	47C/12H/45T	RT	30	47C/12H/45T	27.2	6.9	20.4	2-DEIN12
36-7-35	35-1	40	14	RT	30	7C/7T	RT	30	7C/7T	0.0	0.0	0.0	--
36-7-35	35-2	40	9	RT	30	8C/1T	RT	30	8C/1T	3.7	0.7	3.1	--
37-4-17	17-5	110	50	DM/TM	40/60	26H/24TA	DM/TM	40/60	28H/22TA	12.1	3.1	9.0	--
37-4-18	18-1	100	153	DM/TM	40/60	153TA	DM/TM	40/60	26H/127TA	0.0	0.0	0.0	--
37-4-18	18-2	120	7	RT	30	7T	RT	30	7T	47.7	24.6	23.2	--
37-4-18	13-9	120	83	DM/TM	40/60	83TA	DM/TM	40/60	77H/6TA	0.0	0.0	0.0	2-DEIN12
37-4-20	20-5	80	24	DM/TM	40/60	24TA	DM/TM	40/60	24H	2.6	0.7	1.9	1-CYFA
37-4-21	21-13	70	25	DM/TM	40/60	25TA	DM/TM	40/60	23H/2TA	2.8	0.6	2.3	--
37-5-13	13-7	40	6	RT	30	6T	RT	30	6T	0.0	0.0	0.0	--
37-5-13	13-8	60	470	DM/TM	40/60	470TA	DM/TM	40/60	470H	96.1	34.0	62.1	1-CYFA 17-DEIN12 1-RAAB4 2-RACA
37-5-14	14-5	80	24	DM/TM	40/60	24T	DM/TM	40/60	24T	0.0	0.0	0.0	2-DEIN12
37-5-15	15-11	160	93	DM/TM	40/60	93TA	DM/TM	40/60	93H	15.0	10.7	4.3	2-DEIN12 1-ENOC
37-5-20	20-4	140	85	RT	30	85H	RT	30	85H	14.5	4.9	9.6	1-CHSU14
37-5-23	23-7	140	55	RT	30	55TA	DM/TM	40/60	55TA	0.0	0.0	0.0	1-CYFA 1-DEIN12
37-5-23	23-8	140	9	DM/TM	40/60	9TA	DM/TM	40/60	9TA	0.0	0.0	0.0	1-DEIN12
37-5-23	23-9	60	15	DM/TM	40/60	15H	DM/TM	40/60	15H	0.0	0.0	0.0	--
37-5-26	26-7	80	95	RT	30	95TA	DM/TM	40/60	95TA	18.0	6.4	11.5	2-DEIN12
37-6-7	7-3	80	101	RT	30	38C/63T	RT	30	38C/63T	40.3	22.8	17.5	1-CHFU3
37-6-7	7-5	150	36	RT	30	36TA	DM/TM	40/60	36H	2.4	1.2	1.2	--
37-6-17	17-1	120	41	RT	30	41TA	RT	30	41H	0.7	0.0	0.7	--
37-6-21	21-6	70	61	DM/TM	40/60	47H/14C	DM/TM	40/60	47H/14C	10.2	3.0	7.2	--
37-6-21	21-7	110	16	DM/TM	40/60	16T	DM/TM	40/60	16T	12.1	6.0	6.1	--
37-6-23	23-6	130	267	DM/TM	40/60	5C/53H/209T	DM/TM	40/60	262H/5C	169.9	101.2	68.8	1-CHFE7 1-CHFU3
37-7-5	5-4	110	15	RT	30	15TA	RT	30	15H	7.7	2.8	4.9	--
37-7-9	9-4	80	16	RT	30	16TA	RT	30	16H	12.6	5.5	7.1	2-CYFA
37-7-13	13-1	150	48	DM/DG	40	48H	DM/TM	40/60	48H	10.5	1.9	8.6	--
37-7-13	13-2	100	35	DM/DG	40	35TA	DM/TM	40/60	35TA	24.8	10.6	14.1	--
37-7-15	15-3	70	137	RT	30	48C/89T	RT	30	48C/89T	54.2	24.6	29.6	2-CHFE7 3-CYFA 2-DERA5 2-RHTR4
37-7-15	15-4	70	91	RT	30	85C/6T	DM/TM	40/60	85C/6T	18.6	5.0	13.6	--
37-7-15	15-5	90	6	RT	30	6T	DM/TM	40/60	6T	0.9	0.0	0.9	--
37-7-15	15-6	90	6	RT	30	6T	DM/TM	40/60	6T	4.8	0.4	4.4	--
37-7-15	15-7	90	13	RT	30	13T	DM/TM	40/60	13T	4.4	0.3	4.1	--
37-7-21	21-4	230	43	RT	30	36C/7T	DM/TM	40/60	36C/7T	0.0	0.0	0.0	--
37-7-21	21-5	220	13	RT	30	12C/1T	DM/TM	40/60	12H/1T	0.0	0.0	0.0	2-CHFE7 1-MYQU3
37-7-22	22-4	120	79	RT	30	79TA	DM/TM	40/60	77TA/2H	21.6	10.4	11.3	1-CHFU3

Township Range Section	Unit Number	Age	Acres	Alternative 2 RX	Minimum Canopy Cover Percent After Harvest	Harvest Systems	Alternative 3 RX	Minimum Canopy Cover Percent After Harvest	Harvest Systems	Riparian Reserve Acres	Inner Riparian Zones Acres	Outer Riparian Zone Acres	Botany*
37-7-23	23-2	70	14	DM/TM	40/60	14TA	NA		14TA	5.4	2.0	3.4	1-CHSU14
37-7-33	33-4	100	2	DM/DG	40	2T	DM/TM	40/60	2T	2.4	1.4	0.9	--
37-7-33	33-5	100	85	RT	30	22C/63T	DM/TM	40/60	22C/63T	54.6	29.7	24.9	1-PHOL
37-7-33	33-6	100	5	DM/DG	40	5C	DM/TM	40/60	5C	4.4	3.2	1.2	--
37-7-33	33-7	100	7	RT	30	7C	DM/TM	40/60	7C	6.2	2.0	4.2	--
37-7-33	33-8	140	85	RT	30	37C/48T	DM/TM	40/60	50C/35T	27.3	15.4	11.9	1-CHFU7 1-CHFE3 2-RARU6
37-7-34	34-2	90	19	RT	30	15C/4T	DM/TM	40/60	15C/4T	2.9	0.1	2.8	--
37-7-34	34-3	90	22	DM/DG	40	19C/3T	DM/TM	40/60	19C/3T	7.1	1.5	5.7	1-DERA5 1-SAFU6
37-8-35	35-3	160	35	RT	30	31T/4C	RT	30	31T/4C	4.6	0.1	4.5	--
37-8-35	35-4	160	16	RT	30	16H	RT	30	16H	8.2	2.0	6.2	1-DEIN12
38-7-3	3-6	120	54	DM/DG		45C/9T	DM/TM	40/60	45C/9T	19.7	8.7	11.0	--
38-7-3	3-7	100	11	RT	30	11C	DM/TM	40/60	11C	3.7	1.2	2.5	--
38-7-3	3-8	120	3	RT	30	3C	DM/TM	40/60	3H	1.2	0.1	1.1	--
38-7-11	11-1	130	92	RT	30	29T/63C	DM/TM	40/60	29T/63C	42.9	27.2	15.7	1-DEIN12 1-SUBA
38-7-11	11-3	140	36	DM/DG	40	21T/15C	DM/TM	40/60	21T/15C	29.3	15.1	14.1	1-DEIN12
38-7-11	11-7	80	34	DM/TM	40/60	22T/12C	DM/TM	40/60	22T/12C	0.0	0.0	0.0	--
38-7-11	11-9	180	19	DM/DG	40	19T	DM/TM	40/60	19T	1.6	0.2	1.4	2-RHTR4
38-7-14	14-1	170	9	RT	30	9C	DM/TM	40/60	9C	0.0	0.0	0.0	--
38-7-14	14-2	170	42	RT	30	42C	RT	30	42C/51H	1.4	0.1	1.3	--
38-7-17	17-2	120	65	RT	30	48C/17T	DM/TM	40/60	48C/17T	21.8	8.3	13.5	--
38-7-21	21-8	130	24	RT	30	13C/11T	DM/TM	40/60	13C/11T	4.5	0.0	4.5	--
38-7-21	21-9	180	3	DM/DG	40	3C	DM/TM	40/60	3C	3.6	0.5	3.1	--
38-7-21	21-10	140	18	DM/DG	40	18T	DM/TM	40/60	18T	2.9	0.7	2.2	1-RARU6 1-RHTR4
38-7-21	21-12	150	28	RT	30	27C/1T	DM/TM	40/60	27C/1T	2.0	1.2	0.8	--
38-7-22	21-11	140	25	DM/DG	40	25C	DM/TM	40/60	25C	1.8	0.1	1.6	--
38-7-22	22-5	180	12	RT	30	12C	DM/TM	40/60	12C	0.0	0.0	0.0	1-PHCA40 1-PHKA3
38-7-23	23-5	120	9	RT	30	9C	DM/TM	40/60	9H	0.0	0.0	0.0	--
38-7-26	26-1	120	5	DM/DG	40	5H	DM/TM	40/60	5H	4.3	1.4	2.9	--
38-7-26	26-2	120	14	DM/DG	40	14C	DM/TM	40/60	14H	0.1	0.0	0.1	--
38-7-26	26-3	180	7	RT	30	7H	DM/TM	40/60	7H	0.0	0.0	0.0	--
38-7-26	26-4	180	7	RT	30	7H	DM/TM	40/60	7H	0.0	0.0	0.0	--
38-7-27	27-12	130	15	RT	30	15H	DM/TM	40/60	15H	5.5	3.1	2.4	--
38-7-27	27-13	130	3	DM/DG	40	3H	DM/TM	40/60	3H	1.1	0.5	0.6	--
38-7-27	27-14	130	9	RT	30	9T	DM/TM	40/60	9T	4.1	0.7	3.4	--
38-7-31	31-11	100	25	RT	30	15C/10T	RT	30	15C/10T	0.7	0.0	0.7	1-CHSU14 2-DERA5 1-RHTR4
38-7-35	35-9	150	59	DM/TM	40/60	58C/1T	DM/TM	40/60	59H	22.4	15.3	7.1	--
38-7-35	35-10	90	46	DM/DG	40	24C/22T	DM/TM	40/60	24C/22T	23.9	16.1	7.8	--
38-7-35	35-11	190	51	DM/DG	40	47C/4H	DM/TM	40/60	47C/4H	19.1	8.3	10.8	1-DERA5 1-LOST3 1-RHTR4
38-8-3	3-5	180	285	RT	30	143C/142T	RT	30	13C/165H/107T	124.0	57.6	66.4	2-CHCH14

Township Range Section	Unit Number	Age	Acres	Alternative 2 RX	Minimum Canopy Cover Percent After Harvest	Harvest Systems	Alternative 3 RX	Minimum Canopy Cover Percent After Harvest	Harvest Systems	Riparian Reserve Acres	Inner Riparian Zones Acres	Outer Riparian Zone Acres	Botany*
													1-CHFE7 2-CHSU14 3-CLOC4 2-CYFA 1-DEIN12 2-DERA5 1-MYQU3 1-PHAT3 1-RARU5 1-RHTR4 2-TRHE7
38-8-13	13-3	150	49	RT	30	46C/3T	RT	30	46C/3T	16.9	4.2	12.7	--
38-8-13	13-4	160	47	RT	30	22C/25T	RT	30	22C/25T	17.9	3.9	14.0	--
38-8-23	23-3	40	40	RT	30	34C/6T	RT	30	34C/6T	19.2	5.5	13.7	--
38-8-23	23-4	160	76	RT	30	30C/46T	RT	30	30C/47T	43.9	17.4	26.6	--
39-7-3	3-9	160	15	RT	30	15C	RT	30	15C	14.9	5.3	9.6	--
39-7-3	3-10	160	21	RT	30	21C	RT	30	21C	1.0	0.1	0.8	--
39-7-3	3-11	160	23	RT	30	7C/8H/9T	RT	30	7C/8H/9T	5.7	3.4	2.3	1-CYFA
39-7-4	4-1	140	45	RT	30	43C/2T	DM/TM	40/60	43C/2T	1.9	0.3	1.7	--
39-7-9	9-5	50	60	RT	30	49C/11T	RT	30	49C/11T	17.2	9.3	7.9	--

