United States Department of the Interior

BUREAU OF LAND MANAGEMENT
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1792(OR-120)
EA OR128-07-02
Edson Thin

April 4, 2008

Dear Citizen:

Enclosed is a copy of the "Edson Thin Environmental Assessment" (EA OR 128-07-02) and finding of no significant impact (FONSI) for proposed commercial thinning, density management and red alder conversion harvest projects. These projects are designed to implement management objectives described in the BLM Coos Bay District Resource Management Plan and Northwest Forest Plan. The environmental assessment analyzes a no-action alternative and a proposed-action alternative.

The Myrtlewood Field Office proposes to thin 35-60 year old forest stands consisting primarily of conifer plantations. The project would thin approximately 490 acres of conifer stands. Management actions would occur within the Matrix and Riparian Reserve land-use allocations in the following subwatersheds listed in Table 1.

Table:1 Project Area Location by Watershed and Subwatershed

Fifth Field Watershed	Sixth Field Subwatershed	Acres
New River Frontal	Lower Floras Creek	346
Sixes River	Middle Sixes	90
	Total Acres Project Area	**490**

The legal descriptions for proposed project are depicted in Table 2.

Table 2: Legal Description for all Units

Township	Range	Sections
T. 31 S.	R. 14 W.	14, 15, 22, 23, 24, 25, 26
T. 32 S.	R. 14 W.	14

You are encouraged to read the EA and comment on the appropriateness of the FONSI prior to the end of the 30-day comment period, May 7, 2008. The harvest could be accomplished by timber sale contract in FY 2008. A Decision Document will be published prior to the sale of timber.

Comments, including names and street addresses of respondents, will be available for public review at the address above during regular business hours (8:00 a.m. to 4:30 p.m.), Monday through Friday, except holidays, and may be published as part of the EA document or other related documents. Individual respondents may request confidentiality. If you wish to withhold your name or street address from public review or from disclosure under Freedom of Information Act, you must state this prominently at the beginning of your written comment. Such requests will be honored to the extent allowed by law. All submissions from organizations or businesses,

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

Questions should be directed to Chris Schumacher at (541) 751-4277.

Written comments on the EA and appropriateness of the FONSI may be sent to:

BLM Coos Bay District
Attn: Chris Schumacher
1300 Airport Lane
North Bend OR 97459-2000

You may e-mail your comments to:

OR_CoosBay_Mail@blm.gov,
RE: Edson Thin EA OR128-07-02, Chris Schumacher

Sincerely,

Paul T. Flanagan

Paul T. Flanagan
Myrtlewood Field Manager

Attachments:

(1)Edson Thin EA OR128-07-02 FONSI (4 pp)
(2)Edson Thin EA OR128-07-02 (115 pp)

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1792(OR-120)
EA-OR128-07-02

FINDING OF NO SIGNIFICANT IMPACT (FONSI)
For
Edson Thin
EA OR128-07-02

I. Introduction

An interdisciplinary team for the Edson Thin EA within the Myrtlewood Resource Area, Coos Bay District, Bureau of Land Management, has analyzed two alternatives: a no-action alternative and a proposed-action alternative for forest and road management. The No-Action alternative would defer management of forest stands and forest roads. The Proposed Action proposes to manage tree densities on about 490 acres and construct 3.3 miles of new road, renovate or improve 22 miles of road, decommission 10.6 miles of road, and create snags and downed. The locations for the project area/units are described Table 1.

Table 1: Legal Description for all Units

Township	Range	Sections
T. 31 S.	R. 14 W.	14, 15, 22, 23, 24, 25, 26
T. 32 S.	R. 14 W.	14

The analysis area encompasses the New River and Sixes 5th field watersheds. Stand treatments would occur in the Matrix and Riparian Reserve land-use allocations.

II. Background

The Coos Bay District of the Bureau of Land Management (BLM) is under the direction of the Final Coos Bay District Proposed Resource Management Plan Final Environmental Impact Statement (USDI 1994) and it's Record of Decision (USDI 1995), and the 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 (FSEIS), commonly referred to as the Northwest Forest Plan [NFP] (USDA and USDI 1994a) and its Record of Decision (USDA and USDI 1994b) as supplemented and amended by:

> *Management of Port-Orford-cedar in Southwest Oregon Final Supplemental Environmental Impact Statement* (USDA and USDI 2004a) and its *Record of Decision* (USDA and USDI 2004b).
>
> *Final Supplemental to the 2004 Supplemental Environmental Impact Statement To remove or Modify the Survey & Manage Measure Standards and Guidelines* (USDA and USDI 2007) and it's *Record of Decision* (USDI 2007b).

This EA is tiered to and in conformance with the *Final Programmatic Environmental Impact Statement Vegetation Treatments Using Herbicides On Bureau Of Land Management Lands in 17 Western States* (USDI 2007c) and it's *Record of Decision* (USDI 2007d).

Through these documents, the BLM, in conjunction with other Federal land agencies, is directed to conduct watershed analysis (WA), and to implement restoration projects to aid in the recovery of water quality and aquatic, riparian, and terrestrial habitats.

As stated in the ROD for the NFP, the Aquatic Conservation Strategy (ACS) was developed to maintain the ecological health of watersheds and aquatic ecosystems on public lands within the range of Pacific Ocean anadromy. The Environmental Consequences section of the EA describes the consistency of the proposed alternative with the ACS.

All Federal agencies are charged with managing programs to enhance the recovery of Federally listed endangered and threatened species and their habitats (Section 7(a) (1) of the Endangered Species Act). The U.S. Fish and Wildlife Service was consulted and issued a letter of concurrence that threatened or endangered species may be affected, but are not likely to be adversely affected by the alternatives (USDI 2007a). It was determined that no consultation with the National Marine Fisheries Service was required because it was determined that the alternatives would have no effect to coastal coho salmon (USDI 2008).

III. Finding of No Significant Impact

Based on information contained in the Edson Thin EA and all other information available to me, it is my determination that none of the alternatives constitutes a major Federal action significantly affecting the quality of the human environment. Therefore, an Environmental Impact Statement will not be prepared for this analysis area. This finding and conclusion is based on my consideration of the Council on Environmental Quality's (CEQ) criteria for significance (40 CFR1508.27), both with regard to the context and intensity of the impacts described in the EA.

Context:

The proposed activities are not national or regional in scope. The Edson Thin EA Project Area comprises 490 project acres spread between two 5th field watersheds totaling 151,027 acres. Table 2 summarizes the project area/units by watershed/subwatershed.

Table 2- Project Area Location by Watershed and Subwatershed

Fifth Field Watershed	Sixth Field Subwatershed	Acres
New River Frontal	Lower Floras Creek	346
Sixes River	Middle Sixes River	144

Intensity

1) Impacts that may be both beneficial and adverse

The environmental assessment has considered both beneficial and adverse impacts of the timber harvest and road related activities. Commercial thinning in the Matrix and density management in Riparian Reserves are expected to have some short-term effects to microclimate, forest canopy closure, and small diameter coarse woody debris recruitment potential into streams but overall these activities will result in healthier forest stands with components found in late-successional riparian systems. Overall, road related activities including, culvert replacement, renovation, and decommissioning provide opportunities to address current and potential future sources of sediment

input into streams. The individual treatment areas are located at previously managed sites, and the silvicultural prescriptions would help restore the natural physical environment.

2) The degree to which the proposed action affects public health or safety
The proposed activities would not significantly affect public health and safety. Best Management Practices and other provisions are incorporated in the EA that require spill prevention control and countermeasures (SPCC) and where applicable, the presence of spill containment kits and operators trained in their use on work sites would minimize the risk. In addition, notifications in the event of a release threatening waterways are to be made in accordance with the BLM Coos Bay District Riparian Spill Plan, and Oregon DEQ Administrative Rule (OAR) 340-108, *Oil and Hazardous Materials Spills and Releases*.

3) *Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.* The proposed activities would not have an impact on unique characteristics of the geographic area such as historical or cultural resources, park lands, prime farmlands, Port-Orford-cedar, wild and scenic rivers, ecological critical areas, or energy development

4) *The degree to which the effects on the quality of the human environment are likely to be highly controversial.* The effects on the quality of the human environment of the proposed activities are not highly controversial.

5) *The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.* The possible effects of the proposed activities on the quality of the human environment are not highly uncertain and do not involve unique or unknown risks.

6) *The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.* The proposed actions do not establish a precedent for future actions or represent a decision in principle about future action with potentially significant effects. The proposed actions are consistent with the Management Direction in the Resource Management Plan.

7) *Whether the action is related to other actions with individually insignificant but cumulatively significant impacts.* There are no significant cumulative effects identified by this assessment.

8) *The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the NRHP or may cause loss or destruction of significant scientific, cultural, or historical resources.* The proposed activities would not affect districts, sites, highways, structures or objects listed in or eligible for listing in the Natural Register of Historic Places, nor would the activities cause a loss or destruction of significant scientific, cultural, or historical resources.

9) *The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the ESA of 1973.* The proposed projects will fully comply with the Endangered Species Act of 1973, as amended.

The proposed activities that may affect listed species within the project area were submitted for consultation with the U.S. Fish and wildlife Service in accordance with section 7(A)(4) of the Endangered Species Act of 1973 [16 U.S.C. 1536(A)(2) and (A)(4) as amended]. The US Fish

and Wildlife Service issued a Letter of Concurrence (LOC. Ref # 13420-2007-I-0184) dated June 29, 2007(USDI 2007a). The letter concurs that the proposed actions may affect but are not likely to adversely affect the northern spotted owl or the marbled murrelet.

The proposed activities were determined no effect to the coho salmon (USDI 2008); therefore, no consultation with the National Marine Fisheries Service was required.

10) *Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.* The proposed activities would not violate Federal, State, or local laws imposed for the protection of the environment.

9. There are no irreversible or irretrievable resource commitments identified by this assessment beyond those identified in the Resource Management Plan.

10. The proposed activities would not violate Federal, State, or local laws imposed for the protection of the environment.

Paul T. Flanagan *4/4/2008*

Paul T. Flanagan Date
Myrtlewood Field Manager

Edson Thin

ENVIRONMENTAL ASSESSMENT
EA: OR128-07-02

Myrtlewood Field Office
Coos Bay District
Bureau of Land Management

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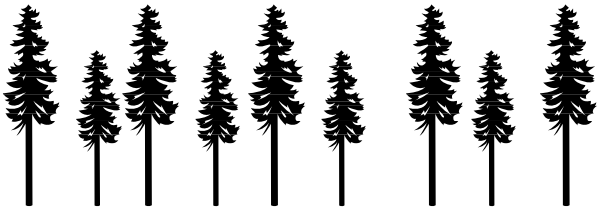
In Memory of Jim Kowalick, a Proficient
Forester and a Good Friend



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Chapter I. **PURPOSE OF AND NEED FOR ACTION**

Background

The Myrtlewood Field Office has reviewed its Forest Operations Inventory, aerial photos, and field stand-exam information in the New River Frontal and Sixes River watersheds. These sources indicate that approximately 490 acres of 30 to 60 year-old timber stands would benefit from a combination of commercial thinning treatments in the General Forest Management Area (GFMA) portion of the Matrix land-use allocation and density management treatments in the Riparian Reserve land-use allocation.

The Coos Bay District Resource Management Plan allocated the uses of lands for different primary purposes. The Matrix lands are lands located outside of designated reserves and special management areas and are primarily available for planned timber harvest. The Riparian Reserve land use allocation was designed to restore and maintain the ecological health of watersheds and their aquatic ecosystems on public lands (USDI 1995 RMP-ROD, p6).

Conformance with Existing Land-use Plans

This EA is tiered to and was developed to be in conformance with the:

- *Final Coos Bay District Resource Management Plan/ Environmental Impact Statement* (RMP FEIS) (USDI-BLM 1994) *and its Record of Decision* (RMP-ROD) (USDI 1995) as supplemented and amended; that is in conformance with the *Northwest Forest Plan (NFP) 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* (NFP FSEIS, (USDA and USDI 1994a), its *Record of Decision (NFP ROD),* and its *Standards and Guidelines (NFP S&G's)* (USDA and USDI 1994b) as supplemented and amended.
- *Final Supplemental to the 2004 Supplemental Environmental Impact Statement To remove or Modify the Survey & Manage Measure Standards and Guidelines* (USDA and USDI 2007) and it's *Record of Decision* (USDI 2007b).
- *Management of Port-Orford-cedar in Southwest Oregon Final Supplemental Environmental Impact Statement* (USDA and USDI 2004a) and its *Record of Decision* (USDA and USDI 2004b).

This EA is tiered to and in conformance with the *Final Programmatic Environmental Impact Statement Vegetation Treatments Using Herbicides On Bureau Of Land Management Lands in 17 Western States* (USDI 2007d) and it's *Record of Decision* (USDI 2007e).

This proposed action has been reviewed and determined to conform to the land-use plan terms as required by 43 CFR 1601.5.

All of these documents are available for review at the Coos Bay District Office of the Bureau of Land Management, during regular business hours. Some of the documents are available at the Coos Bay and North Bend Public Libraries, the Coos Bay District's Internet Home Page at

http://www.or.blm.gov/districts/coosbay/index.php, and the Oregon State Office of the Bureau of Land Management in Portland, Oregon.

Project Location

The proposed harvest activities are located in T.31S., R.14W., Sections 10, 14, 15, 22, 23, 24, 25, and 26; and T.32S., R.14W., Section 14; Willamette Meridian. See maps in Appendix E.

The proposed treatment area of approximately 490 acres is located approximately 10 to 12 miles inland from the Pacific Coast, and approximately 7 miles southeast of Langlois, Oregon. Most of the proposed units are in the Lower Floras Creek 6th field subwatershed of the New River Frontal 5th field watershed and the Middle Sixes River 6th field subwatershed of Sixes River 5th field watershed.

Project Description

The Myrtlewood Field Office proposes to treat 30 to 60 year-old Douglas-fir and western hemlock stands within the Matrix land-use allocation by commercial thinning (CT) and within the Riparian Reserve land-use allocation by density management thinning (DMT). The treatments in the 490-acre project area would remove the suppressed, intermediate, and some co-dominant trees competing with each other for growing space (thinning from below). Some of the areas proposed for a thinning are interspersed with red alder. These areas would be thinned with some alder being removed.

Within the Riparian Reserve, variable width no-harvest buffers would be maintained along streams for bank stability where needed and other areas along small intermittent streams with stable banks would be thinned through. Generally, alder found adjacent to streams are excluded from treatment units, although thinning corridors may be needed through these areas. Any trees cut to facilitate yarding through the no-harvest buffers would be felled towards streams and left in place.

Harvest would be accomplished with a combination of skyline and ground-based logging equipment depending on road access and the steepness of the terrain.

Access to the treatment units would require utilization of the existing transportation network, renovation, reconstruction, or improvement of existing poorly maintained roads, and construction of new roads. New road construction would consist of construction of temporary (no future use anticipated) and semi-permanent roads (future use anticipated), depending on management objectives of the associated road tributary areas. Road renovation (including reconstruction) would consist of brushing, grading, providing adequate drainage, replacing old culverts, and/or restoring the rock surfacing to the original constructed standard on older existing roads. Road improvement would consist of improvements such as placing rock surfacing on existing dirt roads or adding culverts. The proposed action would make extensive use of the existing private road system. Private haul roads would be subject to “conditions of use” by the owner controlling the road; actions on these roads may include brushing, blading, and spot rocking. BLM controlled roads not providing access to private lands and no longer needed for

administrative purposes would be decommissioned. Specific road information can be found in Appendix C.

The project would be funded by the sale of excess trees removed from the stands in a timber sale that is planned for Fiscal Year 2008.

Need for the Project

The *Final - Coos Bay District Resource Management Plan and Environmental Impact Statement* and its *Record of Decision* (USDI 1995) responds to two needs: the need for forest habitat and the need for forest products (USDI 1995 p1). These needs were addressed in the RMP through an ecosystem management strategy under which BLM lands "will be managed to maintain healthy, functioning ecosystems from which a sustainable production of natural resources can be provided" (USDI 1995, p. 5). The proposed action, as described in this EA, is to implement the Coos Bay District's RMP in the Edson Thin project area. The proposed project would improve stand health and restore desired forest habitats within the Matrix, and the Riparian Reserve land-use allocations. Other than the "no action" alternative, in order for an alternative to be seriously considered, it must be designed to satisfy the needs described below.

The Coos Bay District declared in the RMP an Allowable Sale Quantity (ASQ) of 27 MMBF per year, which is to be derived entirely from the Matrix land-use allocation. A uniform structure, heavy stocking, slowing growth rate, and low stand vigor characterize the timber stands identified for commercial thinning in this project. Research indicates that stands that develop at very high densities have a limited variation in tree size, which makes them susceptible to diameter growth stagnation and instability (Wilson and Oliver 2000). Without treatment at the appropriate time, these dense stands rapidly decline in growth and vigor resulting in a stagnant stand that becomes more susceptible to wind, insects, disease, and fire disturbances. Ultimately, the spread of insects, disease or, fire may jeopardize the health of adjacent forests. In addition, commercial thinning treatment of these stands to reduce their density would provide an immediate supply of timber to the local economy while improving the growth rate of the residual stand and insuring a healthy stand of timber would be available for future needs. Such treatments would further the achievement of the RMP objectives in the project area. The timber proposed for harvest within the GFMA are on lands allocated to the primary purpose of timber production and are of the age and condition anticipated for commercial thinning under the RMP.

Current stocking levels in conifer stands in the proposed treatment areas are currently not on a trajectory to achieve desirable growth rates or achieve desirable stand structure. Therefore, reducing stand densities is required to maintain optimum growth and health.

The stands within the Riparian Reserve in this project are in the same over-stocked condition as the commercial thinning units described above and the need for timely treatment is the same. If left untreated, these stands might not achieve the desired vegetation characteristics envisioned in the Aquatic Conservation Strategy (USDI 1995, p. 13). Controlling the stocking on these lands through density management treatments is indicated by recent research to meet the need for achieving the future condition on the Riparian Reserves located within the project area.

Individual trees within managed young-growth conifer stands are developing under greater competition than the conditions that dominant conifers would have grown in naturally regenerated old-growth stands at an equivalent age (Tappeiner *et al.* 1997). Increased growing space of individual trees has a direct correlation to stand stability and unstable stands are more subject to windthrow (Wilson and Oliver 2000). Forest stands in the Riparian Reserve are not currently on a trajectory to achieve desired habitat characteristics. Current stocking levels in the streamside stands would retard attainment of Riparian Reserve objectives of maintaining and restoring the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems. Therefore, reducing stand densities is required in order to maintain a growth trajectory and improve stand stability to meet the Riparian Reserve objectives.

The road network in the Edson Thin project area is a mixture of private and BLM roads built over the past 70 years of forest management activities; the road network was primarily designed for clearcut harvests. Several of the roads have drainage structures that have been in place since they were first constructed and are at risk of failing or have failed, which could contribute sediment to the stream network. The Northwest Forest Plan directs the agency to address roads that place Aquatic Conservation Strategy objectives at risk (USDA and USDI 1994b pC-32). The shift from past clear-cut harvest to commercial thinning requires that new roads be built to access portions of stands. Only the Moon Mt road accessing 120 acres is open to the public, all other roads in the project area are closed to public use. The BLM has a need for efficient road access to carry out forest management activities, to renovate and reconstruct lower maintenance level roads providing access to treatment units, and to reduce the potential risk to the aquatic network from the road infrastructure by decommissioning roads.

Purpose of the Project

The following purposes are identified the RMP. These purposes may be given different weight, depending on the objectives for the lands on which the action would take place under the RMP's land allocation decision.

1. Improve GFMA stand structure by thinning trees in overstocked stands to enhance the growth and vigor of the residual trees while maintaining native species diversity. *"Apply silvicultural systems that are planned to produce, over time, forests with desired species composition, structural characteristics, and distribution of seral or age classes"*(USDI 1995 p53).

2. Improve Riparian Reserve stand structure by thinning trees in overstocked stands to enhance the growth and vigor of the residual trees for future management objectives while maintaining native species diversity.

3. Work towards the goals in the *Western Oregon Districts Transportation Management Plan* by renovating or improving roads and decommissioning roads not needed for continued resource management.

4. Provide cost effective management that would enable implementation of these management objectives while providing collateral economic benefits to society.

5. Provide timber sale volume toward the Coos Bay District Allowable Sale Quantity as required by the Coos Bay District RMP that is directly related to Section 1 of the O&C Act (43 USC § 1181a) which stipulates that O&C Lands be managed "… for permanent forest production, and the timber thereon shall be sold, cut, and removed in conformity with the principal of sustained yield for the purpose of providing a permanent source of timber supply, protecting watersheds, regulating stream flow, and contributing to the economic stability of local communities and industries, and providing recreational facilities…"

6. Protect and/or restore rare and key habitats (wetlands, cliff habitats, talus habitats, grassy balds, or meadows). "Using interdisciplinary teams, identify special habitat areas and determine relevant values for protection or management on a case-by-case basis" (USDI 1995 p28).

7. Develop and maintain a transportation system that serves the needs of users in an environmentally sound manner and correct problems associated with high road density by reducing minor collector and local road densities where those problems exist. (USDI 1995 p69)

8. Manage roads to meet the needs identified under other resource programs. (USDI 1995 p69)

Scoping

The primary purposes of scoping are to identify agency and public concerns relating to a proposed project and define the environmental impacts of concern in the EA. The public was notified of the proposed project and EA through publication of the District's semi-annual Planning Update. Additional scoping notices were also sent to adjacent landowners, agencies that have requested these documents, and other interested parties on the District NEPA mailing list. The scoping period for the project ran between December 4, 2006, and January 5, 2007. Chapter IV lists the individuals and agencies that have requested scoping notices. Five responses were received. The U. S. Fish and Wildlife Service was consulted and a letter of concurrence was received on Jun 29, 2007 (USDI 2007a).

Identified Issues

After reviewing the public responses to scoping and agency policy, the following issues were identified.

Issue: Dense conifer stands
Would the prescribed treatments improve the health and vigor of the stands and achieve the RMP goals for the relevant land-use allocations? Assess the effectiveness of the prescribed treatments in meeting the purpose and need.

Issue: Roads and Sedimentation

To what extent do the road network, proposed road treatments, and road use contribute to sedimentation? Assess the alternatives for the potential to increase erosion or decrease water quality.

Issue: Roads and Hydrological Connectivity
To what extent does the road network alter hydrological connectivity? Assess road and stream interconnectivity of the alternatives.

Issue: Special Status Species
Would the proposed action affect listed species or contribute to the need to list any special status species? Assess the effects of the alternatives on special status species

Issue: Aquatic Conservation Strategy (ACS)
Would the proposed action prevent or retard attainment of the ACS objectives? Assess the alternatives relative to achieving ACS objectives.

Concerns Identified but Eliminated from Comparative Analysis

The other scoping comments received were determined to be either beyond the scope of this EA, or concerns that could be resolved by slightly modifying individual proposed units and/or modifying the design features of the project. No concerns were identified where the potential impacts would require analysis of another action alternative or would highlight significant differences between alternatives.

Concern – Roads (other than sedimentation and connectivity)
A number of other road-related issues were included by some of the respondents in the scoping comments. Below are quotes that characterize the concerns. The team's broad interpretations of the comments are included in parentheses.

- "extensive road construction or reconstruction will not be justified by a small restoration thinning effort" (feasibility/efficiency)
- "it is possible for the agency to conduct extensive young stand thinning without extensive construction of roads" (avoid new construction)
- "human-caused wildland fire is nearly five times more likely on essentially roaded lands" (road use contribution to fire hazard)
- roads "harm wildlife" (road use potentially harms wildlife)
- "how many acres are reached by each road segment in a stand by stand description" (efficient road network)

Much of the current road system in the analysis area was designed for clear-cut harvesting using large yarding towers (90'or taller) without regard for log suspension, where downhill cable yarding was used, and downhill tractor yarding across streams occurred. The legacy road network is not well suited for current harvest practices where streams and residual trees must be protected. This legacy road system would need to be changed in order to accommodate the changes in harvest practices. The team must weigh the benefits of treatment with the feasibility and effects of the operation; this includes efficient access to the treatment areas. Options include:

- Helicopter yarding, which is expensive and may not be possible with lower timber prices

- Use existing access, which would potentially include yarding through streams and may not be possible given the terrain and smaller equipment used in thinning.
- Forego treatment, which leaves stands in their current suppressed growth condition and forgoes the opportunity to improve the health and vigor of overstocked stands.

The proposed action would treat approximately ¼ of the 30 to year-old stands in the watershed. The treatment units are selected based on the combined experience of the team members in evaluating the complex, interrelated biological and economic factors associated with treatment and access planning. Some of the factors evaluated include; stand characteristics (density, tree size distribution, stand area, species composition etc), proximity to threatened species habitat, lack of existing roads, expense of possible road work, soils and geology at prospective road locations, arrangement of streams with relation to the roads and treatment area, stand slope position, proximity to other treatment areas, potential future access needs, and access rights through adjacent landowners. The selection of units in the proposed action is the team's attempt at balancing the relevant factors for the possible treatment areas.

An alternative that used only existing open road (no road construction or reconstruction) would limit and scatter the treatment areas make it unlikely that the thinning could be implemented. The current road network accesses only 110 acres of the proposed 490 acres. Most of these units would be widely scattered, 22 of which would require access from the east side of the coast range using the Eckley Creek County Rd. The increased cost due to the mobilization of the equipment and reduced effectiveness from thinning fewer acres would not be offset by the revenue generated from the resale of the harvested timber. The RMP does not contain a restriction to limit management actions to the use of existing roads; to the contrary, the RMP provides direction to address problem roads by "Reconstructing roads and associated drainage features that pose a substantial risk" and "closing and stabilizing … roads based on ongoing and potential effects to Aquatic Conservation Strategy objectives and considering short-term and long-term transportation needs" (USDI 1995 p69). The team has identified several drainage features that are at risk of failure. To access these problem areas, reconstruction of existing road failures would need to occur. It is reasonable to complete and fund this work in conjunction with the stand treatments.

An alternative that included helicopter yarding would require harvesting trees that have high value. The grade of the logs to be removed from the treatment areas is low and the increased costs associated with helicopter yarding makes implementation much more sensitive to market conditions. The RMP selected a preference for cable yarding in recognition of this sensitivity (USDI 1995 AppD).Currently, fuel costs are near historic highs and log prices are near historic lows. These factors indicate that a helicopter alternative would be cost prohibitive.

The infeasibility of both of these harvest scenarios renders them unlikely to meet the purpose and need for the project; therefore, they are not reasonable alternatives.

Regarding the expressed fire concern, most of the project area is behind a private timber company locked gate system with limited public access; the company's fire protection plan is more restrictive than State fire regulations, limiting operations and access during the fire season. Because of the limited access, and influence of summer coastal fog, human-caused fire is less of

a concern and had limited value in comparing the alternatives. Potential roadside-fuel accumulation is addressed in the project design features.

Roads can affect wildlife directly through road mortality or indirectly by providing access for hunters through disturbance, and by creating barriers to movement for some species. However, most of the roads in the analysis area are controlled by adjacent landowners, including private roads on BLM lands. All units, except units 11 and 12, are accessed by private roads with locked gates. Forest management activities among the local landowners are the primary source of vehicle traffic, but some limited hunting occurs behind the locked gates by the landowners, and with permission, by the general public willing to walk.

The RMP (p29) acknowledged vulnerability of big game to disturbance and harassment related to road use and set a target road-density goal of 2.9 miles per square mile in designated areas encompassing the analysis area. Watershed analysis indicated the current road densities in the two watersheds is approximately 2.94 miles, but the computation was based on 1994 data and did not include county roads (USDI 2008c). Observations of more recent activity indicates that road density may have increased. Due to the BLM's limited ownership in the two watersheds (3.5%), obtaining an accurate accounting of all new roads built since 1994 from all landowners to update the number is cost prohibitive. Instead, roads used in the proposed action were assessed to see if they access 221 acres per mile of road. The 221 acres per mile value is the equivalent of the 2.9 miles per square mile (640 acres/2.9 miles). Those roads that would access less than 221 acres per mile, would receive the highest priority for decommissioning (see Table I-1).

Table I-1: Estimate of area accessed by select roads

Road Number	Type	Estimated Road Feet	Estimated Road Miles	Estimated Treatment Acres	Estimate of Treatment Acres Accessed per mile of Road
54-4A	Existing	333	0.063	2	**32**
40NW-1	New	512	0.097	5	**52**
46-1	New	1,104	0.209	11	**53**
37N-1	New	391	0.074	4	**54**
37-2B	New	1,162	0.220	15	**68**
36-1	New	729	0.138	20	**75**
55-1	New	808	0.153	14	**91**
20NE-2	New	338	0.064	6	**94**
45-1	New	1,383	0.262	28	**107**
45SW-1	Existing	312	0.059	7	**118**
20NE-1B	New	243	0.046	6	**131**
40-2	New	818	0.155	25	**162**
37-3	New	491	0.093	15	**162**
54-1	New	850	0.161	34	**211**
46-2	New	95	0.018	4	**219**
40-2	New	818	0.155	34	**220**
Totals			1.967	230	

This project would build up to 3.3 miles of new road. The 3.3 miles per square mile of new road construction would temporarily (with respect to wildlife concerns) increase road density in the watersheds by 0.01 miles per square mile. Approximately 10.6 miles would be decommissioned

(no longer open for vehicle access) resulting in a net decrease in drivable roads in the analysis area. Most of the roads in the analysis area are controlled by adjacent landowners, including private roads on BLM lands. The nearest designated roadless area in the Siskiyou National Forest is approximately 2 miles to the east and south of unit 12 associated with the Grassy Knob Wilderness area.

Due to the limited public access to the proposed action, the limited BLM ownership in the analysis area, the proximity to other low road-density areas and the net reduction in open roads on BLM lands, wildlife harassment by people is of limited concern and has limited value in comparing the alternatives.

Concern – Riparian Reserves
A number of concerns were expressed concerning Riparian Reserve management.

- "only enter riparian areas once, thin heavier and completely remove road leading to the stand" (minimize frequency of disturbance)
- " a mix of species should be left in the Riparian Reserves" (maintain diversity)
- "prescribe more thinning treatments in Reserves to promote creation of late seral habitat" (maximize treatment area)
- "activities do not result in yarding corridors, roads, or other yarding activities impacting water quality" (avoid impacts to water quality)

Project Design Features and "best-management practices" have been incorporated to protect water quality and maintain species diversity (see design features and effects analysis sections). Thinning treatments have been designed to leave fewer trees per acre within Riparian Reserves in areas of least risk of blowdown to reduce the need for re-entry and to grow large-diameter trees.

Concern - Pileated Woodpeckers
The following is a response received from the public during scoping: "The BLM must consider new information on pileated woodpeckers that live on the west side of the Cascades. They need more and larger roosting trees than nesting trees and these needs are not recognized in current management requirements. Determining pileated woodpeckers population potential based on nesting sites is inadequate. The EA must address this new scientific information. See *Science Findings* Issue 57 (October 2003) *Coming home to roost: the pileated woodpecker as ecosystem engineer*, by Keith Aubry, and Catherine Raley."

It is unlikely pileated woodpeckers are nesting or roosting within the treatment units because of the small size of the trees (means range from 10" to 16" DBH) and the lack of large snags and decadent trees > 26" DBH. Project design features will reserve the largest trees, protect residual trees, reserve larger defective trees, reserve larger trees with nests or cavities, protect existing snags (except for those that pose a safety hazard), and reserve existing large down logs (≥20" diameter large end). Protection of these trees would minimize the loss of potential roosts and nesting structures.

Thinning these stands would accelerate development of large trees and recruitment of large snags which would benefit pileated woodpeckers. In addition, inadvertent damage to adjacent trees from harvest operations will create a mechanism for entry of heart-rot fungi spores, potentially

creating future decadent trees. Logging damage is expected to affect less than 10 percent of the residual trees.

Concern – Economics
The following scoping comments were received regarding the economics of commercial thinning:
"no economic benefit to thinning" (treatment viability)
"hand piling of slash costly and unnecessary" (avoid added costs)
"expense of road work for low volume produced in an extended season" (efficiency)
"short season of operation during height of fire season when log prices are low" (consider cost ramifications of seasonal restrictions)
"use traditional harvesting methods such as skyline or ground based" (efficiency)
"helicopter logging extremely expensive – avoid use" (efficiency)

The RMP identifies thinning in Matrix lands and density management thinnings in Riparian Reserves. Regeneration harvest could occur in the Matrix as early as the culmination of mean annual increment (CMAI), which can vary from a stand age of 60 to 100 years; these stands are less than 60 years old. The BLM cannot base its decision solely on industrial timber economics, which maximize net-present value, as other land-use goals are also relevant.

Concern– Big Game Habitat
The following comments were received regarding big game habitat:
"provide big game habitat on BLM lands by use of multiple patch cuts of 3-5 acres" (forage availability)
"thinning treatments do not provide quantity or quality of forage" (forage availability)

Recent timber harvests on adjacent private lands are providing forage for big game wildlife species. BLM lands appear to be best able to provide hiding cover. Hiding cover is less abundant on the adjacent private lands near the proposed action. Thinning of the stands will increase the shrub and herb layer as the canopy cover is decreased, thereby increasing available forage to some extent. Elk and deer species would benefit from this increase in forage, flower, and fruit production.

Hiding cover would temporarily decrease after thinning, but the value of hiding cover is minimal since hunting access is restricted in most of the area. Acceleration of mature forest would ultimately provide higher quality thermal cover in the area, but the benefit of thermal cover to elk and other ungulates is currently in doubt (Cook *et al.* 1998).

Affected Resources not Analyzed in Detail

Due to the lack of concern expressed by the scoping respondents, adequacy of existing best-management practices and policy, and the limited intensity or scope of the anticipated effects, the items below were excluded from detailed comparative analysis.

