

**U.S. Department of Interior
Bureau of Land Management
Roseburg District, Oregon**

Environmental Assessment for the Swiftwater Field Office

**Bell Mountain
Commercial Thinning & Density Management
EA #OR – 104 – 06 – 09**

This environmental assessment analyzes the environmental impacts associated with the Swiftwater Field Office's proposal for a commercial thinning project. The proposed commercial thinning harvest would occur on four scattered units (approximately 151 acres) of mid-seral, second-growth forest located in the Elk Creek Fifth-Field Watershed in Sections 14, 23 and 27; T22S, R07W; W.M. Of the 151 acres of treatment, approximately 2 acres would be removed for the development of spur roads. This project is within the General Forest Management Area and Connectivity/Diversity Block Land Use Allocations and is designed to help meet the Roseburg District's annual allowable sale quantity of 45 million board feet declared in the Roseburg District *Record of Decision and Resource Management Plan* (ROD/RMP, p. 8). This project is in conformance with management direction from the ROD/RMP.

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Chapter 1. Purpose and Need for Action

A. Background

Bell Mountain was previously analyzed as regeneration harvest and commercial thinning project in the Bell Mountain Regeneration Harvest and Commercial Thinning EA (EA# OR-104-98-03) released for public review July 14, 1998. The Bell Mountain timber sale was sold September 22, 1998 but the contract (OR100-100-TS99-03) was not awarded due to ongoing appeals and litigations at that time. Consequently, in March 2005 Bell Mountain was rejected by the high bidder.

Bell Mountain is now proposed as part of the FY2007 timber sale plan to be re-analyzed by the Swiftwater Field Office. The Bell Mountain timber sale will be re-analyzed as a commercial thinning and density management project. The regeneration harvest formerly included in the project has been deferred at this time.

This January 04, 2006 version of the Bell Mountain Commercial Thinning EA replaces the previous Bell Mountain Regeneration Harvest and Commercial Thinning EA (EA# OR-104-98-03) and its associated analyses and will reconsider the consequences of the proposed action. The previous Bell Mountain decision is no longer considered valid. If the decision is to implement the proposed action, a new decision will be issued for project.

B. Proposed Action

BLM proposes commercial thinning of four mid-seral forest stands (units) in the Elk Creek Fifth-Field Watershed. BLM analyzed potential harvest of approximately 155 acres. After interdisciplinary team review, approximately 4 acres were dropped from consideration since it was not economical to commercially thin those acres given the timber volume available there. As a result, the interdisciplinary team reduced the proposed harvest units to 151 acres. Table 1 below provides a summary of BLM's Proposed Action. Chapter 2 (pgs. 7-11) of this EA provides a detailed description of the Proposed Action Alternative.

It is anticipated that the proposed action would yield approximately 2.5 million board feet (MMBF) of timber in support of local and regional manufacturers and economies. Volume derived from treatments in the General Forest Management Area and Connectivity/Diversity Block land use allocations would contribute toward the annual allowable sale quantity (ASQ) of 45 MMBF for the Roseburg District. Timber volume derived from density management in Riparian Reserves would not be chargeable towards this objective.

Table 1. Bell Mountain Activity Summary.

	Activity	Total
Timber Harvest	Commercial Thinning	
	General Forest Management Area	106 acres
	Connectivity/Diversity Block	26 acres

	Density Management of Riparian Reserves General Forest Management Area Connectivity/Diversity Block	15 acres 4 acres
	Temporary Spur Right-of-Way	2 acres
Yarding	Cable Ground Based*	72 acres 79 acres
Hauling	Wet Season Dry Season Total Haul	6.15 miles 0.47 miles 6.62 miles
Road Activities	Roads to be Constructed Renovation of Existing Roads Improvement of Existing Roads Road Decommissioning with subsoiling Road Decommissioning without subsoiling	0.47 miles 5.59 miles 0.56 miles 0.04 miles 0.43 miles
Fuel Treatment	Machine Pile and Burn at Landings	9 acres

*Up to 10 acres of additional, incidental ground-based logging could occur in areas designated for cable logging for a total of 89 acres. This would include activities such as removal of guyline anchor trees and small isolated portions of units not readily yarded with a cable system.