**The Botany column includes Federally Threatened and Endangered species, Interagency Special Status/Sensitive Species, and Survey and Manage species which require buffers. For an explanation of the codes used in the Botany column see Chapter 3.8.*

Appendix J Hazardous Fuels Reduction Maintenance Table

Township, Range, Section	Treatment Name	Treatment Number	Acres	Botany*	Category 1 Soils (Acres)
34-7-15	ANGORA CREEK	15	4	--	--
34-7-15	STRATTON HOG	15	125	--	--
34-7-21	STRATTON HOG	21	27	--	--
34-7-21	STRATTON HOG	21-1	35	--	--
34-7-21	STRATTON HOG	21-15	30	2-RARU6	--
34-7-22	STRATTON HOG	22-1	11	3-RARU6	--
34-7-23	SHINEY QUEEN	23-5AB	7	--	--
34-7-23	SHINEY QUEEN	23-9	6	--	--
34-7-27	STRATTON HOG	27	29	1-DEIN12	--
34-7-27	STRATTON HOG	27-12	12	--	--
34-7-27	STRATTON HOG	27-2	13	--	--
34-7-27	STRATTON HOG	27-5	22	1-RARU6	--
34-7-27	STRATTON HOG	27-6	32	1-RARU6	5
34-7-27	STRATTON HOG	27-7	22	--	--
34-7-29	MAPLE SYRUP	29.007	14		--
34-7-29	MAPLE SYRUP	29.007A	89	1- SEMO5	--
34-7-29	MAPLE SYRUP	29.007C	61	--	--
34-7-29	MAPLE SYRUP	29.011	10	--	--
34-7-29	MAPLE SYRUP	29.3N	16	--	--
34-7-29	MAPLE SYRUP	29-006A	8	--	--
34-7-29	MAPLE SYRUP	29-011A	5	--	--
34-7-29	MAPLE SYRUP	29-2	60	1-SEMO5	--
34-7-29	MAPLE SYRUP	29-30	38	--	10
34-7-29	MAPLE SYRUP	29-3AS	8	--	--
34-7-29	MAPLE SYRUP	29-3B	5	--	--
34-7-29	MAPLE SYRUP	FMZ29	5	--	--
34-7-29	MAPLE SYRUP	M-29-31	1	--	--
34-7-30	MAPLE SYRUP	30.1	163	--	5
34-7-30	MAPLE SYRUP	30.3	31	--	--
34-7-30	MAPLE SYRUP	30-005	28	--	--
34-7-30	MAPLE SYRUP	30-014A	5	--	--
34-7-30	MAPLE SYRUP	30-2	28	--	--
34-7-31	MAPLE SYRUP	31.003	59	1-CHFE7	--
34-7-31	MAPLE SYRUP	31.006	17	--	6

Township, Range, Section	Treatment Name	Treatment Number	Acres	Botany*	Category 1 Soils (Acres)
34-7-31	MAPLE SYRUP	31.2	121	1-ESCA	--
34-7-31	MAPLE SYRUP	31.3	84	--	--
34-7-31	MAPLE SYRUP	31.4	21	--	--
34-7-31	MAPLE SYRUP	31.5	14	--	--
34-7-31	MAPLE SYRUP	31-009	26	1-CYFA	--
34-7-31	MAPLE SYRUP	31-30	10	--	--
34-7-33	STRATTON HOG	33	3	1-DEIN12	--
34-7-33	STRATTON HOG	33-18	48	--	--
34-7-33	STRATTON HOG	33-20	101	1-DEIN12	--
34-7-35	HOG REMAINS	2	45	1-LOST3	--
34-7-35	STRATTON HOG	35-10	17	--	--
34-7-35	STRATTON HOG	35-19	88	2-LOST3	--
34-8-25	MAPLE SYRUP	25-1	14	--	--
34-8-27	RICH AND ROCKY	27-1	18	--	1
34-8-27	RICH AND ROCKY	27-10	38	--	--
34-8-27	RICH AND ROCKY	27-11	41	--	--
34-8-27	RICH AND ROCKY	27-11B	5	--	--
34-8-27	RICH AND ROCKY	27-18	10	--	--
34-8-27	RICH AND ROCKY	27-19	13	--	--
34-8-27	RICH AND ROCKY	27-19A	15	--	--
34-8-27	RICH AND ROCKY	27-2	64	--	--
34-8-27	RICH AND ROCKY	27-3A	7	--	--
34-8-27	RICH AND ROCKY	27-3B	23	1-RHTR4	--
34-8-29	GALICE COMPLEX	4	34	--	1
34-8-34	RICH AND ROCKY	34-14	19	--	--
34-8-34	RICH AND ROCKY	34-1A	26	--	--
34-8-34	RICH AND ROCKY	34-3A	19	--	--
34-8-34	RICH AND ROCKY	34-3B	7	1-SOLE3	--
34-8-34	RICH AND ROCKY	34-3D	3	--	--
35-6-30	PICKETT SNAKE	30	24	1-CHSU14	--
35-6-31	PICKETT SNAKE	31B	142	1-CHCH14 1-CHFE7 1-CHSU14	1
35-7-1	STRATTON HOG	1	10	2-LOST3	--
35-7-1	STRATTON HOG	1-1	70	1-DEIN12 4-LOST3	--
35-7-1	STRATTON HOG	1-3	14	--	--

Township, Range, Section	Treatment Name	Treatment Number	Acres	Botany*	Category 1 Soils (Acres)
35-7-1	STRATTON HOG	1-5	6	1-DEIN12	--
35-7-3	STRATTON HOG	3	26	--	8
35-7-5	MAPLE SYRUP	5.003A	12	--	--
35-7-5	MAPLE SYRUP	5.003B	10	--	--
35-7-5	MAPLE SYRUP	5.1	58	--	--
35-7-5	MAPLE SYRUP	5.7	23	--	--
35-7-5	MAPLE SYRUP	5-006B	14	--	--
35-7-5	MAPLE SYRUP	5-10	49	2-SOLE3	--
35-7-5	MAPLE SYRUP	5-9	3	--	--
35-7-9	PICKETT SNAKE	9	26	1-CAHO12	26
35-7-11	CROOKED BUCK	L 31	23	--	--
35-7-11	STRATTON HOG	11-4A	42	1-LETE13 1-RARU6	--
35-7-11	STRATTON HOG	11-4B	39	1-DEIN12	--
35-7-15	PARADISE GREENTREEN	14-1	12	--	--
35-7-15	PICKETT SNAKE	15	24	--	9
35-7-15	PICKETT SNAKE	FRT 15-5B	67	--	--
35-7-15	PICKETT SNAKE	TBRIDGE	91	1-CAHO12	84
35-7-21	PICKETT SNAKE	21	289	--	248
35-7-22	PICKETT SNAKE	FRT 22-1	40	--	--
35-7-22	PICKETT SNAKE	FRT 22-27	36	1-DERA5	--
35-7-22	PICKETT SNAKE	FRT 22-2A	29	1-DEIN12	4
35-7-22	PICKETT SNAKE	FRT 22-2B	44	--	3
35-7-22	PICKETT SNAKE	FRT 22-2D	48	--	2
35-7-26	PICKETT SNAKE	26	23	1-RARU6	--
35-7-27	PICKETT OVER	27-3	38	1-SOLE3	--
35-7-27	PICKETT OVER	27-5	32	--	--
35-7-27	PICKETT OVER	27-5A	14	1-SOLE3	--
35-7-27	PICKETT OVER	27-6B	28	1-LOST3 1-CYFA	--
35-7-27	PICKETT OVER	27-6C	36	--	--
35-7-27	PICKETT SNAKE	27-5A	22	--	--
35-7-28	PICKETT SNAKE	28-A	6	--	6
35-7-28	PICKETT SNAKE	28-B	5	--	5
35-7-28	PICKETT SNAKE	28-C	29	1-SOLE3	--
35-7-29	BUCKHORN SOUTH	20A1	46	--	5
35-7-29	PICKETT AGAIN	Fir lim	28	--	--

Township, Range, Section	Treatment Name	Treatment Number	Acres	Botany*	Category 1 Soils (Acres)
35-7-29	PICKETT OVER	39-9	29	--	--
35-7-29	PICKETT SNAKE	FRT 29-8B	19	2-BUVI2 2-DEIN12 2-SEMO5	6
35-7-29	PICKETT SNAKE	FRT 29-9	27	--	1
35-7-29	PICKETT SNAKE	FRT 29-8C	28	--	1
35-7-29	PICKETT SNAKE	PS 29-8A	59	--	--
35-7-31	PICKETT OVER	31-8A	39	--	--
35-7-31	PICKETT OVER	31-8B	28	--	--
35-7-33	PICKETT SNAKE	33	107		107
35-7-33	PICKETT SNAKE	FRT 33-6	156	3-CYFA 1-SOLE3	4
35-7-33	PICKETT SNAKE	FRT 33-1	16	2-DEIN12 1-DERA5	2
35-7-34	PICKETT SNAKE	RIA34	120	--	--
36-6-5	PINNON	2	29		39
36-6-5	STEWART ROAD	5	112	2-CHFE7 1-DEIN12	112
36-6-33	MIDWAY	1	40	--	40
36-7-23	BLUE DRAPER	23-1	8	1- CYMO2	--
36-7-3	GRIFFIN	2-5A	7	1-CHCH14	--
36-7-27	ROUND BULL	27-1	11	--	1
36-7-35	ROUND BULL	35-123A	106	1-DEIN12	--
36-7-35	ROUND BULL	35-1B	111	3-SOLE3	--
37-4-17	NORTH MURPHY	17.029	31	--	--
37-4-17	NORTH MURPHY	17-18 FMZ	29	--	7
37-4-19	NORTH MURPHY	19A	222	--	181
37-4-19	NORTH MURPHY	19B	80	1-CYFA	--
37-4-19	NORTH MURPHY	19C	97	1-CYFA	39
37-4-19	NORTH MURPHY	19D	50	--	--
37-4-19	SPRECHT	1	3	--	3
37-4-20	NORTH MURPHY	20	15	--	4
37-4-21	NORTH MURPHY	21	12	1-DEIN12	8
37-4-21	NORTH MURPHY	21A	104	--	86
37-4-29	NORTH MURPHY	29-31	54	2-DEIN12 1-CYFA	35
37-4-29	NORTH MURPHY	29A	84	5-CYFA 2-CYMO2	--
37-4-31	AVFD	9-1	1	--	1