1. **Air Quality** – Landing pile burning, if burning is necessary to reduce potential wild land fire intensity, would adhere to the Oregon Smoke Management Plan (OAR 629-43-043) for limiting the effects of particulate emissions. A post-harvest assessment of the treatment areas would determine whether landing piles would be burned.

2. **Solid or Hazardous waste** – A level-1 survey was conducted and no hazardous waste was identified. Minor spills (diesel fuel, gasoline, or hydraulic fluid leaking from mechanized equipment), with little to no chance of migrating to surface or ground water before absorption or evaporation, are possible. Project design criteria have been included to limit the risk of water contamination. Any quantity discharged to the waters of the state or land surface spill larger than 42 gallons would be reportable and would require appropriate response under 40CFR 302 and Oregon law (OAR 340-142-0050).
3. **Noxious Weed Spread** – The project design criteria use an integrated pest management approach described in the Coos Bay Integrated Noxious Weed Program (EA OR 120-97-11). The open BLM controlled roads in the analysis area are surveyed annually and treated where appropriate. Noxious weeds near the treatment areas are minimal due to the annual survey and treatment efforts (in 10/07, this consisted of hand pulling of a few isolated broom plants), and due to the aggressive herbicide treatment of competing vegetation on the adjacent industrial forestlands. Project design criteria have been included to manage the risk of weed spread. This project does not include any specific actions under the recently published programmatic EIS for noxious weed control (USDI 2007d, e)
4. **Port-Orford Cedar Root Disease** – A risk-assessment was completed (see Appendix A). No Port-Orford cedars have been identified that measurably contribute to resource plan objectives nor would any be placed at risk. Uninfected 7th field watersheds would not be affected. No mitigation measures were indicated.
5. **Wilderness values –** the Grassy Knob wilderness area is located on USDA Forest Service lands approximately ½ mile to the south of Unit 12. Units 11 and 12 are not visible from the wilderness area. Sounds related to harvest activities in Units 11 and 12 may be perceptible in some portions of the wilderness area. The proposed action is similar to other landowner activities adjacent to the designated wilderness.

Unaffected Resources

Analysis of the No-Action Alternative and the Proposed Action Alternative has shown no impacts on the following critical elements of the human environment:

1. Areas of Critical Environmental Concern (ACEC) – none present
2. Farmlands, prime or unique – no effect to farmlands, prime or unique. See locations of designated farmlands in the Curry county soil survey (USDA 2005).
3. Flood Plains – no effect to flood plains
4. Wild and Scenic Rivers – none present
5. Cultural Resource Values, Native American Religious Concerns, and Environmental Justice – A project evaluation can be found in Appendix D

Decision Factors

Factors to be considered when selecting among alternatives will include:

- The degree to which the stated objectives would be achieved including: the manner in which timber harvest would be conducted with respect to the type(s) of equipment and method of yarding to be employed, as well as the season(s) of operations; and the manner in which access would be provided, including road renovation, and the type and location of any road construction;

- The nature and intensity of environmental impacts that would result from implementation and the effectiveness of measures to mitigate impacts to resources including, but not limited to wildlife and wildlife habitat, soil productivity, water quality, and air quality.

- Compliance with: management direction from the ROD/RMP; terms of consultation on species listed and habitat designated under the Endangered Species Act; the Clean Water Act, Clean Air Act, Safe Drinking Water Act and O&C Act; and other programs such as Special Status Species.

- Economics: supply timber, as a portion of the Allowable Sale Quantity, to the local community, provide revenue to the Federal government and associated O&C counties from the sale of those resources, and reduce the costs of both short-term and long-term of managing lands in the project area.

- To determine if a FONSI is appropriate, or should an Environmental Impact Statement (EIS) be prepared if the proposed action would result in a finding of significant impacts to the human environment. If impacts are significant, determine if the project proposals could be modified to mitigate the impacts so an EIS would not be necessary.

Chapter II. **ALTERNATIVES**

No Action Alternative

This alternative would maintain the status quo. There would be no thinning to reduce densities in overstocked stands and Riparian Reserves. The proposed road management activities would not occur. Repairs to the roads currently contributing chronic sediment to the stream network would not occur. Decommissioning of roads where future sedimentation is probable would also not occur. This alternative would fail to meet the purpose and need.

Proposed Action Alternative

Thin dense conifer stands

The Proposed Action Alternative would treat approximately 490 acres. Approximately 58% of the treatment acres are within the Matrix land-use allocation and 42% is within the Riparian Reserve (RR) land use allocation as designated by the *Coos Bay District Resource Management Plan and Record of Decision.* Treatments would be completed by commercial harvest utilizing skyline (483 acres) and ground based (7 acres) yarding methods. The ground based yarding area is within the Matrix land allocation.

The proposed action would treat approximately ¼ of the BLM's thinning-aged stands within the watershed. The treatment units are selected based on the combined experience of the team members in evaluating the complex, interrelated biological and economic factors associated with treatment and access planning. Some of the factors evaluated included; stand characteristics (density, tree size distribution, stand area, species composition etc), proximity to threatened species habitat, lack of existing roads, expense of possible road work, soils and geology at prospective road locations, arrangement of streams with relation to the roads and treatment area, stand slope position, proximity to other treatment areas, potential future access needs, and access rights through adjacent landowners. The selection of units in the proposed action is the team's attempt at balancing the relevant factors for the possible treatment areas.

Stand Treatments

The Proposed Action Alternative is to reduce stand density on approximately 490 acres of BLM administered lands by removal of commercial timber. This action would reduce stand densities by commercial thinning (CT) in the Matrix and density management thinning (DMT) in the Riparian Reserve marked using a basal area prescription (described below). In addition, stand structure would be improved by creating additional snags and down wood in the treatment areas.

In commercial thinning, the decisions of when and how much to thin, and which thinning technique will be used are based on stand development objectives. The conifer volume, but not the hardwood volume, cut from the Matrix counts toward meeting the Allowable Sale Quantity (ASQ) as described in the RMP (USDI 1995).

The commercial thinning technique that will be applied to the stands on Matrix land in this project is commonly called "thinning from below" and will be implemented using a basal area

marking prescription to obtain the desired relative density. The Matrix stands will be thinned from below by cutting the overtopped, intermediate, and some co-dominant trees. Species with infrequent occurrence may be retained to provide species spatial and structural diversity. The conifers and red alder that will be left are the larger dominant trees and co-dominant trees. These trees will be well distributed across the site to capture the growing space made available by the removal of competing trees. The leave trees will be those trees with the healthiest crowns and largest diameters relative to the other trees in the immediate area of each leave tree. The prescribed trees per acre and tree spacing will coincide with a Relative Density (RD) range of 33 to 50. Additional variability occurs within the stand depending on tree size distribution at the patch scale. Patches with larger trees would have fewer trees marked if they are below a specified diameter threshold (see Table II-1). Average post treatment canopy closure will be greater than 60%. Port-Orford cedar (POC) will be left on 25' x 25' spacing to maintain presence in the stand and reduce likelihood of POC root-rot disease spread. Pacific yew, western redcedar, myrtlewood, and bigleaf maple, would be reserved to maintain species diversity. The stands considered for commercial thinning are overstocked and are in the biomass accumulation/stem exclusion phase of stand development (Franklin *et al.* 2002).

Using a basal area target rather than a spacing target will obtain a greater variation in spacing and a more natural appearing relationship between the tree sizes and spacing. In the resulting stand, small trees will be more closely spaced and large trees will be spaced farther apart than would have been obtained using a spacing based on trees per acre target prescriptions. When thinning from below to a basal area target where the trees to be selected as leave tree are small, more trees per acre will be retained than in those parts of the stand where the potential leave trees are large in order to attain the same basal area per acre in both locations. The effect is that where the suitable leave trees are small, trees will be spaced more closely together; and, where leave trees are large, the trees will be more widely spaced.

Density management thinning prescriptions are applied to immature Riparian Reserves to accelerate the growth on individual trees. DMT differs fundamentally from conventional commercial thinning in that the intent of treatment is to redirect the stand development trajectory to provide desired stand structural conditions. Density management thinning using moderate and heavy thinning is proposed to obtain rapid sustained diameter growth. Tappeiner and others (1997) observed that old-growth trees often averaged 20 inches dbh at age 50 and 40 inches dbh at age 100. This individual growth rate is higher than what they observed in young plantations. By running stand development simulations, Tappeiner found stand densities of 31 to 46 trees per acre at age 20-years resulted in the better fit to old-growth stands with respect to the estimates of total densities and densities of the larger diameter classes. (Franklin and Hemstrom 1981) noted that old-growth stands could be in an open-grown condition during their first 40-years and be sufficiently open to allow successful establishment of shade-intolerant trees for 100 years. This suggests that old-growth stands developed with low density, regenerated over time, and had little inter-tree competition. The implications are that well-stocked plantations and young well-stocked wild stands are not on the same stand-development trajectory that created many of the mature stands currently on the landscape.

Setting these young trees on a trajectory to develop into large diameter trees will require a disturbance of sufficient intensity to increase growing space to allow attainment of large

diameter trees that in turn can eventually provide habitat to those species uniquely adapted to stand structures more typically found in older forest.

The stands in the density management portion of the proposed project will be thinned to a target 100 to 180 square feet basal area per acre (Table II-1) resulting in 60 to 180 trees per acre. The basal area target will be met in parts of the stands away from the existing gaps; however, the number of gaps left by snow and wind damage by winter storms means the average basal area for the stands, as a whole, would be lower. This is intentional and desirable, and in those areas with large or clustered pre-existing gaps, it is unavoidable. The lower retained basal areas associated with the gaps will result in locally more rapid tree growth and more vigorous understory vegetation. Average post treatment canopy closure will be greater than 60%. Port-Orford cedar (POC) will be left at no closer than a 25' x 25' spacing to maintain presence in the stand and reduce likelihood of POC root disease spread. Pacific yew, western red cedar, myrtlewood, and big leaf maple, would be reserved to maintain species diversity.

The relative density targets are chosen to ensure sufficient trees are retained to produce a fully stocked late seral stand and have a sufficient number of trees for mid-term and long-term recruitment of large snags and large down wood.

Leaving streamside protection strips in the density management thinning to meet hydrologic and aquatic objectives, would result in retention of alders with the highest probability of providing litter fall to streams; this is important in maintaining nutrient cycling in the associated streams.

Snag and down wood creation would add structurally important features generally lacking from the managed plantations considered for treatment. Snags and down wood can play a major role in the suitability of habitat for wildlife (Laudenslayer *et al.* 2002). Their importance was addressed in the RMP and further research continues to show the value of this habitat component for many wildlife species and ecosystem functions. Dead wood (both standing and down) contributes to biological richness as substrate, cavity and forage sites, shelter and cover. In the Pacific Northwest, 69 vertebrate species commonly use cavities and 47 vertebrate species respond positively to down wood (Bunnell et al. *in* (Laudenslayer *et al.* 2002)). Appropriate amounts of dead wood for managed forests continue to be debated due to data gaps concerning species needs and decay dynamics. Snags and down wood would be created according to Table III-7 (Chapter III).

Accumulations of limbs and non-merchantable wood alongside roads would be scattered or piled and burned during the wet season to reduce the potential fire intensity near roads that could be used as fire breaks in the event of a wildfire. Some of the landing piles would be retained to provide cover for some small wildlife species.

Table II-1: Proposed Action - Stand Prescription summary

Unit	EA/Stand Exam Unit	Age in 2008	Acres	Pre BA/ac	Pre DBH	Pre TPA	Estimated Leave BA/ac	UDL	Estimated Leave DBH	Estimated Leave TPA	Leave RD	Comments*
1	36	48	16	287	11.9	372	140	17	15.5	106	36	LV RA 19' x 19', POC 25' x25'
	36 R	48	3	"	"	"	"	"	"	"	"	"
	37, 37E	50	6	207	10.7	330	130	20	13.4	133	36	"
	37, 37E R	50	16	"	"	"	120	20	15.4	111	32	"
	37 N R	50	4	"	"	"	100	20	16.6	79	26	"
2	40 NW	44	2	246	10.1	445	140	16	13.6	138	38	DF Stand, LV RA 19' x 19', POC 25' x25'
	40 NW R	44	3	"	"	"	100	16	18.0	81	26	"
3	433	57	3	316	13.4	324	180	20	15.6	135	45	Hemlock, LV DF, RA>14", POC 25' x 25'
	433 R	57	6	"	"	"	160	20	15.2	125	41	", Riparian RX
4	432	51	16	173	13.2	181	140	20	15.4	108	36	Hemlock stand, wind protected
	432 R	51	7	"	"	"	120	20	15.6	91	30	Hemlock stand, Riparian RX
5	40	60	14	310	12.7	353	180	20	18.9	92	41	Hemlock stand: LV DF >16" & LV all RA
	40 R	60	20	"	"	"	160	20	19.3	78	36	" , Riparian RX
	41	60	6	343	13.0	374	200	20	14.4	177	53	Hemlock stand: LV DF >16" & LV all RA
	41 R	60	20	"	"	"	180	20	14.4	157	47	" , Riparian RX
	44	45	16	256	10.0	470	120	16	13.2	141	34	DF/Hemlock stand
6	45	51	28	301	12.1	377	180	16	17.2	129	45	Moderate thin, wind exposed, cut all trees < 13" poor H/d ratio's
	45 R east	"	"	"	"	"	120	18	17.6	76	29	Larger trees, less wind exposed
	45 East	"	"	"	"	"	160	16	17.2	108	39	"
	45 SW	51	3	"	"	"	180	16	17.2	129	45	Moderate thin, wind exposed, cut all trees < 13" poor H/d ratio's
	45 SW R	51	4	"	"	"	160	16	17.7	108	39	Moderate thin, wind exposed, cut all trees < 13" poor H/d ratio's, Riparian RX
7	46	50	16	267	11.5	367	160	16	14.2	144	42	Moderate thin, wind exposed, cut all trees < 12.5" poor H/d ratio's
8	53w,nw s2, w1, w2	42	2	172	12.0	220	140	17	14.0	130	37	LV RA 19' x 19', POC 25' x25', DF Stand, wind protected
	53w,nw s2,w1, w2 – R	"	8	"	"	"	100	17	15.0	100	26	LV RA 19' x 19', POC 25' x25', DF stand, Wind Protected, Riparian RX
	58n, 58s	38	2	186	12.9	205	140	16	15.6	104	35	LV RA 19' x 19', POC 25' x25'
	58n – R	"	2	"	"	"	120	16	16.0	85	30	" , Riparian RX
	58s – R	"	3	"	"	"	100	16	16.3	69	25	", Riparian RX
	59n,59s, 59w	41	20	208	12.8	233	140	17	16.3	97	35	LV RA 19' x 19', POC 25' x25'
	59n, 59s, 59w - R	"	16	"	"	"	100	17	17.2	61	24	", Riparian RX
9	53, 53 s1	42	13	172	12.0	220	140	17	14.0	130	37	LV RA 19' x 19', POC 25' x25'
	53 SE	42	10	166	10.2	290	120	17	12.0	111	35	"
	53, SE, S1 – R	42	21	172	12.0	220	100	17	15.0	81	26	"
	54	42	29	213	13.0	230	140	17	16.2	97	35	"

Unit	EA/Stand Exam Unit	Age in 2008	Acres	Pre BA/ac	Pre DBH	Pre TPA	Estimated Leave BA/ac	UDL	Estimated Leave DBH	Estimated Leave TPA	Leave RD	Comments*
	54 – R	"	5	"	"	"	100	17	16.7	65	24	"
	55,55s	44	3	223	15.3	174	160	17	19.1	88	38	"
	55, 55s – R	"	11	223	15.3	174	120	17	19.1	60	27	"
	57, 57e – R	44	14	221	13.5	223	120	17	17.9	68	28	"
	57s - R	41	4	184	12.6	211	100	16	16.8	64	24	LV RA 19' x 19', POC 25' x25'
10	52	41	7	219	14.1	202	140	16	17.1	87	34	LV RA 19' x 19', POC 25' x25'
	52 R	"	11	"	"	"	120	16	17.5	71	28	"
11	20	44	16	184	10.4	313	120	16	12.9	132	33	LV RA 19' x 19', POC 25' x25'
	20 E	"	1	"	"	"	"	"	"	"	"	"
	20 R	"	16	"	"	"	100	16	16.2	102	27	LV all HWDS, POC 25 x 25'
12	19	45	45	181	11.9	232	140	17	17.5	121	37	LV RA 19' x 19', POC 25' x25'
	19 R	"	16	"	"	"	100	17	19.0	77	26	LV all HWDS , POC 25' x 25'

Estimates of TPA and RD are preliminary, based on current information and modeling.
R = Riparian Prescription, Density Management Thinning
TPA = trees per acre
DBH = Diameter Breast Height
BA = Basal Area
RD = Relative Density
Age in 2008 – is the total tree age at the time of sale

Table II-2: Estimated Unit Acres of Commercial Thinning and Density Management Thinning in Riparian Reserve with Estimated Timber Volume Harvested by Unit.

Unit Number	EA Stand/ RX Number	GFMA Acres	Riparian Reserve Acres		MBF	MBF
		Commercial Thin	Density Management.	Unit Acres	ASQ	Non-ASQ
1	36, 37, 37N, 37E	24	22	46	451	290
2	40NW	2	3	5	27	42
3	433	3	6	9	100	221
4	432	16	7	23	80	34
5	40, 41, 44	36	40	76	779	1388
6	45, 45SW	30	5	35	558	124
7	46, 46W	14	2	16	199	19
8	53w, 53nw, 53s2, 53w1, 53w2, 58n, 58s, 59n, 59s, 59w	27	30	57	250	434
9	53, 53s1, 53se, 54, 55, 57, 57e, 57s	58	51	109	839	958
10	52	7	11	18	86	206

Unit Number	EA Stand/ RX Number	GFMA Acres	Riparian Reserve Acres		MBF	MBF
		Commercial Thin	Density Management.	Unit Acres	ASQ	Non-ASQ
11	20, 20R, 20e	21	13	34	259	195
12	19	45	16	61	384	227
TOTAL		283	**206**	**489**	**4012**	**4138**

Managing Risk for Blowdown

The Edson project area is 10-12 miles east of Cape Blanco, which is subject to high winter storm winds (> 50mph), generally from the southwest direction. At times, wind gusts may reach speeds in excess of 90mph at the headlands. Stands in the Edson area currently have some scattered blowdown in them. The majority of the blowdown is found on windward slopes adjacent to private clearcuts, natural gaps, or following draws that are oriented in a southerly direction. Some scattered blowdown was observed in private commercially thinned stands on windward slopes. Areas that would be considered high risk for blowdown would be: stands with high Height /Diameter (H/D) ratios, exposure to storm winds, leeward slopes behind exposed high ridges, stands adjacent to clearcuts, stands adjacent to future clearcuts within 1-2 years of thinning, gaps that funnel winds into stands, soil type, hemlock stands with a high percentage of trees growing on old stumps and/or down logs, and stands with evidence of past blowdown (Harris 1989).

Where blowdown is a risk, steps would be taken to minimize the risk. Thinning to a level that does not open the stand to blowdown must be considered. Some studies (Harris 1989) indicate that no more than about 1/3 of stand basal area should be removed where blowdown is a high risk. Windward edges of the stand (or potential windward edges next to stands that could be clear-cut within a few years) can be left unthinned to serve as a wind screen (Smith 1962). Unthinned “skips” or strips might be retained in blow-down prone areas of the stand. Gaps would not be prescribed in the CT or DMT prescriptions. Residual leave trees with height to diameter ratios of 80 or less reduced the risk of wind damage and height to diameter ratios of 50 or less may enable trees to resist blowdown during extreme storms, (Wilson and Oliver 2000). Height to diameter ratios of leave trees would be generally less than 70.

Road Management

Direction for road management is provided by the Coos Bay RMP (USDI 1995 p69) and the Transportation Management Plan (USDI 2002), which was developed to implement this road management direction The road network was evaluated with respect to current and future access needs and the effect on the ability to meet the various management objectives listed in the RMP. A management objective was recommended for each road controlled by BLM (see TMO list in Appendix C). Access to units for log hauling would be from existing rock surfaced roads, or seasonal dirt surface roads. Most of the roads would require renovation (including re-construction) or improvement due to lack or previous maintenance and an evaluation of the current risk to meeting the Aquatic Conservation Strategy. Construction of new rock surfaced or

dirt surfaced roads and roadside landings would be required to access some portions of the proposed units. Either existing roads are controlled by BLM or BLM has rights to use existing roads under reciprocal road right-of-way agreements. Public access to the units is limited to the units 11 and 12 in Section 14, T. 32 S. R. 14 W. Wm. (see maps in Appendix E)

New road construction would consist of approximately 3.3 miles of dirt or rocked surface roads to be constructed on or near ridge top locations in most cases. New roads would be single lane with turnouts. Some landing construction would consist of creating wide spots on existing roads to facilitate safe yarding and loading of logs. Landings are typically about 1/10 acre in size including the existing roadbed. All road construction would be completed in the dry season. All new construction will avoid wetlands, suitable habitat and fragile sites.

Approximately 0.8 miles of new roads will be constructed within the Riparian Reserve including four new stream crossings (3 would be temporary use and 1 would be semi-permanent use). Some roadside landings would be constructed on or adjacent to existing roads would be in the upland portion of the Riparian Reserve. Roads management in Riparian Reserves was addressed by the RMP (p13 and p69) and the Best Management Practices for Road and Landing Construction listed in Appendix D (p D-3) of the RMP.

Road maintenance, renovation, and improvement would be limited to the dry season for activities requiring soil displacement, such as culvert installation or replacement. Road renovation is defined as reestablishing the condition of a road to meet the current design standards for that class of road; new drainage features would meet the 100-year flood standard in the RMP. Re-construction of legacy roads would also fall under renovation. Renovation may also include clearing brush or trees along roadsides, cleaning or replacing stream and grade culverts, restoring proper road surface drainage, grading, removal of slide and slough material to designated disposal areas, or other light maintenance. Road improvement consists of raising the current standard of a road to a higher class (i.e. increasing road width or added surfacing). Rocked surfaced roads would extend cable harvesting and hauling during the winter season to allow work outside of murrelet and owl seasonal restricted periods and to reduce yarding damage in stands where western hemlock would be a large proportion of the residual stand.

Road decommissioning of resource-classed roads and some minor local-classed roads (see USDI 2002 p10 for road class definitions) would be used to control road densities, reduce the risk to the Aquatic Conservation Strategy objectives and eliminate the need for maintenance on roads not needed for management in the short term. Generally, short temporary-use spurs would be decommissioned. Some longer local roads would be decommissioned depending on; the plans for the lands tributary to those roads; or, the risk to meeting ACS Objectives. Mainline (collector) roads or roads accessing other ownerships would generally remain open unless the landowner agrees to limit access. Decommissioning may include blocking, waterbarring, removal of stream pipes, or fracturing of the road surface to allow water infiltration. Specific road decommissioning plans are described in Appendix C.

Design Features for the Proposed Action

This section describes measures designed to avoid, minimize or rectify impacts on resources and are included as part of the proposed action. Design features are site-specific measures, restrictions, requirements, or physical structures included in the design of a project in order to

reduce adverse environmental impacts. Additionally, the RMP (Appendix D) lists "Best Management Practices" (BMP's) which are measures designed to maintain water quality and soil productivity.

Trees Reserved from Harvest

When leave trees are marked, the largest trees with the healthiest canopies (including remnants) would be reserved. A 60% or greater canopy closure would be maintained at the stand scale.

Existing snags would be reserved from cutting except those that must be felled to meet safety standards. Snags felled or accidentally knocked over would be retained on site.

Boundaries, spur roads, landings, and yarding corridors would be designed to avoid and protect large remnant trees whenever possible.

Existing down logs in Decay Classes 3, 4, and 5 would be reserved. Existing down logs greater than 20" diameter on large end would be reserved from cutting and/or removal during logging operations. Existing down logs would be protected from damage during logging operations to the extent possible.

Bigleaf maple, myrtle, and other minor hardwood tree species would be reserved to the extent possible.

Harvest Operations

There would be less than 10% of residual trees damaged during operations. Damage is defined as any tree having greater than 3 inches wide or wider of the bark removed down to the cambium layer from the bole of the tree, any tree with top diameter broken at three (3) inches in diameter or greater, any visible bark removal on tree roots, or any tree being visually root-sprung.

Cable yarding, preferably with partial log suspension, would be the preferred standard method for log yarding … (RMP, D-5 #3)

In the designing of roads, landings, and yarding corridors, large remnant trees would be avoided.

Special habitat features (a rock outcrop, some wet seeps) would be buffered out of the units.

Ground-Based area 46w

Ground-based equipment would be restricted to the dry season when soil moistures are below the 25% threshold. This threshold is defined as when soil moisture content measurements, taken 2 to 4 inches below the organic layer, are below 25%. Soil moisture contents above 25% may require the discontinuation or limitation of ground-based operations in order to prevent excessive compaction.

Tree felling may also be accomplished by a feller-buncher or hand-felled with chainsaws.

Trees would be felled away from roads to reduce the amount of hazardous fuels to be treated.

If tractors are used for log skidding, skid trails would be designated with the objective of having less than 12 percent of a harvest area affected by compaction. Existing skid roads would be used to the extent practical (ROD, D-5 #8a).

Tractors would be restricted to slopes of less than 35 percent and used only during the driest part of the year, typically mid-July to mid-September (ROD, D-5 #8b).

Other ground-based yarding systems (e.g. spider-walkers and feller bunchers) may be used on slopes over 35 percent, provided the expected growth-loss effect is insignificant and skid trails involves less than 12 percent of the harvest area (ROD, D-5 #8c).

Forwarder/harvester operations would utilize slash layers created by the harvesting process to limit bare soil exposure to <30% of the forwarding path.

A crawler tractor may be used in conjunction with road construction to skid logs within the road construction right-of-way.

Drainage and erosion control measures, including water-barring of skid trails, would be applied to bare soil areas following use and prior to winter rains (ROD, D-5 #8f).

A skyline cable system would be permitted to operate during the wet season in this EA unit (46w); however, road surface condition may restrict timber haul.

Cable-Yarding units

Skyline corridors would be a maximum of 12 feet wide. Distance between skyline corridors would be a minimum of 150 feet apart at the widest point where feasible; this would require skyline cable system with 75-foot lateral yarding capability. This design feature is intended to limit the effect of yarding corridors on stand density and soil disturbance.

Lift trees and intermediate supports would be used where needed to help attain desired log suspension.

Where feasible, the skyline corridors would be spaced to avoid creating small clearings that would occur from multiple corridors extending out radially from landings.

The location, number, and width of corridors within no-harvest buffers would be specified prior to yarding, and natural openings would be used as much as possible (ROD, D-5 #2).

Skyline corridors would be perpendicular to streams as much as possible to minimize the total length of openings created by yarding corridors along stream channels.

Conventional tree felling with chain saws generally would be used. Trees cut to facilitate yarding corridors, outside of no-treatment buffers, would be felled and yarded to landings. Cutting may be done with a mechanical harvester on slopes <40%, provided soil moistures are below the 25% threshold.

Trees would be directionally felled upland away from no-harvest buffers. Trees that must be felled within this no-harvest buffer to provide cable yarding corridors would be felled toward the stream channel and retained on site to provide bank armoring and coarse woody debris. Full log suspension over stream channels would be used where feasible (ROD, D-5 #2).

Hazardous Fuels Reduction

Hazardous fuel reduction measures would be conducted within units along those roads that are not identified for closure or decommissioning after harvest operations.

All slash greater than 2 feet in length and up to 6 inches diameter would be piled or pulled back 20 feet away from each side of roads not identified for closure or decommissioning and along roads open to public travel (unit 19).

Heavy concentrations of slash on landings and roads resulting from cable yarding operations would be piled and burned. The number of piles would be minimized and free of soil and rock material. Placement of landing piles closer than 15 feet to reserved trees or snags, would be avoided. Burning would generally occur during the late fall and winter months.

Alternatively, smaller concentrations of slash would be broken up and scattered throughout the harvest unit before equipment vacates the site.

Applicable Oregon State Fire Laws would be followed. Burning of slash piles would comply with the Oregon Smoke Management Plan (OAR 629-43-043).

Road Construction

New construction would use the applicable "Conservation Practices for Road and Landing Construction" Best Management Practices (RMP FEIS pp. D3-D4) found in the RMP. These include:

- Road and landing construction activities would be limited to the dry season, generally from June to October.

- Roads and landings would be designed and constructed to BLM standards, but be the narrowest and smallest dimensions that would meet safety standards, objectives of anticipated uses, and resource protection.

- Roads and landings would be located out of Riparian Reserves to the extent possible.

- Roads would be located on stable locations as much as possible (e.g. ridge tops, stable benches or flats, and gentle-to-moderate side-slopes.

- The theoretical 100-year-flood would be used as design criteria for all culverts.

- Stable end-haul (waste) sites would be located prior to end-hauling. These sites would be kept properly shaped, drained, and vegetated.

- Road drainage would be designed to minimize soil erosion and stream sedimentation. Energy dissipaters, culvert down pipes, or drainage dips would be used where water is discharged onto loose material and onto erodible or steep slopes.

- Road surface shape (e.g. crowning, insloping, and outsloping) that meets planned use and resource protection needs would be used.

Road drainage features (such as ditch relief culverts) would be installed an appropriate distance upslope of stream crossings in order to route most of the ditch flow away from streams and onto forest soils where it can re-infiltrate. Depending on site conditions, this distance would generally be about 50-200 feet from the drainage feature outlet to the stream channel. The following table would be used as the guide for drainage spacing.

Table II-3: Guide for Drainage Spacing by Soil Erosion Classes and Road Grade (Spacing in feet).

Gradients (%)	Erosion Class		
	High	Moderate	Low
3-5	200	300	400
6-10	150	200	300
11-15	100	150	200
16-20	75	100	150
21-35	50	75	100
36+	50	50	50
Spacing is determined by slope distance and is the maximum allowed for the grade.			

Bare soil areas created from landing and road construction would be mulched and seeded with native species (if available) and fertilized. If native seed were not available, disturbed areas would be seeded with an approved seed mix.

Drainage and soil erosion control practices would be applied to renovated or reconstructed roads in the same manner as newly-constructed roads (ROD, D-4 #17). These may include, but are not limited to, dry season grading and culvert replacements, appropriate end-haul and disposal areas, and proper dispersal of water from ditch-relief culverts.

Road maintenance activities would be planned to minimize soil erosion and subsequent stream sedimentation (ROD, D-4 #18). Maintenance would include, but would not be limited to; grading to remove ruts, removal of bank slough, placement of sediment control devices, and adding gravel lifts where needed in the road surface.

When replacing stream-crossing culverts on perennial streams, stream flow would be diverted around the work area, sediment would be contained using appropriate filters or barriers, and turbid water would be pumped from the excavation site onto a vegetated terrace or hill slope.

Replacement of perennial stream crossings would follow ODFW in-stream timing guidelines, which is from July 15 – September 30. Intermittent stream crossings would be replaced during the dry season after cessation of flow.

Haul

Hauling on dirt-surfaced roads would be prohibited from October 15 through June 1 unless dry conditions extend the hauling season.

Road conditions would be monitored during winter use to prevent rutting of the rock surface.

At designated stream crossings during winter haul, any offsite movement of sediment from the road or ditch flow near streams would be contained with silt fencing or sediment entrapping blankets. Such control measures would allow for the free passage of water without detention or plugging. These control structures and applications would receive frequent maintenance and would be removed at the completion of haul. Once haul is completed, sediment retained by the filters would be removed and disposed in areas in which the sediment would not be delivered to stream channels.

An additional lift of rock would be applied to the area of road that can influence the stream if erosion and sediment delivery is evident from the road tread near live stream crossings.

If the ground is already saturated from winter rains and more than 1 inches of precipitation is predicted in the project area over the next 24 hours, then winter haul would be suspended. Operations would resume after the 24-hour suspension, except when another storm (exceeding 1 inch) is forecasted. Currently, precipitation predictions are based on the Quantitative Precipitation Forecast (QPF) maps from The Hydrometeorological Predication Center internet site: http://www.hpc.ncep.noaa.gov/html/fcst2.html. A similar predictive model internet site may be used if this site should be unavailable in the future.

Dirt roads and landings will receive seasonal preventative maintenance prior to the onset of winter rains each year prior to the contractor leaving the project area during non-hauling periods. Seasonal preventative maintenance may include, but is not limited to cross-ditching, sediment control mats or devices, removing ruts, mulching, and barricades.

Road Closure/Decommissioning

For roads to be closed or less than fully decommissioned shown in Appendix C, water bars would be installed to route surface runoff to vegetated areas. Water bars would also be installed near culverts to prevent diversions. Newly constructed spurs would be water-barred before the onset of the rainy season.

Where roads are designated for full decommissioning, landing material would be scattered over the fractured road surface to protect and reintroduce organic material to the soil.

For roads to be fully decommissioned, the road surface would be broken up to a depth of at least 8 inches and enough to allow ponded surface water to infiltrate the ground. The surface would be manipulated by one or more of the following: excavator bucket, rippers on track, graders mounted on track, and/or a sub-soiler on a cat.

Fisheries/Aquatic Resources

Most intermittent stream channels would have at a minimum 30-foot (slope distance) no-harvest buffer. Perennial streams would have at a minimum 60-foot (slope distance) no-harvest buffer.

Buffer distances would be measured starting from a stream bank, an identifiable topographic break near the bank (generally, the top of a steep inner gorge), or from the streamside edge of

vegetation, whichever is greater. Trees harvested in the adjacent unit would be felled away from the streams. The no-harvest areas would be expanded on a site-specific basis, if necessary, to provide additional protection in specific areas identified by resource specialists.