C. Relevant Policies, Assessments, and Plans

1. National Policy and Northwest Forest Plan Level Guidance

This EA will consider the environmental consequences of the proposed action and no action alternatives in order to provide sufficient evidence for determining whether there would be impacts exceeding those considered in the Roseburg District PRMP/EIS which would require preparation of a Supplemental Environmental Impact Statement (SEIS). In addition to the PRMP/EIS, this analysis is tiered to assumptions and analysis of consequences provided by:

- The Final Supplemental Environmental Impact Statement (FSEIS) on Management of Habitat for Late-Successional and Old-Growth Related Species Within the Range of the Northern Spotted Owl (USDA, USDI 1994a);
- The FSEIS for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines in Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl (USDA, USDI 2001); and
- The FSEIS to Clarify Provisions Relating to the Aquatic Conservation Strategy (USDA, USDI 2004b).

Implementation of the proposed action would conform to management direction from the ROD/RMP which incorporates as management direction the standards and guidelines of the Record of Decision for Amendments (ROD) to Forest Service and Bureau of Land Management

Planning Documents Within the Range of the Northern Spotted Owl (USDA, USDI 1994b). The ROD/RMP is further amended by the Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines in Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl (USDA, USDI 2001) and the Record of Decision to Clarify Provisions Relating to the Aquatic Conservation Strategy (USDA, USDI 2004b).

Timber management on the Revested Oregon and California Railroad Lands (O&C Lands) managed by the Swiftwater Field Office is principally authorized and guided by: The Oregon and California Act of 1937:

- Section 1 of the O&C Act stipulates that suitable commercial forest lands revested by the government from the Oregon and California Railroad are to 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...” (pg. 5).
- The Federal Land Policy and Management Act (FLPMA): Section 302 at 43 U.S.C. 1732(a), directs that “The Secretary shall manage the public lands . . . in accordance with the land use plans developed by him under section 202 of this Act when they are available . . .”
- Roseburg District Record of Decision/Resource Management Plan (ROD/RMP): The ROD/RMP (USDI, BLM 1995b), approved in accordance with the requirements of FLPMA, provides specific direction for timber management.

2. Roseburg District ROD/RMP Guidance

The ROD/RMP assumed that suitable lands in the General Forest Management Area and Connectivity/Diversity Blocks would be managed in a manner consistent with the principles of sustained yield timber management. Once this decision was made, the primary unresolved issue regarding management of these lands is not if timber will be harvested, but when and how timber harvest will occur.

The Proposed Action was developed in conformance with and within the scope of impacts anticipated/analyzed by the Final - Roseburg District Proposed Resource Management Plan / Environmental Impact Statement (PRMP/EIS) dated October 1994 and its associated Roseburg District Record of Decision and Resources Management Plan (ROD/RMP) dated June 2, 1995. These documents were written to be consistent with federal statute including the O&C Act, Endangered Species Act, and the Clean Water Act (PRMP/EIS, pg. 1-3).

3. Watershed Level Guidance

The Elk Creek/Umpqua River Watershed Analysis (USDI, 2004; pg. 61) identified approximately 2,600 acres of mid-seral stands on General Forest Management Area and Connectivity/Diversity lands as high priority for commercial thinning in the next five years (i.e. 2004-2009) and an additional 1,150 acres of mid-seral stands as a moderate priority for commercial thinning within the next five to ten years (2009-2014). In addition, the watershed analysis also identified approximately 2,655 acres of mid-seral stands in Riparian Reserves as high priority for density management in the next five years and 1,005 acres as moderate priority within the next five to ten years (USDI, 2004; pg. 61).

Many of the growth rates in mid-seral forest stands within Connectivity/Diversity Blocks and General Forest Management Area are slowing while natural tree mortality is increasing. Thinning would bring a financial return on the planting, fertilizing, and pre-commercial thinning investment costs from previous years in the managed stands. Thinning would also provide a valuable product for the local and regional economy (USDI, 2004; pg. 61).

The Elk Creek/Umpqua River Watershed Analysis also specifically recommended the implementation of timber sales that had been sold through 2006 in Connectivity/Diversity Blocks and General Forest Management Areas (USDI, 2004; pg. 60). Bell Mountain commercial thinning was one of the sales identified (USDI, 2004; Figure 2-3).

D. Objectives

The objective of the proposed treatment is the reduction of the relative density of stands in order to maintain individual tree and stand vigor, consistent with stand and landscape objectives described in Appendix E of the Roseburg District ROD/RMP (pgs. 150-154).

The objectives of the proposed action are to:

1. Implement the following management direction from the ROD/RMP, pertaining to timber management on lands in the Matrix land use allocations.

- Provide a sustainable supply of timber and other forest commodities from the identified stands and thereby provide jobs and contribute to community stability (ROD/RMP, pgs. 15 and 33).
- Contribute to the Roseburg District's Allowable Sale Quantity (ASQ) of 45 MMBF (ROD/RMP, pgs. 8 and 60).