Township, Range, Section	Treatment Name	Treatment Number	Acres	Botany*	Category 1 Soils (Acres)
37-4-31	CHENEY SLATE	31	192	1-CYFA 1-DEIN12 2-FRGE 1-LETE13 3-MEOR	192
37-4-31	NORTH MURPHY	RIA31A	18	--	18
37-5-5	JILLANA	5	42	--	--
37-5-5	WILDROSE	RIA 1	29	1-DEIN12	25
37-5-7	JAYNES DR	1	91	2-CHFE7	91
37-5-9	BOARD SHANTY	9	40	--	24
37-5-9	BOARD SHANTY	FMZ1	3	--	--
37-5-9	BOARD SHANTY	FMZ2	10	--	--
37-5-9	NORTH MURPHY	9-1A	55	1-CYMO2	3
37-5-9	NORTH MURPHY	9-1B	59	--	43
37-5-11	NORTH MURPHY	11.14.15	45	1-DEIN12	--
37-5-11	NORTH MURPHY	11+14	15	--	--
37-5-14	NORTH MURPHY	14	5	1-DEIN12	--
37-5-14	NORTH MURPHY	14A	56	--	--
37-5-15	NORTH MURPHY	15	30	1-DEIN12	--
37-5-15	NORTH MURPHY	15A	197	--	--
37-5-15	NORTH MURPHY	15B	12	--	--
37-5-17	NORTH APPLEGATE	17	430	--	--
37-5-20	COPPER DRIVE	1	118	1-CHSU14	43
37-5-23	NORTH MURPHY	23	44	--	--
37-5-23	NORTH MURPHY	23.26	29	1-DEIN12	7
37-5-23	SAVAGE PASS	1	41	--	--
37-5-24	NORTH MURPHY	13-8.9	42	--	17
37-5-24	NORTH MURPHY	24	7	--	1
37-5-24	NORTH MURPHY	24A	112	--	1
37-5-26	NORTH MURPHY	23-26	87	1-DEIN12	8
37-5-26	NORTH MURPHY	26-3	210	1-CYFA 1-DEIN12	--
37-5-26	NORTH MURPHY	RIA26	64	--	3
37-5-29	GRAYS CREEK	1	80	--	--
37-6-3	STRINGER	3-1	58	1-CYFA	58
37-6-11	STRINGER	11-1	71	--	71
37-6-13	NEW HOPE	1	249	1-CYFA 3-CYMO2	--

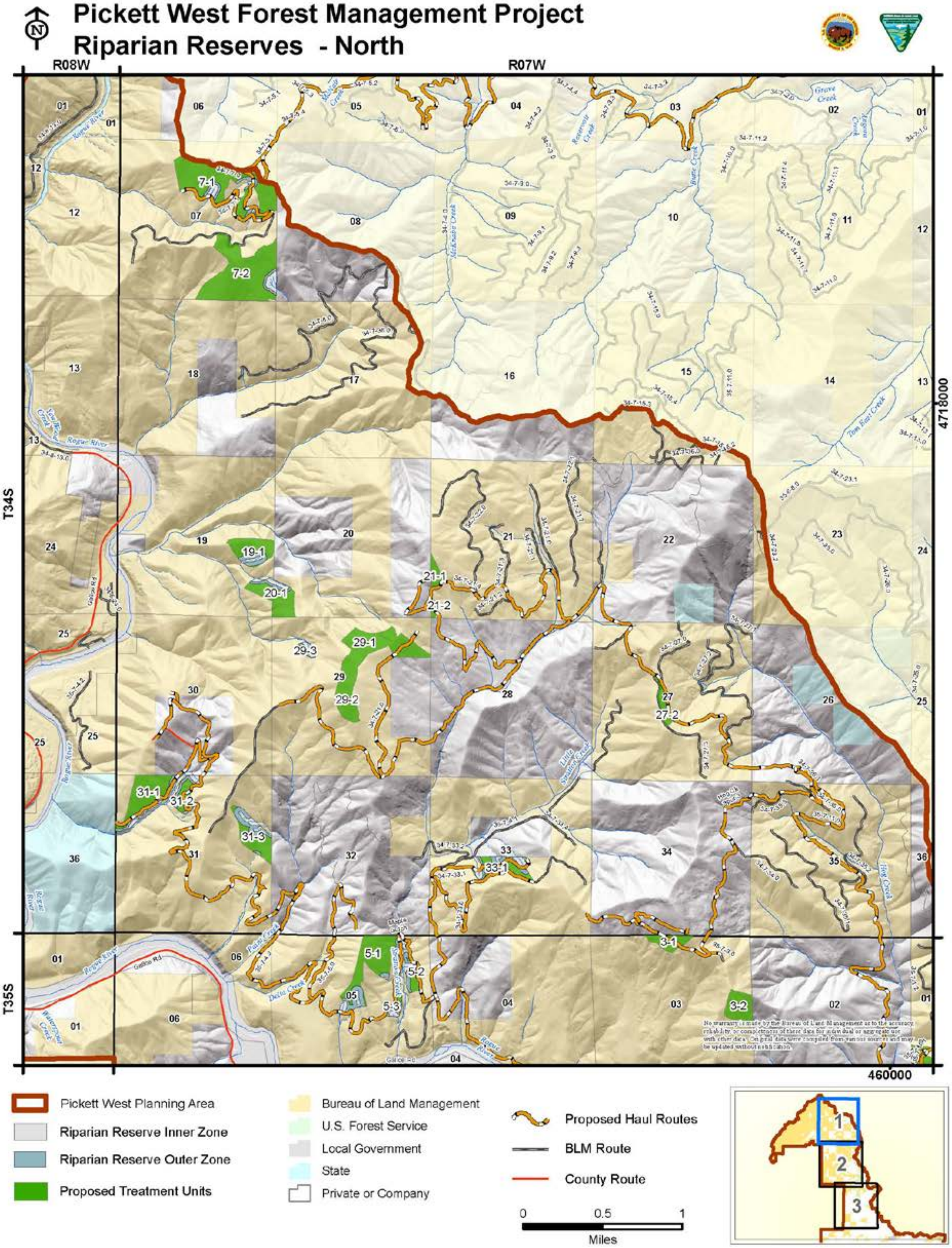
Township, Range, Section	Treatment Name	Treatment Number	Acres	Botany*	Category 1 Soils (Acres)
37-6-15	FISH HATCHERY	1	81	--	--
37-6-15	FISH HATCHERY	2	41	--	--
37-6-17	ROUND BULL	17-1	24	--	--
37-6-21	ROUND BULL	21.123A	17	--	--
37-6-21	ROUND BULL	21.123B	8	--	--
37-6-21	ROUND BULL	21.123C	16	--	--
37-6-21	ROUND BULL	21-2	31	--	--
37-6-23	CHENEY SLATE	23-1	44	--	35
37-6-23	CHENEY SLATE	23-5	10	1-CHFE7	--
37-7-1	SLATE KNIGHT	1-1	7	--	--
37-7-3	ROUND BULL	3-3C	18	3-CYFA	--
37-7-3	ROUND BULL	3A	52	--	--
37-7-3	ROUND BULL	3B	74	--	17
37-7-3	ROUND BULL	3-Z	330	25-CYFA	--
37-7-3	ROUND PRAIRIE	3	9	5-CYFA	--
37-7-3	ROUND PRAIRIE	4.002	22	--	--
37-7-5	SLATE KNIGHT	5-8	52	2-CYFA	--
37-7-7	SLATE CR	7-2	8	--	--
37-7-15	HOT LOFT	15-3	7	--	--
37-7-15	ROUND BULL	15-3A	45	--	--
37-7-15	ROUND BULL	15-3B	32	--	--
37-7-19	CHENEY SLATE	19-1A	49	--	--
37-7-21	ROUND BULL	21-1	24	--	--
37-7-29	DEER MOM	29-2A	66	--	--
37-7-29	DEER MOM	29-2B	86	--	--
37-7-29	DEER MOM	29-2D	35	--	--
37-7-31	BLUE DRAPER	31-2	21	--	--
37-7-33	QUARTER MOON	33-1E	8	--	--
37-8-25	ANDERSON WEST	25-1	25	1-CYFA	--
37-8-25	ANDERSON WEST	25-3	160	--	--
37-8-35	ANDERSON WEST	35.2003	80	--	--
38-5-3	WILLIAMS	3-3	65	1-DEIN12	--
38-5-3	WILLIAMS	3-4	57	--	24
38-5-3	WILLIAMS	3-6	70	--	--
38-5-3	WILLIAMS	3-6A	35	--	--
38-5-3	WILLIAMS	3-6B	12	--	--

Township, Range, Section	Treatment Name	Treatment Number	Acres	Botany*	Category 1 Soils (Acres)
38-5-3	WILLIAMS	3-8	35	1-CHSU14	--
38-7-3	CROOKED CEDAR	3-1A	20	--	--
38-7-3	CROOKED CEDAR	3-2A	37	--	--
38-7-3	CROOKED CEDAR	3-3A	20	--	--
38-7-3	DERRY TRESPASS	3-5	6	--	--
38-7-5	QUARTER MOON	5-1	11	--	--
38-7-7	DEER MOM	7-1	31	--	--
38-7-7	DEER MOM	7-2	85	1-ALBOB 1-CLOC4 2-DEIN12 3-RARU6	--
38-7-7	DEER NORTH	7-11	13	--	--
38-7-7	TALL TIMBER	7-5B	11	--	--
38-7-9	CROOKED CEDAR	9-1	23	--	--
38-7-11	CROOKED CEDAR	11-1B	20	--	--
38-7-11	DEER MOM	11-4	15	--	--
38-7-11	TALL TIMBER	11-3	15	--	--
38-7-11	TALL TIMBER	11-6	47	--	--
38-7-15	DRY WHITE	15-1	53	1-CYMO2	--
38-7-21	TALL TIMBER	21-7	11	--	--
38-7-29	MCMULLIN	29-1	54	--	--
38-7-29	MCMULLIN	29-12	12	--	--
38-7-29	MCMULLIN	29-2A	22	--	--
38-7-29	MCMULLIN	29-2B	16	--	--
38-7-29	MCMULLIN	29-4A	7	--	0.5
38-7-29	MCMULLIN	29-4B	32	--	0.5
38-7-29	MCMULLIN	29-5	53	--	10
38-7-29	MCMULLIN	29-6	31	--	--
38-7-29	MCMULLIN	29-6A	1	--	--
38-7-29	MCMULLIN	29-6B	7	--	--
38-7-29	MCMULLIN	29-8	21	--	--
38-7-31	DEER MOM	31-1	168	--	--
38-7-31	MCMULLIN	31-18A	13	--	--
38-7-31	MCMULLIN	31-25	20	--	--
38-7-31	MCMULLIN	31-7	7	--	--
38-7-31	SCOTTISH VERBAS	2-D	11	--	--
38-7-31	SCOTTISH VERBAS	31-2B	19	--	--