Special Status Species-Including T & E Species

To minimize effects to marbled murrelets (MAMU) and northern spotted owls (NSO), activities within the disturbance threshold distances would follow seasonal and daily timing restrictions, listed below.

Table II-4: Activity based disturbance threshold distances for MAMU and NSO

Type of Activity	Disturbance Threshold Distances[1]	
	Marbled Murrelet (MAMU)	Northern Spotted Owl (NSO)
Use of heavy equipment	100 yards	35 yards
Chainsaws (hazard tree removal, tree harvest, etc.)	100 yards	65 yards
Blast of more than 2 lbs. of explosive	*One mile*	*One mile*
Blast of 2 lbs. or less of explosive	*120 yards*	*120 yards*
Impact pile driver, jackhammer, or rock drill	*100 yards*	*60 yards*

[1] The U.S. Fish & Wildlife Service has determined that adverse effects from disturbance are very unlikely to occur beyond these distances (USDI F&WS 2004). Those activities in italics are not anticipated but may be required during road construction

No bald eagle roosts or nests have been located within the project area. However, if found, seasonal restrictions would apply to activities during the bald eagle nesting season and are included in the following table.

Surveys in suitable marbled murrelet habitat near proposed units are ongoing. If surveys indicate a lack of occupancy, restriction to the units or roadwork indicated in Table II-5 would no longer apply.

Table II-5: Seasonal Restrictions and Daily Timing Restrictions (DTR)

Activity	Reason for Restriction	Adjacent EA Unit or road work affected	Restricted Dates	Dates Restrictions in Effect											
				J	F	M	A	M	J	J	A	S	O	N	D
Chainsaw use, felling, yarding, heavy equipment, jackhammer, etc.	NSO nest or activity center within 65 yards of project (35 yards for heavy equipment)	19(occ), 432 (surv)	No activity March 1 thru June 30			1	>	>	30						
			Extend thru Sept 30 if late nesting							>	>	30			
Chainsaw use, felling, yarding, heavy equipment, jackhammer, etc.	Occupied or unsurveyed suitable MAMU habitat within 100 yards of unit	19 (occ) 36,40,41,45 46, 432, 59w (surveys)	No activity April 1 thru Aug. 5, then apply DTR thru Sept. 15				1	>	>	>	5 DTR 6	15			
Blasting (more than 2 lbs. of explosive) *(if required for road construction)*	Occupied or Unsurveyed MAMU habitat within 1.0 mile of unit	(No Blasting Anticipated)	No activity April 1 thru Aug. 5, then apply DTR thru Sept. 15				1	>	>	>	5				
All Potentially Disturbing Activities	Bald Eagle active nests, roosts or habitual perches within 400m or 800m line-of- sight of unit	None	From Jan 1 thru Aug 31 for nests and perches November 15 thru Mar 15 for roosts	1 1	> >	> 15	>	>	>	>	31			15	>

Since several special status lichens, bryophytes, and vascular plants are suspected of occurring on the project area, pre-project botanical surveys would be completed on all proposed units Appendix B. A conservation assessment would be used to assess the effects of the proposed action on any fungi species suspected of occurring in the project area. If any Bureau Sensitive vascular or nonvascular plant species were found during pre-disturbance surveys, the site would be protected using known site management recommendations developed by the Coos Bay District (Brian et al. 2003).

Noxious Weeds/Port-Orford cedar

To prevent the introduction and spread of non-native species during the contract period, equipment would be washed prior to entering project area.

Hazardous Materials

Activity resulting from the Action Alternatives would be subject to State of Oregon Administrative Rule No. 340-108, *Oil and Hazardous Materials Spills and Releases.* This specifies the reporting requirements, cleanup standards, and liability that attaches to a spill or release or threatened spill or release involving oil or hazardous substances. Site monitoring for solid and hazardous waste would be performed in conjunction with normal contract administration. In addition, the Coos Bay District Hazardous Materials Contingency Plan and Spill Plan for Riparian Operations (USDI 2000) would apply when applicable to operations where a release threatens to reach surface waters or is in excess of reportable quantities.

Cultural Resources

If cultural resources are encountered during this project, all work in the vicinity would be stopped and the District Archaeologist would be notified.

Chapter III. **AFFECTED ENVIRONMENT and EFFECTS ANALYSIS**

This chapter combines the affected-environment and effects-analysis discussion and has been arranged by the issues outlined in Chapter I.

A description of the current state of the environment naturally includes the effects of past actions. This will serve as a more accurate and useful starting point for a cumulative effects analysis than attempting to establish an arbitrary starting point by accumulating the described effects of individual past natural events and past human actions. The importance of past actions is to determine the context for understanding the incremental effects of the proposed action. This context is determined by combining the present conditions with available information on the expected effects of other present and reasonably foreseeable future actions.

Cumulative impacts are not separate from direct or indirect effects of individual actions, rather the scope of analysis is expanded to analyze the impacts in the context of all the actions reasonably known to have occurred or will occur regardless of the source of the action. An assumption is made that industrial forest landowners would manage timber and construct roads consistent with the Oregon Forest Practices Act. The team assumed a 40-50 year rotation age for industrial timberlands. No attempt was made to assess effects from other land uses in the analysis area: such as, farming, ranching, residential woodlot management, golf course management, urban growth, etc.; except where such effects are manifested as trends in the current landscape condition and related to the identified issues.

The Western Oregon Plan Revisions, although reasonably foreseeable, are still in process and subject to change based on public comments and subsequent administrative remedies. They, therefore, provide insufficient information for meaningful consideration at this time (see *NAEC v. Kempthorne*, 457 F.3d 969, 979-80 (9th Cir. 2006) finding it lawful to consider the cumulative effects in the later broad-scale planning analysis).

Additionally, the purpose of this current proposal is to implement the existing Coos Bay District Resource Management Plan (RMP). This EA has been prepared to determine if any significant environmental effects of the proposal are substantially greater than what has already been analyzed in the existing RMP's programmatic EIS. The EIS associated with the current Western Oregon Plan Revision effort contains a cumulative effects analysis that incorporates these implementation actions (projected to occur under the existing plan as the "No Action" alternative and possible ongoing actions carried forward into the action alternatives), in a manner appropriate to the land use planning scale. The Western Oregon Plan Revision EIS therefore serves as the appropriate vehicle for analyzing the cumulative effects of each land use alternative's management scheme. Any potentially cumulative effects of this proposal at the programmatic level that would be relevant to the proposed plan revision will be considered in that process.

It is not the intent of the planning or NEPA processes to recalibrate all analyses of existing plan implementation actions whenever a new planning effort begins for consideration of a broad array of management guidelines and alternative allocations at the programmatic scale. Analyzing the outcome of the plan revision process as a "reasonably foreseeable future action" in every implementing project of the current plan would create a circular analysis process, where the effects of revising the plan would be used to determine whether to supplement the current plan's analysis that is already being revisited in the revision effort. Rather, the plan-level EIS itself will factor in the cumulative program effects and reset the stage for analysis of subsequent plan implementation actions.

Issue: Dense Conifer Stands

Stand density has a strong effect on the characteristics of individual tree growth within the stand. Trees grown under intense competition have less capacity to respond to other environmental stressors such as drought or insect infestation. By controlling density, managers can reallocate growing space to those trees that have already established a competitive advantage. Public scoping indicated a preference for variable density thinning while managing stocking in young plantations and suggested that variability at the scale of individual trees and groups of trees was important to the development of forest structure important in determining the suitability of a forest patch for wildlife. The RMP direction is to *Apply silvicultural systems that are planned to produce, over time, forests with desired species composition, structural characteristics, and distribution of seral or age classes"*(USDI 1995 p.53)

The discussion below describes the current condition of the proposed treatment units and their relationship to the larger landscape, describes within stand and between stand variability, describes a number of constraints on density treatments, and describes the availability of structural elements important to wildlife. The effects of the alternatives on stand density and stand structure are also discussed.

Stand Density

The analysis area consists of a highly complex mosaic of forest conditions due in part to interrelationships of the complex geology, soils, spatial distribution of past disturbance, and varied land-use (USDI 2008c). Forested land uses range from small residential woodlots to intensively managed industrial forest and large blocks of unmanaged old-growth forests on USDA Forest Service lands. Non-forested areas are also present and include recent clear-cut patches, sand dunes, rangeland, farmland, and urban areas. Stand densities across the analysis area are generally increasing as an intentional consequence of industrial wood production or unintentionally, as a consequence of fire suppression.

The BLM manages approximately 5260-forested acres in the analysis area. Approximately 4100 acres are classified as dominated by Douglas-fir and W. hemlock or Douglas-fir with an alder component. The remainder is a collection of mixed conifers, mixed confers/hardwoods and mixed hardwoods. Because the forested area is extremely complex, a classification system is used to facilitate management decisions and

discussion of effects. The classification system is a subjective interpretation from aerial photography of stand conditions at the landscape scale. The classification method describes areas greater than 5 acres in size of similar stand characteristics that ignores small dissimilarities in order to create an operational forest inventory.

Of the 4100 BLM acres of conifer-dominated stands within the analysis area, approximately 1850 acres are aged from 30-80 years old in the "canopy closure/stem exclusion stage" of stand development (Franklin *et al.* 2002). Using a broad three-tier landscape-scale stocking classification system, approximately 64% of the 1850 acres of thinning-aged stands are classified as overstocked, 26 % as moderately overstocked, and the remainder (10%) are described as moderately stocked or lower.

Contiguous areas of highest apparent density were reviewed and sampled. Table III-1 depicts the range of plot level densities in the proposed treatment units. Note that the average across all plots is similar to the density classification at the larger landscape scale. The plots are stratified into "no competition" (relative density less than 20), "low competition" (relative density from 21 to 34), "high competition" (relative density 35 to 55) and high competition transitioning to "imminent mortality" (relative density greater than 55).

Table III-1: Distribution of plot level (patch) Relative Density of sampled stands

	Site name	Location	Stand Exam date	Total plots	Average RD	Percent plots by relative density range			
						No competition: RD of 0.20 and less	Low competition: RD of 0.21 to 0.34	High competition: RD of 0.35 to 0.55	High competition transitioning to imminent mortality: RD 0.56 and greater
Edson CT Pre-treatment	Unit 1	See Map	2005	20	**0.70**	5.0%	5.0%	20.0%	**70.0%**
	Unit 2	"	2005	3	**0.60**	0.0%	0.0%	66.7%	**33.3%**
	Unit 3	"	2005	8	**0.86**	0.0%	0.0%	12.5%	**87.5%**
	Unit 4	"	2005	12	**0.60**	0.0%	16.7%	33.3%	**50.0%**
	Unit 5	"	2005	22	**0.86**	0.0%	4.6%	13.6%	**81.8%**
	Unit 6	"	2005	10	**0.90**	0.0%	0.0%	10.0%	**90.0%**
	Unit 7	"	2005	6	**0.78**	0.0%	0.0%	0.0%	**100%**
	Unit 8	"	2005	33	**0.56**	3.0%	12.1%	33.3%	**51.5%**
	Unit 9	"	2005	53	**0.55**	1.9%	15.1%	34.0%	**49.1%**
	Unit 10	"	2005	6	**0.58**	16.7%	0.0%	16.7%	**66.7%**
	Unit 11	"	2005	9	**0.60**	11.1%	11.1%	11.1%	**66.7%**
	Unit 12	"	2005	18	**0.52**	11.1%	11.1%	27.8%	**50.0%**
	Pretreatment Average			200	**0.64**	3.5%	9.5%	25.5%	**61.5%**

The density of trees relative to characteristics of stand development and stand processes. RD increases for a given number of trees per acres as stem diameters increase is called relative density (RD). RD decreases for a given stem diameter if the number of trees per acre decrease. Stands with a RD of 55 are at the lower threshold of imminent competition mortality and have small live crowns that cover only the upper 35% to 40% of the stem (Table III-2) (Drew and Flewelling 1979). The correlation between relative density and stand condition is not exact with some of the variation attributable to light

levels as influenced by topographic shading, average annual number of cloudy days, and distance from the equator (Lonsdale and Watkinson 1982). This may partly explain why other researchers place the lower limit of imminent mortality at RD 65 or 60 (Long and Shaw 2005, Long *et al.* 1981). An RD of 35 is considered full site occupancy for stand management decisions. Technically speaking, a stand with an RD35 is producing approximately 75% of the gross volume periodic annual increment of what that stand would produce if had sufficient stocking to be at the lower limit of self-thinning (Long *et al.* 1981). As depicted in Table II-1 and Table III-1, all stands selected for possible treatment exceed this density. A Douglas-fir stand with a RD of 25 to 35 is considered less than fully occupied and capable of understory development (Hayes *et al.* 1997). Stands with a RD 15 are just at the threshold of crown closure. Western Hemlock can grow to higher densities than Douglas-fir due to its greater shade tolerance, hence the need for different relative density thresholds for the two species.

Table III-2: Relative Density for Douglas-fir and W. hemlock

Relative Density for Douglas-fir	Stand Condition for Douglas-fir	Relative Density for Hemlock (USDA, 2002)	Stand Condition for W. hemlock
15	Crown Closure	20	Crown Closure
25	On set of competition	35 and less	Individual tree growth is maximized
35	75% of full stand occupancy	35 - 50	Stand Vigor and Growth are maximized
40	Transition from low tree competition to high tree competition.	50 - 70	Transition from low tree competition to high tree competition.
55	Lower limit of self-thinning, transition into the zone of imminent mortality. Live crown ratio approximately 35-40%. Trees with small crowns will have a delayed response to thinning	70 and above	Lower limit of self-thinning, transition into the zone of imminent mortality
100	Theoretical maximum density	100	Theoretical maximum density

Because of the exposure to strong winter storm winds, the potential for windthrow damage acts as a constraint on the lower end of density treatment. Trees suddenly released from dense competition are more susceptible to windthrow because of the loss of adjacent trees to buffer the wind forces and because of the poor height to diameter ratios trees develop when grown at higher densities. Tree growing under intense competition are forced to grow ever taller in an effort to overtop adjacent trees and allocate energy towards height growth rather than diameter growth; this results in heights that are greater than open grown trees of the same diameter. This greater height to smaller diameter ratio makes trees more susceptible to bending or breaking under heavy wind. Weak root-strength due to soil properties exacerbates the risk. Soils, along with landscape position are also an important factor in determining wind throw risk.

Soils contribution to risk of windthrow is provided by the Curry County soil survey. Table III-3 provides a summary of the units that have soils that are rated as having a severe risk. Windthrow is greatest against a hard cut line, such as a change in ownership along a property line where a clear-cut has recently occurred and along topographic features where funneling of wind energy could occur. Those soils that have shallow rooting zones or an abundance of rock within the upper or middle horizons have a tendency to be prone to windthrow. In an Olympic Peninsula study of wind damage after

variable density thinning, Roberts and others (2007) found that wind was responsible for damaging approximately 1.8% of all trees; however, where hemlock was only 32% of residual trees, it accounted for 85% of the wind damage. They found that topographic relief, soils, and the height to diameter ratio of the residual stand, accounted for most of the damage (Roberts *et al.* 2007). These results are consistent with team observations of previous thinning treatments elsewhere in the resource area. Units 3-5 have a greater hemlock component than other stands.

Unit 6 has been exposed along the south edge (predominant winter-storm wind direction is southwest) from a recent clear cut, has soils with a windthrow hazard rating, and is located within proximity of drainage features that may funnel winds into the bottom edge of this unit.

Table III-3: Soil Ratings from NRCS Database For Windthrow Hazard

Map Symbol- Soil Names Comprising the Map Unit	Windthrow Hazard Rating by Soil Name	EA Unit (Units) Affected by Severe Wind Ratings
73F DEADLINE- BARKSHANTY- NAILKEG-COMPLEX	Moderate Slight Severe	NW 52 (Unit 10), S 45 (Unit 6), East Edge 36 and 37E (Unit 1)
75E DEADLINE- IRMA- NAILKEG-COMPLEX	Moderate Slight Severe	NW Corner 52 (Unit 10)
173F MILBURY- REMOTE- UMPCOOS-COMPLEX	Moderate Slight Severe	Most of 19 (Unit 12), North edge 20E and South Center 20 (Unit 11)
175G MILBURY- UMPCOOS- DYSTROCHREPTS-COMPLEX	Moderate Severe Not Rated	NE half of 20 and West side 20E (Unit 11)
204E REDFLAT- MISLATNAH- GREGGO-COMPLEX	Slight Moderate Severe	South 52 (Unit 10) , Ctn 53 (Unit 8 and 9), West side 54 (Unit 9)
224E SADDLEPEAK- THREETREES-COMPLEX	Moderate Severe	West, South and NE Corner 45 (Unit 6), West half 46 (Unit 7)
227F and 260F SADDLEPEAK- THREETREES- SCALEROCK-COMPLEX	Moderate Severe Severe	East Sides 40 and 41 (Unit 5) Remaining parts of 45 (Unit 6) and 46 (Unit 7), South half of 432 (Unit 4)

No Action Alternative Effects on Stand Density

Approximately 490 acres of overstocked stands would continue to decline in overall stand and individual tree growth rate. Densities at the stand scale in the analysis area would continue to increase as a consequence of intensive forest management and modification of natural disturbance patterns. Height to diameter ratios of the standing trees would continue to trend towards instability, increasing the wind-damage risk, and increasing the risk for patch or stand level mortality. None of the dying trees would contribute volume to the ASQ. The Riparian Reserve would continue to develop under conditions atypical of old-growth stands (Poage and Tappeiner 2002, Tappeiner *et al.*

1997). Producing old growth is not a stated objective for the Riparian Reserve; however, several functions of the Riparian Reserve depend on having large conifer trees.

Proposed Action Effects on Stand Density

All the stands in the proposed action are in the 30-80 year old, biomass-accumulation/competitive-exclusion phase of stand development (Franklin *et al.* 2002). The proposed action would treat approximately 490 acres of the 1850 acres (26%) of Douglas-fir/W. hemlock and Douglas-fir/alder mixed stands in the 30-80 year old age range. Of the proposed treatment acres, 61% are in the overstocked category, 30 % are in the moderately-overstocked category, and 9% are in the moderately stocked category; this distribution is similar to the available acres in these stocking categories.

Some of the available heavily stocked acres in the analysis area could not be treated at this time due to the constraints imposed by of one or more, of the following factors; stand characteristics (density, tree size distribution, stand area, species composition etc), proximity to threatened species habitat, lack of existing roads, expense of possible road work, soils and geology at prospective road locations, arrangement of streams with relation to the roads and treatment area, stand slope position, proximity to other treatment areas, and access rights through adjacent landowners.

The residual relative density prescribed for each unit is a stand average density. Variability at stand establishment, naturally occurring clustered mortality, windthrow damage, differential growth patterns, imprecision in tree marking implementation, and logging-associated mortality produce within-stand density variation. Residual densities at the stand scale are expected to range from 90-150 trees per acre. Densities at the individual ≈0.15-acre plot/patch scale are expected to range from 50-300 trees per acre; density would depend on the unique characteristics at the plot/patch scale. Down wood and snag creation (see Stand Structure discussion) would create additional tree density variation throughout the treated stands. Selection of patches of trees for snag and down wood creation would create small gaps. Differing prescriptions applied to individual units and maintenance of untreated areas would maintain density variation at the landscape scale.

A comparison of pretreatment and post treatment data from previous thinning projects illustrates the amount of within-stand density variability expected. Table III-4 is a summary of these data from three stands with pretreatment densities comparable to the proposed action. The plots are stratified into “no competition” (relative density less than 20), “low competition” (relative density from 21 to 34), “high competition” (relative density 35 to 55) and high competition transitioning to “imminent mortality” (relative density greater than 55). As indicted by the data, the relative density of approximately half the post-harvest plots or patches within a stand will correspond to the average completion category of the stand as a whole. However, many other plots will have relative densities that are higher or lower than the stand average. There was no specific goal to achieve variability in these treated areas and a single Relative Density was the

target. The proposed action is expected to be similar to the results depicted with the following caveats:

- The lower densities prescribed in the Riparian Reserve (which did not occur in the depicted units) may result in more plots in the lower density range.
- The proposed creation of snags and down wood post harvest may also result in more plots in the lower density range, especially when snag and down wood creation is clumped, which would occur for about two thirds of the prescribed numbers (Table III-7) depending on a post harvest assessment.

Table III-4: Comparison of Pre and post thinning percent of plots (patches) by relative density range in typical thinning treatments on the Coos Bay District

	Site name	Location	Stand Exam date	Total plots	Average RD	Percent plots by relative density range			
						No competition: RD of 0.20 and less	Low competition: RD of 0.21 to 0.34	High competition: RD of 0.35 to 0.55	High competition transitioning to imminent mortality: RD 0.56 and greater
Edson Thin	**Pretreatment Average** (See Table III-1 for unit level data)			200	**0.64**	3.5%	9.5%	25.5%	**61.5%**
Previous Sale Pre-treatment Data	Scare Ridge	Sec. 13, T.21S., R.09W.	1991	18	**0.59**	5.6%	16.7%	22.2%	**55.6%**
	Mose15	Sec. 15, T.21S., R.08W.	1994	21	**0.49**	4.8%	23.8%	**38.1%**	33.3%
	Soup Creek	Sec. 19 & 30, T.23S., R.09W.	1994	11	**0.57**	0.0%	18.2%	18.2%	**63.6%**
	Pretreatment Average					**3.4%**	**19.6%**	**26.2%**	**50.8%**
First Exam Post-treatment	Scare Ridge	Sec. 13, T.21S., R.09W.	1996	46	**0.32**	17.4%	**45.7%**	37.0%	0.0%
	Mose15	Sec. 15, T.21S., R.08W.	2002	27	**0.30**	22.2%	**44.4%**	33.3%	0.0%
	Soup Creek	Sec. 19 & 30, T.23S., R.09W.	1998	8	**0.39**	12.5%	25.0%	**50.0%**	12.5%
	Post-treatment Average					**17.4%**	**38.4%**	**40.1%**	**4.2%**

After treatment, 17.4% of plots had relative densities less than 20, which would allow enough light into the stand to allow establishment of understory trees, provide for and maintain herb and shrub growth, allow retention of lower live branches, allow some epicormic branching, and maximize individual tree growth. A few (40.1%) post treatment plots had relative densities approaching relative density 55. The amount of light reaching the forest floor under the trees in these plots is not enough to allow survival of any but the most shade-tolerant plants; while thinning increased the amount of light reaching into the canopy, the leave trees would recapture the growing space resulting in the resumption of the effects of overcrowding and density dependent mortality.

A portion of unit 6 at the top of the draw exposed to possible extreme winds was excluded from treatment (see maps). A higher residual-tree density is prescribed for unit 6 where soil type and wind exposure may potentially cause greater wind-throw damage (See Table II-1). Higher stand density helps buffer individual trees from the effects of heavy winds. The remaining units with severe soil ratings for wind damage are generally well protected, which limited the concern. Units 3-5, which have a higher than average hemlock component (W. hemlock has poor root strength when compared to Douglas-fir), have a higher residual tree density prescribed.

As previously mentioned, approximately 90% of BLM's forested land base in the analysis area is in the overstocked or moderately overstocked categories. Private timberlands in the analysis area are also expected to have a similar high level of stocking, where no intermediate treatments are conducted between stand establishment and final harvest (clear-cut) every 40-50 years. By thinning the proposed units, the project would reduce stand densities on 490 acres of the 30-80 year-old thinning aged class (1850 BLM-acres); coverage in stands at the highest density class would be expected to decrease from 64% to 49%, coverage in moderately high density would increase from 26% to 30%, and coverage in moderately density would increase from 13% to 21% using the average post treatment values. The thinning-aged stands are 35% of BLM ownership and the BLM manages only 3.5% of the analysis area. The effects of the action on stand densities would be indiscernible at the landscape scale due to the limited scope of the project area, limited intensity of the treatments and limited BLM ownership. The landscape as a whole would trend towards higher densities. The intensity of treatments would be well within the range of densities already occurring across the landscape and result in stand densities more consistent with naturally regenerated stands. Effects would be most evident only at the local stand scale; this is consistent with the goal of increasing individual tree or patch growth for improved tree resiliency and for creation of stand structure important to wildlife, while still maintaining adequate stand-level growth rates for timber production. Through time, the treated stands would trend back towards the overstocked to moderately-overstocked condition where individual patches would progress at different rates depending on conditions post harvest; however, density independent factors (disease, wind etc.) are expected to play a greater role as the stands develop towards mature forest (Franklin *et al.* 2002). Individual dominant trees would maintain higher growth rates and would be affected less by canopy closure at the stand level.

Stand Structure

Remnant trees, mature forest, snags, and down logs can play a major role in the suitability of habitat for wildlife. The following is a discussion of the occurrence of these important elements within or near the treatment units. Further discussion of these structures as they relate directly to marbled murrelets and the northern spotted owl is included in the Special Status Species Issue discussed later. Where noise disturbance to marbled murrelets is possible, remnant trees or adjacent suitable-habitat patches would be surveyed using established protocols or assumed to be occupied where disturbance could be an issue.

Remnant trees occur in and outside of units along existing roads, unit edges, near drainages, and in forest openings. These remnants are larger and appear older than other trees within units but lack nesting features for murrelets and owls. One potential remnant nesting tree has been identified (within EA unit 45), and it would be surveyed using established protocol. Additional potential nest trees, if identified, would either be surveyed to protocol or protected through the terms and conditions outlined in the letter of concurrence (USFWS 13420-2007-I-0184) and have been included as project design criteria.

Mature forest patches (age 100 years or more) occur along openings, roads, edges, and adjacent drainages, but outside of proposed units. The patches tend to be small (5 acres or less) and, in some wind-exposed areas, trees are "stunted" with large branches beginning at eye-level (for example, between EA units 45 and 46). Many of these patches are suitable marbled murrelet and spotted owl habitat because of the existence of large trees with moss covered branches. These patches typically lack large snags or decadent trees for northern spotted owl nesting, but could provide roosting and foraging habitat. Further discussion of related to suitability of habitat for species is discussed in the Special Status Species Issue.

Snags and down wood can play a major role in the suitability of habitat for wildlife (Laudenslayer *et al.* 2002). Their importance was addressed in the RMP and further research continues to show the value of this habitat component for many wildlife species and ecosystem functions. Dead wood (both standing and down) contributes to biological richness as substrate, cavity and forage sites, shelter, and cover. In the Pacific Northwest, 69 vertebrate species commonly use cavities and 47 vertebrate species respond positively to down wood (Bunnel et al. in Laudenslayer *et al.* 2002). Appropriate amounts of dead wood for managed forests continue to be debated due to data gaps concerning species needs and decay dynamics.

Coos Bay District RMP Management Direction for thinning of stands on matrix lands specify that, at a minimum, snags are to be retained in harvest units at levels sufficient to support species of cavity-nesting birds at 40% of potential population levels(USDI 1995 p27). These requirements are to be met throughout the matrix in areas no larger than 40 acres. One hard snag per acre greater than 15 inches DBH and one-half snag per acre greater than 17 inches DBH are required to meet the 40% population level[1]. Large size classes are not always available in young stands

Levels of snags and down wood within units are substantially below those of unmanaged forests of similar age, except where bear damage or mortality from Port-Orford-cedar root rot has occurred. Past salvage and harvest activities generally removed existing snags and down wood. Existing snags are the result of past fire or harvest activities and are: 1) small, hard snags from recent suppression or damage, or 2) large, soft snags devoid of most bark. This is generally true of the analysis area, except for the large contiguous block of late-successional forest on Forest Service lands to the south.

Snag distribution and densities are highly variable within units. Table III-5 lists estimated snag densities for snags ≥10 inches DBH and ≥10 feet tall. Data were recorded during stand exams and are summarized as follows:

- Total snags range from 0 to 27.2 per acre, with an average of 6.09 snags per acre for all units reported.
- Hard snags (decay classes 1-3 >15" DBH) range from 0 to 3.0 per acre, with an average of 0.46 hard snags per acre.

[1] Sheridan, C. 2007. Unpublished data. Forest Ecologist, Coos Bay District BLM, 1300 Airport Lane, North Bend, OR 97459

- Soft snags (decay classes 4-5 >15" DBH) range from 0 to 0.7 per acre, with an average of 0.09 soft snags per acre.

Table III-5: Snag densities in portions of stands including proposed units. Data is only for coniferous snags >10" DBH and taller than 20 feet.

Unit No.	Stand Exam/EA Unit No.	Acres	Hard Snags/Acre (Decay Class 1-3)			Soft Snags/Acre (Decay Class 4-5)		Total Snags Per Acre	Other Treatment EA Units Represented
			10-11" DBH	11-15" DBH	> 15" DBH	11-15" DBH	> 15" DBH		
1	36	20	0.0	0.0	0.0	0.0	0.0	0.0	
	37	15	0.0	1.6	3.0	0.0	0.0	4.6	37E, 37N
2	40	34	0.0	4.0	1.3	0.0	0.4	5.7	
	40 NW	5	0.0	0.0	0.0	0.0	0.0	0.0	
3	433	9	0.0	4.6	1.2	0.0	0.8	6.6	
4	432S	23	0.0	2.5	2.0	0.0	0.0	4.5	
5	41	25	0.0	0.0	0.0	0.0	0.5	0.5	
	44	16	0.0	0.0	0.0	0.0	0.0	0.0	
6	45	28	0.0	0.0	0.0	0.0	0.7	0.7	45 NT, 45 SW
7	46	11	0.0	0.0	0.0	0.0	0.0	0.0	46W
8 and 9	53	25	0.0	8.2	0.0	0.0	0.0	8.2	53NW, 53SE, 53S1, 53S2, 53W1, 53W2
9	54	34	0.0	0.0	0.0	0.0	0.0	0.0	
	55	14	7.7	19.5	0.0	0.0	0.0	27.2	55 S
	57	11	10.7	10.4	0.0	0.0	0.0	21.1	57S, 57E
	57E	3	0.0	5.3	1.6	0.0	0.0	6.9	
10	52	18	0.0	5.2	0.0	0.0	0.0	5.2	
11	20	28	0.0	6.8	0.0	0.0	0.0	6.8	20E
12	19	60	8.2	4.2	0.0	0.0	0.0	12.4	
AVERAGES			**1.48**	**4.02**	**0.51**	**0.0**	**0.13**	**6.14**	

Coos Bay District RMP Management Direction does not require a specific amount of down wood in areas of partial harvest, but the same basic management direction is to be applied with modifications that reflect stand development (USDI 1995 p22). Existing large down wood within units is generally remnant from previous harvest, tends to be clumped near old landings, and is typically in soft decay classes (classes 3-5).

Down wood was surveyed during stand exams using line transects. Table III-6 lists estimates of the current lineal feet per acre of down wood for logs ≥ 5 inches diameter (at transect crossing) and at least 8 feet long. Data were recorded during stand exams for units or portions of units and are summarized as follows:

- Down wood in all decay classes, ≥ 16" diameter at large end and ≥ 8' long, ranges from 0 to 2,346 lineal feet per acre with an average of 1,002 lineal feet per acre.
- EA Unit 36, 41, and 432S contain ROD compliant down wood (decay classes 1 & 2, ≥ 16" diameter large end, and ≥ 16' long). All other units had no ROD compliant down wood during transect surveys.

Table III-6: Down wood in portions of stands including proposed units. Estimated from stand exam line transects. Data were collected for down wood ≥ 5 inches diameter (at intersection with transect) and at least 8 feet long.

Unit No.	*Unit / Transect No.	Total Hard & Soft Down Wood (lineal feet per acre) (Decay Classes 1-5; ≥ 8' long)		RMP Compliant Down Wood (lineal feet per acre) (Decay Classes 1-2; ≥ 16' long ≥ 16" dia. at large end)
		4-15" dia. at large end	≥ 16" dia. at large end	
1	36	1596.5	684.3	114.0
	37 NE	1052.6	1210.7	0.0
2	40 NW	729.4	1779.5	0.0
3	433	No Data	No Data	0.0
4	432 S	1592.7	1085.6	77.5
5	40 H S1 H	1733.3	2235.3	0.0
	40 SH1	1857.2	2346.0	0.0
	41	2394.8	1824.7	342.1
	44, 44 E(A)	957.8	1368.6	0.0
	44, 44 E(B)	821.1	1915.9	0.0
	44 E	821.4	1778.7	0.0
6	45	478.9	68.5	0.0
7	46	456.1	0.0	0.0
8	58	513.2	171.0	0.0
	59	627.2	399.2	0.0
8 and 9	53	475.9	833.1	0.0
9	53 SE	513.2	684.2	0.0
	54	532.2	684.2	0.0
	55	684.2	513.2	0.0
	56	821.0	1094.9	0.0
	57	488.7	586.5	0.0
	57 S	1026.3	1026.4	0.0
10	52	228.0	228.0	0.0
11	20	836.3	532.2	0.0
12	No Data	No Data	No Data	0.0
	Averages	**923.4**	**1002.2**	

*Transect numbers were split to reflect stand changes and may not reflect final unit numbers.

No Action - Effects on Stand Structure

The potential disturbance to adjacent remnant forest structures would not occur. Under the no-action alternative, stands in the project area would continue in their current development trajectory. It is expected that stands would continue through a series of suppression mortality stages before eventually developing habitat legacy components of large trees, snags, and course woody debris. A single story canopy with a narrow size and age range would continue to dominate the stands. In the absence of disturbance, vertical stand complexity would remain relatively unchanged over the next several decades. Individual tree crown development would continue to be narrow with small branches. Understory tree recruitment would be unlikely to occur for many decades. The herbaceous/shrub layer would show little development until such time that the stand opens up through competition or disturbance.

Stand projection simulations suggest that it would take unthinned stands 200 years to produce large diameter forest structure associated with late-seral stands (USDI 2001b). In contrast, Tappeiner et al. (1997) found that many Coast Range old-growth stands developed under low stocking densities and developed large diameter trees capable of providing large structure by the time those trees were 50 years-old.

The development of large trees with suitable nesting structures would be delayed under this alternative as growth stagnation of trees growing at high densities would continue. Under the current RMP, the matrix portion of these stands would be Regeneration Harvested in the future and large diameter trees for Green Tree Retention would not be readily available. The delayed development of large wood in the Riparian Reserve may affect the functionality of the Reserve in meeting ACS objectives. Development of mature, structurally complex stands would continue to be uncommon across the landscape.

The current trajectory of snag and coarse wood development would continue where snags and coarse wood recruitment would primarily originate from the smallest suppressed trees. As suppression mortality continued, there would be an increase in species associated with this habitat as flushes of small snags and coarse wood become available. Species utilization of snags and down wood depends on the size of the material, stage of decay, as well as the amount of material on the landscape. Pileated woodpeckers, and other primary cavity excavators, utilize a variety of snag sizes for foraging, but generally utilize larger snags (≥26" DBH) for nesting and roosting. Most of the snags and coarse wood in the project area would provide foraging substrate, but would not provide nesting and roosting habitat except for smaller cavity nesting species. Longevity of the snags and down wood would be short (10 to 20 years) due to the relatively small size and increased rate of decay associated with small wood.

Proposed Action - Effects on Stand Structure

Adjacent remnant patches would not be modified and remnant trees within the treatment units would be reserved from harvest and protected to the extent possible.

Thinning these stands would accelerate the development of large trees and, ultimately, provide large snags and down logs. Through time, the treated areas would be able to provide larger snags and down wood in less time than would have been likely without treatment.

Existing snags and large down wood (> 8" diameter large end) would be protected to the greatest extent possible. Some older soft snags and logs would be degraded (cut, knocked over, or smashed) through harvest activities or cut for safety reasons. Trees felled for yarding corridors within Riparian Reserves would remain on site as down logs. Overall, there would be an increase in hard snags and down wood and a decrease in soft snags and down wood following harvest.

Harvest activities would inadvertently create some immediate hard snags and down wood through injury and breakage. One study found 0.16 snags >20" DBH were created following group selection harvest methods (Walter and Maguire 2005). Another study found after 1-10 years 13% of trees retained in a tree-retention harvest of mature forest in the Cascade Range of Oregon had become snags (12" and greater) by natural processes (Busby et al. 2006). Snag data gathered on District in similar stands post-thinning

showed an average of 14 hard snags per acre (range 0-39). Data were collected on snags greater than 5.9" DBH and 6' tall[2]. No pre-thinning data was available for comparison.

Snag and down wood creation will occur in units where it is warranted. An effort is made to balance between creating small (< 17" DBH) snags now, against growing large trees to provide future snags and down wood of greater wildlife value. In stands where at least one-third of the leave trees will be ≥ 16" DBH (for snag creation) or ≥ 18" (for large down wood creation), snags and down wood will be created if the pre-harvest unit does not meet RMP direction or are not expected to meet RMP direction post-harvest. Table III-7 summarizes the estimated DBH of trees remaining after harvest at the 66th percentile (66.6 percent of leave trees are smaller than this DBH, 33.3 percent are greater than this DBH). Tree diameters were obtained from stand exam data. Table III-7 also indicates whether the unit currently meets RMP direction for snags and down wood, and whether snag and/or down wood creation appears warranted based on that data. Factors such as tree species and destruction of snags and down wood during harvest operations will also be considered prior to snag and/or down wood creation.

Table III-7: Snag and down wood creation parameters for proposed units. Pre-harvest ROD compliance within units and DBH of leave trees at the 66th percentile (threshold for snag creation is ≥16" DBH and for down wood creation is ≥18" DBH).

TS Unit	EA Unit No.	ROD Compliant Snags (snags/acre) (≥11" DBH, ≥ 10' tall, all decay classes)			ROD Compliant Down Wood (lineal ft/acre) (Decay classes 1-2; ≥ 16' long ≥ 16" dia.)	Estimated DBH at 66th percentile of leave trees	Snag/down wood Creation Code*
		11-15" DBH	> 15" DBH	Total			
1	36	0.0	0.0	0.0	114.0	17"	2/Snags
1	37	1.6	3.0	4.6	0.0	15"	0/No
2	40 NW	0.0	0.0	0.0	0.0	14"	0/No
3	433	1.6	2.0	6.6	No Data	17"	1/No
4	432S	2.5	2.0	4.5	77.5	17"	1/No
5	40	4.0	1.3	5.7	0.0	18"	3/DW
5	41	0.0	0.5	0.5	342.1	15"	0/No
5	44	0.0	0.0	0.0	0.0	13"	0/No
6	45	0.0	0.7	0.7	0.0	15"	0/No
7	46	0.0	0.0	0.0	0.0	14"	0/No
8&9	53	8.2	0.0	8.2	0.0	14"	0/No
9	54	0.0	0.0	0.0	0.0	16"	2/Snags
9	55	19.5	0.0	19.5	0.0	19"	3/DW
9	57	10.4	0.0	10.4	0.0	17"	1/No
9	57E	5.3	1.6	6.9	0.0	17"	1/No
11	20	6.8	0.0	6.8	0.0	13"	0/No
10	52	5.2	0.0	5.2	0.0	17"	1/No
12	19	4.2	0.0	12.4	n/a	15"	0/No

*** Snag/down wood creation codes:**
0/No – Minimum DBH (≥ 16" DBH) at 66th percentile was not met.
1/No – Snag creation not recommended unless snags are lost to harvest – Unit is ROD compliant for snags pre-harvest. DBH at 66th percentile is ≥ 16" DBH but less than the 18" down wood threshold.
2/Snags – Snag creation recommended – DBH at 66th percentile is ≥ 16" DBH **and** unit is not ROD compliant for snags.
3/DW – Down wood creation recommended – DBH at 66th percentile is ≥ 18" DBH **and** unit is not ROD compliant in down wood but is ROD compliant for snags pre-harvest.

[2] Fontaine, P. 2007. Unpublished data. Forester, Coos Bay District BLM, 1300 Airport Lane, North Bend, OR 97459.

Issue: Roads and Sedimentation

Natural and management related processes introduce sediment to stream channels. Primary sediment sources include hill slope erosion, episodic landslides, stream banks, and roads. Management related increases in sedimentation are most often the result of poorly designed and/or poorly maintained forest roads. These roads can be a major contributor of fine sediment to streams (Reid and Dunne 1984).

Sediment delivery to streams is caused by down cutting of ditch lines and by erosion of unprotected road surfaces from overland flow. Landslides can occur when road drainage is concentrated on unstable or erosive slopes. In addition, failure of inadequate road/stream crossings has the potential to deliver large inputs of sediment to streams. Reid and Dunne (1984) and others found that the amount of sediment produced by a road is highly dependent on the location, amount of use, surface type and other factors. They measured 130 times as much sediment coming from a heavily used road compared with an abandoned road, and a paved road yielded less than 1% as much sediment as a heavily used gravel road. It is also important to note that the roads must be hydrologically connected to a stream channel in order to deliver sediment-laden runoff. Heavily used roads with poor surfaces that are adjacent to a stream channel have the highest capacity to deliver sediment and reduce water quality.

The geology of the Sixes River and New River Frontal watersheds is influential in the sedimentation processes in the affected drainages. The geological composition is similar to the South Fork of the Coquille River watershed to the east but contrasts with the Klamath Formation of the Elk River to the south. It is the inherent nature of the underlying formation of the affected drainages, the Otter Point Formation, to be prone to slow earth creep and high sediment delivery when exposed and undergoing runoff in this high precipitation zone. The formation is composed of sheared mudstone, sandstone, volcanic rocks, chert, serpentinite, and blueschist, has slopes between 30 and 50%. The high percentage of clay and silt sized particles (roughly 40 to 60% of the total) in the surface soils provide an above average fine sediment source. The parent materials also do not have high load bearing strength when wet; therefore, it requires surfacing to allow wet season use. The soil types within the proposed project area have well, to moderately well, drainage classes for most of the land areas (USDA 2005). The well-drained soil ratings demonstrate the ability of the undisturbed soil to infiltrate the large amount of rain the area receives and limits the likelihood of overland flow.

The road network in the project area is primarily a mixture of private and BLM roads built over the past 70 years for forest management activities. Approximately one third of the roads in the three affected drainages were constructed since the mid 1990's. The road network and road related sediment sources in the Floras Creek watershed were assessed by the South Coast Watershed Council as part of the Floras Creek Watershed Assessment (Maguire 2001). The assessment used the indicators of road density on slopes greater than 50 percent and road/stream crossing density to characterize sediment delivery potential. According to their results, drainages in the Floras Creek watershed received a low risk or moderately low risk from density of roads and stream crossings.

There are no streams in the affected subwatersheds currently listed by DEQ as impaired by excess fine sediment. However, the team's observations of the road network in the proposed project indicate that some streams have been subject to episodes of excess fine sediment input due to poor road design, location, and lack of maintenance. This has caused fill washouts and subsequent debris flows.

Most of the stream-crossing culverts in the affected area are constructed of corrugated metal. The useful life of these culverts is approximately 25-30 years. Many of the existing culverts are much older and are rusted, undersized, damaged, filled by debris, or are otherwise in poor condition and are at risk of failure within the next 5-10 years. Some roads show evidence of surface erosion, inadequate drainage, inadequate stream-crossings, or unstable cut-banks and fill slopes. For example, a portion of the 31-14-23.0 road (proposed haul route, see maps) on BLM-managed land has several stream culverts and cross drains that have plugged completely. Four perennial stream crossing culverts have failed and the road and fill have been washed out. Diversions and plugging of undersized diameter pipes continues to remove fill material and deliver it to the streams in the analysis area. This has resulted in a continual source of sediment to these associated stream channels.

Roads are more than 100 feet from the adjacent streams for most of the project area except at the stream crossings. On well-maintained roads, fine sediment generated from the road surface infiltrates into adjacent forest soils. However, not all proposed haul roads are in this condition. Grading and cleaning of ditchlines as well as a number of culvert replacements occurred on the Plum Trees and Crystal Creek private mainline roads (32-14-4.0 & 31-14-21.0) in the winter of 2006-07. However, this maintenance was not enough to alleviate problems of rutting and puddle formation that was observed during private haul. Fine sediments generated from winter use of these two roadbeds was observed in ditches with connection to eight intermittent streams.

Effects on Sedimentation - No Action

Most stream-crossing culverts in the planning areas are constructed of corrugated metal (CMP). Many culverts are rusted, undersized, damaged, filled by debris or are otherwise in poor condition, and are at risk for failure within the next 5-10 years. Diversion of flow through and around road grade would continue to cause chronic and increased potential for episodic sedimentation to the stream network.

For example, on the 31-14-23.0 road, the team estimates that approximately 500 tons of sediment has been delivered to the stream network from each of the four fill failures (on average). Over the next 5-10 years, similar amounts of sediment could be delivered from additional failures. Under the No Action Alternative, 15 culverts would not be replaced on the proposed haul route. The team estimates that failure of these remaining culverts could result in 500 tons of sediment input per culvert (estimated at 7500 tons total).

The existing roads and culverts identified as potentially adding sediment to streams would not be renovated or decommissioned at this time. Future road decommissioning and closures within the affected area would depend on the availability of funding from

other sources. Roads on private lands would continue to be constructed and improved through time under Oregon Forest Practice rules. More than 90% of roads in the analysis area are controlled by private landowners. Approximately one third (50 miles out of 150 miles total) of the roads in the three affected drainages have been constructed by private timber companies since the mid-1990s. The team assumes that more roads will be built in the future by private land owners, however, the team estimates that the rate of road building on private lands will diminish as most of the harvestable areas are accessed.

New road design and construction practices required by the Oregon Department of Forestry (ODF) have been greatly improved since the legacy roads were first constructed in the 1960s and 1970s. As compared to these legacy roads, new road construction practices require greater protection of water quality. ODF rules designed to maintain water quality include those for road location, design, stream crossings, drainage, maintenance, and use of wet weather roads (ODF 2007, Division 625). For example, requirements include:

> "Operators shall install dips, water bars, or cross drainage culverts above and away from stream crossings so that road drainage water may be filtered before entering waters of the state." ((2007) OAR 629-625-0330 (4))
>
> "Operators shall avoid locating roads on steep slopes, slide areas, high landslide hazard locations, and in wetlands, riparian management areas, channels or floodplains where viable alternatives exist." ((2007) OAR 629-625-0200 (3))

It is also anticipated that older legacy roads would be improved or decommissioned in the future. Therefore, even as new private roads are constructed, the team expects that the cumulative effects of sediment from BLM and private roads would remain nearly the same in the near future, as at-risk roads are decommissioned in the affected drainages.

Effects on Sedimentation - Proposed Action

The following analysis is separated into effects related to new road construction, road renovation/improvement, road closure/decommissioning, and road use/haul of the proposed action. It assesses the potential rate and volume of sediment delivery to stream channels in the short and long term as a result of the proposed action. The proposed road activity occurs in three sub-watersheds/drainages (See Figure 1)

New Road Construction

Approximately 3.3 miles of natural or rocked surface road would be constructed to access harvest units. Of this amount, approximately 0.8 miles of the total new road would be constructed within the Riparian Reserve, and portions of these would cross four intermittent stream channels; one crossing would remain in place as part of a semi-permanent road and receive sporadic future use. Some roadside landings constructed on or adjacent to existing roads would be in the upland portion of the Riparian Reserve. In some cases, road construction has shown measured increases in the rate of sedimentation, but this effect has been found to decline rapidly over time. Megahan and Kidd (1972)

reported about 84 percent of all sediment produced from road surface erosion was generated during the first year after construction.

In contrast to the heavy sediment producing roads measured by Reid and Dunne (1984) and discussed above, the proposed new roads would be primarily located on or near ridge tops and would incorporate design features that avoid fragile or unstable areas, minimize excavation and height of cuts, require end-haul of waste material where appropriate, and require construction during the dry season (RMP D3-D4). Road drainage features would be designed so that and any sediment-laden surface water would quickly infiltrate into forest soils. The high infiltration rates in most undisturbed forested catchments means that rainsplash, sheetwash, and rilling typically generate no more than a small fraction of the sediment that is delivered from hillslopes to headwater channels (Hassan *et al.* 2005, Roberts and Church 1986). Even if road-surface flow does occur, the dense vegetative cover and high surface roughness minimizes overland flow velocities and sediment transport capacity (Dietrich 1982). Therefore, these roads would have a negligible effect on sediment delivery to stream channels and would have little potential to affect water quality.

Soil disturbance from installation and removal of three temporary stream culverts, and installation of one new permanent stream culvert, would cause a short-term increase in sediment delivery to adjacent, intermittent streams. The team specialists estimated that 1-5 tons (≈1 to 4 cubic yards @ 2,500 lbs/yd^3) of sediment could enter the stream from each new crossing during the first few major storm events in the winter after work is completed. This would be seen at the site level as a temporary increase in stream turbidity. For comparison, due to high rainfall and geology type, average annual sediment yield for similar basins in southwest Oregon may vary from 5,000 to 8,000 tons per square mile per year on average (Reiter and Beschta 1995) (the three affected drainages are approximately 30 sq. mi. in total area). The team estimates that 4-20 tons would result from the installation of the four new culverts (in contrast to the 150,000-240,000 tons of sediments developed annually from the three affected drainages). Therefore, the total of any temporary input of sediment from these stream crossings would be several orders of magnitude less than background levels and would only affect water quality immediately downstream of the site. The drainage areas above the new culvert installations are from 5-20 acres. A single culvert replacement on a stream draining a 7-acre catchment could contribute up to a 6% increase over the average sediment load of an affected stream segment (1-5 tons in addition to 55-88 tons estimate from the average natural-erosion rate). Although these numbers are estimates and applying the average yield of the watershed to smaller scales is somewhat problematic due to the stochastic nature of sediment inputs at smaller scales, it is useful in evaluating the relative magnitude of sediment that may enter the stream network as a result of the proposed action. This added sediment may be stored in the local channel and remain imbedded until the next major debris flow event or may be progressively moved through the stream network with periodic higher storm flows and normal channel forming processes. Soil disturbance would be minimized due to the use of BPMs designed to protect water quality (ROD/RMP D3 – D4). The BMPs for constructing or replacing stream crossings would include construction during the dry season; restricting the use of

heavy equipment in streams to the site area; cessation of activity during flow; minimizing diversion potential; and seeding and mulching disturbed soils prior to winter rains to minimize potential soil erosion.

Soil disturbance associated with new construction of roads and landings would be seasonally maintained prior to winter rains if use was planned the following year or decommissioned if no additional use was planned. Seasonal maintenance may include but is not limited to providing adequate water bars, mulching using wood chips or straw, and seeding with a district approved erosion-control seed-mix. The roads are not expected to increase sediment delivery to stream channels due to their locations, intervening forest buffers, and distances to streams. Therefore, the roads and landings would have little potential to affect water quality. The affected watersheds would still retain the low or moderately low risk ratings for road density and stream crossings as analyzed in the Floras Creek Watershed Assessment (Maguire 2001) after completion of the proposed action.

All of the newly constructed roads not required for future management would be closed when project activities associated with each road are completed. Approximately 3.1 miles of the newly constructed roads would be decommissioned. The 57-1 road as part of the 31-14-23.0 road would be blocked but is expected to be reopened for use by an adjacent landowner in 2 to 4 years for the duration of their harvest activities; although it will be technically decommissioned by the proposed action, the short timeframe indicated that the road not be included in the total miles of new roads to be decommissioned. See Appendix C for detailed road information.

Road Renovation (Reconstruction)/Improvement

Approximately 22 miles of the existing, proposed haul route would be renovated or improved. Some renovation of spur roads would meet dry-season use-standards and would remain un-surfaced. Renovation of these roads to the newest standards (USDI 1995 D3-D4) would divert road drainage away from stream channels and toward the forest floor where it could re-infiltrate. Renovation (including re-construction) may include but is not limited to re-surfacing with rock, stabilizing cut-banks and fill slopes, restoring out-slope or crown sections, providing adequate drainage and improving stream crossings. Some of these roads have sections with ditch lines and cross drains that flow directly into headwalls or stream channels. For example, a portion of the proposed haul route (31-14-23.0 road, see map Figure 2(b)) has several stream culverts and cross drains that have plugged completely. In two areas, the plugged culverts had caused the road and fill to wash out and the road is impassable. Renovation of this road, as well as others, will reduce their potential to deliver sediment to stream channels. The RMP provides direction to reconstruct roads when the ACS objectives are potentially at risk (USDI 1995 p69, 2002 TMPp3)

Road renovation and improvement would occur in the dry season for activities requiring soil displacement, such as culvert installation or replacement. The project would include replacement of approximately 15 stream crossing culverts. The team estimates that 15-75 tons (in contrast to the 150,000-240,000 tons of annual sediment yield) would result from

the 15 replaced culverts. Several ditch relief culverts would also be replaced or added in order to provide additional drainage while upgrading road grade and surface conditions. Renovation would have a minor, 1-2 year potential for increased sediment caused by soil displacement, including the placement of upgraded culverts and associated fill material. Renovation would provide a long-term (many years) benefit to flow routing and water quality in the affected subwatersheds with the improved road design standards.

Road Closure and Decommissioning

Approximately 10.6 miles of new and renovated roads would be decommissioned at completion of proposed project activities. Decommissioning would be designed to restore "natural hydrologic flow" (USDI 2002) and may include but is not limited to sub-soiling or tilling, removal of unstable fills, removal of cross drains, construction of water bars, removal of stream crossings, and construction of a suitable barrier to block access. Closing and/or decommissioning these roads will reduce their potential to deliver sediment to stream channels or alter flow routing in the affected drainages. Decommissioning would have a minor, 1-2 year potential for increased sediment. Approximately 8 culverts would be removed during decommissioning. Approximately 8-40 tons of sediment could be delivered to the stream network as a result (contrast to 150,000-240,000 tons of annual sediment yield) Decommissioning these roads is beneficial due to the high risk posed by the geology and soils as evidenced by the previous road failures. In contrast, decommissioning would provide many years of benefit to flow routing and water quality in the affected subwatersheds.

Sedimentation Effects of Haul Activities and Road Maintenance

Access to the proposed units for log hauling would be from existing or renovated rock surfaced roads, or from natural surface roads during the dry season (generally June 1 – September 30). Most of the roads would require renovation or improvement as described above. There are 18 miles of gravel road being considered for use on private land. Hauling would be seasonally restricted where road surfaces have inadequate rock surface for wet season haul. During the dry season, there would be a negligible (in contrast to the average annual sediment yield) change in sediment delivery to streams as a result of haul on the proposed main haul routes and spurs since there would be no mechanism (flowing water on road surfaces and ditchlines) for sediment delivery. During the wet season, hauling activities have the potential to increase sediment delivered to stream channels.

To minimize the potential for increased sediment delivery from haul activities and road maintenance, design features listed in Chapter 2 (Design Features for the Proposed Action) would be implemented. These design features would be in place before winter haul and may include but are not limited to applying an additional lift of rock to stream crossings if there is a potential for road sediment delivery to a stream; containing any offsite movement of sediment from the road or ditch flow near streams with appropriate sediment filters or barriers; monitoring road conditions during winter use to prevent rutting of the rock surface; and suspending haul during very wet conditions. In addition, if the ground is already saturated from winter rains and more than 1 inch of precipitation is predicted in the project area over the next 24 hours, then winter haul will be suspended.

Operations may resume after the 24-hour suspension, except when another storm, exceeding 1-inch of rainfall, is forecasted.

Road maintenance during the life of the project would minimize road drainage problems and reduce the possibility of road failures and increased sediment delivery to streams. Maintenance may include but is not limited to grading to remove ruts, removal of bank slough, placement of sediment control devices, and adding gravel lifts where needed in the road surface. To prevent sediment-laden water from entering the stream network, maintenance of roadway ditchline segments that drain directly into stream channels would be conducted only during the dry season from July 15 - September 30; however, work on these ditchline segments could be conducted outside this period when appropriate to protect water quality or soils. Road maintenance of the haul route across private lands will be performed by the BLM or the private landowner depending on the road-use agreement.

The use of these roads is expected to be short term and limited by weather conditions as specified in the site-specific project design features. Though some minor sedimentation may result from the additional proposed haul activities, occurrence should only take place during prolonged rainfall events, until haul is suspended as noted above. Further, due to the steady level of private haul presently on these roads, additional amounts should be negligible and not outside levels that presently occur during such rainfall events.

Most of the gravel-surfaced haul-routes are under private control and may be used extensively throughout the year by private timber companies. The winter use of roads for the proposed action would be minimal, generally 3-5 loaded trips per day. Moreover, access to all EA units except 19 & 20 is limited by a locked private industry gate thus limiting sediment delivery from other users. Therefore, the amount of fine sediment introduced to streams during proposed action haul activities would be indiscernible beyond private inputs and natural erosion processes occurring during winter rains.

Cumulative Road Effects on Sedimentation

Results of the Floras Creek Watershed Assessment (Maguire 2001) and the BLM watershed analysis (USDI 2008c) represent the cumulative effects of road related sediment sources from past actions. Both analyses showed that the analysis area received a low risk or moderately low risk from density of roads and stream crossings.

Road decommissioning would result in a net decrease of approximately 7.3 miles of the total 150 miles of road in the affected drainages. Combined with the planned road restoration and improvement work, the proposed action would slightly decrease the amount of sediment delivery from roads in the affected drainages.

More than 90% of roads in the analysis area are controlled by private landowners. Approximately one third (50 miles out of 150 miles total) of the roads in the affected drainages have been constructed by private timber companies since the mid-1990s. The team assumes that more roads will be built in the future by private land owners, however,

the team estimates that the rate of road building on private lands will diminish as most of the harvestable areas are accessed.

New road design and construction practices required by the Oregon Department of Forestry (ODF) have been greatly improved since the legacy roads were first constructed in the 1960s and 1970s. As compared to these legacy roads, new road construction practices require greater protection of water quality. ODF rules designed to maintain water quality include those for road location, design, stream crossings, drainage, maintenance, and use of wet weather roads ((2007), Division 625). For example, requirements include:

> "Operators shall install dips, water bars, or cross drainage culverts above and away from stream crossings so that road drainage water may be filtered before entering waters of the state." ((2007), OAR 629-625-0330 (4))
>
> "Operators shall avoid locating roads on steep slopes, slide areas, high landslide hazard locations, and in wetlands, riparian management areas, channels or floodplains where viable alternatives exist." ((2007),OAR 629-625-0200 (3))

It is also anticipated that older legacy roads would be improved or decommissioned in the future. Therefore, even as new private roads are constructed, the team expects that the cumulative effects of sediment from BLM and private roads would remain nearly the same in the near future, as at-risk roads are decommissioned in the affected drainages and roads are relocated to ridges.

Issue: Roads and Hydrological Connectivity

Roads have the potential to increase peak flows (Beschta 1978, Wemple *et al.* 1996). Mid-slope roads with cut-banks can intercept surface and subsurface water and divert it into the road drainage system. This can effectively extend the stream channel network and speed up delivery of water to streams. Roads or road segments that drain directly into stream channels have been termed "hydrologically-connected" roads (Furniss *et al.* 2000). Historically, forest roads were not designed to alleviate this effect. It was common practice to direct road drainage into stream channels as a cost saving measure (one less cross drain to install).

A method for assessing the potential risk of the road network to cause an impact on stream flow was developed for the Governors Watershed Enhancement Board (GWEB). The assessment assigns a "threshold of concern" for hydrologic impacts based on the percentage of catchment area covered by roads. The threshold levels are 0-4 % low risk, 4-8 % moderate risk, and above 8 % high risk (WPN 1999 pIV-15). The table below illustrates percent area covered by roads and the risk level for the three affected drainages (7th Field watersheds).

Table III-8: Current Risk of Hydrologic Impacts due to Roads

Drainage	*Drainage Area (mi^2)	*Road Length (miles)	*Road Area (mi^2)	**Percent Road Area**	Risk Level
South Fork Floras	12.24	55.65	0.32	**2.6**	**Low**
West Fork Floras	12.47	36.11	0.21	**1.7**	**Low**
Plum Trees	9.72	55.61	0.32	**3.3**	**Low**
Totals/**Ave.**	34.43	147.37	0.84	**2.4**	**Low**

*approximate values based on GIS data, 2005 aerial photos, and an average road width of 30 feet (0.0057 miles).

The approximate area currently covered by roads varies from 1.7 to 3.3 percent with an average of 2.4 percent. Therefore, according to the GWEB method, the analysis area currently has a low risk (< 4 % road area) of hydraulic impacts due to roads. However, as stated by the authors, the condition of roads and the design of drainage systems may be just as important in determining the impact of roads on stream flow. The drainage systems of many roads in the analysis area are directly connected to stream channels.

Most paired-watershed studies used to detect the hydrologic effects of road building have included clear-cut timber harvest. The range of various results for paired-watershed studies have shown that the combination of forest harvest and roads can increase the size of peakflows, decrease the size of peak flows, or have no extensive effect (Austin 1999, Harr and McCorison 1979, Moore and Wondzell 2005). The greatest response has been measured in small peak flows (< 1 to 2 yr. return interval) and small catchments (< few km^2). Two studies of small coastal basins, one in western Washington by Bowling and Lettenmaier (1997), and one in the Oregon Coast Range by Harr (1975) documented peak flow increases of 11 and 20 percent respectively for small floods. Small peak flows have little effect on channel form compared to larger events. Large peak flows (> 5 yr. return interval) which can scour stream channels, modify floodplains, and carry tremendous quantities of sediment have not been significantly affected in paired watershed studies (Harr 1976, Rothacher 1973).

In larger catchments, peaks may be smoothed out due to changes in flow timing from adjacent watersheds. As small streams form increasingly larger drainage networks, the ability of individual small watersheds to affect flow decreases (Garbrecht 1991). As a result, peak flow increases following harvest or road building at the drainage level are likely to be undetectable farther downstream. Therefore, analysis of larger watersheds generally has not been able to document road-induced increases in peak flows.

Although changes to stream flow from roads has been difficult to measure, the causal mechanisms are well understood. Changes to subsurface flow paths, and their relative contribution to surface stream flow, depend on the location and design of the road. A study by Wemple and Jones (2003) determined that hillslope length, soil depth, and cutbank depth largely determined the difference in flow magnitude and timing between catchments and between storm events. The simplest way to ameliorate the hydrologic effect of mid-slope roads is to disconnect them from the stream network. This can be accomplished by increasing the number of drainage structures; cross drains, water bars, out-sloping the road prism, and improving their placement and design.

Effects of Road on Hydrological Connectivity - No Action

Flow timing and magnitude would remain unaffected because none of the road construction, renovation or decommissioning projects would be implemented. The legacy road system would remain connected to the stream network. Roads in the project proposed for renovation or decommissioning would continue to potentially affect stream flow due to their capacity to extend the drainage network.

Effects of Road on Hydrological Connectivity - Proposed Action

Using the GWEB analysis, table 3 below shows the 3.3 miles of proposed new road construction would result in an increase of percent road area from 2.4 to 2.5 percent; still well within the low (< 4%) risk of concern for hydrologic impacts.

Table III-9: Risk of Hydrologic Impacts with New Road Construction

Drainage	*Drainage Area (mi^2)	*Road Length (miles) with proposed New Road Construction	*Road Area (mi^2) with proposed New Road Construction	**Percent Road Area with proposed New Road Construction**	Risk Level with proposed New Road Construction
South Fork Floras	12.24	57.66	0.33	**2.7**	**Low**
West Fork Floras	12.47	36.78	0.21	**1.7**	**Low**
Plum Trees	9.72	55.61	0.32	**3.3**	**Low**
Totals	34.43	150.05	0.86	**2.5**	**Low**

*approximate values based on GIS data, 2005 aerial photos, and an average road width of 30 feet (0.0057 miles

In addition, new roads constructed for the proposed project would be primarily located on or near ridge tops. Ridge-top roads have little potential to modify subsurface flow paths. New roads would incorporate design features that avoid fragile or unstable areas, minimize excavation and height of cuts, require endhaul of waste material where appropriate, and require construction during the dry season (ROD/RMP D3-D4). Road drainage features for new road construction would be designed so that surface water would be diverted onto and infiltrate into forest soils. Specifications for the design and spacing of drainage structures are located in Chapter 2, Design Features for the Proposed Action. Therefore, when properly maintained or decommissioned, these roads would have a negligible effect on flow routing or peak flows in the affected watersheds.

Under the proposed action, four new stream crossings will be constructed adding approximately 400 feet (100 feet of road per stream crossing) of road drainage to the affected stream network. Approximately 10.6 miles of new and renovated roads would be decommissioned at completion of proposed project activities. The proposed decommissioning would disconnect approximately 1,800 feet of road drainage (~ 18 stream crossings) from the stream network. Decommissioning would be designed to restore "natural hydrologic flow" (USDI 2001) and may include but is not limited to subsoiling or tilling, removal of unstable fills, removal of cross drains, construction of water bars, eliminating diversion potential at stream crossings, and construction of a suitable barrier to block access. Decommissioning these roads would reduce their potential to alter flow routing in the analysis area.

The proposed project would result in a net decrease of approximately 7.3 miles (3.3 miles of new construction minus 10.6 miles decommissioned) to the total road network in the analysis area. In addition, by improving road drainage, some roads proposed for renovation but not decommissioned would effectively be disconnected from the stream network.

Cumulative Road Effects on Hydrological Connectivity

The cumulative effects of road connectivity and sedimentation are closely tied together because fine sediment is transported and delivered to streams by surface water flowing from the road network. The following analysis is based on using Best Management Practices for Maintaining Water Quality and Soil Productivity (RMP D3-D4) to limit excess sediment delivery from roads and construction areas to acceptable levels. Employment of Design Features listed in Chapter 2 would include improvements in road alignment, drainage systems, construction design, and protection of vegetative buffer strips to filter sediment, and restrictions on the amount and timing of traffic during winter haul. The use of private roads by BLM for haul would be of low volume and would include maintenance of the roads to reduce the amount of fine sediment to the ditches and stream networks.

Using the GWEB method, the analysis area currently has a low risk (< 4 % road area) of hydraulic impacts due to roads. Table III-9 (Risk of Hydrologic Impacts with New Road Construction) represents the landscape scale effect of road connectivity from the proposed action and the accumulation of previous actions. Using the GWEB analysis, it would require a total of approximately 240 miles of road (150 miles existing plus 90 future miles) from all ownerships to exceed the low risk threshold (> 4 % road area). As mentioned earlier, as much of the area is already road accessible, the rate of new road construction is expected to decrease and would be preferentially located on ridge tops.

At the completion of project activities, proposed road drainage improvements and road decommissioning would result in a long-term connectivity decrease along approximately 12 miles of hydrologically connected BLM roads in the affected drainages.

As described in the Sedimentation Issue previously, more than 90% of roads in the analysis area are controlled by private landowners, and approximately one-third of the roads have been constructed by private timber companies since the mid-1990s. As compared to the legacy roads, new road construction practices require road drainage and other design features that effectively disconnect roads from the stream network. For example:

> "Operators shall install dips, water bars, or cross drainage culverts above and away from stream crossings so that road drainage water may be filtered before entering waters of the state." ((2007), OAR629-625-0330 (4))

Although the main purpose of this rule is to protect water quality by reducing sediment, it also serves to disconnect road drainage that could affect stream flow. In addition, it is likely that older legacy roads will be improved or decommissioned in the future.

Therefore, even as new private roads are constructed, the team expects that the combined effects from BLM and private roads would remain nearly the same or potentially decrease in the near future based on current management practices resulting in the incremental disconnection of the legacy road network from the stream network.

Issue: Special Status Species

The BLM is directed to conserve special status species (SSS) and ecosystems upon which they depend (USDI 2001a). SSS include threatened and endangered (T & E), proposed, candidate, state listed, and Bureau Sensitive species. T & E and Bureau Sensitive species are discussed under their respective sections below.