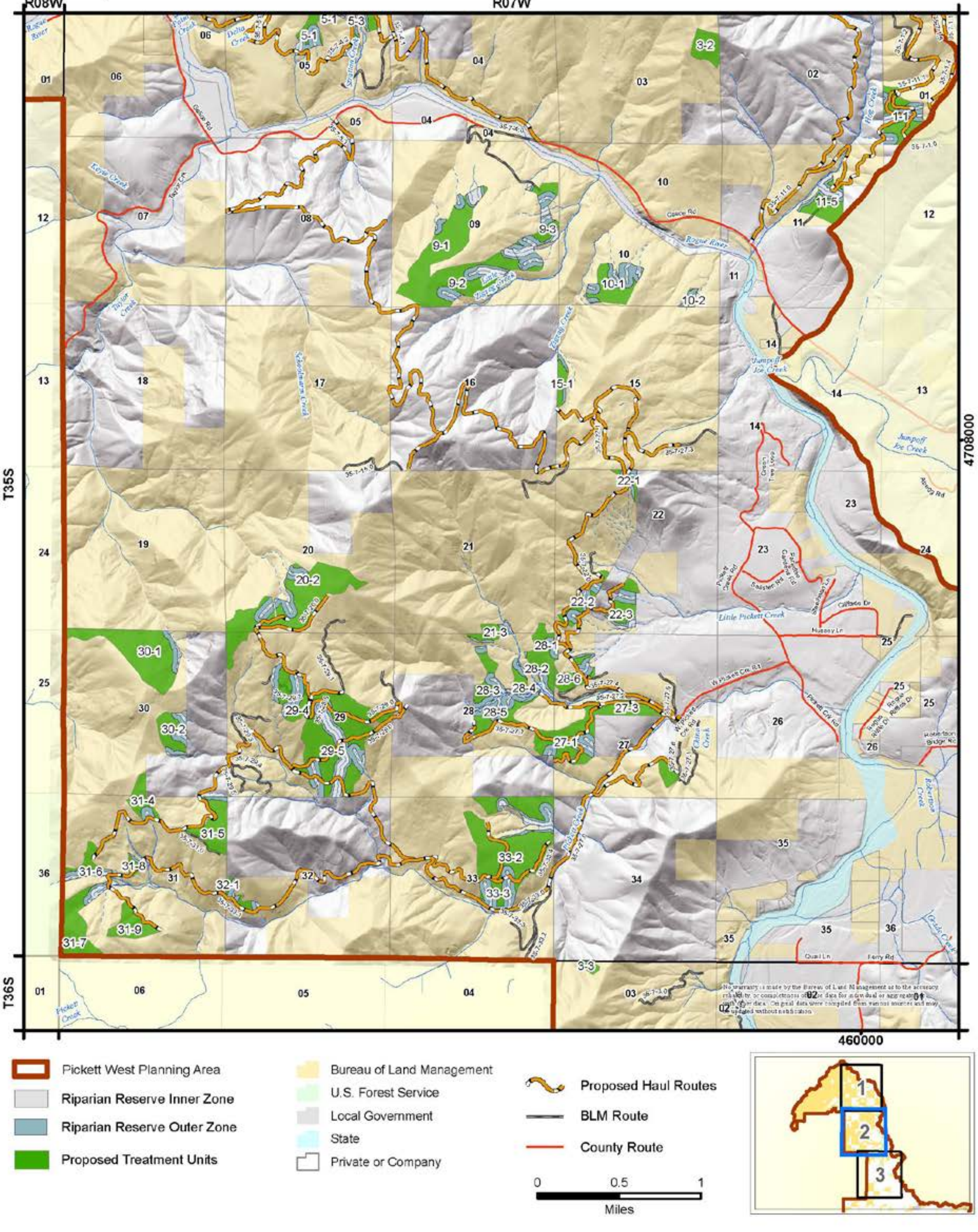
Township, Range, Section	Treatment Name	Treatment Number	Acres	Botany*	Category 1 Soils (Acres)
38-7-31	SCOTTISH VERBAS	31-2G	15	--	--
38-7-31	SCOTTISH VERBASCUM	2D	4	--	--
38-7-35	THOMPSON CREEK	4	41	--	--
39-8-1	LUCKY POT	6	18	--	--
38-8-23	ANDERSON WEST	23-4	26	--	--
38-8-23	ANDERSON WEST	23-6	64	--	--
38-8-25	DEER SELMAC	25-2	18	--	--
38-8-25	LUCKY POT	13	20	--	--
38-8-25	LUCKY POT	9	5	--	--
38-8-25	MCMULLIN	25-18	25	--	--
38-8-25	MCMULLIN	25-2	47	--	--
38-8-25	MCMULLIN	25-3	8	--	--
39-7-3	BARE NELSON	3-7	17	--	--
39-7-4	BARE NELSON	4-6	10	1-CYFA	--
39-7-5	MCMULLIN	5-1A	6	--	--
39-7-5	MCMULLIN	5-1B	24	--	--
39-7-5	MCMULLIN	5-8	9	--	--
39-7-5	MCMULLIN	5-9	20	--	--
39-7-5	MCMULLIN CREEK	005	16	--	--
39-7-5	MCMULLIN CREEK	5-6	92	--	--
39-7-5	OLD LITTLE GRAYBACK	5-9	36	--	--
Total (acres)			**11,102**		

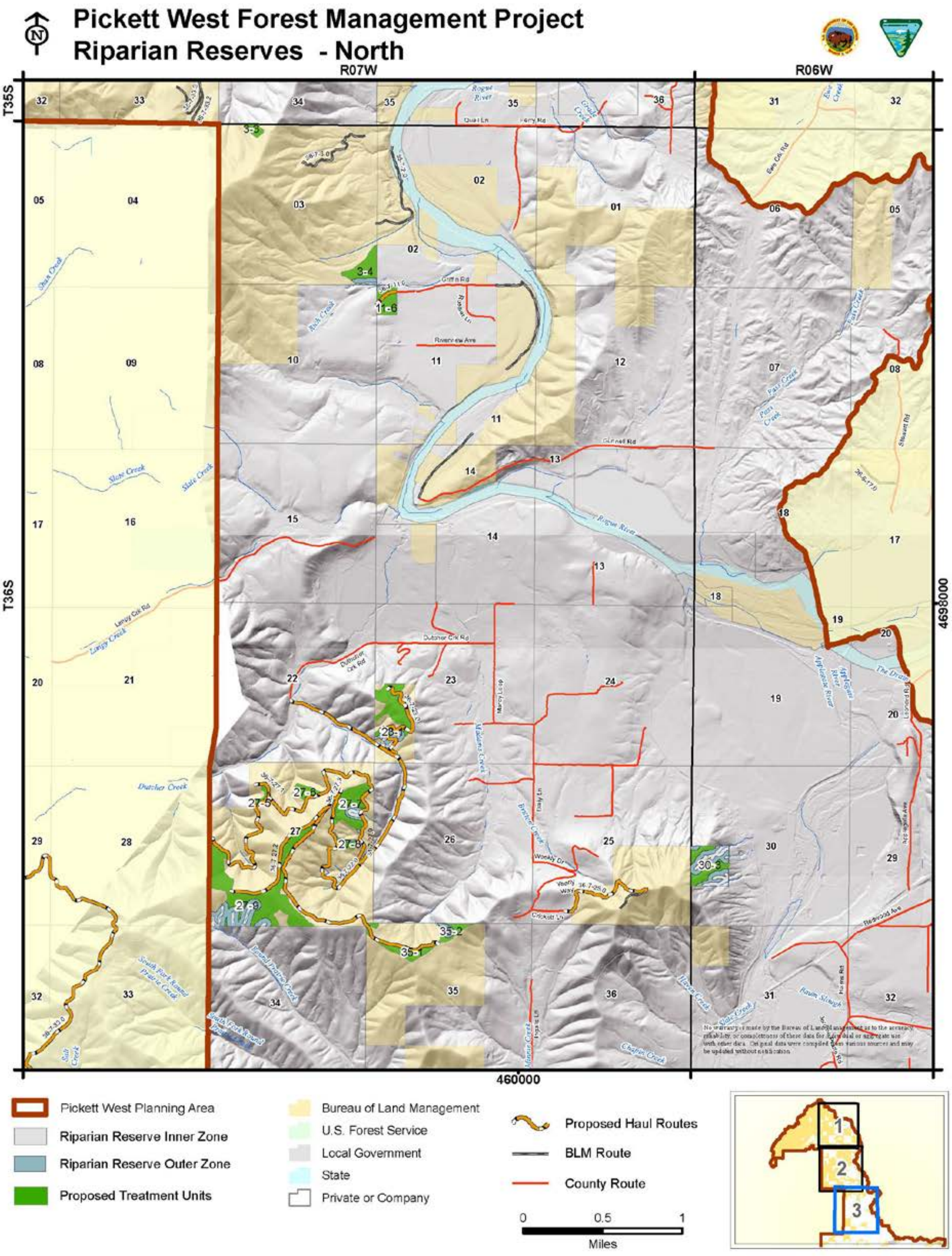
**The Botany column includes Federally Threatened and Endangered species, Interagency Special Status/Sensitive Species, and Survey and Manage species which require buffers. For an explanation of the codes used in the Botany column see Chapter 3.8.*

Appendix K Riparian Reserve Maps



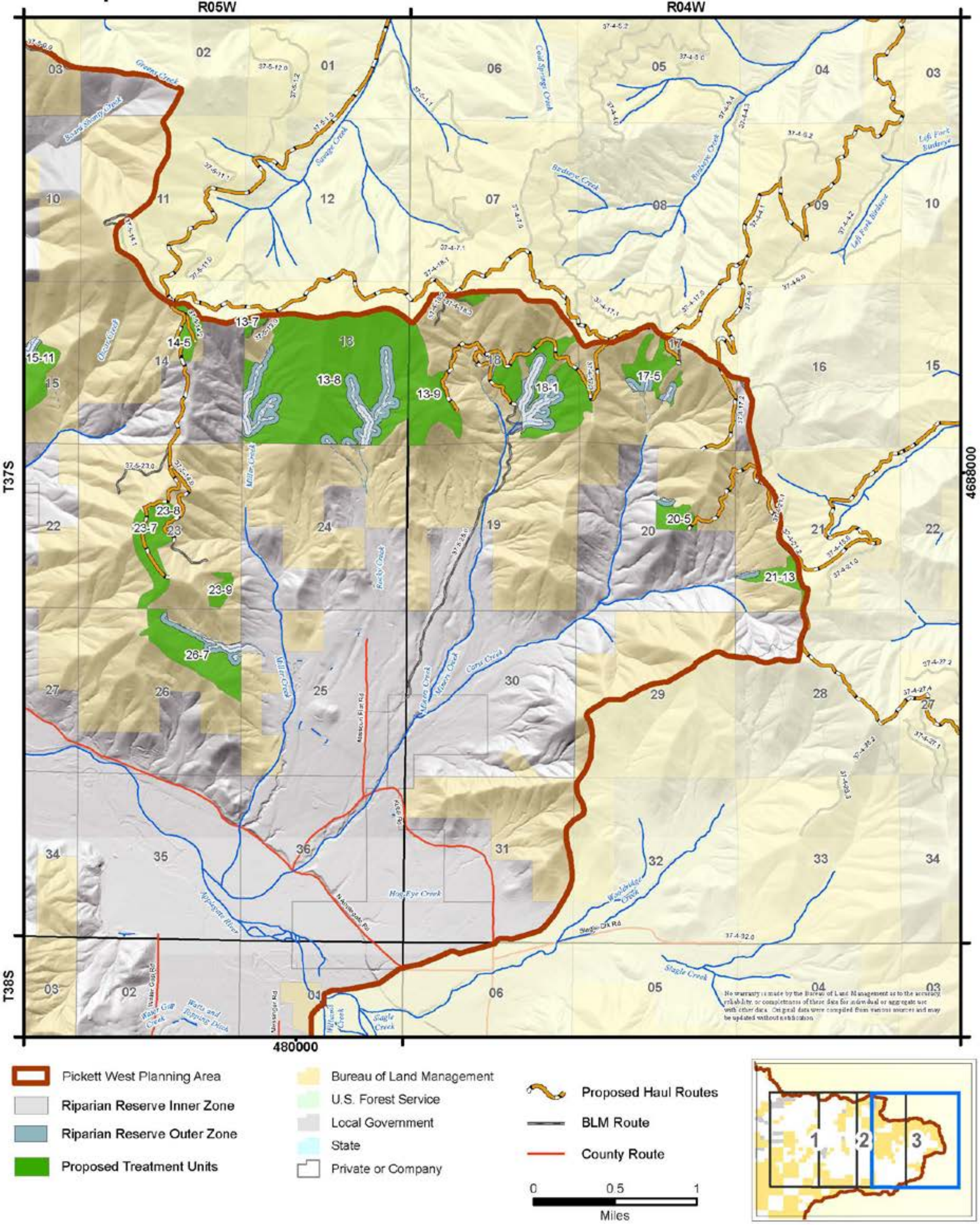
Pickett West Forest Management Project
Riparian Reserves - North



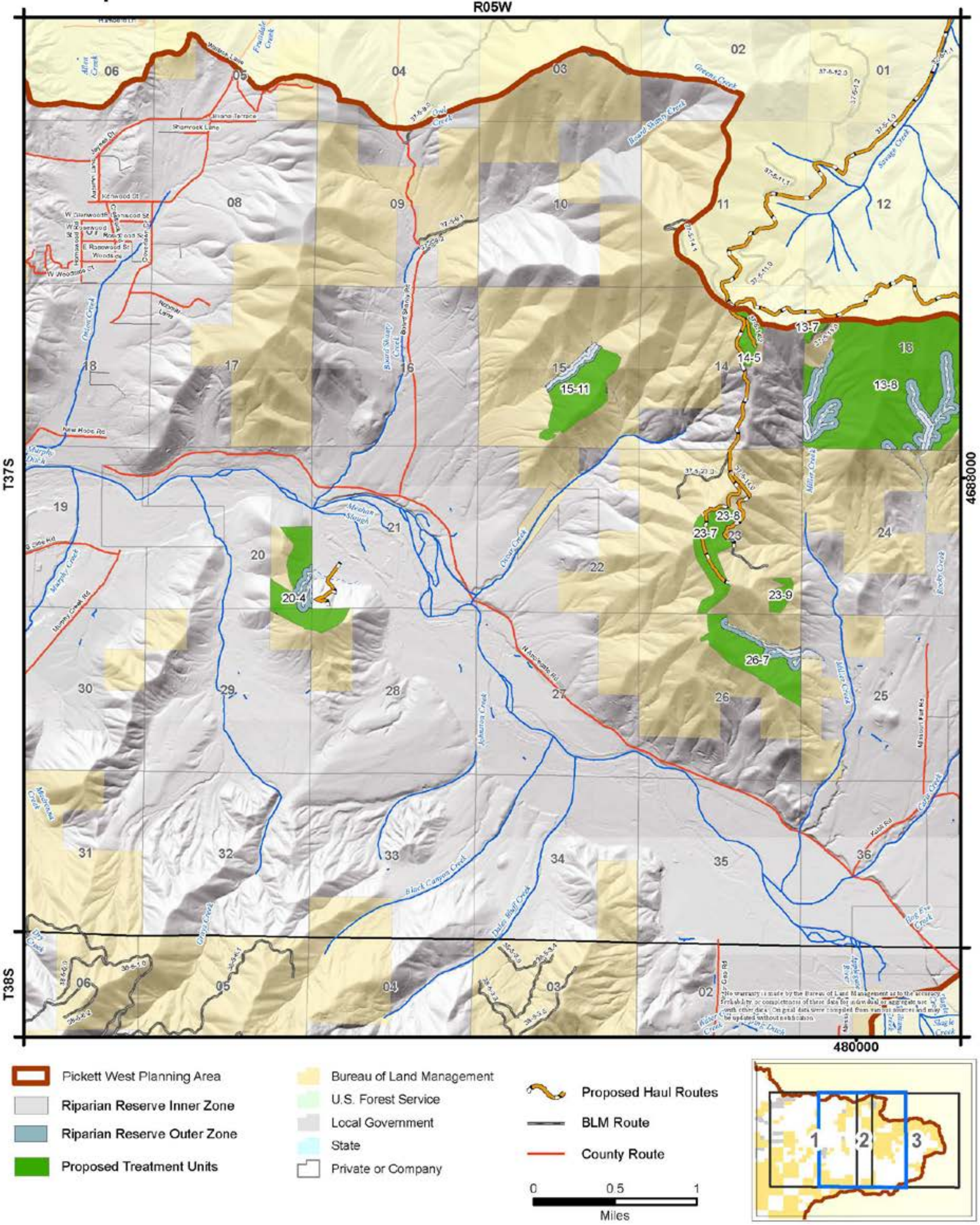


Pickett West Forest Management Project
Riparian Reserves - North
R07W
R06W
T35S
T36S
4698000
460000
Rogue River
Slate Creek
Shan Creek
Rich Creek
Dutcher Creek
Galice Rd
Riverview Ave
Quail Ln
Ferry Rd
Lange Crk Rd
Dutcher Crk Rd
Murry Loop
Woolley Dr
Crockett Ln
Redwood Ave
Applegate River
Pickett West Planning Area
Riparian Reserve Inner Zone
Riparian Reserve Outer Zone
Proposed Treatment Units
Bureau of Land Management
U.S. Forest Service
Local Government
State
Private or Company
Proposed Haul Routes
BLM Route
County Route
0
0.5
1
Miles
1
2
3

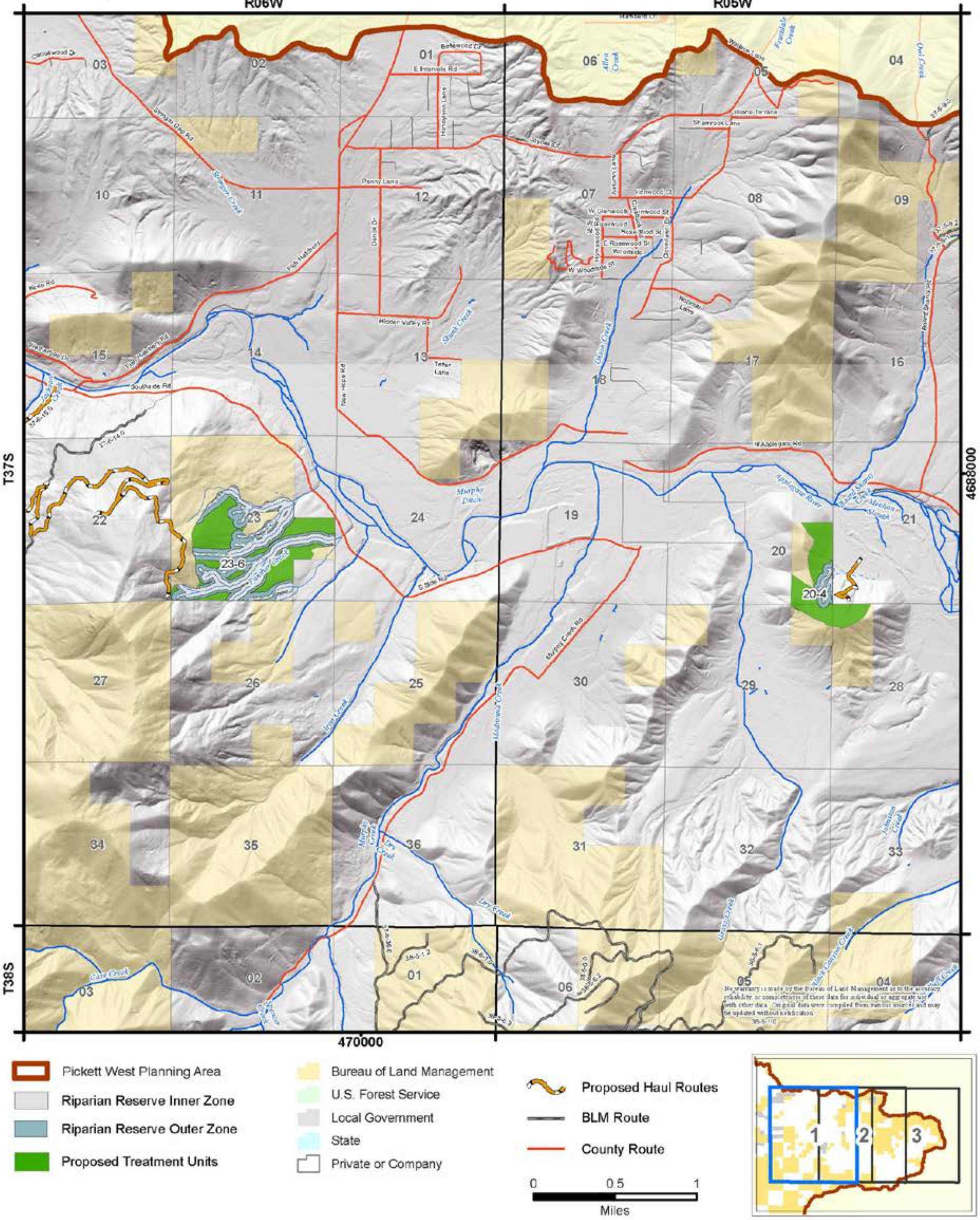
Pickett West Forest Management Project
Riparian Reserves - Southeast



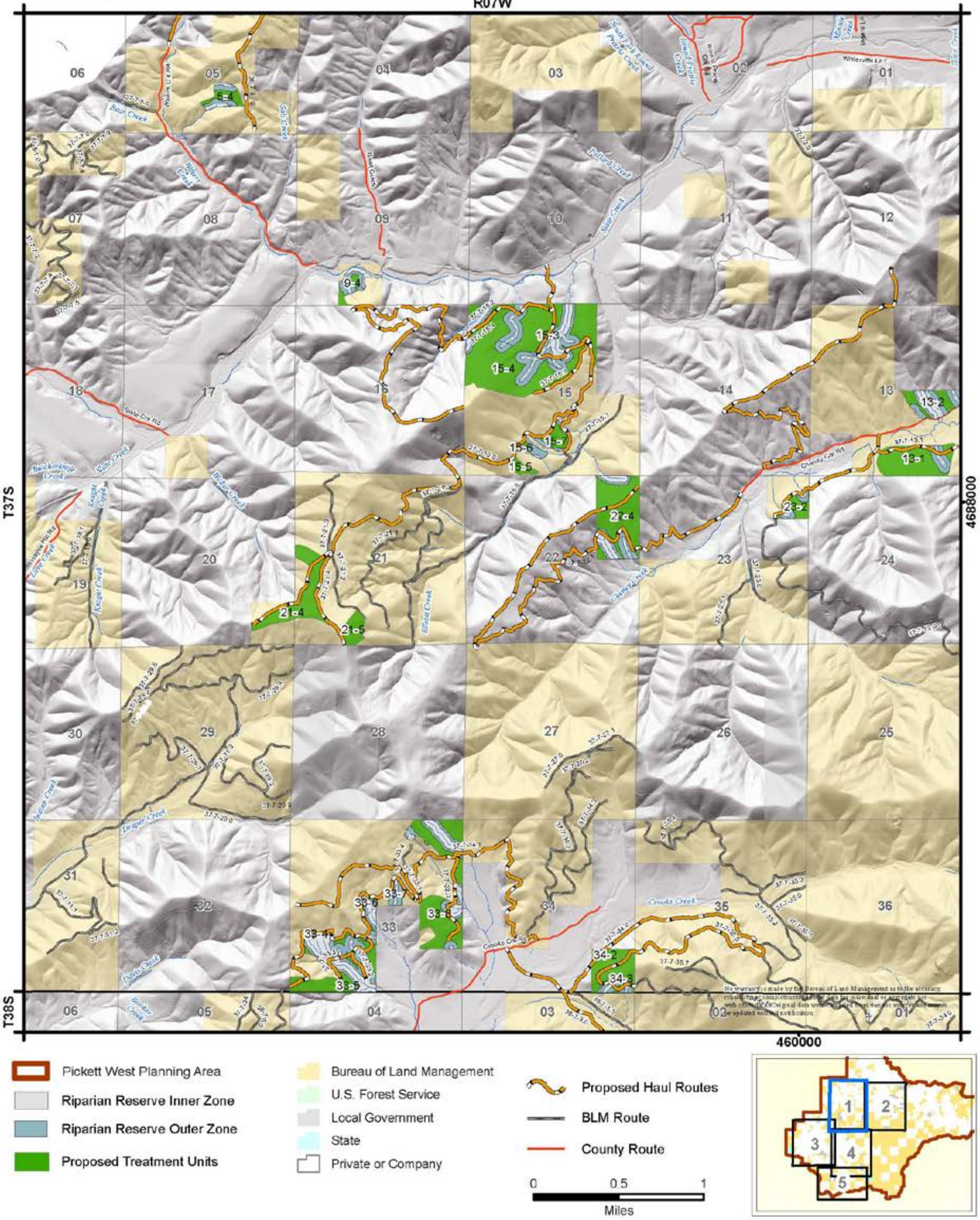
Pickett West Forest Management Project
Riparian Reserves - Southeast