In Oregon and Washington, policy identifies two tiers of Special Status Species: Bureau Sensitive and Bureau Strategic (USDI 2007c). Bureau Sensitive species are those that have appeared in the Federal Register as proposed for classification and are under consideration for official listing as threatened or endangered (T & E); are on an official state list; or are recognized by the implementing agencies as needing special management to prevent their being placed on federal or state lists. Bureau Strategic species are not considered as SSS for management purposes; however, districts are encouraged to collect occurrence data on these species.

To comply with Bureau policy to assess the effects of a proposed action on Bureau Sensitive species, the District may use one or more of the following techniques: (1) evaluation of species habitat association, (2) application of conservation strategies, plans, or other conservation tools, (3) review existing survey records, inventories, and spatial data, (4) use professional research and literature, (5) use professional judgment, and (6) complete pre-project surveys (IM No. OR-2008-038 and IM No. OR-2003-054)(USDI 2003, 2008b). Appendix B lists all special status species not analyzed in depth and the reason the proposed action will have no effect. These species were not analyzed in depth because of one or more of the following: 1) the project is outside of the species' known range; 2) key habitat features are not within the reach of project impacts; or, 3) the species is unlikely to be present because key habitat features are lacking or other evidence suggests they would not be present.

Threatened and Endangered Species

Effects from this project would neither contribute to the need to list any special status species nor jeopardize the existence of current ESA listed species. Project design criteria would be followed to minimize the risk to ESA listed species. All standards and guidelines outlined in the Coos Bay RMP, which are applicable to this project, would be followed.

Invertebrates

There are no threatened or endangered invertebrates known or expected within the analysis area.

Vertebrates

Marbled Murrelets (Brachyramphus marmoratus) (Federally Threatened)
Declining population was the primary reason for listing the murrelet as threatened in 1992 (USDI 1992). The Marbled Murrelet Recovery Plan (USDI 1997) identified the primary threats to the species as: 1) predation; 2) loss of nesting habitat; 3) by-catch in gill-nets; and 4) oil pollution from both chronic and major spills.

At-sea surveys are used to monitor murrelet populations in each of the 5 murrelet conservation zones. The analysis area is within Zone 4, and population densities have declined since 2002, with rising and falling modulations(Huff *et al.* 2006). This is not yet a statistically valid trend, but the population density in Zone 4 of 3.14 birds per square kilometer for 2005 is below the 2002 benchmark of 4.21 birds per square kilometer.

Murrelet suitable habitat and occupied sites generally contain large trees greater than 18 inches DBH, multi-storied canopies with moderate closure, sufficient limb size and substrate (moss, duff, etc.) to support nest cups, flight accessibility, and protective cover (Manley and Nelson 1999, Nelson and Wilson 2002).

Suitable habitat within 35 miles of the coast (Zone 1) has a higher likelihood of occupancy because murrelets forage in the ocean. All EA units are within 10 to 12 miles of the Pacific Ocean.

The following is a summary of Murrelet suitable habitat, occupied sites, and critical habitat in the analysis area:

- Within the Analysis Area:
    - Suitable Murrelet Habitat –
        - 1,266 acres under BLM management (25% of all BLM acres).
        - Approximately 21,000 acres under Forest Service management (97% of Forest Service acres within the analysis area).
    - Occupied Murrelet Sites - Six known occupied sites.
    - Critical Habitat - All 21,692 acres of the Forest Service lands are within murrelet Critical Habitat Unit #OR-07-a.

- Within Proposed Units:
    - Suitable Murrelet Habitat: Unit 45 (One potential nest tree would be surveyed and would not be removed. See “Remnant Trees” above).
    - Occupied Murrelet Sites: None
    - Critical Habitat: None

- Adjacent to Proposed Units (within 100 yards):
    - Suitable Murrelet Habitat is adjacent to: EA Unit 36, 40, 45, 46, 59, and 432
    - Occupied Murrelet Sites adjacent to: EA Unit 19
    - Critical Habitat adjacent to: EA Unit 19

Under the no-action alternative, the development of stand structures important to marbled murrelets would be delayed.

The proposed action would cause no measurable negative effects to marbled murrelets because no suitable nesting habitat would be removed and disturbance to nesting birds would be minimized through Project Design Criteria (PDC) that stipulate either seasonal restrictions on activities or a determination of non-nesting through surveys. Thinning of the existing forest would accelerate the development of suitable murrelet nesting habitat. The U.S. Fish & Wildlife Service has concurred that noise disturbance associated with the proposed action may affect, but is not likely to adversely affect, marbled murrelets (USDI 2007a).

Because no suitable habitat would be removed by the proposed action, all adjacent suitable habitat would be surveyed to establish occupancy, design features avoid noise disturbance if occupancy is detected, and there is no discernable suitable murrelet-nesting habitat identified on private lands in the analysis area that might be harvested, there would be no additional foreseeable effects to murrelets.

Northern Spotted Owls (Strix occidentalis caurina) (Federally Threatened)
The spotted owl was listed as federally threatened in 1990 due to declining populations, decreases in suitable nesting habitat, and the lack of protective regulation mechanisms to protect it (USDI 1990).

The forested areas within the project units are spotted owl dispersal habitat, but much of it is poor quality due to small tree size, dense stocking levels, and low levels of snags and down wood. Dispersal habitat is generally forested area; greater than 40 years of age, with canopy cover above 40%, which offers cover from predators, provides some foraging opportunities, and provides adequate space for flight.

In the Oregon Coast Range and Klamath Provinces, old-growth forest was the only forest type used for roosting and foraging in greater proportion than its availability at the landscape scale(Carey *et al.* 1992). However, at a finer scale, owls used portions of young forests for foraging in greater proportion than its availability, especially where woodrats were present. In the Western Cascades of Oregon, 50 percent of spotted owl nests were in late-seral/old-growth stands and none were found in stands less than 40 years old (Irwin *et al.* 2000). A 2004 review of northern spotted owl information confirmed the definition of suitable owl habitat and the species tendency to select stands with mature and old-growth components for dispersal, roosting, foraging, and nesting (Courtney *et al.* 2004).

Spotted owls rely on the following stand characteristics: a multi-layered, multi-species canopy dominated by large overstory trees; moderate to high canopy closure; a high incidence of trees with large cavities and other types of deformities; numerous large snags; an abundance of large, dead wood on the ground; and open space within and below the upper canopy for spotted owls to fly (Thomas *et al.* 1990).

The following is a summary of spotted owl suitable habitat, activity centers and critical habitat:

- Within the Analysis Area:
  - Suitable Spotted Owl Dispersal Habitat –
    - 4,085 acres under BLM management (82% of BLM acres).
  - Suitable Spotted Owl Nesting, Roosting, and Foraging Habitat –
    - 1,725 acres under BLM management (35% of BLM acres).
    - Approximately 21,000 acres under Forest Service management (97% of Forest Service acres within the analysis area).
  - Spotted Owl Nest Sites/Activity Centers - One known site.
  - Critical Habitat – Approximately 20,000 acres of the Forest Service lands are within N. Spotted Owl Critical Habitat Unit #OR-66.

- Within Proposed Units:
  - Dispersal Habitat: 490 Acres
  - Critical Habitat: None

- Adjacent to Proposed Units (within 65 yards):
  - N. Spotted Owl Nest Site/Activity Center adjacent to: EA Unit 19
  - Critical Habitat adjacent to: EA Unit 19

Under the no-action alternative, stand development trajectory would not be altered to more closely reflect the development regime of old-growth forests and spotted owl nesting, roosting, and foraging habitat. The development of large snags and down logs would be delayed, thereby delaying benefits to spotted owls and their prey species. Stands within units would continue to provide dispersal habitat, and there would be no risk of disturbance to nesting birds.

The proposed action would cause no measurable negative effects to spotted owls because no suitable nesting habitat would be removed and disturbance to nesting birds would be minimized through Project Design Criteria that stipulate either seasonal restrictions on activities or a determination of non-nesting through surveys. In addition, spotted owl dispersal habitat would be maintained because canopy cover would remain above 40% within thinning units. The U.S. Fish & Wildlife Service has concurred that this action may affect, but is not likely to adversely affect the northern spotted owl (USDI 2007a).

Thinning of the existing forest would accelerate the development of nesting, roosting, and foraging habitat for spotted owls. Recruitment of large snags and down logs would be accelerated, which is especially beneficial to spotted owl prey species. Some loss or degradation of existing snags and down wood from harvest activities is anticipated, but all wood would be left on-site to continue to provide habitat for prey species.

Because no suitable nesting, roosting, and foraging habitat would be removed by the proposed action and there is no discernable suitable habitat identified on private lands that might be harvested, there would be no additional foreseeable effects to spotted owls.

Oregon Coast Coho Salmon (*Oncorhynchus kisutch*) (Federally Proposed Threatened)

Endangered Species Act Background

The analysis area is located within the Oregon coast coho evolutionary significant unit (ESU). The National Marine Fisheries Service (NMFS) issued an open letter to the United States Congress on May 14th, 2004, stating that "after re-evaluating the listing of 26 species of salmon and steelhead, and considering the science on hatcheries, we have preliminarily determined to propose relisting at least 25 of the 26 species." As a result, Oregon coast (OC) coho salmon (*O. kisutch*) were proposed for listing as threatened under the Act on June 14, 2004 (69 FR 33102). NMFS made a decision on January 19, 2006 that this ESU was not warranted for listing. This decision was challenged by a group of plaintiffs. On July 13, 2007, a Magistrate Judge in the U.S. District Court issued findings and recommendations. On October 5, 2007, U.S. District Judge Garr M. King ruled that NMFS must issue a new final listing rule consistent with the ESA within 60 days. A November 27, 2007 letter from NMFS to Federal Agencies stated that Judge King's decision invalidated NMFS' withdrawal decision and restored OC coho to its previous status – proposed as threatened, with correspondingly proposed critical habitat. In a Federal Register published February 11, 2008 NMFS issued the listing determination for OC coho as "*Threatened*" effective May 12, 2008 (73 FR 7816).

Distribution

Within the New River Frontal 5th Field, a long-standing natural barrier limits coho distribution to only the lower 7.1 miles of Floras Creek (Streamnet). The closest proposed activity to the barrier is Unit 1. This unit is located approximately 4.5 stream miles above the barrier among headwater intermittent stream channels to West Fork Floras Creek.

Units 2 through 7 are located in the headwater areas of Dwyer Creek, a stream distance of approximately 5 miles above the barrier. In the headwaters of South Fork Floras Creek, are Units 8, 9, and 10. These three Units are located >7.5 miles above the limit of coho distribution.

In the Sixes River 5th Field, coho and critical habitat are located downstream approximately 0.75 miles from Unit 11. An intermittent stream adjacent to the unit leads to an unnamed perennial stream, which empties into the main stem Sixes River, where coho and critical habitat is designated.

Effects Analysis

The No Action alternative would not implement sediment reducing road related maintenance or improvements within the headwaters of the New River/Sixes River watersheds. The risk for 7500 tons of sediment to enter stream channels from potential culvert failures would not be eliminated. The currently overstocked stand condition of the Riparian Reserves would slowly decline in overall health. The annual sediment yield (normal background level) at the location of coho and EFH is estimated at 270,000 to 430,000 tons per year. Because of the long distance to coho habitat, the potential input of

7500 tons of sediment to the stream network would be indistinguishable to coho when compared to normal background levels.

The effects of past land management practices on private and BLM lands have contributed to degraded fish habitat conditions within the New River/Sixes River watersheds. On BLM lands, the Proposed Action is expected to have beneficial effects on headwater streams because of improvements in riparian conditions and reductions in road related sediment over the long term. Areas of localized sediment input would occur as a result of the proposed roadwork. Roadwork associated with Units 8, 9, and 10 have potential to deliver most of the expected sediment to stream channels; however, these roads are located approximately 7.5 miles above a long-standing natural barrier limiting coho presence. Project design features would be incorporated to arrest sediment delivery mechanisms. Sediment from culvert replacement activities could be approximately 19-95 tons. The three new road crossings could contribute another 3-15 tons of sediment disturbance for a total of 18-90 tons. The annual sediment yield (normal background level) at the location of coho and EFH is estimated at 270,000 to 430,000 tons per year.

This would not be the actual amount of sediment that would reach stream channels, as PDFs and BMPs are specifically designed to arrest the causal mechanisms that deliver sediment to the hydrologic system. The BMPs for constructing or replacing stream crossings would include construction in the dry season; restricting the use of heavy equipment in streams to the site area; cessation of activity during flow; minimizing diversion potential; and seeding and mulching disturbed soils prior to winter rains. One group of researchers found that on established logging roads within the Oregon Coast Range, the maximum observed distance sediment travels below a cross-drain culvert with vegetation filtering or a stream crossing culvert with stream material present (LWD, boulder, debris, etc.) was typically not more than 6.21 meters (Brake *et al.* 1997).

Not all of this sediment would be disturbed at the same time. Some roads and culverts may be constructed over different summer seasons. So the input of the estimated sediment budget described above would vary over time and place, and not be input all at one time.

Because of the limited scope of the proposed action and long distance to coho habitat, both the long-term benefits and the potential short-term sedimentation effects to headwater streams would be unimportant to coho.

<u>Endangered Species Act consultation</u>
The Proposed Actions have been determined to have *No Effect* on OC coho and critical habitat (USDI 2008a). Because of this effect determination, consultation with NMFS is not needed. Implementation of Project Design Features, no-harvest stream buffers, and the large distance proposed activities would occur above OC coho habitat are the main factors leading to this conclusion. There would be no effects to stream temperatures, water flows, or water quality from the implementation of the proposed action.

Essential Fish Habitat Assessment

Within the analysis area Essential Fish Habitat (EFH) is the same as OC coho distribution described earlier (NOAA web Site). The nearest EFH to the proposed action is Lower Floras Creek and the mainstem of the Sixes River.

The Proposed Actions would *Not Adversely Affect* EFH. This Assessment fulfills the consultation requirements as described in the Magnuson-Stevens Fishery Conservation Management Act (16 U.S.C 1855((b)). Consultation with NMFS for EFH is not needed because there would be no adverse effects to EFH. The following assessment contains the information needed to satisfy the requirements listed in 50 CFR 600.920 (g).

Mandatory contents of EFH Assessment:

1) Description of the Proposed Actions: A description of the Purpose and Need and the Proposed Action can be found within Chapters 1 and 2 of this document.

2) Analysis of individual and cumulative adverse effects on EFH: With the implementation of the sediment-arresting project design features listed in Chapter II, the large distance from EFH stream channels, there would be no adverse effect to EFH. The analysis has concluded implementation of the proposed action would have no measurable impact to stream temperatures, stream bank stability, or in-stream flows and connectivity. The proposed DMT within the Riparian Reserves would enhance the growth trajectory of the stand to develop late-successional characteristics; however, due to the project distance to EFH, the likelihood that the improved stands would deliver large wood to EFH is minimal. Treatments would benefit plants and animals associated with riparian headwater ecosystems, which may have indirect benefits to EFH. Road maintenance would reduce chronic sediment input to stream channels and restore hydrologic connectivity within the headwater areas, which may improve water quality in EFH.

3) Determination of effects on EFH: The Proposed Actions would *Not Adversely Affect* EFH. The current quantity and quality of EFH within the analysis area would remain the same.

4) Proposed mitigation: No mitigation would be required. Best management practices found within the Coos Bay District RMP and Design Features located in Chapter 2 would prevent adverse impacts to EFH.

Additional EFH analysis can be found in the Effects Determination for Edson Thin (USDI 2008b).

Vascular Plants

There are no known or suspected T & E vascular plants species on the Edson Thinning analysis area so there will be no direct, indirect, or cumulative effects to any T & E vascular plant species for either the No Action or Proposed Action alternatives.

Nonvascular Plants (Lichen/Bryophytes)

There are no known or suspected T & E lichen or bryophyte species in treatment areas so there will be no direct, indirect, or cumulative effects to any T & E lichen or bryophyte species for either the No Action or Proposed Action alternatives.

Fungi

There are no known or suspected T & E fungi in the project area so there would be no direct, indirect or cumulative impacts to T & E fungi for either the No Action or Proposed Action alternatives.

Bureau Sensitive Species

Detailed information about the Interagency Special Status Sensitive Species Program (ISSSSP) and listing criteria can be found at http://www.fs.fed.us/r6/sfpnw/issssp/. Conservation assessments have been written for many Bureau Sensitive plant species and a few of the wildlife species, but knowledge remains limited of the distribution, abundance, and life history of many of the Bureau Sensitive wildlife species. However, coordination of the program and participation in regional monitoring programs has increased our understanding of many wildlife species (peregrine falcons, bald eagles, bats, mollusks, fisher, and butterflies). Project area surveys for Bureau Sensitive wildlife species are conducted as part of general wildlife surveys and are generally neither intensive nor to established protocols. This analysis describes potential effects based on the current knowledge of the target species, knowledge of similar species, and on habitat correlates.

Invertebrates

Green Sideband Snail (Monadenia fidelis beryllica)

This species has been documented in Sixes River Recreation Site and is primarily a Curry County, Oregon species (USDI 2006a). This is the northern-most record of this species on district. All remaining sightings (15) have occurred between approximately Sixes River and Hunter Creek. No surveys were conducted in the proposed units.

Green sideband snails are generally associated with deciduous trees (including alder) and brush in wet, undisturbed forest at low elevation (USDI 2005). They are often, but not always, associated with riparian areas. Little is known about the life history of this species. Because deciduous trees and low-elevation forests are within project units, the green sideband could be present.

The no action alternative would have no effect on this species; though the dense conifer cover would prevent establishment of hardwoods in the understory until disturbance of sufficient intensity occurs. Approximately 33% of the analysis area contains some cover by broadleaf vegetation (IVMP 2001). Broadleaf cover appears to be greater in draws and east facing slopes than on ridge tops and west facing slopes and appears to be well connected throughout the analysis area.

Harvest activities that disturb the ground (yarding, tree felling, road building, etc.) could disrupt this species through direct mortality, habitat alteration, and changes in micro-

climate. Green sidebands are typically associated with deciduous trees and brush, so their presence within units would be restricted to areas with a deciduous component. Approximately 23% of the proposed treatment area contains some broadleaf vegetation, as compared to 33% of the analysis area (IVMP 2001). Given its association with hardwood species, the percent broadleaf cover indicates that this species is less likely to occur in the proposed units than on the broader landscape. Project design criteria reserve deciduous trees where they occur within and adjacent to units to the extent possible. Thinning decreases the tree canopy, thereby altering the microclimate, which may affect this species. Other terrestrial mollusks have shown intolerance to microclimate changes when canopy closure is below 40% (USDI 2005).

Effects to this species habitat would be minimal because canopy cover would remain above 60% at the stand scale. In addition, hardwood dominated riparian areas would be excluded from the treatment areas. Through time, the increase in available light in the understory may allow establishment of additional deciduous brush or trees, thereby increasing available habitat within the treatment units. Though some direct mortality of individuals may occur within the treatment units, the limited scope and intensity of the proposed action, the continuation and potential improvement of stands as habitat for the species, exclusion of adjacent hardwood dominated riparian areas, retention of hardwoods within the treatment units, and greater cover of broadleaf trees outside the treatment areas, the proposed action would not contribute to the need to list this species.

Spotted Tail-dropper Slug (Prophysaon vanattae pardalis)

The nearest known spotted tail-dropper site to the project area is in T31S-R12W-Sec. 07 in the Lower South Fork Coquille watershed. The species is not considered common but is thought to be widely distributed. When a site is located, it normally consists of a single individual. No surveys were conducted in the proposed units.

The type locality for spotted tail-dropper was under leaf litter in moist, closed-canopy forest. Sites generally contain deciduous trees or shrubs and are found in the coastal fog zone near the ocean (USDI 2006a). Little is known about the life history of this species. Because project units consist of closed-canopy forest within the fog zone, the spotted tail-dropper could be present.

The no-action alternative would have no effect on this species because no changes in microclimate would occur. Approximately 33% of the analysis area contains some cover by broadleaf vegetation (IVMP 2001). Broadleaf cover appears to be greater in draws and southeast facing slopes than on ridge tops and northwest facing slopes and appears to be well connected throughout the analysis area. Although private clear cuts appear to have reduced broadleaf cover in some locations, broadleaf cover was not completely eliminated from those locations.

Harvest activities that disturb the ground (yarding, tree felling, road building, etc.) could disrupt this species through direct mortality, habitat alteration, and change in microclimate. It has been shown that maintaining a 40% canopy cover does not diminish habitat for a similar *Prophysaon* species (USDI 2005). Canopy closure for the proposed

action would remain above 60% at the stand scale. Approximately 23% of the proposed treatment area contains some broadleaf vegetation, as compared to 33% of the analysis area (IVMP 2001). Given its association with hardwood species, the percent broadleaf cover indicates that this species is less likely to occur in the proposed units than on the broader landscape. Though some direct mortality of individuals may occur within the treatment units, the limited scope and intensity of the proposed action, the continuation and potential improvement of stands as habitat for the species, exclusion of adjacent hardwood dominated riparian areas, retention of hardwoods within the treatment units, and greater cover of broadleaf trees outside the treatment areas, the proposed action would not contribute to the need to list this species.

Vertebrates

Foothill Yellow-legged Frog (Rana boylii)

This species has been documented in Sixes River Recreation Site and Edson Creek. There are no documented sightings in the Floras Creek watershed.

Yellow-legged frogs require partially shaded permanent (and some types of intermittent), low-gradient, medium size streams (4th-6th order). They also use streams that are reduced to waterholes connected by trickles during the dry season (Nussbaum *et al.* 1983); however, they are less abundant than in mid-sized streams (Applegarth 1994a). Newly transformed juveniles migrate upstream during fall and winter (Applegarth 1994b). Breeding and egg-laying generally occurs during the spring in streams and rivers. Once considered abundant in southwestern Oregon, some populations evidently now are greatly reduced. Contributing factors for decline include habitat alteration, airborne agrochemicals, and/or effects of exotic species (NatureServe 2008). Peak flow changes, generally associated with water impoundments, appear to also be a major threat (Olson and Davis 2007). Some sedimentation may be beneficial in small amounts by making egg masses less conspicuous to predators (AmphibiaWeb 2008), but too much fine sedimentation can embed stream substrates and interstitial spaces (Olson and Davis 2007)

Adult yellow-legged frogs could be present within or adjacent to streams proximal to the proposed units, but it is highly unlikely because all of these streams are small, are fully shaded, and are a long distance from egg-laying habitat. None of the streams immediately adjacent to units provide egg-laying habitat.

The no action alternative would possibly continue to input larger amounts of sediment from potential future culvert and road failures. However, these failures would likely have little effect to the species because of the distance from the roads to egg-laying habitat and magnitude of background sediment levels. In addition, these road failures are most often associated with the heaviest rain events, which do not usually correlate with the egg-laying season.

Maintenance of no-harvest buffers would prevent direct effects to species within stream channels. BMPs and proximity of activities would prevent sediment generated by road activities from reaching larger streams that provide high quality egg-laying habitat (such as Edson Creek and Sixes River). In addition, sediment generated from road associated

activities is generally mobilized during the first heavy winter rains which does not coincide with the egg-laying and larval stages of this frog. Finally, there would be no changes to peak flows as a result of the proposed action because thinning maintains stands as hydrologically mature. Due to the project-design features that limit effects to water quality, proximity to likely habitat, and long-term beneficial effects associated with meeting ACS objectives, the proposed action is not expected to contribute to the need to list the yellow-legged frog.

Bald Eagle (Haliaeetus leucocephalus)

The final ruling to remove the bald eagle from the Federal List of Endangered and Threatened Wildlife was effective 8 August 2007. Protections remain in place under the Bald and Golden Eagle Protection Act (BGEPA) and the Migratory Bird Treaty Act (MBTA). Population declines at time of listing were the result of environmental contaminants, habitat destruction, a declining food base, disturbance, electrocution, and illegal killing.

Bald eagles nest in mature or old-growth trees, snags, cliffs and on man-made structures. Nests typically include at least one perch with a clear view of water (USDI 2006b). In Oregon, bald eagles nest within 4.5 miles of a major water body, although most are within one mile (Isaacs *et al.* 1983). No critical habitat has been designated for the bald eagle.

The nearest known nest site to the project area is near Two Mile Creek in southern Coos County. There are no confirmed bald eagle nests in the Sixes River watershed, but there are frequent sightings along the river. There is some evidence that eagles may be nesting in the Dry Creek sub-watershed of the Sixes River, but no nest has been confirmed to-date[3]. All harvest units are located substantially beyond the disturbance distances for eagles from the nearest known or the suspected nesting areas.

- No suitable bald eagle nesting or roosting habitat would be altered or removed with this project.
- There are no known bald eagle nest sites or roosts within 400 meters (1,312 feet) of proposed units.

Under the no-action alternative, stand development trajectory would not be altered to reflect more closely that of typical old-growth forests and bald eagle nesting habitat. The development of large snags would be delayed. Oregon Forest Practices requires retention of streamside trees; no such requirement exists for agricultural lands. The retention of streamside trees on industrial forestlands would benefit the bald eagle in the long term.

Should a nest be located in the future within disturbance threshold distances, project design criteria (PDC) would lessen the risk of disturbance through seasonal restrictions. The U.S. Fish & Wildlife Service has concurred that there would be no effect to bald eagles from the proposed action (USDI 2007a).

[3] Heaney, J. 2007. Personal communication. Wildlife biologist, Coos Bay District BLM, 1300 Airport Lane, North Bend, OR 97459.

The proposed action would accelerate the development of potential suitable nesting habitat for bald eagles and large snags for future roosting habitat.

Approximately one-third of bald eagle nests occur on non-Federal lands and are protected by Oregon Forest Practice Rules. Isaacs et. al (2005) found FPRs effectively protected non-Federal bald eagle nests.

Since the proposed action would not affect bald eagles, it does not measurably add to the effects to bald eagles from past and future private and BLM actions in the analysis area.

Fringed Myotis Bat (Myotis thysanodes)
The nearest known fringed myotis site to the project area is in T32S-R12W-Sec. 26; outside of the analysis area. This species is rare along the Oregon coast, but it regularly uses the Oregon Caves National Monument in Josephine County, Oregon (Maser *et al.* 1981). Fringed myotis depends on old-growth conditions with abundant, large roosting snags. It also roosts in caves, buildings, and mines. Bridges and rock crevices are used as solitary day and night roosts, and crevices may be used for hibernation (Keinath 2004). This bat has been captured along the Oregon coast in alder/salmonberry habitat near immature conifers (Maser *et al.* 1981). Females produce one offspring per year, so population increases are slow to occur. They are highly colonial, and maternity colonies of several hundred individuals are common (Maser *et al.* 1981). Threats include roost loss and modification, disturbance of roosts, modification of forest around roosts, and removal of snags (Keinath 2004). Because projected units contain rock outcrops with crevices and alder/salmonberry near immature conifer, the fringed myotis could be present.

The no action alternative would not risk disturbance to bats roosting in rock crevices or large snags.

The proposed action would exclude large rock outcrops from harvest units and maintain the canopy cover above 40%, which would minimize effects from altered microclimate if this species were roosting in rock crevices. Because no high quality large (>30” DBH) snags have been seen or sampled within units and snag loss would be minimized, impacts to solitary roosts would be unlikely. The acceleration of large tree development and large snag recruitment would benefit the species in the future.

Northwestern Pond Turtle (Clemmys marmorata marmorata)
This species has been documented in Floras Creek/New River. This turtle is rare throughout the District.

The pond turtle inhabits marshes, sloughs, moderately deep ponds, and slow-moving portions of creeks and rivers. It requires basking sites such as partially submerged logs, mats of vegetation, and rocks (Nussbaum *et al.* 1983). Nest sites are in open areas with a clay soil component, usually within 100m of water and usually in a southern exposure (Rathburn *et al.* 1992). Threats include predation on hatchlings (by bullfrogs, bass, and

other exotic species), flood control, habitat loss, illegal collection, and vehicular related mortality on roads.

Because a man-made fire pond exists near EA unit 45, the northwestern pond turtle could be present in this thinning unit. However, it is unlikely they are present because the pond is small (less than a half acre), lacks basking structures, is at the headwater of a steep intermittent stream, and is several miles from a large stream or river. Visual surveys during optimal conditions found no turtles or signs of basking (such as claw marks on logs).

No effects would occur to this species from the no-action alternative. No effects from the proposed action are likely to occur to this species because the pond in EA Unit 45 is very small, has no basking sites, has no non-forested fields nearby for nesting, and visual surveys found no turtles or their sign present. Use of this pond is highly unlikely by this species.

Vascular Plants

There were 10 Bureau Sensitive vascular plant species suspected of occurring on the project area (**Appendix Table 1**). Vascular plant surveys have been completed and no Bureau Sensitive vascular plant species were located. Thus, there would be no direct, indirect, or cumulative effects to any Bureau Sensitive vascular plant species for either the No Action or Proposed Action alternatives.

Non-Vascular Plants

There were 14 Bureau Sensitive lichen and bryophyte species suspected of occurring on the project area (Appendix Table 2). Non-vascular plant surveys have been completed and no Bureau Sensitive lichen or bryophyte species were located. Thus, there would be no direct, indirect, or cumulative effects to any Bureau Sensitive lichen or bryophyte species for either the No Action or Proposed Action alternatives.

Fungi

There are 14 Bureau Sensitive fungi suspected of occurring on the project area (Table III-10). Fungi are not considered practical to survey for (Cushman and Huff 2007)so no surveys would be done for any Bureau Sensitive fungal species.

The No Action alternative would not disturb any of the proposed units so no direct, indirect, or cumulative impacts would be expected under this alternative. These fungi species are generally associated with late-successional forests, so it is unlikely that industrial forest lands managed on 40-50 year rotation would provide additional habitat.

The Proposed Action alternative could potentially affect Bureau Sensitive fungi in the project area. To comply with Bureau policy to assess the effects of a proposed action on special status species, the “Conservation Assessment for Fungi Included in Forest Service Regions 5 and 6 Sensitive and BLM California, Oregon and Washington Special Status Species Programs” was consulted. This conservation assessment lists general characteristics of some specific federal management actions that serve as examples of

actions that may potentially threaten known fungal sites (Cushman and Huff 2007). These characteristics include:

1. Actions that intensively or extensively remove or consume the woody substrate, forest floor litter, or shrub hosts with which the species is associated, such as:
   - High intensity fire/burning
   - Densely spaced pile burning
   - Mastication or chipping to reduce the fuel bed

2. Actions that remove or destroy the fungal organism, such as:
   - Extensive applications of long-term fire retardant/foam
   - Intensive mushroom harvesting and raking

3. Actions that remove host tree species or significantly modify the microclimate at the species' site, such as:
   - Thinning, regeneration, shelterwood and green tree retention prescriptions where host trees are removed and canopy cover (which aids in the retention of forest floor moisture) is reduced to around 40% or less

As outlined by this conservation assessment, thinning these proposed units would not cause actions that intensively or extensively remove or consume the woody substrate, forest floor litter, or shrub hosts with which the individual species are associated nor would thinning cause actions that would remove or destroy the fungal organism. In addition, thinning prescriptions for the proposed units would not result in forest canopy covers less than 40%. Based on this assessment, thinning the proposed project area would not result in specific federal management actions that may potentially threaten known special status fungal sites (Cushman and Huff 2007). Therefore, no direct, indirect, or cumulative effects are anticipated to any Bureau Sensitive fungal species from the Proposed Action alternative.

Table III-10 lists the 14 species of fungi suspected of occurring on the project area, the number of known sites in the range of the northern spotted owl, habitat requirements, the number of known sites on Coos Bay BLM, and the range of the species.