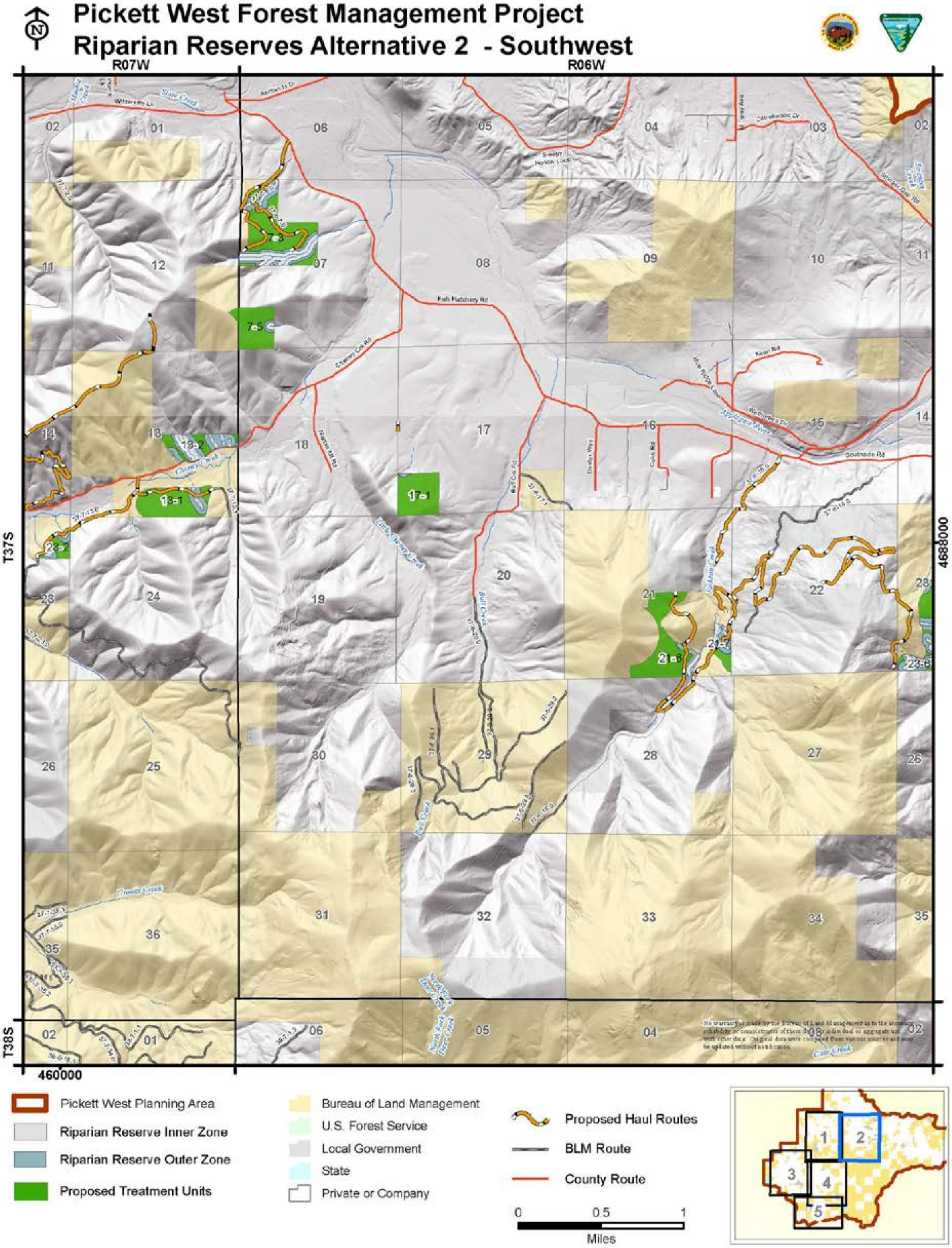


Pickett West Forest Management Project
Riparian Reserves - Southeast

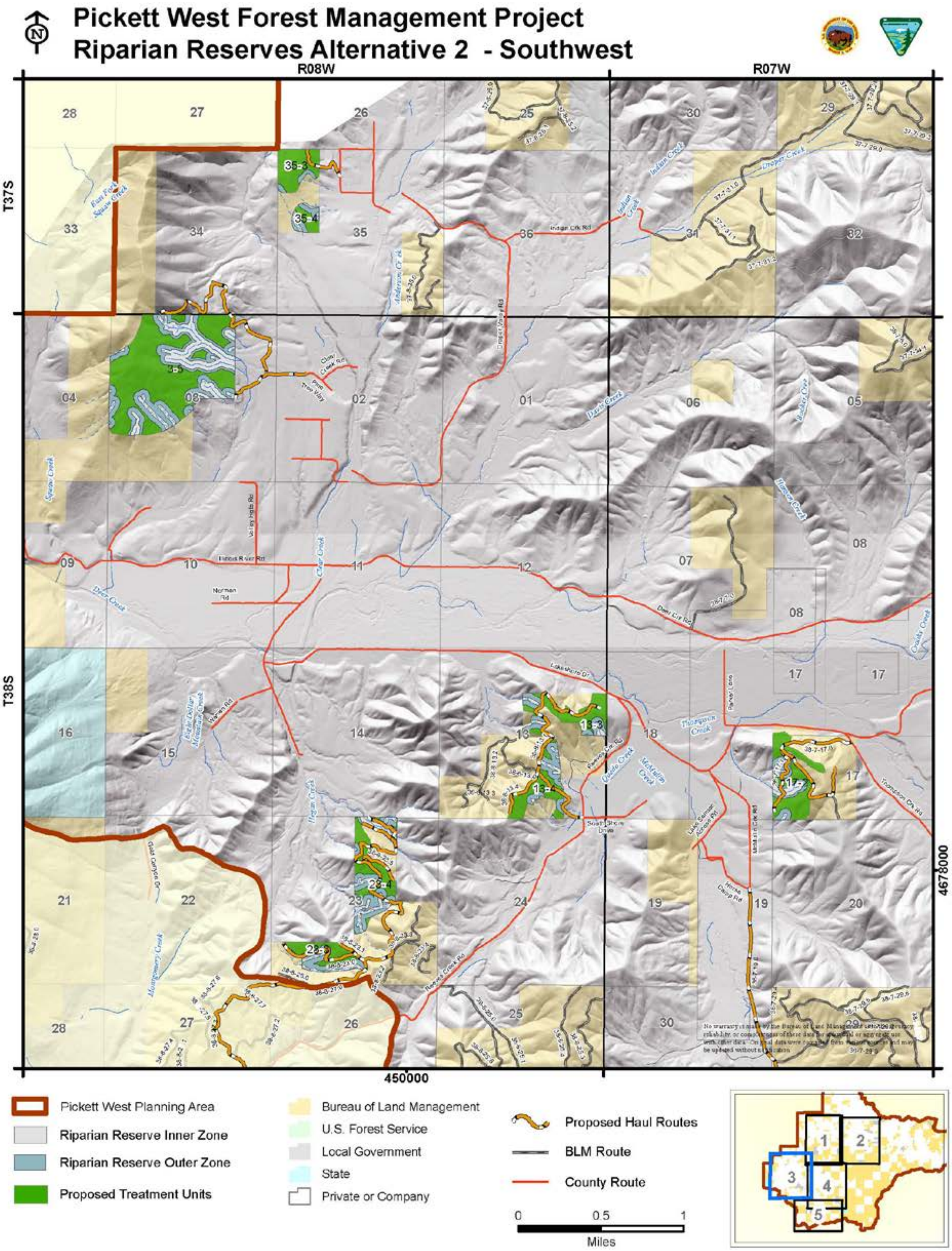


Pickett West Forest Management Project
Riparian Reserves Alternative 2 - Southwest

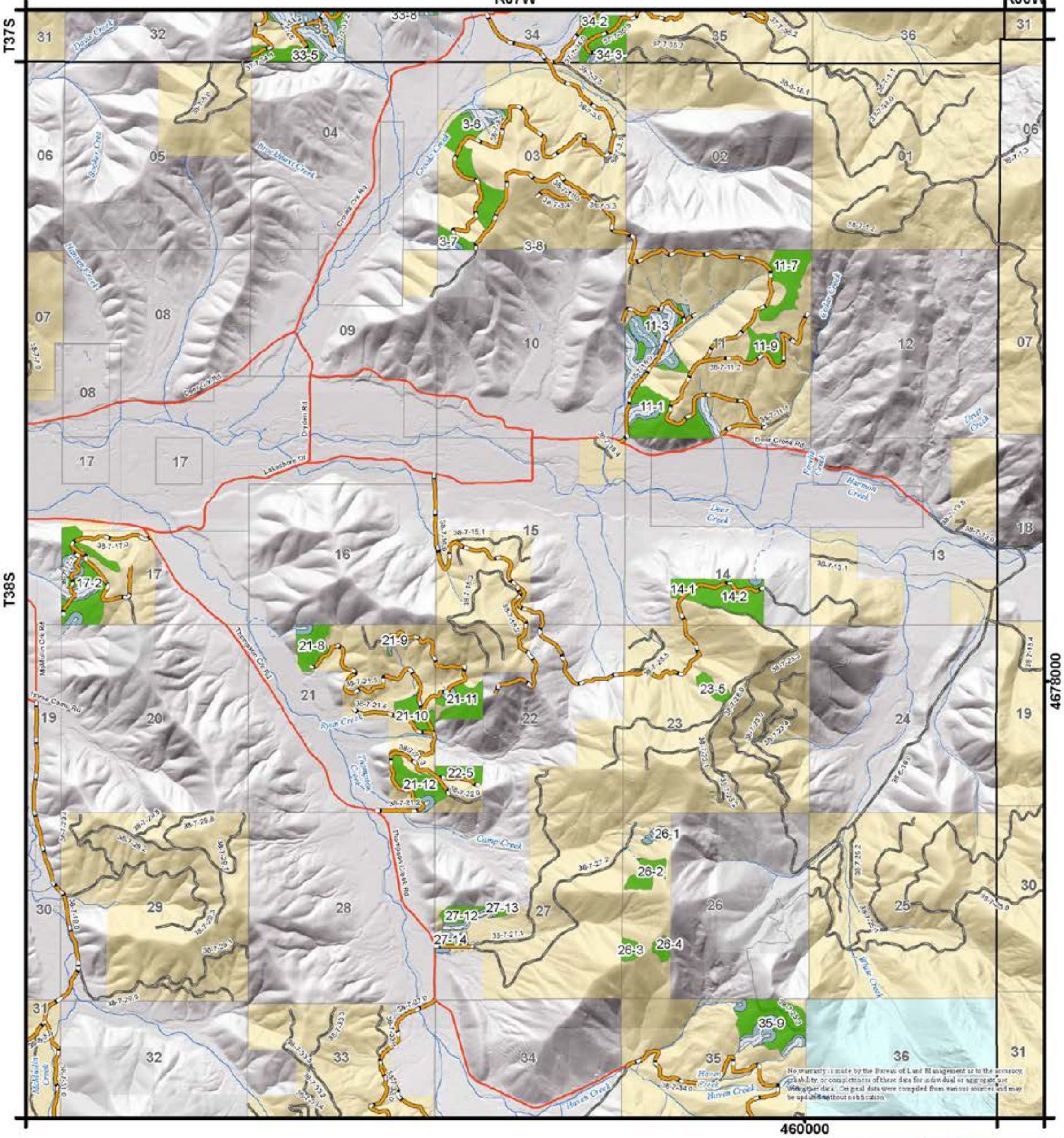




Pickett West Forest Management Project
Riparian Reserves Alternative 2 - Southwest
R07W
R06W
T37S
T38S
460000
4688000
Pickett West Planning Area
Riparian Reserve Inner Zone
Riparian Reserve Outer Zone
Proposed Treatment Units
Bureau of Land Management
U.S. Forest Service
Local Government
State
Private or Company
Proposed Haul Routes
BLM Route
County Route
0
0.5
1
Miles


Pickett West Forest Management Project
Riparian Reserves Alternative 2 - Southwest
R08W
R07W
T37S
T38S
450000
4678000
Pickett West Planning Area
Riparian Reserve Inner Zone
Riparian Reserve Outer Zone
Proposed Treatment Units
Bureau of Land Management
U.S. Forest Service
Local Government
State
Private or Company
Proposed Haul Routes
BLM Route
County Route
0
0.5
1
Miles

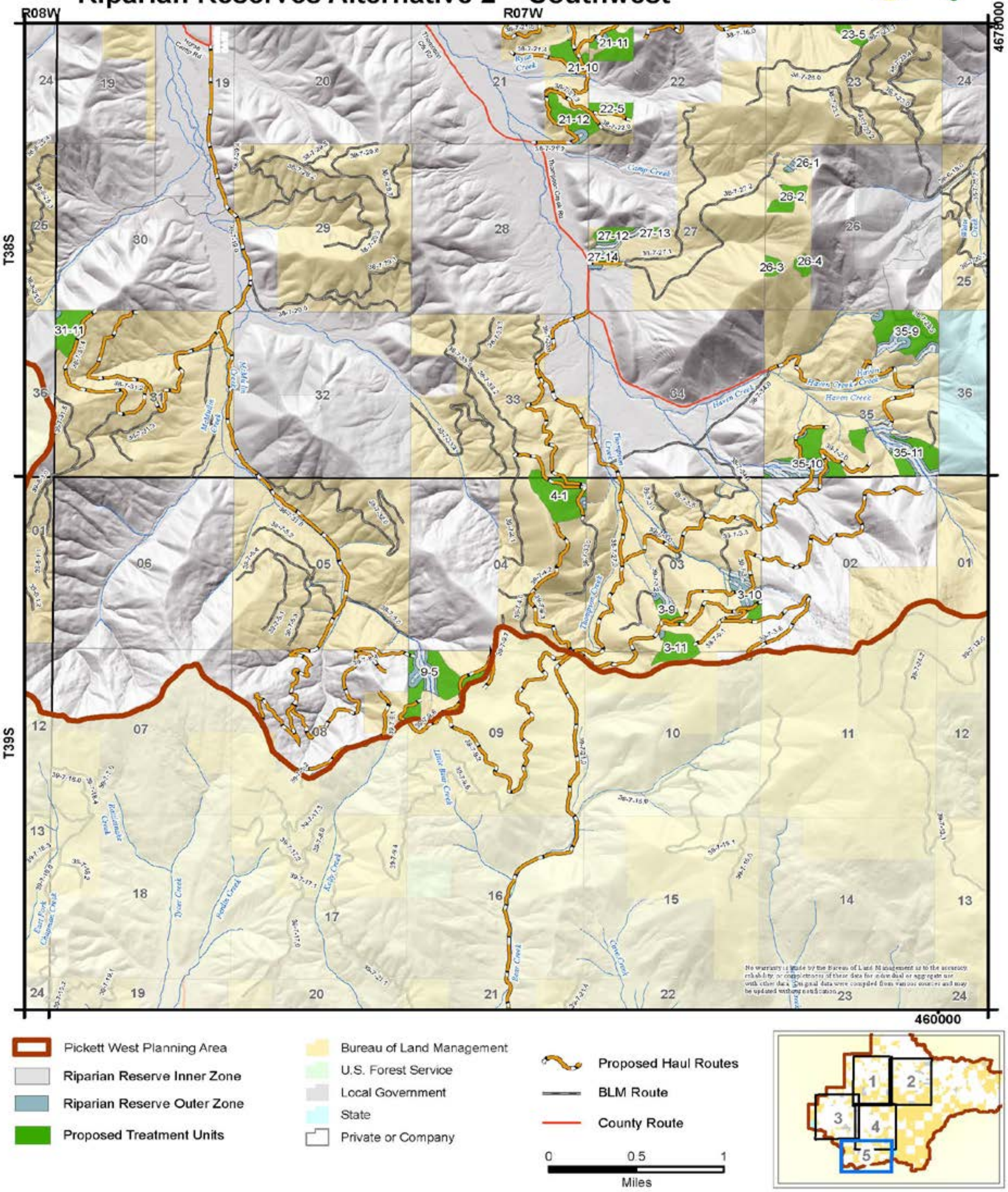
Pickett West Forest Management Project
Riparian Reserves Alternative 2 - Southwest



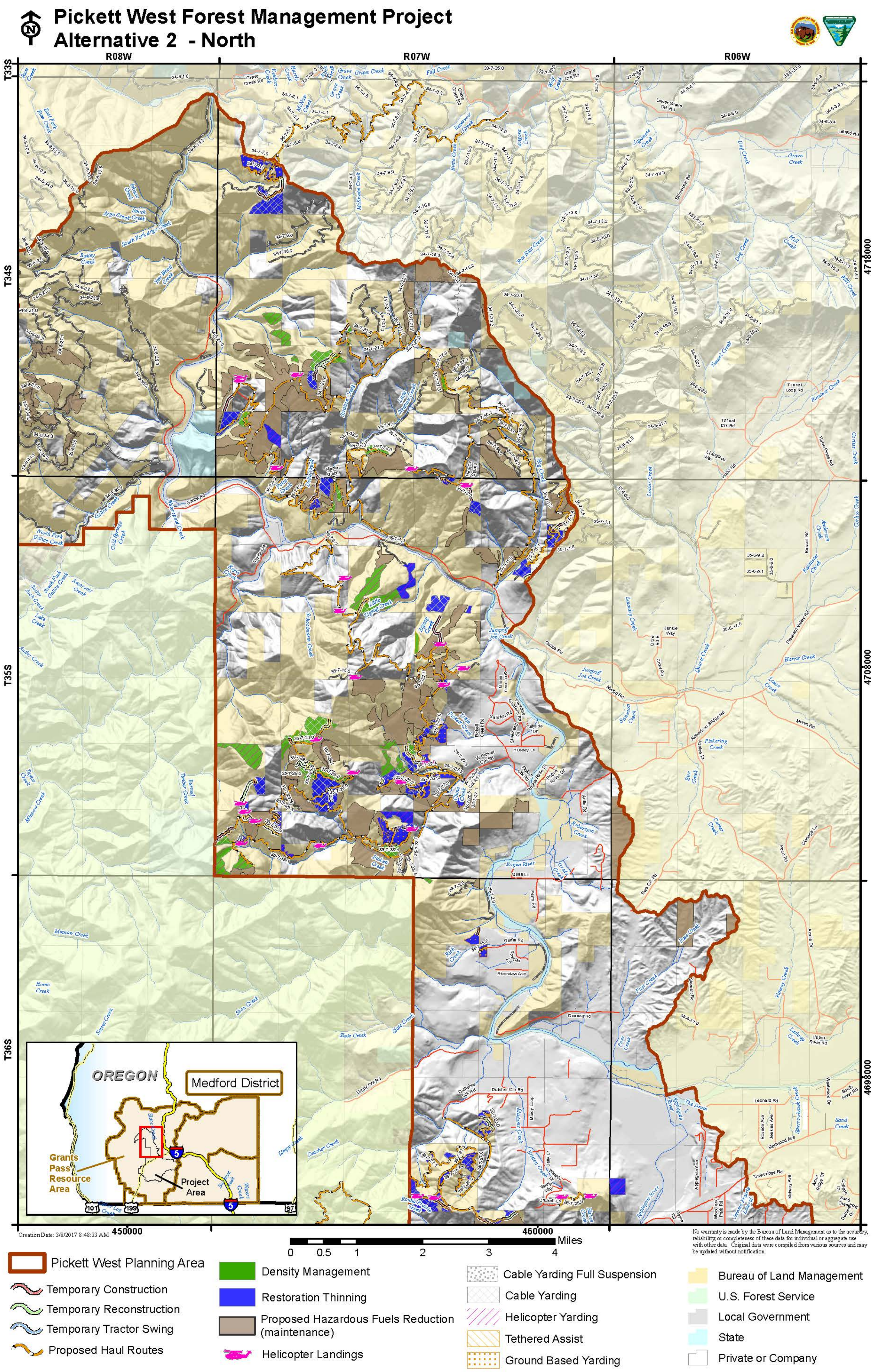
Pickett West Planning Area
Riparian Reserve Inner Zone
Riparian Reserve Outer Zone
Proposed Treatment Units
Bureau of Land Management
U.S. Forest Service
Local Government
State
Private or Company
Proposed Haul Routes
BLM Route
County Route

0 0.5 1
Miles

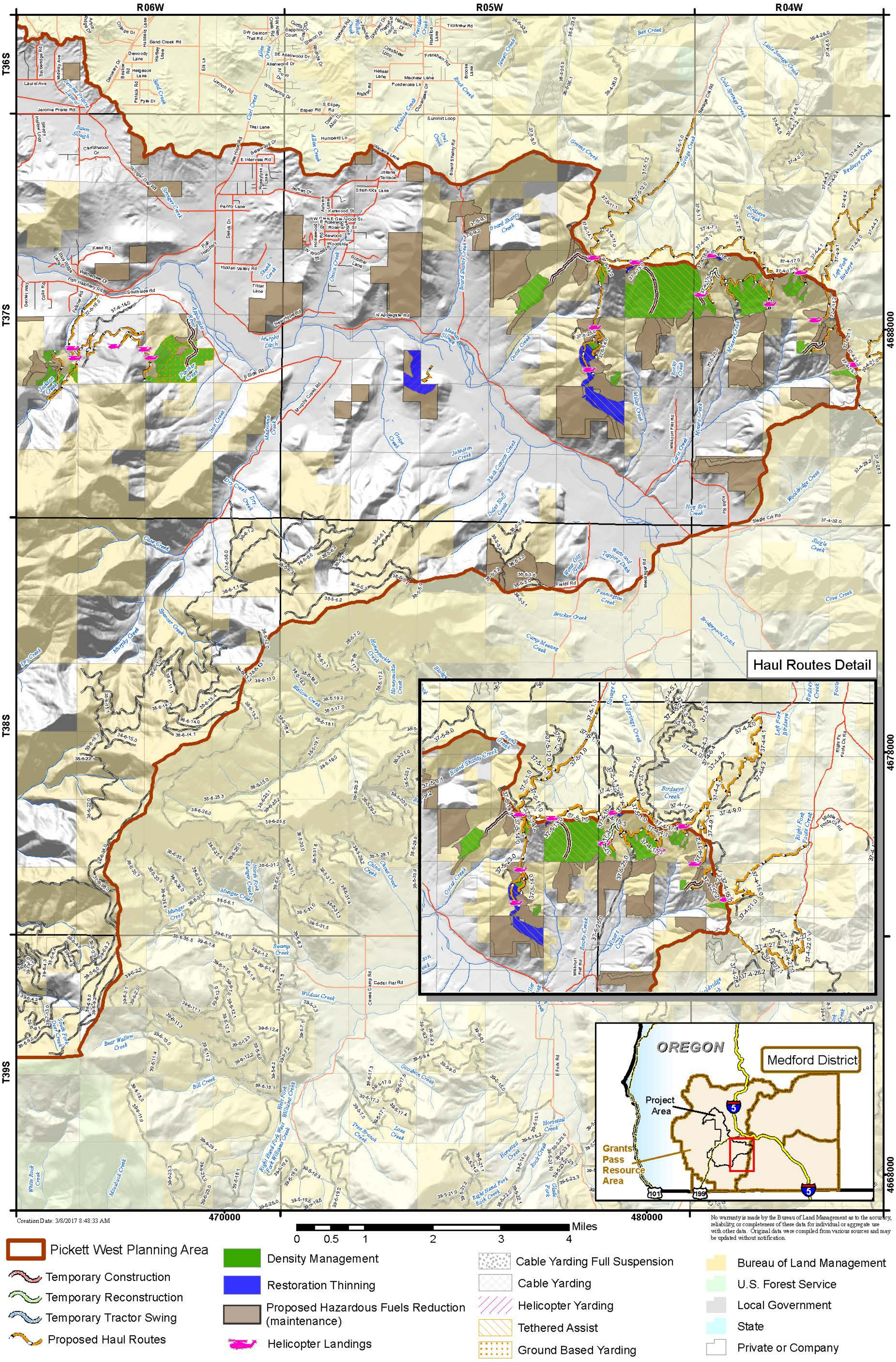
Pickett West Forest Management Project
Riparian Reserves Alternative 2 - Southwest