Table III-10: Special Status fungal species suspected to occur in the analysis area

Species	Number of Known Sites (OR, WA, CA)[1] + New Sites found on Coos Bay BLM lands in 2007.	Habitat Requirement + Number of Sites on BLM (as of 1/29/2008)	Likelihood of Occurring on the Project Area	Range of Species (ORNHIC 2004)
Arcangeliella camphorata	13	Associated with pines, especially Douglas-fir and western hemlock, 200 to 950 m, March through November; known from Oregon (Benton, Coos, Curry, and Polk Counties), Washington (Clallam, Grays Harbor, and Jefferson Counties), British Columbia, and Mexico (State of Queretaro, under oaks); CR & KM Ecoregions and Washington. 13 sites known on Coos Bay BLM.	Low-Moderate. Several sites have been found on district.	From the Siskiyou Mountains of S. Oregon north through the Coast Range to the Olympic Peninsula and in B.C.
Boletus pulcherrimus	26	West side Cascades in Lane County, sporocarps usually solitary in association with mixed conifer (grand fir, Douglas-fir) and	Low.	Endemic to the Pacific Northwest from

		hardwoods (tanoak) in coastal forests. One site on Coos Bay BLM.	Recent site from Blacklock Point area of coastal Curry County.	Washington south to CA.
Cortinarius barlowensis (=C. azureus)	26	Coastal to montane mixed coniferous forests up to 4,000 feet elevation with western hemlock, Pacific Silver fir, Sitka spruce, and Douglas-fir. No known sites on Coos Bay BLM.	Low. No known sites on District.	Widely distributed in western WA & OR.
Cudonia monticola	32	Grows on spruce needles and coniferous debris; fruits in late summer and autumn; three sites on District including younger thinning units in the Burnt Ridge area.	Moderate. Five sites on District including younger thinning units in the Burnt Ridge area.	Endemic to western North America.
Gomphus kauffmanii	72	Closely gregarious to caespitose, partially hidden in deep humus under Pinus and Abies sp. One site on district in a 50 yr. old Doug-fir plantation.	Moderate. One site on district in a 50 yr. old Doug-fir plantation.	Endemic to western North America.
Leucogaster citrinus	57	Sub-surface soil. Roots of white fir, sub-alpine fir, shore pine, western white pine, Douglas-fir, and western hemlock. Seven known sites on Coos Bay BLM.	Moderate. One site located adjacent to CB district but not on BLM lands.	Endemic to the Pacific Northwest from Washington south to CA.
Otidea smithii	13	Exposed soil, duff, or moss under black cottonwood, Douglas-fir, and western hemlock; solitary to gregarious. No known sites on Coos Bay BLM.	Low. No known sites on District.	Probably endemic to the Pacific Northwest from Washington south to CA.
Phaeocollybia californica	53+10=63	40 year old plantations to >400 year old-growth forests, associated with the roots of Pacific silver fir, Douglas-fir, and western hemlock; fruits October-December; 10 sites on the Coos Bay district.	Low. There are few legacy trees left on the project area.	Endemic to the Pacific Northwest from Washington south to CA.
Phaeocollybia olivacea	47+10 = 57	40 year old plantations to >400 year old-growth forests, associated with the roots of Pacific silver fir, Douglas-fir, and western hemlock; fruits October-December; 29 sites on Coos Bay district.	High. 29 sites known on the Coos Bay district.	Endemic to the Pacific Northwest from Washington south to CA.
Phaeocollybia pseudofestiva	45+9 = 54	40 year old plantations to >400 year old-growth forests, associated with the roots of Pacific silver fir, Douglas-fir, and western hemlock; 20 sites on Coos Bay district, fruits October-December.	High. 19 sites known on the Coos Bay district.	Endemic to the Pacific Northwest from Washington south to CA.
Phaeocollybia sipei	54+20 = 74	40 year old plantations to >400 year old-growth forests, associated with the roots of Pacific silver fir, Douglas-fir, and western hemlock; 46 sites on district, fruits October-December.	High. 46 sites known on the Coos Bay district.	Endemic to the Pacific Northwest from Washington south to CA.
Phaeocollybia spadicea	83+12 = 95	40 year old plantations to >200 year old old-growth Douglas-fir forests and in mature Sitka spruce stands in coastal lowlands regions; solitary to scattered to closely gregarious; fruits October-December; 40 sites on the Coos Bay district.	High. 40 sites known on the Coos Bay district.	Endemic to the Pacific Northwest from Washington south to CA.
Rhizopogon exiguus	3	Coastal, known site at Mapleton, hypogeous fungi in coniferous forest; CR & KM Ecoregion. Fruits in March, August, September, and November. No known sites on Coos Bay BLM.	Low. Habitat is present and it occurs in coniferous forest near Mapleton on the Siuslaw NF.	W. Oregon and the Washington Cascades.
Sowerbyella rhenana	73-1= 72 (one site potentially destroyed on Coos Bay BLM)	Groups in duff of moist, undisturbed mature conifer forests, one collection from a tan oak stand in Curry County on Coos Bay BLM; CR & WC Ecoregions. Fruits October through December. One known site on Coos Bay BLM likely destroyed during hardwood conversion and subsequent burning operations.	Low. Only has been found in a tan oak stand on Coos Bay BLM.	To be expected across the cool North Temperate zone in Europe and Asia as well as N. America.

[1]This data is taken from the 2007 Final Supplement to the 2004 SEIS to Remove or Modify Survey and Manage Mitigation Measure Standards and Guidelines (USDA and USDI 2007).

Migratory Birds

Migratory birds as a group are not Bureau sensitive species. Executive Order 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds* (66 FR 3853), of January 17, 2001, directs federal agencies to conserve migratory birds to meet obligations under the migratory bird conventions and the Migratory Bird Treaty Act. Interim management guidance is provided by BLM Instruction Memorandum No. 2008-050, dated 18 December 2007. This guidance establishes a consistent approach to project level analysis until a Memorandum of Understanding (MOU) is established with the U.S. Fish and Wildlife Service. Western birds on the U.S. Fish and Wildlife Services' *Bird Species of Conservation Concern* and *Game Birds below Desired Condition* are to be addressed when actions could potentially affect those species. These lists are based primarily on declining trends in North American breeding bird survey data which can be accessed at http://www.mbr-pwrc.usgs.gov/bbs/ (Sauer *et al.* 2007).

The Partners in Flight (PIF) conservation strategy for land birds in Western Oregon coniferous forests gives a detailed accounting of threats to migrant birds, including Meslow and Wight's identification of four areas of concern for forest birds associated with traditional managed forests: 1) shortening of the grass-forb-shrub stage, 2) effect of an even-aged Douglas-fir monoculture, 3) elimination of snags, and 4) elimination of old-growth forest (Altman 1999).

The following migratory or game bird species could be potentially affected by this project and have not already been addressed elsewhere in this EA (as T&E or Bureau sensitive species): mourning dove and band-tailed pigeon, black-throated gray warbler, northern goshawk, olive-sided flycatcher, and rufous hummingbird.

Both the mourning dove and band-tailed pigeon are currently hunted in all of Oregon (see: Oregon Game Bird Regulations). Both species are common in western Oregon despite population declines overall. Mourning doves are thought to be currently more numerous than prior to European settlement because of agricultural practices and forest clearing (Marshall *et al.* 2003, 2006). They are nest generalists, and nest on the ground when trees are not available.

In southwest Oregon, black-throated gray warblers are common in mature chaparral, which includes a mixture of oak, madrone, and manzanita. They also frequently reside in early-seral habitats and forests which are a mixture of Oregon white oak and conifer (Marshall *et al.* 2003, 2006). Portions of EA Unit 19 are adjacent to areas of manzanita and chapparel brush species, so this species could be found at the edge of this unit. Habitat is not optimal however, so the warbler would likely be in low numbers and transient rather than nesting, so indirect effects from adjacent thinning would be unlikely.

Northern goshawks are associated with late-seral stands, have not been documented in the analysis area and are rare throughout Curry County (Dillingham 1994). Because thinned stands are expected to achieve old-growth structure sooner than un-thinned stands (Bailey *et al.* 1998, Bailey and Tappeiner 1998), thinning is likely to benefit this species over the long term.

The olive-sided flycatcher is associated with conifer forest, especially where burns have left scattered large snags and live trees. It is unclear why this species is declining in an era of increasingly fragmented forests when it prefers edge habitat, but some types of harvested forests could be acting as "ecological traps" where nesting success is poor (Marshall *et al.* 2003, 2006). However, in one study, this species responded positively to thinning, possibly because thinning creates the uneven canopy needed for foraging forays (Hagar and Howlin 2001).

The reasons for population declines in the rufous hummingbird are unclear. This species was one of a group of Neotropical birds that did not respond to thinning (Hagar and Howlin 2001). Because rufous hummingbirds seem to prefer a high canopy and well-developed understory for breeding (distinct layers)(Marshall *et al.* 2003, 2006), they would likely benefit from thinning over the long term, as thinning would improve available light resulting in improved understory development and flowering, resulting in increased nectar availability.

Effects Analysis

The no-action alternative would not pose a direct disturbance to individual birds and their nests. Though some species are more common in dense, un-thinned stands, no species are known to depend exclusively on this development stage (Hayes *et al.* 1997). Pacific-slope flycatchers were found to be more abundant in un-thinned stands than thinned stands, but peak numbers were found in old-growth stands (Muir *et al.* 2002).

In the Pacific Northwest, migrants typically arrive from late April to early May, are breeding by late May, are fledging young in July and August, and have departed for their wintering grounds sometime in late August/early September.[4] Where thinning occurs during the nesting season, nests and un-fledged offspring would likely be destroyed. However, none of the above-described species with declining trends utilizes dense conifer plantations for nesting. As a result, direct effects to any of the species of concern would be unlikely.

The variable structure and longer rotations of thinned stands ultimately benefits many migratory species, with abundance of birds generally found to be greater in thinned stands (Muir *et al.* 2002). Overall, effects would be minimal to any particular species because canopy cover would remain above 60% on average, the harvest season is varied, some adjacent areas would not be thinned, hardwoods will generally be retained, and similarly aged forests exist throughout the analysis area.

In units where trees of adequate size exist, snags to meet a minimum 40% potential population level for cavity nesting birds would be maintained or created as per the RMP direction. Table III-7 in the Stand Structure section (Overstocked Conifer Stands Issue above) more thoroughly discusses snag and down log creation within units.

[4] Rodenkirk, T. 2006. Personal communication. Botanist, Coos Bay District BLM, 1300 Airport Lane, North Bend, OR 97459.

Issue: Aquatic Conservation Strategy

In, *Pacific Coast Fed. Fisherman's Association vs. National Marine Fisheries Service* (265 F.3d 1028 – 9th Circuit) the 9th circuit court found that analysis must occur at the site scale and watershed scales and at short and long-term time scales. Pursuant to BLM-Instruction Memorandum No. OR-2007-060, ACS consistency is here assessed using site and fifth-field scales over the short and long term, provides a description of the important physical and biological components of the fifth field watershed, and provides the decision maker with relevant findings of watershed analysis. The Sixes/Floras watershed assessment was completed in January 2008.

ACS Components

There are four main components to the ACS: Riparian Reserves, Key Watersheds, Watershed Analysis, and Watershed Restoration. A "fifth" component is a subset of these four, and is the Standards and Guidelines for management activities. These Standards and Guidelines were incorporated into the Draft Coos Bay District Management Plan preferred alternative which was under development (p. A-2). With the signing of the Record of Decision for this Resource Management Plan in May of 1995, these Standards and Guidelines were superseded by the RMP Management Actions/Direction.

Riparian Reserves Component:

The interim Riparian Reserve widths were delineated on all applicable hydrologic features found within the project units.

Key Watersheds Component:

Neither the New River Frontal or Sixes River 5th Field watersheds are designated as Key Watersheds. The Dry Creek 6th Field, within Sixes River, has been designated as a Tier I Key Watershed. However, none of the proposed action would occur within this watershed.

Watershed Analysis Component:

The Sixes River – New River Frontal (SRNR) Watershed Analysis was completed January 2008. Watershed Analysis for the Sixes River (SR) was completed in August of 1997 by the USDA Forest Service. The South Coast Watershed Council also completed two Watershed Assessments, Sixes River and Floras Creek in 2002. These documents were followed up by Action Plans.

The two federal analyses provided recommendations based on relevant findings for decision makers to consider when approving projects. Those considered for the proposed action include:

- Enhance tree diameter-growth trajectories within the Riparian Reserves through density management and hardwood conversion. Hardwood conversion should only be undertaken in areas historically growing conifer. (SRNR p.110)
- Restore riparian areas to more late seral conditions by riparian planting and silvicultural thinning of overstocked stands. (SR p. A-36)

- [It] is recommended that the narrowest streamside buffer consistent with providing shade in the near term and obtaining large wood in the long term be developed. (SRNR p. 109)
- Build the necessary road work to allow economical stand density treatments to occur. Treat stands capable of supporting commercial removal of forest products. Continue to treat stands that have been established in the past (plantations) to encourage them to increase in volume and height. (SRNR p.109-110)
- Repair the degraded roads within Sections 7,14,15,17, 18 & 22-25 of T 31 S, R 14 W. Reestablish running surfaces, properly sized and spaced culverts and remove in-growth of trees and brush species. (SRNR p. 109)
- Improving failing roads through maintenance or closure. Focus efforts on roads with the greatest amounts of road-related sediment run-off into stream channels. (SRNR p. 110)
- Improving the transportation network and developing fine sediment filtering mechanisms would aid the aquatic habitat development in this watershed. (SRNR p. 111)

Watershed Restoration Component:

As stated in the Coos Bay RMP, "Th[is] program's most important components are control and prevention of road-related run-off and sediment production, restoration of the condition of riparian vegetation…" (p. 8)

Approximately 22 miles of the existing, proposed haul route would be renovated or improved. Renovation may include but is not limited to surfacing with rock, stabilizing cutbanks and fill slopes, restoring outslope or crown sections, providing adequate drainage and improving stream crossings. In two specific areas, the road and fill have been washed out and the road is impassable. Renovation of this area of road will reduce its potential to deliver sediment to stream channels.

Approximately 10.6 miles of new and renovated roads would be decommissioned at completion of proposed project activities. Closing and/or decommissioning these roads will reduce their potential to deliver sediment to stream channels or alter flow routing in the affected drainages.

Thinning treatments have been designed to enhance growth trajectories within the Riparian Reserves. There would be 206 acres of Riparian Reserve treated under the proposed action. Several functions of the Riparian Reserve are contingent on large trees or on wood debris delivered from large trees (FEMAT 1993).

Riparian Reserves Management Direction

Road Management

Roads Management direction is described on pages 13 and 14 of the RMP. Below are excerpts:

- Completing watershed analysis including appropriate geotechnical analysis prior to construction of new roads or landings in Riparian Reserves

- Preparing road design criteria, elements, and standards that govern construction and reconstruction
- Minimizing road and landing locations in Riparian Reserves
- Minimizing disruption of natural hydrologic flow paths, including diversion of streamflow and interception of surface and subsurface flow
- Reconstructing roads and associated drainage features that pose a substantial risk
- Closing and stabilizing roads based on ongoing potential effects to the ACS objectives and considering short-term and long-term transportation needs
- Minimize sediment delivery from roads

New road construction would implement the most current design techniques to reduce hydrologic road/stream interconnectivity and prevent sedimentation input to stream channels. There are 0.8 miles of new road construction within Riparian Reserves. All new roads would be semi-permanent or temporary use, and decommissioned or fully decommissioned upon completion of the project. Extensive road renovation to repair hydrologic conditions would also be implemented, especially on the 31-14-23.0 road. The ID Team followed all of the RMP Directions, including the geo-technical analysis of the recently completed Watershed Analysis and minimizing sediment delivery, in project design.

Timber Management

Apply silvicultural practices for Riparian Reserves to control stocking…
Within the Riparian Reserve, no-harvest buffers have been designated at 30 or 50 feet, depending upon specific site conditions to protect stream banks, floodplains, and temperature regimes. Approximately eight headwater intermittent streams would be thinned through. Trees cut for yarding corridors in no-harvest buffers would be felled towards streams and left in place. Generally, alder found adjacent to streams are excluded from treatment units, although thinning corridors may be needed through these areas. Where alder is found in Riparian Reserves (not excluded treatment), these areas would be thinned to reduce competition and enhance growth (EA, p. 4).

Existing Watershed Condition

The existing conditions, including important physical and biological components of the following 5th field watersheds are:

New River Frontal

- The BLM administers 4,354 out of 99,371 acres within this sub-watershed. This equates to 4.3 % of the land base.
- Approximately 2,356 acres or 54.1% of BLM land are in the interim Riparian Reserves.
- Approximately 850 acres or 19.5% of BLM land are classified as Connectivity Reserves.
- Approximately 1,148 acres or 26.4% of BLM land are in the Matrix outside of Riparian Reserves.

- The BLM controls 3.8 miles of roads within 100 feet of streams and 7.0 miles of road within Riparian Reserves.
- Of the 923 total stream miles, resident cutthroat may only access 129.5 stream miles and anadromous steelhead 78.6 miles. Coho and chinook are limited to approximately 64 stream miles. Non of the proposed units are near fish streams
- 95% of the watershed is in private ownership, a large portion of which is industrial forestland.

Sixes River

- The BLM administers 2,107 out of 85,833 acres within this watershed. This equates to 2.5 % of the land base.
- Approximately 1,219 acres or 57.8% of BLM land are in the interim Riparian Reserves.
- Roughly 15.3% or 186 acres of BLM Riparian Reserves have trees 20 years-old or older.
- Approximately 888 acres or 42.2% of BLM land are in the Matrix outside of Riparian Reserves.
- The BLM controls less than 0.1 miles of road within 100 feet of streams and 3.0 miles of road within Riparian Reserves. The majority of these miles are located in Lower Floras Creek.
- Of the 743 total stream miles, resident cutthroat are limited to 130 stream miles and anadromous steelhead to 108 stream miles. Coho and chinook may access approximately 102 stream miles.
- The Forest Service manages 25.3% of the land base. The remaining 84.3% is privately owned.
- 7% of the total land base is agriculture/range and rural residential; 93% is classified forest.

Between both the Sixes River and New River watersheds, only 15.3% of Riparian Reserves are dominated by conifer >20 inches DBH. This equates to only 547 acres out of 3,575 acres that may resemble the desired late-successional characteristics.

The net effects of the Proposed Action on existing aquatic conditions are:

- Thinning would result in lower density stands that would allow growth trajectories that would produce larger and more complex structure for streams and associated biota sooner than would be possible if the stands were left untreated.
- Road reconstruction, renovation, improvement, and subsequent decommissioning would correct drainage problems and reduce or eliminate road related erosion and sediment delivery to stream channels.

Aquatic Conservation Strategy Objectives

ACS Objective 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.

Site Scale Analysis

Short Term

The 'landscape-scale feature' involved in this project is the riparian area associated forest stands. Silvicultural treatment of overstocked stands, including the Riparian Reserves, is one of the main goals of the proposed project. Thinning would remove a portion of the trees comprising the forest stand but in the effort to promote growth and vigor in the residual trees.

Multiple functions are uniquely provided by the riparian forest stand as a landscape-scale feature. These include "the maintenance of surface and ground water quality in aquatic systems; … maintenance of streambank and streambed stability; maintenance and protection of habitat structure for fish, wildlife, and vegetation; and maintenance of favorable microclimates for riparian-dependant species." (Everest and Reeves 2006) The current Objective is appropriate for the discussion of microclimates for this project.

Anderson and co-authors found that with buffers 15 m or greater, the daily maximum air temperature above stream center was less than 1°C greater (Anderson et al. 2007). A temperature change of less than 1°C is well within the range of diurnal temperature change within a single day and within the range of day-to-day temperature variation. This complements work that found the greatest change in microclimate occurs between stream center and 15 m regardless of buffer size or upland treatment (Chan et al. 2004). As most of the stream channels have no-harvest buffers 30 feet and greater (most 50 feet), changes to microclimates within the project area would remain unchanged or unrecognizable from the natural range of variability. The eight intermittent streams that would have thin through prescriptions were chosen because of slope aspect and small length of streams. Any microclimate change would not be detectible and would dissipate as crown closure increases among the residual trees and herbaceous plants increase.

The other functions mentioned above are addressed by the other Objectives. Water quality issues are in Objectives 3 and 5; streambank stability and sediment regimes are in Objectives 4, 6, and 7; and providing habitat for riparian associated species is found in Objectives 2, 8, and 9.

Long Term

As canopy expansion and closure is evident five years after thinning (Chan *et al.* 2004), riparian microclimate conditions would return to pre-harvest conditions within 10 years at the stand scale. As there is no anticipated change in the short-term, the long-term effects would have a net benefit with the resulting riparian associated stand on a healthier progression towards late-successional characteristics. This results in the restoration of this Objective at the site-scale over the long-term

Fifth Field Analysis

Short Term/Long Term

This project would only treat 206 acres out of the approximately 3,575 BLM managed Riparian Reserve designated acres within these two 5th field watersheds. When including private and other federal land ownership, the short and long-term effects would not be visible at the 5th field scales of the New River/Sixes River watersheds.

ACS Objective 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-dependant species.

Site Scale Analysis

Short Term

For the two wetland areas (< 1 acre in size) found within the project areas, unit boundaries were designed to be a minimum of 100 feet away from the edge of riparian vegetation. This exceeds the management recommendations within the RMP. In addition, the smaller floodplain areas associated with perennial streams have been included within the no-harvest buffers. Thus, there would be no impact to wetlands or floodplains.

Upslope areas would have some disturbance from the nature of harvest activities, but this disturbance would be limited to the duration of the project and the recovery for affected associated species would begin within one year of the project completion, which is one of the goals of the project. The eight headwater-intermittent channels that would be yarded through have design features to protect banks from erosion. Project design features, such as full suspension requirements and limiting the number of yarding corridors, would limit direct impacts to resident species.

Long Term

Maintaining the Riparian Reserve network would ensure the effectiveness of the Aquatic Conservation Strategy at the site scale. The stand enhancement activities of this project would ensure the health and function of these Reserves at the site scale by advancing the stands to become more structurally complex. The new road construction techniques and implementation of project design features would ensure the future functionality of the reconstruction, and reducing chronic sediment input over the long term. The proposed road decommissioning would result in a net decrease of approximately 7.3 miles of hydrologically-connected roads within the immediate project area. Along with proposed road renovation and improvement work, the project would result in fewer road segments connected to the stream network.

Fifth Field Analysis

Short/Long Term

At this scale, due to the small amount of land in BLM ownership, the effect of the proposed action to this Objective would be minimal. Floodplains and wetlands are primarily located on private lands. Culvert barriers downstream would remain until actions by other entities are taken. Connectivity with other lands would be dictated by the Oregon Forest Practices Act across most of the watershed. At the landscape scale, taking into consideration the small amount of BLM land compared to privately owned lands, this project would provide a small refugia area for riparian dependant species (wildlife, macro-invertebrates, amphibians) in the headwater areas of the watershed. As explained in the Watershed Analysis: "The scattered parcels of BLM managed lands in the middle section of the watershed do not and can not provide all of the functions as outlined in the NFP. Corridor connectivity and refuge areas are drastically reduced when the adjacent ownership is private land. This is the reality of two different land use requirements, one by the state and the other by federal agencies." (USDI 2008c) The improved stream connectivity by road decommissioning and road renovation would not be discernable at the 5th field scales because of the current condition of other roads on private and federal lands and the small extent of the restorative activities.

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

Site Scale Analysis

Short Term

Project Design Features, such as seasonal restrictions and no-harvest buffers, would ensure no damage to stream bank stability. Riparian Reserve buffers are intended to function as stream protection buffers to avoid adverse impacts to aquatic resources from harvest activities. These buffers would assist in maintaining riparian integrity that includes vegetation composition, shading, and bank stability. The no-harvest riparian buffers of a minimum of 30 feet in addition to intact Riparian Reserve widths would be sufficient to protect stream banks from sediment delivery resulting from project harvest activities (FEMAT 1993).

As there is no anticipated measurable effect to peak flows from either harvest activities or road network connectivity, there would be no effect to current hydrologic function or channel form.

On the eight intermittent streams that would be thinned through, additional project design features include full suspension of logs over the stream channel and banks to prevent erosion. At this scale, the short-term integrity of the aquatic system would be maintained.

Long Term

Development of large wood structure would increase the potential for these to be delivered to stream channels. Large structure in stream channels retains gravels and sediment, and provides high quality habitat for an array of aquatic dependant species. Thus, there would be restoration of the integrity of the aquatic system at the site scale in the long term.

Fifth Field Analysis

Short/Long Term

Due to the small amount of Riparian Reserves treated by the project, there would be no measurable restorative effect at the watershed scale.

ACS Objective 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.

Site Scale Analysis

Short Term

Project Design Features were included in this project specifically to maintain water quality. For winter haul on gravel roads, sediment filters and barriers would be placed in ditchlines to intercept potential sediment delivery. In the dry season, any sediment trapped behind these features would be removed and transported off-site to a location with no delivery mechanism to stream channels.

On the eight intermittent streams with a thin through prescription, full suspension is required to protect stream channels and banks from erosion. Concerning thinning adjacent to these stream channels, these streams provide little or no surface flow to perennial stream reaches during the summer when elevated stream temperatures can occur. Therefore, the proposed density management adjacent to intermittent streams would have a negligible effect on stream temperature. All equipment to be used on site is required to have a chemical spill emergency kit to prevent contamination from accidental spills. There is no anticipated chemical effect to water quality.

Long Term

In the long term, there would be an anticipated incremental increase to water quality from the increased growth of riparian trees, which would more quickly contribute down wood to stream channels. Down wood has long been associated with improved waters quality conditions. However, it is likely that due to the small amount of treatment within the Riparian Reserves, that this benefit would not be detectible due to the range of natural variability.

Fifth Field Analysis

Short/Long Term

As there would be no measurable effects (positive/negative) at the site scale, there would be no effects at the larger 5th field scale.

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

Site Scale Analysis

Short Term

Project analysis shows there would be no expected sediment delivery from harvest activities given the comprehensive design features for sediment control. Some of these include directionally falling trees away from Riparian Reserves, requiring full suspension over stream channels and banks, extensive road-related upgrades, sediment filter placement along ditchlines associated with winter hauls, and suspension of winter haul under periods of heavy rainfall.

Long Term

Large trees that fall into streams have been found to retain sediment (Montgomery et al. 2003). By thinning within the Riparian Reserves, these larger trees would be available to contribute to stream channels as large woody debris sooner than if left un-thinned. Thus, the ability to retain sediment would also happen at an earlier time (in terms of decades).

Fifth Field Analysis

Short/Long Term

Given the relatively small size of the project, especially treatments within Riparian Reserves, benefits from reducing sediment input from roads and the sediment storage capacity from enhancing large wood in streams would be indistinguishable at the landscape scale.

ACS Objective 6. Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetlands habitats 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.

Site Scale Analysis

Short/Long Term

For the Sixes River/New River watersheds, 2500 feet in elevation begins the rain-on-snow zone, a zone with the potential for increasing peak flows during periods of high precipitation, moderate temperatures and wind. Using the OWEB Watershed Assessment protocols, the South Coast Watershed Assessments concluded that since more than 75% of the analyzed sub-watersheds are characterized in the rain category (99%), they have a low potential risk of peak flow enhancement and this is applicable to the whole basin. None of the Edson Thin units are located in this 1% of land, so there would be no measurable or quantifiable changes to peak flows from rain on snow events with implementation of this project.

Additionally, no measurable effect to stream flow is expected as a result of commercial thinning and density management because the project involves only partial removal of vegetation in five percent or less of the associated watersheds. In an overview of several

studies, Satterlund and Adams (1992) found that "Lesser or nonsignificant responses occur [to water yield]... where partial cutting systems remove only a small portion of the cover at any one time." Where individual trees or small groups of trees are harvested, the remaining trees will generally use any increased soil moisture that becomes available following timber harvest.

Fifth Field Analysis

Short/Long Term

As there would be no impacts to in-stream flows at the site scale, there would be no changes at the 5th field scale.

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

Site Scale Analysis

Short/Long Term

There are no meadows within the project and the few wet areas discovered on field inspections have been buffered out of the units. Therefore, these areas would not be directly impacted from proposed activities. The project does not include water diversions or well drilling, which are activities usually associated with lowering water tables. There would be no effects to water tables in the associated meadows and wetlands from the Edson Thin project.

Fifth Field Analysis

Short/Long Term

As there are no effects to floodplain inundation and water tables at the site scale, there would be none at the 5th field scale.

ACS Objective 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.

Site Scale Analysis

Short Term

The project proposes to thin conifers and hardwoods to promote growth within streamside stands. To accomplish this along stream channels, trees would be directionally felled away from riparian areas. Yarding over streams and stream banks would require full suspension to prevent potential erosion. Current coarse wood within the units would be avoided where possible and left on site. Also snags and down wood creation are included among the project design features for Riparian Reserves.

By implementing the proposed action, there would be no effect to large wood delivery to streams. While trees would be removed from the Riparian Reserves, the current size of trees within the project ranges from 8 – 15 DBH. The minimum DBH for large wood is

20 inches and reducing competition would allow for the remaining trees to reach this much sooner than if left alone.

In their literature review to support increased biodiversity, the authors compiled the following discussion of the benefits of thinning to understory plant species:

> Thinning opens up the stand and allows light to reach the forest floor. This provides for better developed understories with greater richness, diversity, and cover (Bailey et al. 1998, Curtis et al. 1997, Thomas et al. 1999, Thysell and Carey 2000). Studies have found that thinned stands have greater herbaceous cover (Carey and Wilson 2001, Muir et al. 2002), greater understory trees and shrubs (Bailey and Tappeiner 1998, Muir et al. 2002, Tappeiner and Zasada 1993), and greater density, survival, and growth of conifer seedlings (Bailey and Tappeiner 1998, Brandeis et al. 2001, DeBell et al. 1997, Muir et al. 2002) (Zobrist and Hinckley 2005).

Additionally, even though cover was initially reduced in response to thinning, the end result was a positive effect to understory vegetation and diversity within sample sites in the Oregon Coast Range (Chan et al. 2006). With the implementation of project design features to prevent sediment delivery and the enhanced growth of the understory layer, this project would have a small restorative aspect to this objective at the site scale.

Long Term

By enhancing the development of late-successional characteristics within stream-side stands, the proposed action would restore this Objective at the site scale over the long term.

Fifth Field Analysis

Short/Long Term

Given the relatively small size of the project, especially treatments within Riparian Reserves, benefits would be indistinguishable at the landscape scale.

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

Site Scale Analysis

Short Term

No-harvest buffers would provide areas of undisturbed litter layers, structures and vegetation, and protected microclimates (see Objective 1) that would provide refugia areas for riparian-dependant plants and animals present on the sites at the time of treatment.

Recently, in an experiment analyzing macroinvertebrate assemblage in headwater streams in response to harvest treatments, Danehy and co-authors found that there was little harvest effect on instream flora and fauna due to thinning (Danehy *et al.* 2007). Additionally, priphyton biomass was larger in thinned stands than in mature stands, but macroinvertebrate assemblage, biotic metrics, functional feeding group composition, or biomass measures were the same in both mature and thinned riparian stands. The authors suggest that "changes in abiotic and biotic features of these systems are less dramatic with the retention of trees near the channel." With the retention of streamside

buffers and minimal thin-through areas, there would be no impacts to the aforementioned biota at the project scale.

There would also be an effect to some members of the riparian aquatic community from harvest activities. Rundio and Olson found that while they did document decreases in terrestrial salamander capture post-thinning in the Coast Range site of their project, they were not eliminated from the thinned area (Rundio and Olson 2007). Terrestrial salamanders seemed to fare better with larger amounts of down wood remaining during harvest activities within thinned sites. A project design feature is to maintain as much of current down wood levels within the units as is feasible, so the short-term effect to terrestrial salamanders is reduced. The no-harvest buffers would also provide protective refugia for these species during harvest operations.

In addition to the species above, other researchers have found that "the short-term consequences of thinning for most bird species evaluated in this study are positive, neutral, or of minor negative impact" (Hayes et al. 2003). Further, another study "suggests that thinning maintains or enhances habitat quality for most species of small mammals in the Oregon Coast Range in the short and long term" (Suzuki and Hayes 2003).

Long Term

Thinning would provide conditions favorable for the development of diversified layers of herbs and shrubs and pockets of shade tolerant trees. This would result in a more diversified array of microclimates, structures, and substrates, and by that, provide additional habitats that can support increased numbers of riparian-dependent species of both plants and animals. "The multi-vegetation layered late-successional forests inherently have a greater abundance of understory tree shrub and herb layer plants and typically greater species richness than stands in the stem exclusion stage of stand development." (USDI 2008c)

By providing for down wood within the project area post-thinning, and ensuring a future supply of large down wood, the persistence of terrestrial salamanders on the landscape would be maintained at the site scale over the long term.

Fifth Field Analysis

Short/Long Term

Given the relatively small size of the project, especially treatments within Riparian Reserves, benefits of this project would be indistinguishable at the landscape scale. Long-term benefits, discernable at the 5th field, would be contingent on the additive effect of multiple restoration projects implemented across the watershed over time, the bulk of which would have to occur on privately owned lands. While there could be minor impacts to mollusks and amphibians at the site scale, the extremely small size of the project would have no effect to the riparian aquatic community as a whole at the 5th field scale.

Moving relatively homogenous forests into the understory re-initiation stage of stand development sooner would result in greater vegetative species diversity, multi-canopy structure, and larger tree size with subsequently larger snags and down wood. Because of natural barriers and stream gradients, it is unlikely that any of the large wood would be able to reach fish-bearing streams. While many of the natural barriers to fish passage and distance from the units would prevent this wood from being deliverable to fish-bearing channels further downstream in the watershed, other aquatic life (i.e. Pacific Giant salamanders, macroinvertebrates, etc.) would benefit in the long term. However, given the small scale of the project, the long-term benefit may not be readily visible at the watershed scale.

Chapter IV. **LIST OF AGENCIES AND INDIVIDUALS CONTACTED**

The public was notified of the planned EA through the publication of Coos Bay District's semi-annual *Planning Update.*

Eleven adjacent landowners were contacted during the scoping process.

The following public agencies and interested parties were notified with e-mail scoping letters:

Coast Range Association
Oregon Natural Resources Council
Wildlife Management Institute
Division of Land Conservation and Development
Division of State Lands
Sierra Club, Many Rivers Group
Umpqua Watersheds
Private Citizens (2)

The following public agencies and interested parties were notified with mailed scoping letters:

NOAA National Marine Fisheries Service
USDI Bureau of Indian Affairs
US Small Business Administration
Rogue Forest Protection Agency
Confederated Tribes of Siletz
Coquille Indian Tribe
Klamath-Siskiyou Wildland Center
John Muir Project
Kalmiopsis Audubon Society (2 interested parties)
Association of O&C Counties
Douglas Timber Operators
NW Environmental Defense Council
Cascadia Wildlands Project
American Forest Resource Council
Southern Oregon Timber Industry Association
Private Citizens (4)

The proposed project was reviewed by the U.S. Fish and Wildlife Service through the consultation process provided under section 7(A)(4) of the Endangered Species Act of 1973. Written concurrence (#13420-2007-I-0184) on the proposed projects determination that the proposed actions “may effect but are not likely to adversely effect” the spotted owl and marbled murrelet, was received on June 29, 2007 (USDI 2007a).

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Appendix A. Port-Orford Cedar and *Phytophthora lateralus*

Phytophthora lateralus (PL) is a fungus that causes mortality in Port-Orford Cedar trees. It is spread primarily through water flow and transport of infected soil.

In response to court order to characterize cumulative effects of forest management decisions on the potential spread of Port-Orford Cedar root disease, the *FSEIS Management of Port-Orford-Cedar in Southwest Oregon* was completed in 2004 (USDA and USDI 2004a).