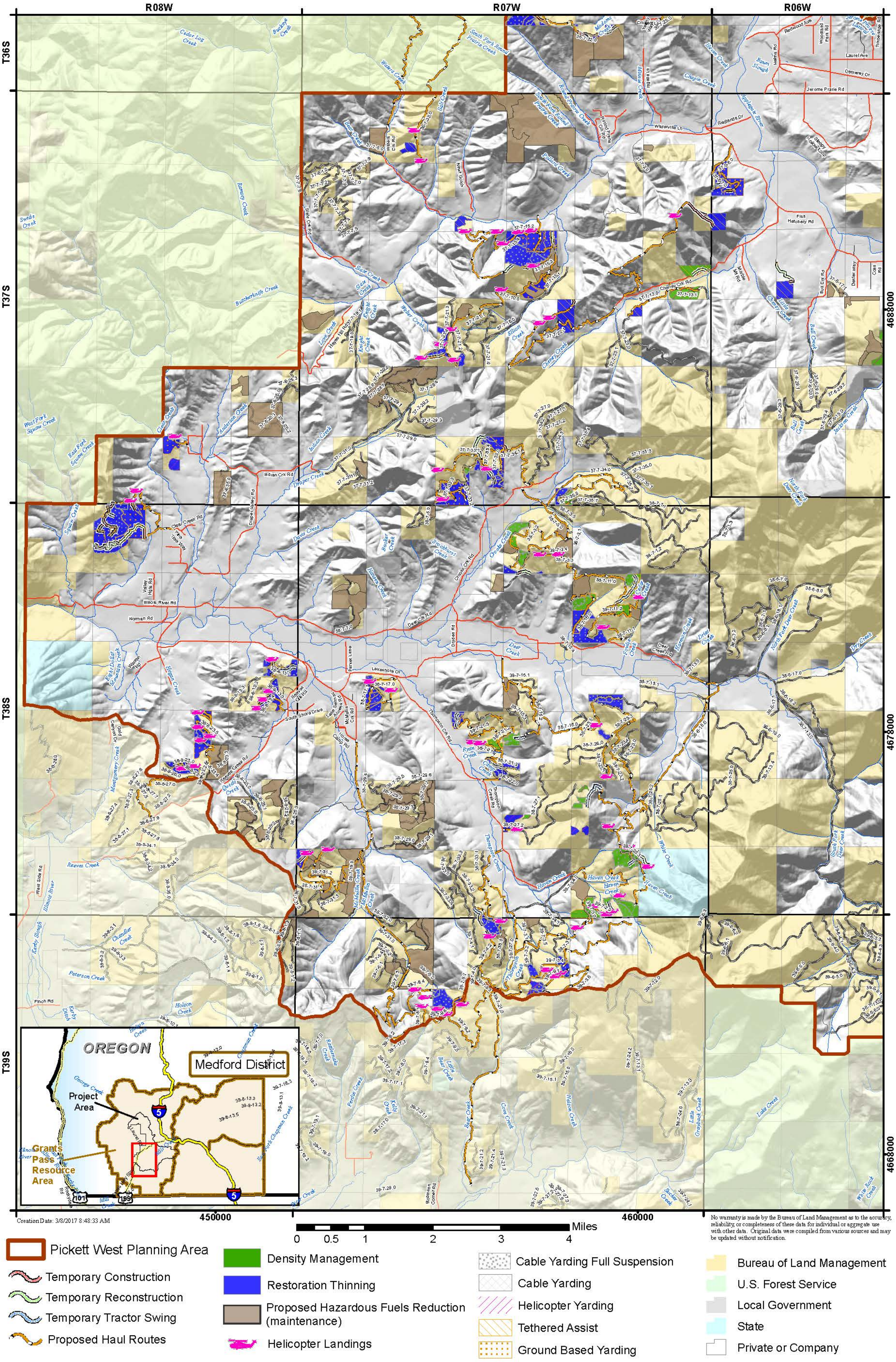
Appendix L Alternative Maps



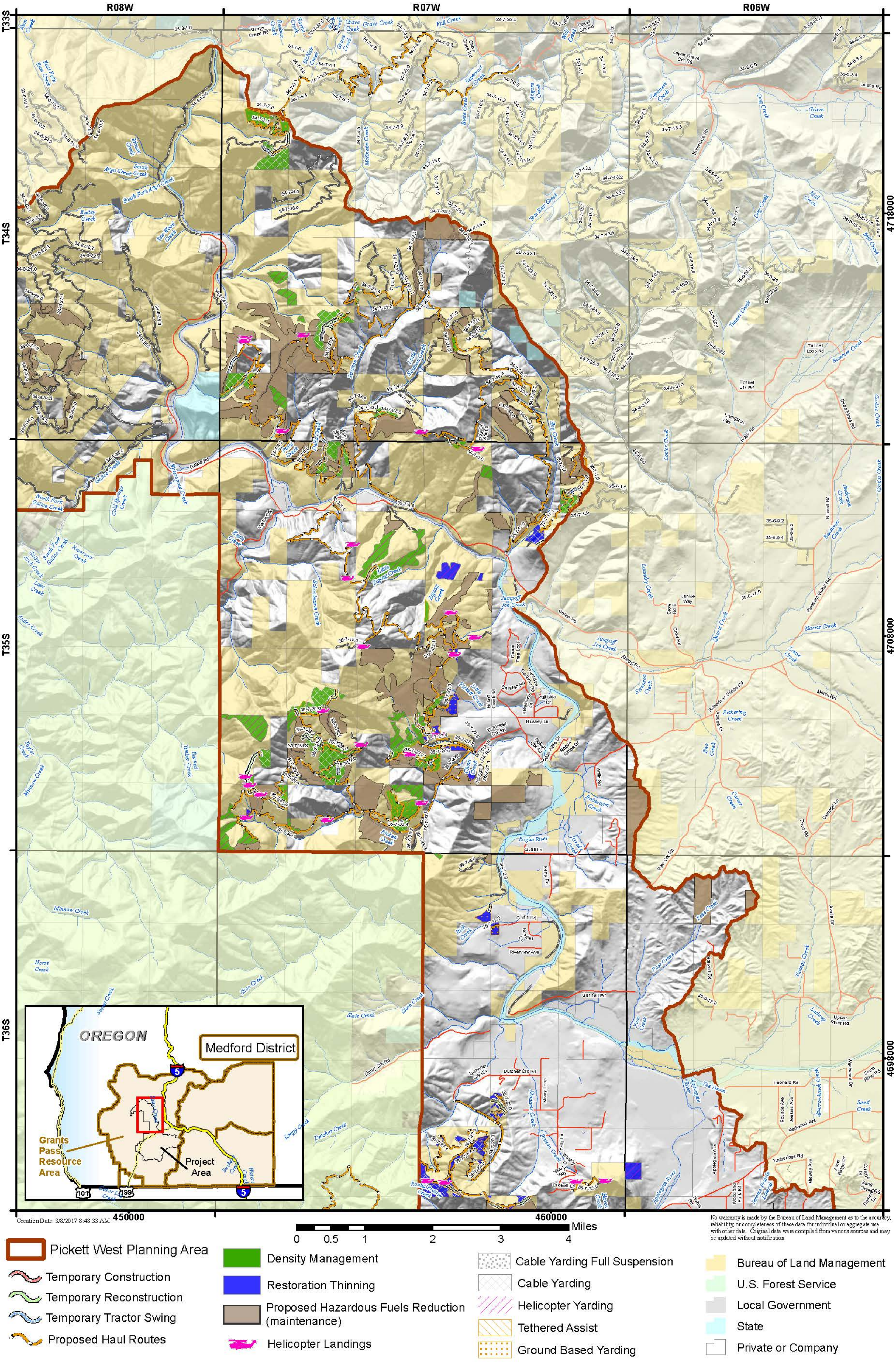
Pickett West Forest Management Project
Alternative 2 - Southeast



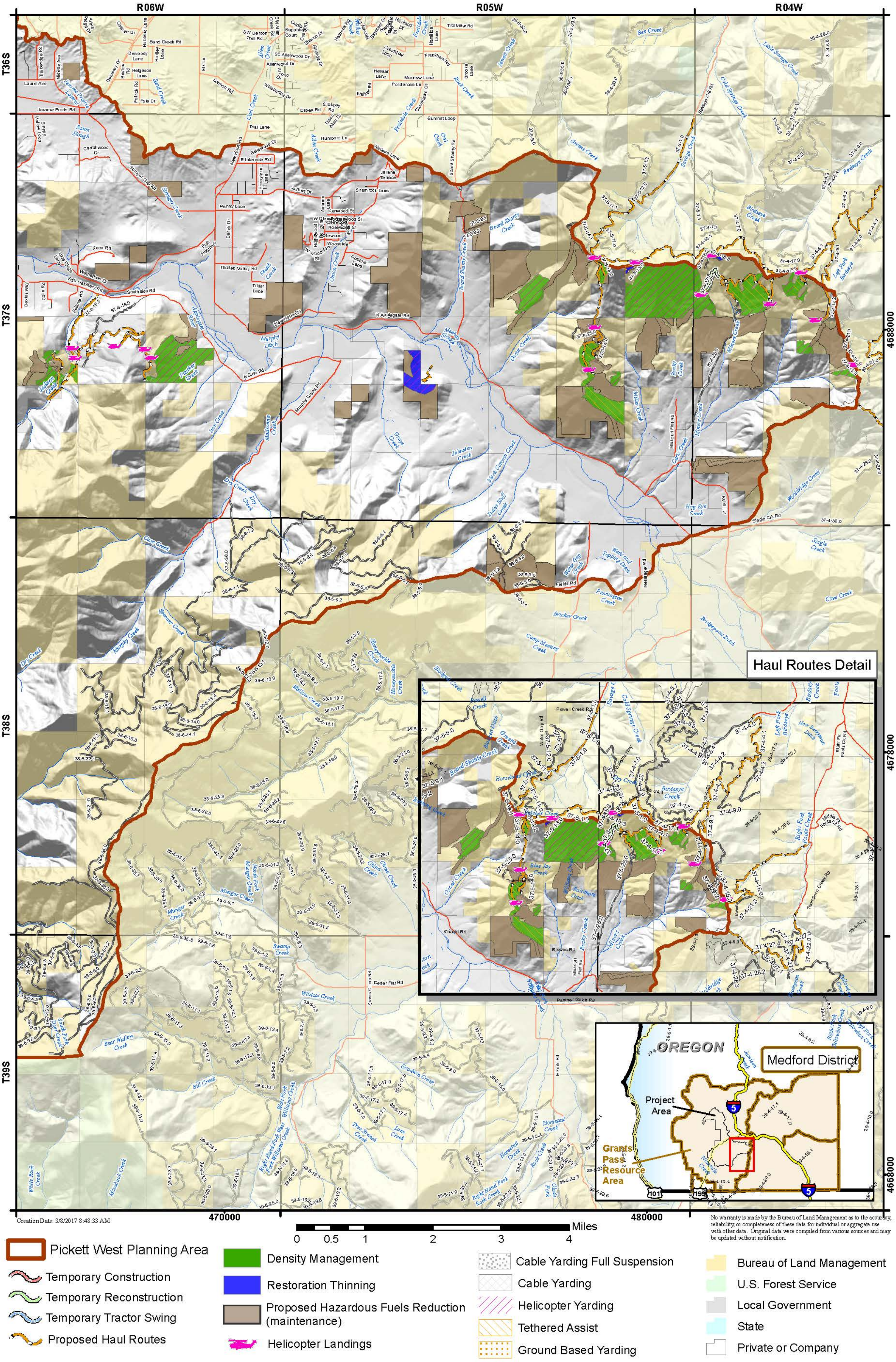
Pickett West Forest Management Project
Alternative 2 - Southwest



Pickett West Forest Management Project
Alternative 3 - North



Pickett West Forest Management Project
Alternative 3 - Southeast



Pickett West Forest Management Project
Alternative 3 - Southwest