The proposed action is located within the Southern Oregon Coastal Mountain Ecoregion of the North Coast Risk Region, which is described in the POC-SEIS as follows**:**

> POC is distributed widely across the landscape. On average 20 percent of the area is comprised of high-risk sites. The pathogen has been present in this area for considerable time. Mapping and forest inventories indicate that about 15 percent of the area (or 75 percent of the 20 percent in high-risk sites) is infested, and most drainages are at level "*i*" on the disease progression curve [high occurrence with slow spread rate]. Most originally occurring cedars in infested high-risk sites have been killed (general estimate is 90 percent). There is chronic mortality of small cedars regenerating on high-risk sites that are infested. Low-risk sites (80 percent of the area) are little impacted (p3&4-44).

The POC-SEIS came to the following conclusion:

> The various effects sections in this SEIS support this, [the] generalization that few important functions will be at risk; they do not identify any significant adverse ecological effect in this risk region [North Coast] from any of the Alternatives (p2-43)

A review of the project area indicates that PL infections area present along extensive portions of the proposed haul route on both private and public lands. Much of the haul route is located along private lands that have been clear-cut and planted exclusively with Douglas-fir, effectively sanitizing much of the route; though an occasional POC has seeded in.

The POC-SEIS evaluated the various management tools and mitigation measures for managing the spread of Phytophthora across the range of Port-Orford Cedar. A risk key was developed to facilitate elucidation of risk of disease spread and the level of protection/mitigation indicated at a given locale. The relevant sections of the key and discussion of key elements as they pertain to the proposed action are as follows:

Key 1a: Are there uninfected POC within, near, or downstream of the activity area whose ecological, Tribal, or product use or function measurably contribute to meeting resource management plan objectives.

> No. POC in the analysis area are scattered throughout the landscape and frequently occur on recently disturbed areas. Within units, POC stocking levels are low or not present and does not contribute measurable to management plan objectives. Because POC within the units is widely spaced, if an isolated tree were to become infected, it would not likely spread to additional trees. High-risk areas near and down stream of the project area are already infected.

1b. Are there uninfected POC within, near, 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 measurably contributes to meeting land and resource management plan objectives?

No. High-risk areas within, near and down-stream of the project are already infected. The soil survey indicates that the extent of ultramafic rock is very limited (USDA 2005), which limits the likelihood that POC exist in pure stands adjacent to streams which would have a disproportionate contribution to meeting plan objectives.

1c. Is the activity within an uninfested 7th field watershed as defined by alternative 6 (FSEIS Table A12-2)?

No, the 7th field watersheds containing the proposed units are infested. All 7th fields within the watershed are already infected. All 7th fields along the transportation route are infected.

When the answers to all three questions (1a-1c) are no, then no POC mitigation is required under the new SEIS guidelines.

Project design criteria are designed to isolate individual Port-Orford cedar on low risk sites, such that an infection in one would not spread to other individuals within the treatment unit or trees outside the treatment unit boundaries. The majority of the project activity is restricted to the summer due to road access limitations; this restriction confines activity to the period when the fungus is least active, further reducing the risk of spread.

Appendix B. Special Status Species Tables

Surveys are recommended for some Bureau Sensitive species that are known or suspected to occur in a proposed unit. If a Bureau Sensitive species is known or suspected to occur in the project area but the management activity is not likely to impact the species, then surveys are not recommended. In addition, surveys are not recommended for species considered impractical to survey for (USDA and USDI 2000). Surveys are considered practical "if characteristics of the species (such as size, regular fruiting) and identifying features result in being able to reliably locate the species, if the species is present, within one to two field seasons and with a reasonable level of effort" (USDA and USDI 2000, Vol. 1 p. 479). Characteristics determining practicality of surveys include: "individual species must be of sufficient size to be detectable; the species must be readily distinguishable in the field or with no more than a simple laboratory or office examination for verification of identification; the species is recognizable, annually or predictably producing identifying structures; and the surveys must not pose a health or safety risk" (USDA and USDI 2000, Vol. 1 p. 479).

The following tables show the species for which vascular plant surveys were completed (**Appendix Table 1**), non-vascular plant surveys were completed (Appendix Table 2), or where no SSS surveys were completed due to lack presence in the analysis area (**Appendix Table 3**).

Appendix Table 1: Vascular Plant Species where Surveys were Completed

*Scientific and Common Name	Documented (D) or Suspected (S)	Status/ practicality of surveys	Habitat	Likelihood of Occurring in the Project Area	Management Activity Likely to Impact Species if Found in Project Area	Survey Recommended (if habitat present, mgmt. activity likely to impact species, and practical to survey for)
Adiantum jordanii (California maidenhair fern)	S	Bureau Sensitive (surveys practical)	Perennial herb, moist shaded seeps, hillsides, or moist woods and forests, <1,200 m.	Moderate. Known from Bear Creek Rec. site T30S-R09W-9.	Yes.	Yes.
Carex gynodynama (wonderwoman sedge)	S	Bureau Sensitive (surveys practical)	Perennial, moist meadows and open forests, <600 m, Smith Pond off of Signal Tree road at T30S, R9W, Sec 3.	Low. The habitat this species prefers is scarce in the proposed project area.	Yes.	Yes.
Cimicifuga elata var. *elata* (tall bugbane)	S	Bureau Sensitive (surveys practical)	Perennial forb or herb, coniferous forest, north of Umpqua River, and east side of district, flowers June to early August.	Low. Present in the western hemlock forest association on Eugene and Roseburg BLM lands directly adjacent to Coos Bay BLM land.	Yes.	Yes.
Erigeron cervinus	S	Bureau Sensitive (surveys	Perennial forb or herb; open, rocky slopes and streamsides, seeps, crevices in walls, meadows,	Low. The habitat this species prefers is scarce in the	Yes.	Yes.

*Scientific and Common Name	Documented (D) or Suspected (S)	Status/ practicality of surveys	Habitat	Likelihood of Occurring in the Project Area	Management Activity Likely to Impact Species if Found in Project Area	Survey Recommended (if habitat present, mgmt. activity likely to impact species, and practical to survey for)
(Siskiyou daisy)		practical)	pine to fir woodlands, chaparral, sometimes over serpentine, (50-)900 to 2300 m; California and Oregon.	proposed project area.		
Iliamna latibracteata (California globe mallow)	S	Bureau Sensitive (surveys practical)	Perennial forb or herb, moist ground and stream banks, blooms June and July, Big Sandy Tie road at T28S, R10W, Sec 31; a site at T31S, R12W, Sec 17 was extirpated during culvert replacement in 1999.	Low. The only known site of this species on district is along the Big Creek mainline. It prefers areas with more light- openings in the forest, recent burns, roadsides, etc.	Yes.	Yes.
Pellaea andromedifolia (Coffee fern)	S	Bureau Sensitive (surveys practical)	Perennial forb or herb, fern, rocky outcrops up to 5900 ft, Cherry Creek Ridge at T27S, R10W, Sec 25, and Irwin Rocks.	Low. The habitat this species prefers is scarce in the proposed project area.	Yes.	Yes.
Polystichum californicum (California sword fern)	S	Bureau Sensitive (surveys practical)	Perennial forb or herb, fern, woods, stream banks, shaded rocky outcrops, Pistol River at T38S, R14W, Sec 22 and Indian Creek Road at T29S, R12W, Sec 24.	Low-Moderate. This species is rare on district but could potentially show up almost anywhere in the project area.	Yes.	Yes.
Romanzoffia thompsonii (Thompson's mist maiden)	S	Bureau Sensitive (surveys practical)	Annual forb or herb, Mossy covered rock outcrops, 750 to 6,000 ft; Slater Ridge at T30S, R9W, Sec 33; flowers from March to early August.	Low. The habitat this species prefers is scarce in the proposed project area.	Yes.	Yes.
Scirpus pendulus (drooping bulrush)	S	Bureau Sensitive (surveys practical)	Marshes, wet meadows, and ditches, 800 to 1,000 m, KM Ecoregion.	Low.	Yes.	Yes.
Trillium kurabayashii (=*T. angustipetalum*) (giant purple trillium)	S	Bureau Sensitive (surveys practical)	Perennial forb, moist forest, montane coniferous forest, foothill woodland, and chaparral at 100 to 2,000 m, known from Grizzly Mountain and Colebrook Butte.	Low.	Yes.	Yes.

Appendix Table 2: Non-Vascular Plant Species where Surveys were Completed

Bryoria subcana	lichen	S	Bureau Sensitive (surveys practical)	Coastal forest and high precipitation summit. Several Coos Bay BLM sites; seems to prefer ridgelines.	High. Has been found in several locations on district.	Yes.	Yes.
Calicium adspersum	lichen	S	Bureau Sensitive (surveys practical)	Growing on bark on boles of old growth conifer trees.	Low. There are few legacy trees left on the project area.	Yes.	Yes.
Diplophyllum plicatum	liver-wort	S	Bureau Sensitive (surveys practical)	Tree boles of western hemlock and red cedar in riparian areas.	Low. There are several sites on district mainly in late-seral and old-growth stands.	Yes.	Yes.
Heterodermia leucomela	lichen	S	Bureau Sensitive (surveys practical)	Sitka spruce and shore pine branches on forested headlands in the coastal fog zones, may also be found inland in riparian areas, moist valleys and fog-intercept ridges.	Low. Mostly found along immediate coast.	Yes.	Yes.
Hypogymnia duplicata	lichen	S	Bureau Sensitive (surveys practical)	Mid-elevation moist western hemlock stands, old-growth Douglas-fir, mature western hemlock/Douglas-fir forest, moist Pacific silver fir or noble fir forests, Sitka spruce, riparian forest and later-successional forest along ridgetops in Oregon Coast Range, also occurs on red alder in sedge-spaghnum bogs in Oregon Coast Range, elevation ranges from 1,100 to 5,450 feet.	Low.	Yes.	Yes.
Hypotrachyna revoluta	liver-wort	S	Bureau Sensitive (surveys practical)	Usually on bark and rarely on rock, Coast Range and immediate coast in OR, at Cape Arago, also from Rocky and Appalachian Mountains, east coast of Canada, Great Lakes area, and southwest border of US with Mexico.	Low. Mostly found along immediate coast.	Yes.	Yes.
Leptogium cyanescens	lichen	S	Bureau Sensitive (surveys practical)	Tree bark of deciduous trees, but also occurs on juniper and western red cedar, decaying logs, and mossy rocks in cool, moist microsites, widely scattered. Location in CR Ecoregion	Low.	Yes.	Yes.

*Scientific Name	Plant Group	Documented (D) or Suspected (S)	Status/ practicality of surveys	Habitat	Likelihood of Occurring on the Project Area	Management Activity Likely to Impact Species if Found in Project Area	Survey Recommended (if habitat present, mgmt. activity likely to impact species, and practical to survey for)
				in Lane & Lincoln Counties.			
Lobaria linita	lichen	S	Bureau Sensitive (surveys practical)	Mature to old growth forests, oak forests with rock outcrops, late-mature tan-oak and madrone forests, 1,800 to 6,700 ft; CR & WC Ecoregions	Low. Has been found as far south as Douglas Co.	Yes.	Yes.
Metzgeria violacea	liver-wort	S	Bureau Sensitive (surveys practical)	Hyper-maritime, on tree trunks, usually shaded, near coast; growing in dense mats or mixed among other bryophytes.	Low. Has been found at South and Catching Sloughs and inland on the Siuslaw NF	Yes.	Yes.
Niebla cephalota	lichen	S	Bureau Sensitive (surveys practical)	Coastal habitats but may extend up to 15 miles inland where influenced by the coastal fog belt, occurs on exposed trees, shrubs, and less often on rocks, rock or bark; known from northern CA, Oregon coast (North Spit), and part of WA coast; CR Ecoregion.	Low. Has been found on the north spit of Coos Bay.	Yes.	Yes.
Porella bolanderi	liver-wort	S	Bureau Sensitive (surveys practical)	On outcrops and boulders (limestone, silica, serpentine, or sandstone), soil, and epiphytic on oaks, myrtlewood, bigleaf maple, Douglas-fir, Shasta red fir, redwood, and ponderosa pine; commonly at 100-750 m but known from 0 to 2,000 m; KM & WV Ecoregion.	Low.	Yes.	Yes.
Schistostega pinnata	moss	S	Bureau Sensitive (surveys practical)	Mineral soil in shaded pockets of overturned tree roots, often with shallow pools of standing water at the base of the root wad; attached to rock or mineral soil around the entrance to caves, old cellars, and animal burrows; CR & WC Ecoregions.	Low.	Yes.	Yes.
Tayloria serrata	moss	S	Bureau Sensitive (surveys practical)	Grows on humus and animal dung; KM, WV, & WC Ecoregions.	Low.	Yes.	Yes.
Tetraphis geniculata	moss	S	Bureau Sensitive (surveys practical)	Found on down logs in late-seral conifer forests in W. OR and WA.	Low. Only a few pockets of remnant legacy trees on proposed thinning units although there is large down wood throughout the project area.	Yes.	Yes.

Appendix Table 3: Special Status Species Not present in the Analysis Area

Taxon	Scientific Name	Common Name	Key Habitat / Species Notes / Range	Reason for No Effects
Invertebrates				
Snails & Slugs	*Algamorda newcombiana*	Newcomb's Littorine Snail	Areas of *Salicornia virginica* (pickleweed/glasswort) along tidal line in Coos Bay.	Outside of known range.
	Helminthoglypta hertleini	Oregon Shoulderband	Rocky & talus substrates. Many mollusk surveys, but no Coos Bay records. Range: Douglas, Jackson Josephine Counties	Outside of known range.
	Gliabates oregonius	Salamander Slug	Mature conifer forest w/leaf litter. Range: Lane County	Outside of known range.
	Hesperarion mariae	Tillamook Westernslug	Habitats unknown. Range: Douglas, Lane, Tillamook Counties	Outside of known range.
	Lanx subrotunda	Rotund Lanx (snail)	Found in large turbulent waters of larger rivers – Range: Mainstem Rogue/Umpqua	Habitat not present.
	Pomatiopsis binneyi	Robust Walker (snail)	Perennial seeps, shallow mud banks and marsh seeps leading into shallow streams. Range: Chetco River drainage.	Outside of known range.
	Pomatiopsis californica	Pacific Walker (snail)	Wet leaf litter and vegetation near flowing or standing water in shaded areas, high humidity. Range: Lower Millicoma sub-basin.	Outside of known range.
Clams, Oysters, & mussels	*Pisidium ultramontanum*	Montane Peaclam	Herbaceous wetlands and Salicornia Plants. Range: Klamath, Malheur Counties	Outside of known range.
Butterflies & Moths	*Callophrys polios maritima*	Hoary Elfin Butterfly	Closely associated with kinnikinnik (Arctostaphylos uva-ursi). Coastal species.	Habitat not present.
	Plebejus saepiolus littoralis	Insular Blue Butterfly	Open areas, clover. Coastal species.	Habitat not present.
	Polites mardon	Mardon Skipper	Grass openings with native grasses and serpentine.	Habitat not present.
Caddisflies		A Caddisfly	Freshwater habitats. Range: Douglas, Lane, Deschutes counties.	Outside of known range.
Vertebrates				
Birds	*Branta hutchinsii leucopareia*	Aleutian Cackling Goose	Coastal grasslands.	Habitat not present.
	Falco peregrinus anatum	American Peregrine Falcon	Nests on cliffs.	Habitat not present.
	Falco peregrinus tundrius	Arctic Peregrine Falcon	Generalist; Cliffs (in breeding range). Occasional winter migrant.	Habitat not present.
	Dolichonyx oryzivorus	Bobolink	Grassland. All records on or adjacent to the coast. Rare.	Habitat not present.
	Cypseloides niger	Black Swift	Nests behind waterfalls.	Habitat not present.
	Branta canadensis occidentalis	Dusky Canada Goose	Open grasslands, wet meadows. Coastal.	Habitat not present
	Melanerpes lewis	Lewis' Woodpecker	Recently burned areas w/snags.	Habitat not present.
	Pooecetes gramineus affinis	Oregon Vesper Sparrow	Grasslands on or adjacent to the coast. Rare migrant.	Habitat not present.
	Progne subis	Purple Martin	Snags in early-seral habitats.	Habitat not present.
	Eremophila alpestris	Streaked Horned Lark	Coastal dunes and grasslands; open beach; open ground with short grass or scattered	Habitat not present.

	strigata		bushes. Rare migrant.	
	Cygnus buccinator	Trumpeter Swan	Marsh, wet meadows, bogs, ponds. Extremely rare winter species.	Habitat not present.
	Anser albifrons elgasi	Tule Goose	Marsh, open grasslands, coastal lowlands. Rare migrant.	Habitat not present.
	Bartramia longicauda	Upland Sandpiper	Open coastal grasslands. Very rare spring migrant.	Habitat not present.
	Charadrius alexandrinus (nivosus)	Western Snowy Plover	Coastal sand	Habitat not present.
	Elanus leucurus	White-tailed Kite	Pastures, open grasslands; typically low elevations. Open areas in coastal and valley lowlands.	Habitat not present.
Fish - Anadromous	*Oncorhynchus kisutch*	Coho Salmon (SO/NC)	Spawn and rear (1.5 yrs) in smaller freshwater streams before migrating to ocean.	Not the ESU for this basin.
Fish - Non-anadromous		Millicoma Dace	Rubble areas in swifter waters, freshwater. Range: Coos River Basin.	Outside of known range.
Salamanders	*Batrachoseps attenuatus*	California Slender Salamander	Late-seral forests, large down logs (especially class 3-4). Somewhat coastal. Tightly associated with down wood.	Presence highly unlikely due to lack of down wood and lack of coastal influence.
Mammals	*Martes pennanti*	Fisher	Forest w/shrub layer & riparian: nests/snags, dead parts of live trees, large live branches	Presence highly unlikely due to lack of dead wood and decadent live trees.
	Corynorhinus townsendii	Townsend's Big-Eared Bat	Breed in caves/mines; bridges for night roosts	Presence unlikely due to lack of caves, mines, bridges.
Vascular Plants				
	Abronia umbellata ssp. breviflora	pink sand verbena	Annual herb, coastal beaches and dunes, <100 ft.	No habitat present + outside of known range.
	Arctostaphylos hispidula	hairy manzanita	Perennial shrub, dry, rocky ridges and gravelly, serpentine soils, 300-600 m.	No habitat present
	Artemisia pycnocephala	coastal sagewort	Perennial shrub; rocky or sandy soil of coastal beaches; 0 to 200 m.	No habitat present + outside of known range.
	Bensoniella oregona	bensonia	Perennial forb or herb, seasonally moist meadows and stream sides in relatively deep soils, 2,500 to 4,500 ft.	No habitat present
	Brodiaea terrestris	dwarf brodiaea	Perennial forb or herb, stabilized dunes and meadows.	No habitat present
	Carex brevicaulis	short-stemmed sedge	Perennial, stabilized sand dunes and meadows.	No habitat present
	Carex crawfordii	Crawford's sedge	Rare weed in cranberry fields on district.	No habitat present + outside of known range.
	Carex scabriuscula (=Carex gigas)	Siskiyou sedge	Perennial, serpentine areas, wet meadows, 850 to 1,800 m.	No habitat present
	Castilleja mendocinensis	Mendocino coast paintbrush	Perennial subshrub or forb/herb, coastal strand, coastal prairie, northern coastal. scrub, closed-cone pine forest in dune and coastal habitats.	No habitat present + outside of known range.
	Cicendia quadrangularis	timwort	Annual forb or herb, coastal wetlands, valley grassland, northern oak woodland, foothill woodland, between 0-1,000 ft.	No habitat present + outside of known range.

	Cordylanthus maritimus ssp. *palustris*	Point Reyes bird's-beak	Annual, coastal salt marshes, sea level.	No habitat present + outside of known range.
	Cryptantha leiocarpa	seaside cryptantha	Annual forb or herb, semi-stabilized sand dunes.	No habitat present + outside of known range.
	Ericameria arborescens	golden fleece	Perennial shrub, foothill woodland, and chaparral, between 0 and 9,000 ft.	No habitat present + outside of known range.
	Eucephalus vialis (=Aster vialis)	Wayside Aster	Dry, open oak or coniferous woods with Douglas-fir, golden chinquapin and Oregon white oak, edges between forest and meadow, 200 to 500 m in Lane, Douglas, and Linn Counties.	Outside of known range.
	Gentiana setigera	Waldo gentian	Perennial herb, serpentine fens, 1,000 to 3,000 ft.	No habitat present + outside of known range.
	Gilia millefoliata	seaside gilia	Annual forb or herb, semi-stabilized coastal dunes, < 32 ft.	No habitat present + outside of known range.
	Hydrocotyle verticillata	whorled marsh pennywort	Perennial vine, forb or herb, swampy ground, lake margins, wetlands, primarily coastal	No habitat present + outside of known range.
	Lasthenia ornduffii (macrantha ssp. *prisca)*	large-flowered goldfields	Perennial herb, coastal headlands, up to 100 ft	No habitat present + outside of known range.
	Lilium kelloggii	Kellogg's lily	Perennial forb or herb, gaps and roadsides in yellow pine and redwood forests, sandstone and sedimentary soil in dry wooded areas, 175 to 1300 m	No habitat present + outside of known range.
	Lilium occidentale	western lily	Perennial herb, coastal bogs and scrub, < 100 m	No habitat present + outside of known range.
	Limonium californicum	western marsh-rosemary	Perennial subshrub, forb, or herb, coastal salt marshes up to 160 ft.	No habitat present + outside of known range.
	Lycopodiella inundata	northern bog clubmoss	Perennial, rhizomatous fern, coastal wetlands, moist conditions in lake and pond margins, muddy depressions, peat bogs, fens, edge, and coastal habitats	No habitat present + outside of known range.
	Oenothera wolfii	Wolf's evening-primrose	Biennial herb, base of coastal bluffs.	No habitat present + outside of known range.
	Ophioglossum pusillum	adder's-tongue	Perennial forb or herb, marsh edges, low pastures, grassy roadside ditches, coastal wetlands, 1,000 to 2,000 m.	No habitat present + outside of known range.
	Phacelia argentea	silvery phacelia	Perennial forb or herb, sand dunes, 10 to 40 ft.	No habitat present + outside of known range.
	Rhynchospora alba	white beakrush	Perennial, marshes, bogs, up to 2000 m, circumboreal.	No habitat present + outside of known range.
	Schoenoplectus (*Scirpus*) *subterminalis*	water clubrush	Perennial, freshwater wetlands, lake-margin and edge habitats.	No habitat present + outside of known range.
	Senecio triangularis var. *angustifolius*	bog groundsel	Perennial subshrub, shrub, or herb, wet meadows, stream banks in open, coniferous forests, coastal sphagnum peat bogs, 1,000 to 3,500 m.	No habitat present.
	Sidalcea malviflora sp. *patula*	coast checker bloom	Perennial herb, open coastal forest, prairie, mixed evergreen forest, grassy coastal headlands and meadows, often in serpentine soils; sea level to 2,600 ft	No habitat present + outside of known range.
	Streptanthus howellii	Howell's streptanthus	Perennial herb, rocky serpentine areas in open conifer and hardwood forests, 600 to	No habitat present + outside

			1,500 m.	of known range.
	Utricularia gibba	humped bladderwort	Annual or perennial forb or herb, wetlands in ponds, shallow lakes, and bogs.	No habitat present + outside of known range.
	Utricularia minor	lesser bladderwort	Perennial forb or herb, wetlands, ponds, shallow lakes, sphagnum bogs.	No habitat present + outside of known range.
	Viola primulifolia ssp. *occidentalis*	western bog violet	Perennial forb or herb, California pitcher plant bogs and fens in serpentine soil, 100 to 500 m.	No habitat present + outside of known range.
Non-Vascular Plants				
Lichens	*Bryoria pseudocapillaris*		On shore pine, Pacific Coast.	No habitat present + outside of known range.
	Bryoria spiralifera		On shore pine, Pacific Coast.	No habitat present + outside of known range.
	Dermatocarpon meiophyllizum (=*D. luridum*)		Occurs between 1,000-4,400 feet on rock and boulders in seepy terraces, slopes, and riparian edges with red alder, Douglas-fir and maple spp., and on granite rocks along stream edges; six sites in Oregon. Located in Douglas county.	No habitat present + outside of known range.
	Erioderma sorediatum		Primarily coastal in Oregon- on pine trees, old dunes, and ericaceous shrubs.	No habitat present + outside of known range.
	Heterodermia leucomela		Sitka spruce and shore pine branches on forested headlands in the coastal fog zones, may also be found inland in riparian areas, moist valleys and fog-intercept ridges.	Outside of known range.
	Hypogymnia duplicata		Mid-elevation moist western hemlock stands, old-growth Douglas-fir, mature western hemlock/Douglas-fir forest, moist Pacific silver fir or noble fir forests, Sitka spruce, riparian forest and later-successional forest along ridgetops in Oregon Coast Range, also occurs on red alder in sedge-spaghnum bogs in Oregon Coast Range, elevation ranges from 1,100 to 5,450 feet.	
	Leioderma sorediatum		Immediate coast in OR and CA, old dunes, pine trees, ericaceous shrubs, and conifers.	No habitat present + outside of known range.
	Pannaria rubiginosa		Wetlands and riparian areas on the immediate coast; mainly on hardwoods, Douglas-fir, western hemlock, Sitka spruce, western red cedar, and shrub thickets of Hooker's willow and ericaceous shrubs in dunes and deflation plain habitats, 50 to 1,600 ft, Northern CA, OR, and WA.	No habitat present + outside of known range.
	Ramalina pollinaria		Coastal habitats on the bark of trees and shrubs, occasionally on shaded rocks.	No habitat present + outside of known range.
	Teloschistes flavicans		Coastal headlands and peninsulas on oak, pine, shrubs, moss, and soils.	No habitat present + outside of known range.
Bryophytes	*Calypogeia sphagnicola*	Liverwort	Wetland bogs containing sphagnum.	No habitat present.
	Campylopus schmidii	Moss	Wetlands along the coast.	No habitat present + outside of known range.
	Cryptomitrium tenerum	Liverwort	Mainly low elevation or coastal. KM Ecoregion.	No habitat present.

	Encalypta brevicollis	Moss	Found on high peaks in SE Coos County and NE Curry County- Collections from Mt. Bolivar in Coos County, and nearby Saddle Peaks in Curry County.	No habitat present.
	Entosthodon fascicularis	Moss	Occurs as individual plants or forming small sods on seasonally wet, exposed soil in seeps or along intermittent streams. Usually hidden among grasses, other mosses, and litter. Found in grassland, oak savanna, grassy balds, and rock outcrops below 3,000 feet in elevation.	No habitat present.
	Kurzia makinoana	Liverwort	Sphagnum moss bogs, or moist mossy rock faces- coastal in Oregon.	Outside of known range.
	Lophozia laxa	Liverwort	Coastal sphagnum and peat bogs of northwestern Oregon coast down to Lane Co.	No habitat present + outside of known range.
	Porella bolanderi	Liverwort	On outcrops and boulders (limestone, silica, serpentine, or sandstone), soil, and epiphytic on oaks, myrtlewood, bigleaf maple, Douglas-fir, Shasta red fir, redwood, and ponderosa pine; commonly at 100-750 m but known from 0 to 2,000 m; KM & WV Ecoregion.	
Fungi				
	Albatrellus avellaneus		Presumed mycorrhizal with pine trees, known from Shore Acres in Coos County.	No habitat present + outside of known range.
	Chamonixia caespitosa		Central Oregon coast, forms sporocarps beneath the soil surface associated with various Douglas-fir and western hemlock in coastal forests.	Outside of known range.
	Dermocybe humboldtensis		Stabilized dunes on roots of pine and huckleberry species and conglomerate rock and gravelly loam soil with Douglas-fir and ponderosa pine.	No habitat present.
	Phaeocollybia dissiliens		Mature and old-growth Douglas-fir forests, associated with the roots of Pacific silver fir, Sitka spruce, Douglas-fir, and western hemlock.	No habitat present.
	Phaeocollybia gregaria		Associated with the roots of Sitka spruce and Douglas-fir, found on the Siuslaw NF at Cascade Head.	Outside of known range.
	Phaeocollybia oregonensis		Associated with the roots of Pacific silver fir, Douglas-fir, and western hemlock; one site on district in a >200 year old Douglas-fir forest.	No habitat present.
	Phaeocollybia scatesiae		Mature and old-growth Douglas-fir forests, associated with the roots of spruce, Sitka spruce, and *Vaccinium* species, 0 to 1,250 m.	No habitat present.
	Ramaria gelatiniaurantia		Mature and old-growth Douglas-fir stands, mycorrhizal species that depends on tree host, endemic to the Pacific NW, a few sites on district.	No habitat present.
	Ramaria largentii		Associated with spruce, western white pine, Douglas-fir, and western hemlock, one site on district in a mature (>120 yr. old) Douglas-fir stand; fruits in October.	No habitat present.
	Thaxterogaster pavelekii		Endemic to mature to old-growth coastal forests or forests with an old-growth legacy of coarse woody debris, usually in mossy places from sea level to 250 m elevation in OR and WA.	No habitat present + outside of known range.

Appendix C. Transportation Management Objectives and GIS Estimate of Road Management Miles

EA Road Number	Owner Designation	Road Class (as defined TMP (2001))	Decommissioning	Decommissioning Type[1]	Recommended Road Work (Miles)			Total Miles
					Improvement	New Construction	Renovation	
19-1	BLM	Resource	Yes	Block		0.01		0.01
19-2	BLM	Resource	Yes	Block WB			0.53	0.53
19-3	BLM	Resource	Yes	Full		0.04		0.04
19-4	BLM	Resource	Yes	WB		0.04		0.04
19-5	BLM	Resource	Yes	WB		0.04		0.04
19-6	BLM	Resource	Yes	WB		0.03		0.03
19-7	BLM	Resource	Yes	WB		0.04		0.04
20-1	BLM	Resource	Yes	WB		0.02		0.02
20-2	BLM	Resource	Yes	WB		0.05		0.05
20NE-1	BLM	Resource	Yes	WB			0.02	0.02
20NE-1A	BLM	Resource	Yes	Full			0.02	0.02
20NE-1B	BLM	Resource	Yes	Full		0.05		0.05
20NE-2	BLM	Resource	Yes	Full		0.06		0.06
36-1	BLM	Resource	Yes	WB		0.14		0.14
37-1A	PVT	Resource	Yes	Block WB			0.11	0.11
37-1B	PVT	Resource	Yes	WB			0.14	0.14
37-2A	BLM	Resource	Yes	Block WB		0.06		0.06
37-2B	BLM	Resource	Yes	WB		0.22		0.22
37-3	BLM	Resource	Yes	Block WB		0.09		0.09
37N-1	BLM	Resource	Yes	WB		0.16		0.16
40-1	BLM	Resource	Yes	Block WB			0.06	0.06
40-2	BLM	Resource	Yes	Block WB		0.15		0.15
40-3	BLM	Resource	Yes	Block WB	0.13			0.13
40-3A	BLM	Resource	Yes	WB		0.03		0.03
40-4	BLM	Resource	Yes	WB		0.08		0.08
40NW-1	BLM	Resource	Yes	WB		0.10		0.10
41-1	BLM	Resource	Yes	Block WB		0.04		0.04
432-1	BLM	Resource	Yes	WB		0.09		0.09
432-2	BLM	Resource	Yes	Block WB		0.02		0.02
433-1	BLM	Resource	Yes	WB		0.02		0.02
44-1	BLM	Resource	Yes	Block WB		0.04		0.04
44-1A	BLM	Resource	Yes	WB			0.21	0.21
44-2	BLM	Resource	Yes	WB		0.03		0.03
45-1	BLM	Resource	Yes	Block WB		0.26		0.26
45-2	BLM	Resource	Yes	Full		0.06		0.06
45-3	BLM	Resource	Yes	Block WB		0.02		0.02
45SW-1	BLM	Resource	No	N/A	0.06			0.06
46-1	BLM	Resource	Yes	Block WB		0.21		0.21
46-2	BLM	Resource	Yes	Block WB		0.02		0.02
52-1	BLM	Resource	Yes	WB			0.14	0.14
52-2	BLM	Resource	Yes	WB			0.05	0.05
52-3	BLM	Local	Yes	WB Pull Pipes		0.29		0.29
53-1	BLM	Resource	Yes	WB		0.04		0.04
53SE-1A	BLM	Local	Yes	WB			0.19	0.19
53SE-1B	BLM	Resource	Yes	Full		0.04		0.04
54-1	BLM	Local	Yes	WB		0.16		0.16

EA Road Number	Owner Designation	Road Class (as defined TMP (2001))	Decommissioning	Decommissioning Type[1]	Recommended Road Work (Miles)			Total Miles
					Improvement	New Construction	Renovation	
54-2	BLM	Local	Yes	Block WB		0.07		0.07
54-3	BLM	Resource	Yes	Full		0.06		0.06
54-4	BLM	Local	Yes	Block WB	0.05			0.05
54-4A	PVT	Local	Yes	WB	0.06			0.06
55-1	BLM	Resource	Yes	WB Pull Pipes		0.15		0.15
57-1	PVT	Local	No	N/A			0.30	0.30
57-2	PVT	Local	No	N/A			0.06	0.06
57-3	PVT	Resource	Yes	Full		0.07		0.07
57-3A	BLM	Resource	Yes	Full		0.01		0.01
57S-1	PVT	Local	No	N/A			0.20	0.20
57S-2	PVT	Resource	Yes	Block WB		0.01		0.01
59N-1	BLM	Resource	Yes	WB		0.03		0.03
59N-2	BLM	Resource	Yes	WB		0.03		0.03
59S-1	BLM	Resource	Yes	WB		0.01		0.01
59S-2	BLM	Resource	Yes	WB		0.03		0.03
59S-3	BLM	Resource	Yes	WB		0.07		0.07
59W-1	BLM	Resource	Yes	WB			0.01	0.01
31-14-15.0	BLM	Local	No	N/A			0.09	0.09
		Resource	No	N/A			0.42	0.42
			Yes	Block WB			0.10	0.10
31-14-15.1	BLM	Resource	No	N/A			0.04	0.04
31-14-21.0	PVT	Collector	No	N/A			1.84	1.84
31-14-21.2	BLM	Local	No	N/A			1.10	1.10
	PVT	Local	No	N/A			0.24	0.24
31-14-22.0	BLM	Local	No	N/A			0.24	0.24
		Resource	No	N/A			0.22	0.22
31-14-22.1	BLM	Resource	Yes	Block WB			0.25	0.25
31-14-22.2	BLM	Local	No	N/A			0.53	0.53
31-14-23.0	BLM	Local	Yes	Block WB			0.10	0.10
				WB			0.58	0.58
		Resource	Yes	Block WB			0.15	0.15
				WB			0.34	0.34
	PVT	Local	No	N/A			0.55	0.55
31-14-23.2	PVT	Local	No	N/A			0.26	0.26
31-14-23.3A	PVT	Local	No	N/A			0.13	0.13
31-14-23.4	PVT	Local	No	N/A			0.06	0.06
31-14-24.0	BLM	Resource	Yes	WB			0.53	0.53
31-14-25.0	BLM	Resource	Yes	WB Pull Pipes			0.35	0.35
31-14-26.0	BLM	Resource	Yes	WB			0.18	0.18
				WB Pull Pipes			0.55	0.55
31-14-4.0	BLM	Resource	No	N/A			0.30	0.30
			Yes	Block WB			0.35	0.35
				WB			0.04	0.04
32-14-11.0	FS	Collector	No	N/A			2.82	2.82
		Local	No	N/A			0.56	0.56
32-14-14.0	BLM	Resource	Yes	Block WB			0.63	0.63
32-14-14.2	PVT	Resource	Yes	Block WB			0.63	0.63
				WB			0.71	0.71
32-14-14.3A	PVT	Resource	Yes	Block WB			0.06	0.06

EA Road Number	Owner Designation	Road Class (as defined TMP (2001))	Decommissioning	Decommissioning Type[1]	Recommended Road Work (Miles)			Total Miles
					Improvement	New Construction	Renovation	
				WB			0.04	0.04
32-14-4.0	PVT	Collector	No	N/A			4.60	4.60
				Totals	0.30	3.34	21.62	25.26

[1] [WB – Waterbar], [WB Pull Pipes - assumes blocking also], [Full – indicates road will not be used again and pipes would be removed if present, also assumes water barring and blocked]

Appendix D. Cultural Resources

The project area is in upland territory traditionally generally associated with Southwestern Oregon coastal Indian tribes who have been grouped by anthropologists under the name "Tutuni". Tutuni Indian tribes spoke a dialect of Athapaskan, which differentiated them from coastal Indian groups to the north and the south. The Tutuni tribe traditionally associated with the project area is the "Kwatami" Indians . It is believed that main Kwatami villages were near the Pacific Coast in the New River and Cape Blanco area (Miller and Seaburg 1990 p581). One known village location was near the mouth of Sixes River. The upland area within which this project is found could have been used for seasonal hunting and gathering. Today, the Federal government recognizes the Confederated Tribes of Siletz Indians of Oregon as the official Native American organization representing descendants of the Tutuni peoples. The Confederated Tribes of Siletz received a copy of the scoping document for this project in December 2006, but no response was received.

Records compiled by the Oregon State Historic Preservation Office and the Coos Bay BLM District do not show known archaeological sites within or in the vicinity of project units. Timber harvest (clear-cutting) was previously accomplished in these units between 1948 and 1970. Subsequently, the units were replanted.

Today, disturbances due to previous clear-cut logging activity (including log hauling, road construction and use, and replanting entry) are largely obscured by heavy vegetative cover. Mineral surface visibility is less than five percent.

Because of the land-use history of these units, it is not anticipated that this project will impact intact cultural resources. If potential cultural resources are discovered during work associated with this project, work should stop and the Myrtlewood Field Office cultural resource specialist should be contacted to provide clearance for work to resume.

The proposed areas of activity in connection with the Edson Thin project are not known to be used by, or disproportionately used by, Native Americans and minority or low-income populations for specific cultural activities, or at greater rates than the general population. This includes their relative geographic location and cultural, religious, employment, subsistence, or recreational activities that may bring them to the proposed areas. Also, BLM concludes that no disproportionately high or adverse human health or environmental effects will occur to Native Americans, and minority or low-income populations as a result of the proposed actions.

Appendix E.Maps

The following maps are included:

Figure 1. General Vicinity (Shows general location and extent of maps location and extent of maps a through c.
Figure 2(a). EA Unit Boundaries, Density Management Areas, and Road Work.
Figure 2(b). EA Unit Boundaries, Density Management Areas, and Road Work.
Figure 2(c). EA Unit Boundaries, Density Management Areas, and Road Work.
Figure 3(a). EA Unit Boundaries, Stand Exam Unit Boundaries and Road Decommissioning
Figure 3(b). EA Unit Boundaries, Stand Exam Unit Boundaries and Road Decommissioning
Figure 3(c). EA Unit Boundaries, Stand Exam Unit Boundaries and Road Decommissioning

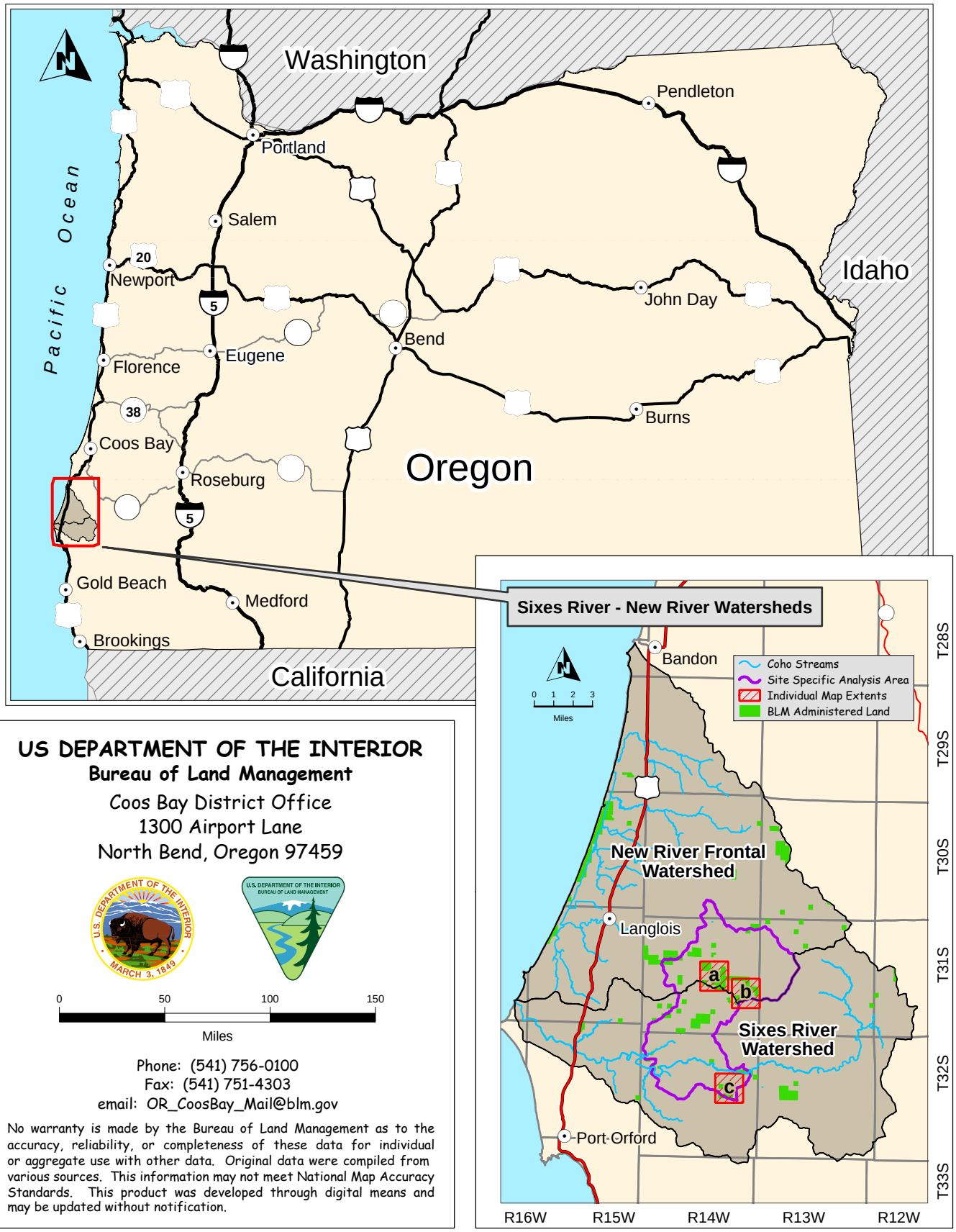

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Figure 1. General Vicinity of the Edson-Thin Environmental Assessment

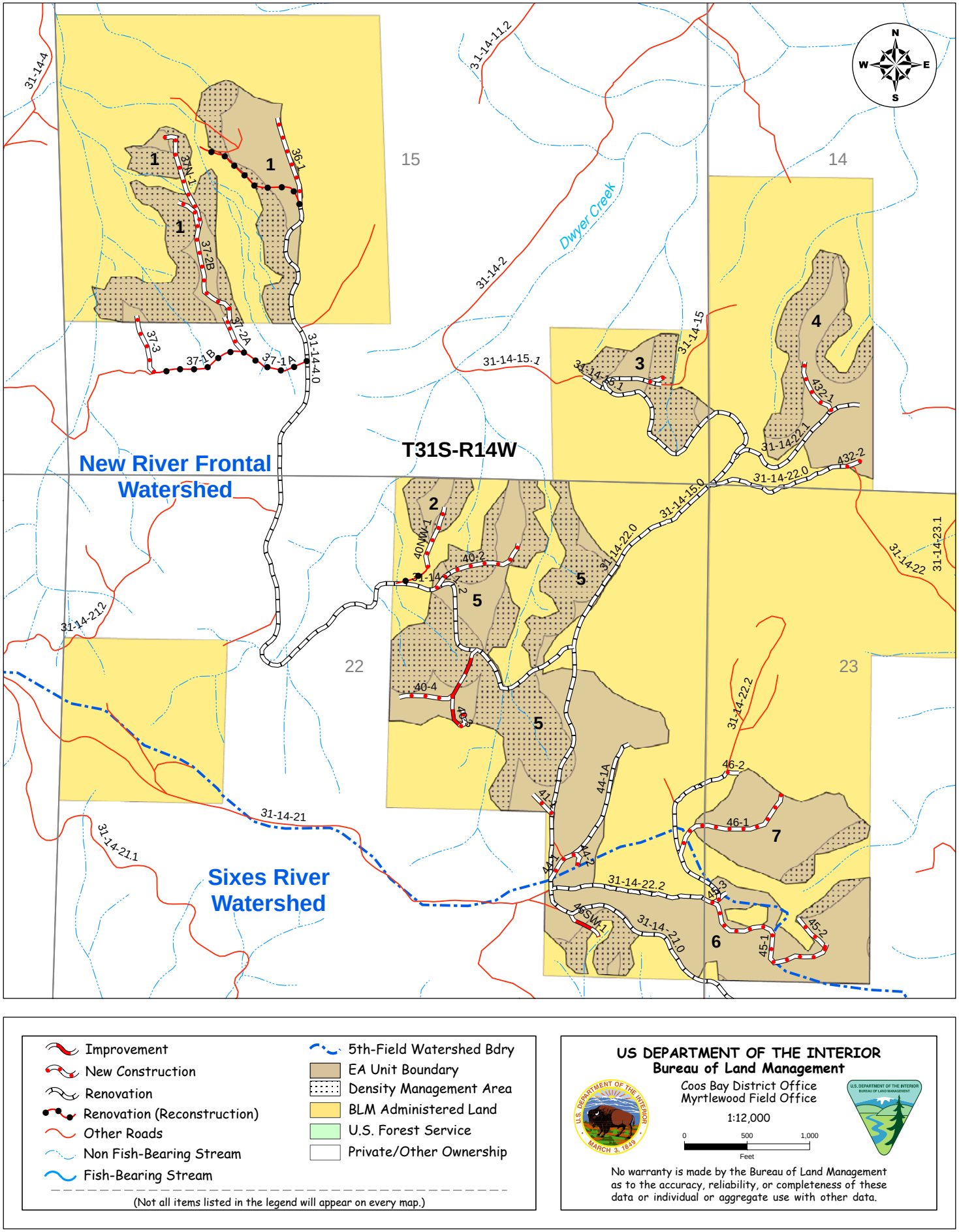
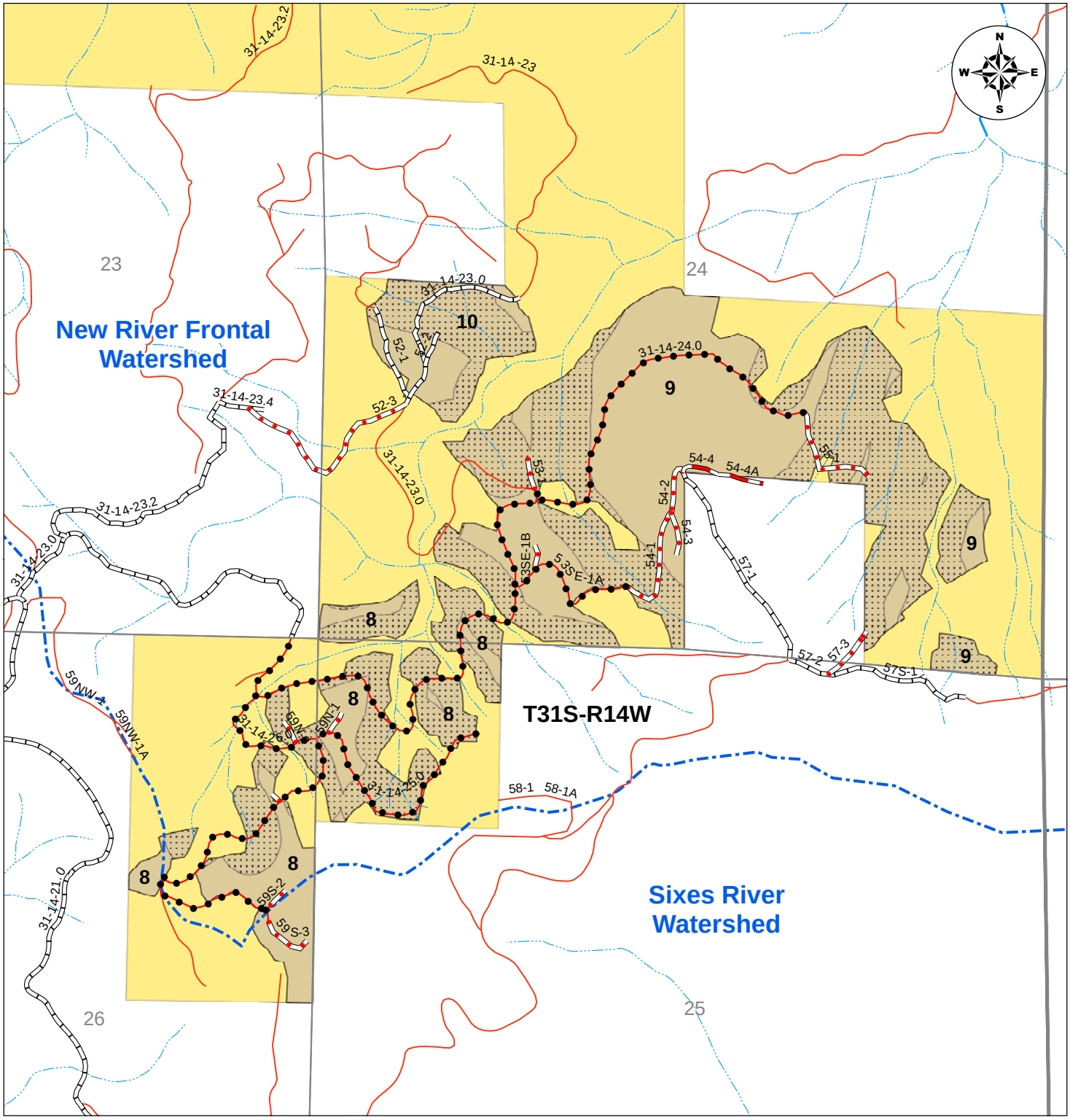


Figure 2(a). EA Unit Boundaries, Density Management Areas and Road Work.



Improvement
New Construction
Renovation
Renovation (Reconstruction)
Other Roads
Non Fish-Bearing Stream
Fish-Bearing Stream
5th-Field Watershed Bdry
EA Unit Boundary
Density Management Area
BLM Administered Land
U.S. Forest Service
Private/Other Ownership

(Not all items listed in the legend will appear on every map.)

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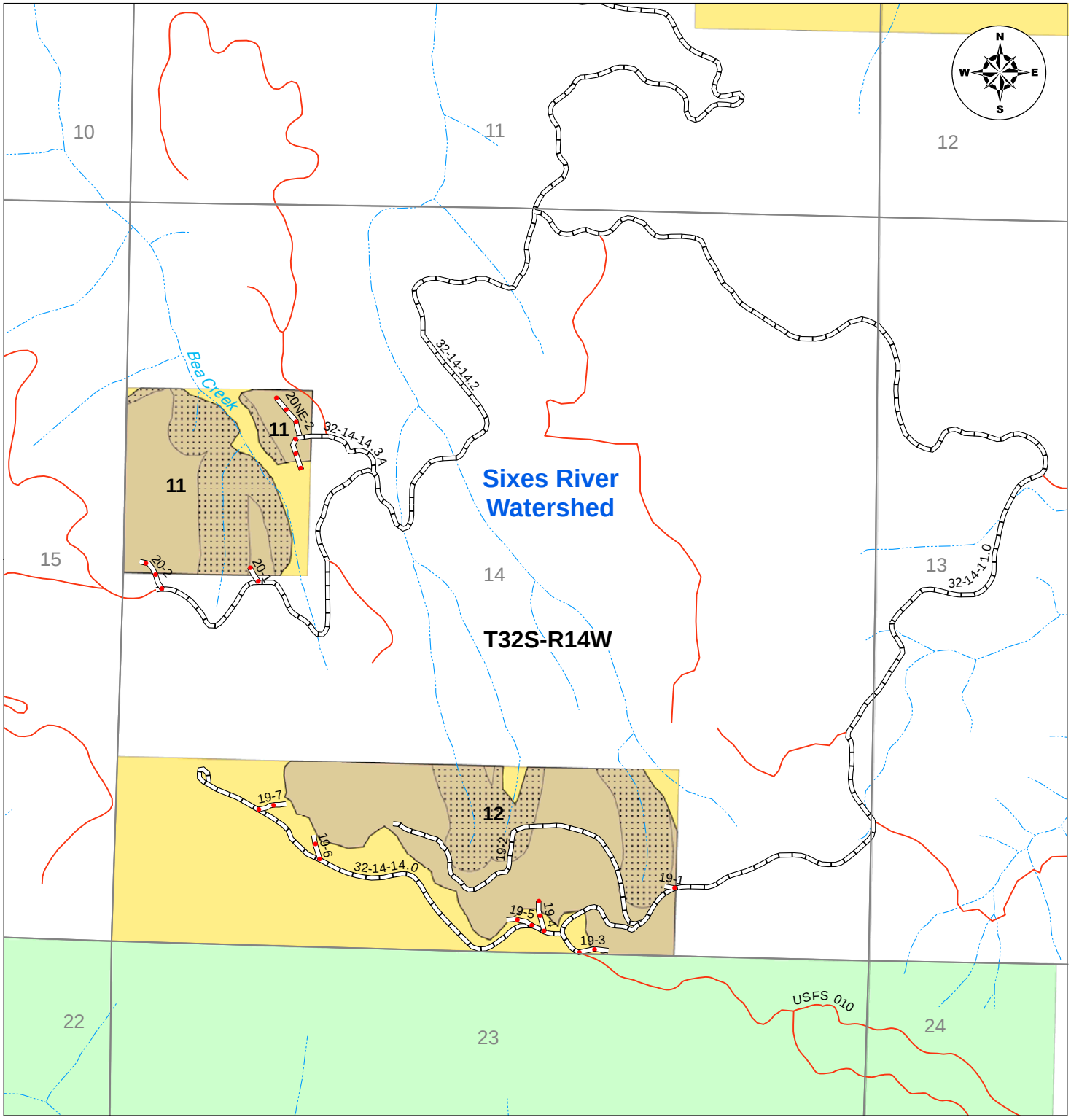
Figure 2(b). EA Unit Boundaries, Density Management Areas and Road Work.



Improvement
New Construction
Renovation
Renovation (Reconstruction)
Other Roads
Non Fish-Bearing Stream
Fish-Bearing Stream

5th-Field Watershed Bdry
EA Unit Boundary
Density Management Area
BLM Administered Land
U.S. Forest Service
Private/Other Ownership

(Not all items listed in the legend will appear on every map.)

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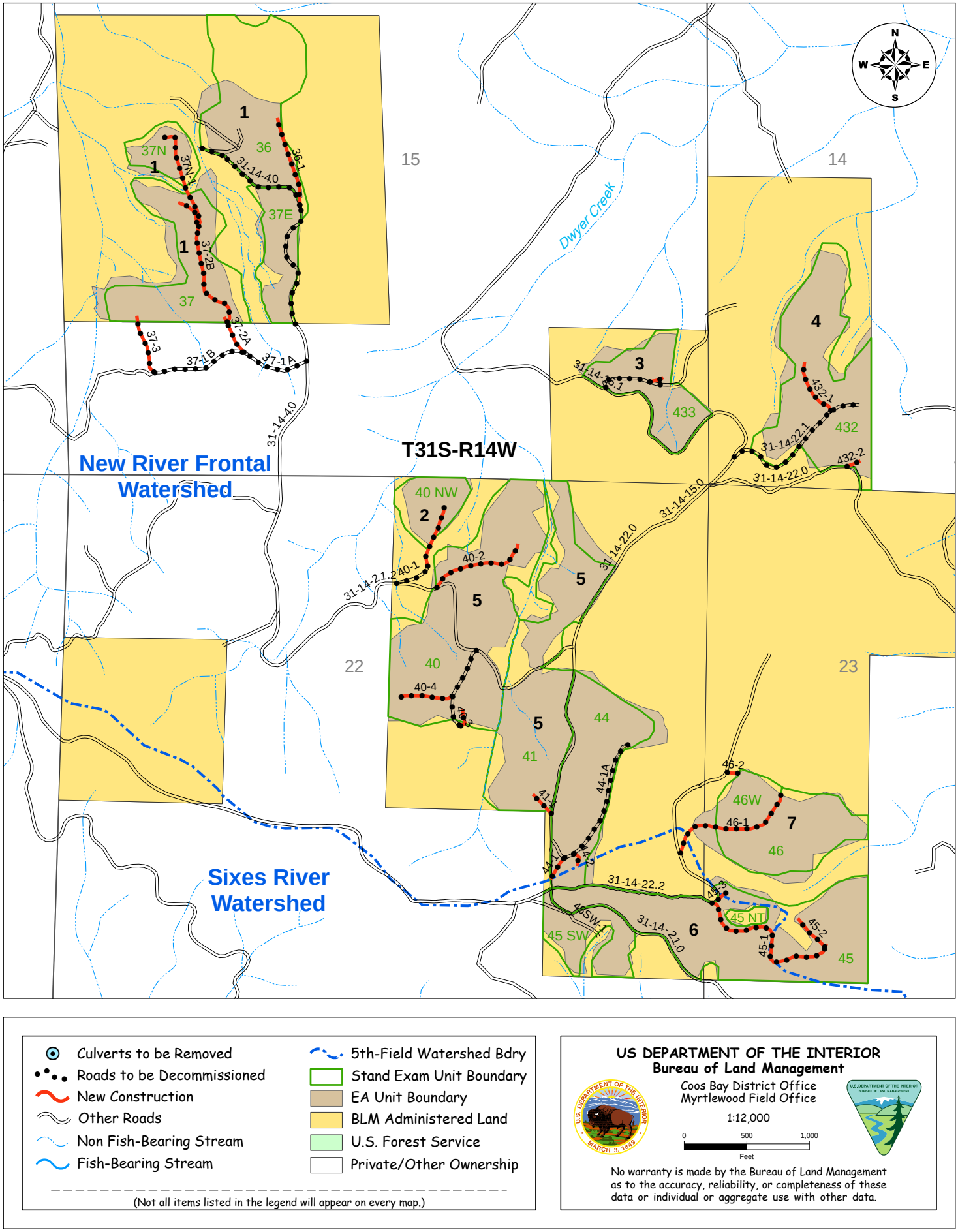
Figure 2(c). EA Unit Boundaries, Density Management Areas and Road Work.



Culverts to be Removed
Roads to be Decommissioned
New Construction
Other Roads
Non Fish-Bearing Stream
Fish-Bearing Stream
5th-Field Watershed Bdry
Stand Exam Unit Boundary
EA Unit Boundary
BLM Administered Land
U.S. Forest Service
Private/Other Ownership

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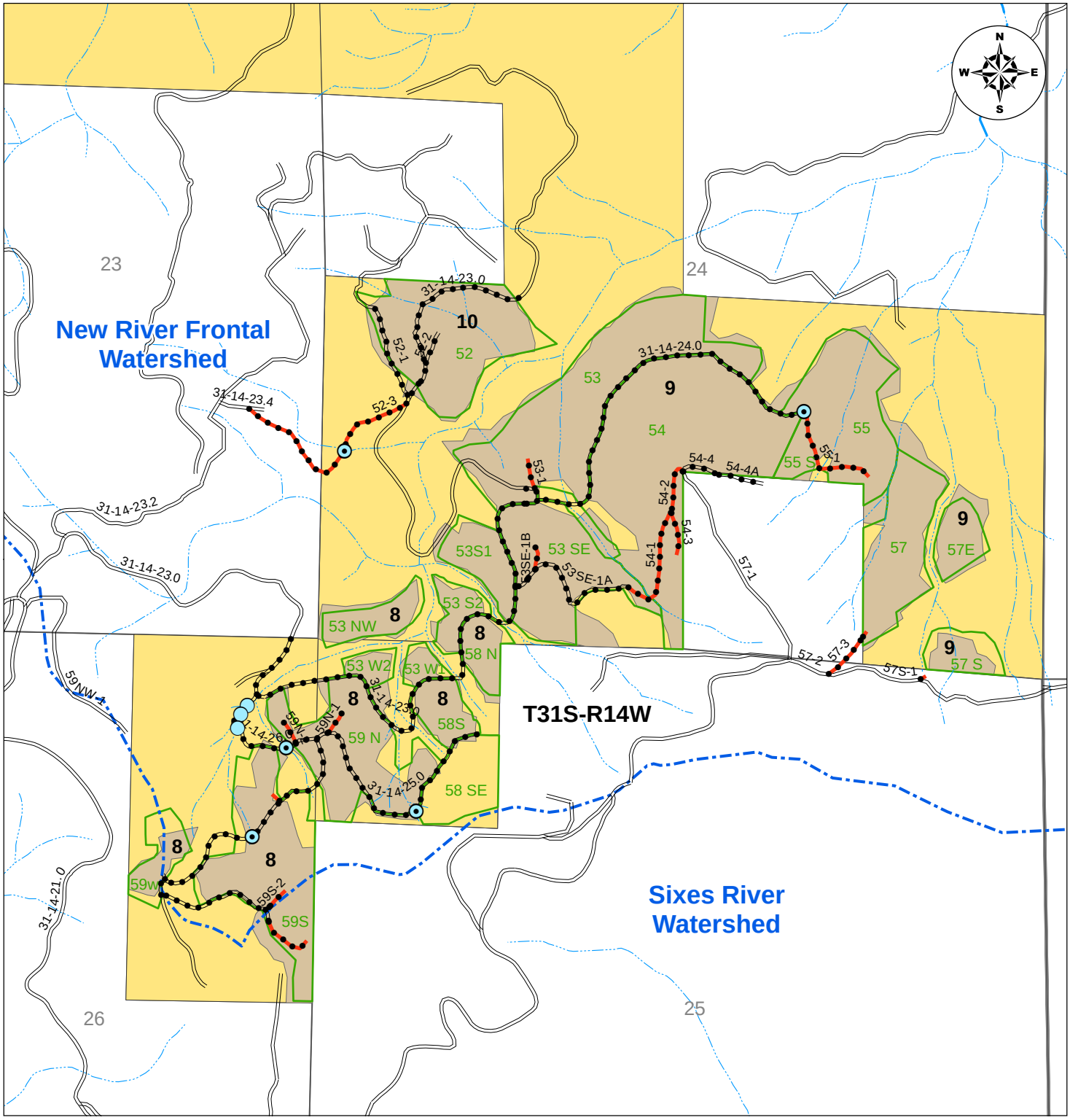
Figure 3(a). EA Unit Boundaries, Stand Exam Boundaries and Road Decommissioning.



Culverts to be Removed
Roads to be Decommissioned
New Construction
Other Roads
Non Fish-Bearing Stream
Fish-Bearing Stream
5th-Field Watershed Bdry
Stand Exam Unit Boundary
EA Unit Boundary
BLM Administered Land
U.S. Forest Service
Private/Other Ownership

(Not all items listed in the legend will appear on every map.)

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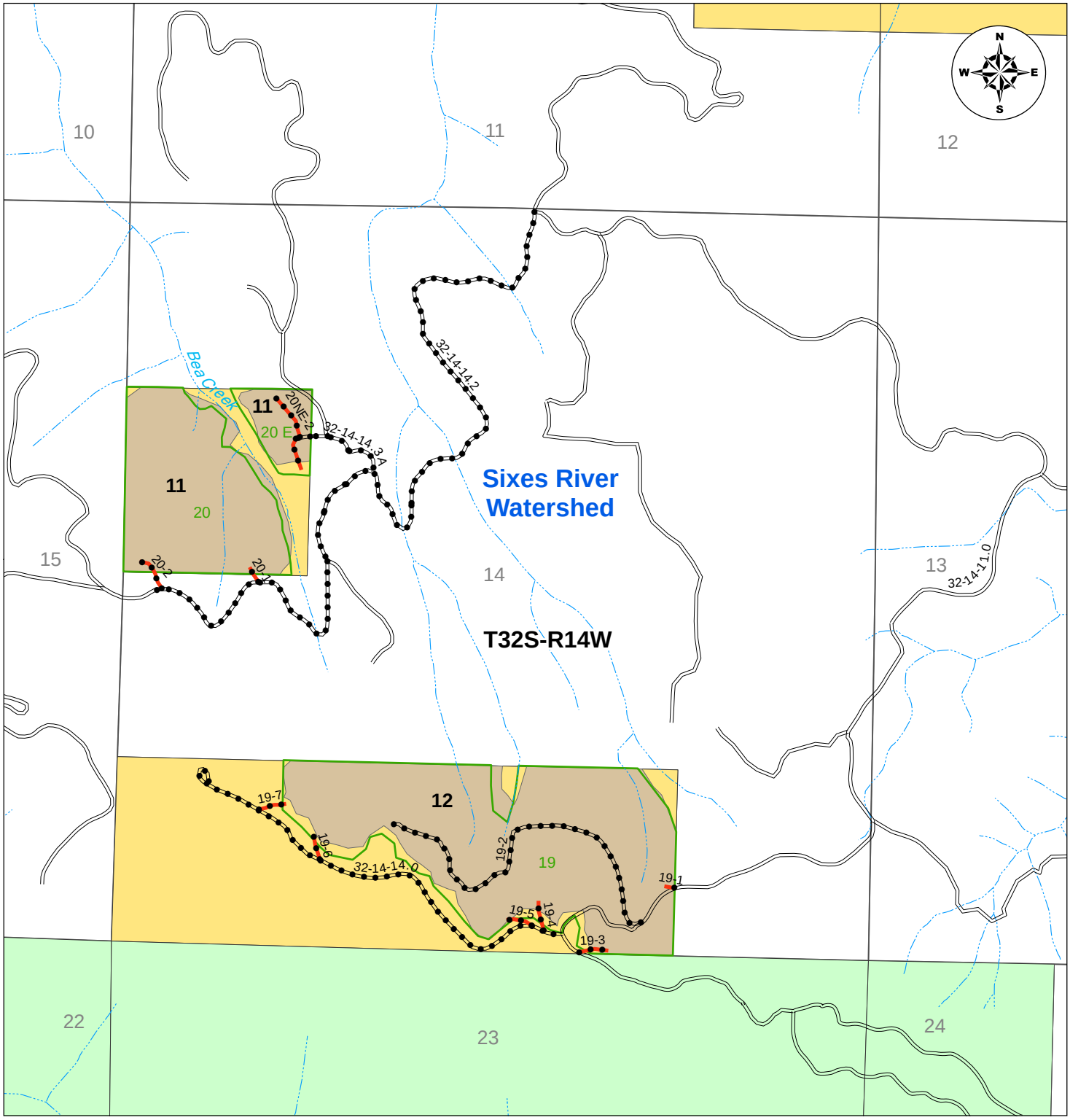
Figure 3(b). EA Unit Boundaries, Stand Exam Boundaries and Road Decommissioning.



Culverts to be Removed
Roads to be Decommissioned
New Construction
Other Roads
Non Fish-Bearing Stream
Fish-Bearing Stream
5th-Field Watershed Bdry
Stand Exam Unit Boundary
EA Unit Boundary
BLM Administered Land
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Figure 3(c). EA Unit Boundaries, Stand Exam Boundaries and Road Decommissioning.