General Forest Management Area

- Manage forest land to assure a high level of sustained timber productivity (ROD/RMP, pg. 150).
- Maintain stand densities within desired ranges through commercial thinning and management of fine grained stand detail (ROD/RMP, pg. 151).

- Program commercial thinning entries for stands under 80 years of age. Design commercial thinning to assure high levels of volume productivity. Retain patches of denser habitat where desired to meet wildlife habitat criteria (ROD/RMP, pg. 151).

Connectivity/Diversity Blocks

- Manage forest land to assure a moderately high level of sustained timber production (ROD/RMP, pg. 151).
- Manage forests so that over time landscapes would trend toward a forest composed of stands containing a variety of structures, stands containing trees of varying age and size, and stands with an assortment of canopy configurations (ROD/RMP, pg. 152).
- Maintain stand densities within desired ranges through a combination of planting density, precommercial thinning, commercial thinning, and management of fine grained stand detail (ROD/RMP, pg. 153).
- Program commercial thinning entries for stands under 120 years of age. Design commercial thinning to usually assure high levels of volume productivity. Retain patches of denser habitat where desired to meet wildlife habitat criteria (ROD/RMP, pg. 153).

Riparian Reserves

- Design silvicultural activities to meet the objectives of the Aquatic Conservation Strategy (ROD/RMP, pg. 153).

2. Comply with 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..."

The timber volume derived from treatments in the General Forest Management Area and Connectivity/Diversity Block land use allocations would contribute to the Roseburg District annual ASQ, supporting socio-economic benefits envisioned in the PRMP/EIS (Vol. 1, p. xii).

E. Decision Factors

Factors to be considered when selecting among alternatives will include:

- The degree to which the objectives previously described 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 nature and effectiveness of measures to mitigate impacts to resources including, but not limited to wildlife and wildlife habitat, soil productivity, water quality, air quality,

and the spread of noxious weeds;

- 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, National Historic Preservation Act; and other programs such as Special Status and Survey & Manage Species).
- How to provide timber resources, and revenue to the government from the sale of those resources, while reducing the short-term and long-term cost of managing lands in the project area.
- Partial recovery of the investment already made by the BLM in the Bell Mountain project through analysis and field work that was performed during previous iterations of the project.

Chapter 2. Discussion of Alternatives

This section describes the No Action and Proposed Action alternative, and alternatives considered but eliminated from detailed analysis. These alternatives represent a range of reasonable potential actions that would meet the reasons for taking this action, and the objectives to be met through taking the action. This section also discusses specific project design features that would be implemented under the proposed action alternative.

A. The No Action Alternative

The No Action Alternative provides a baseline for the comparison of the alternatives. This alternative describes the existing condition and continuing trends anticipated in the absence of the proposal but with the implementation of other reasonably foreseeable federal and private projects. Under the ROD/RMP, the majority of harvest and silvicultural activities are scheduled to occur within the Matrix land use allocation. If the no action alternative were selected there would be no harvesting of timber within the bounds of the project area at this time.

Harvest at this location for purposes of analysis would be deferred for the foreseeable future. Selection of this alternative would not constitute a decision to re-allocate these lands to non-commodity uses. Future harvesting in this area would not be precluded and could be considered again under a subsequent EA. Road maintenance would be on a sporadic “as needed” basis for the primary purpose of keeping roads open to traffic.

B. The Proposed Action Alternative

This alternative proposes the offering of a timber sale contract that would result in commercial thinning and density management of mid-seral stands that would yield approximately 2.5 MMBF of timber towards the Roseburg District's annual harvest commitment of 45 MMBF. The proposed action consists of the following activities (for a summary listing of these actions, see Table 1, page 2).

1. Timber Harvest

a) Treatment Prescription

Four units (14A, 23A, 27A, and 27B) consisting of approximately 151 acres of mid-seral forest, aged 47 to 55 years, would be commercial thinned and have density management treatments applied (refer to Appendix B for maps of the proposed units).

Commercial thinning and density management would be used to reduce the number of trees in stands dominated by Douglas-fir that are generally even-aged. Trees would primarily be removed from the suppressed and intermediate canopy classes, although some co-dominant and dominant trees could be removed where necessary to meet specific density objectives.

Generally, trees selected for retention would have at least a 30 percent live crown ratio so that live crown expansion and accelerated diameter growth would be more likely following thinning (Daniel, et. al. 1979).

Older remnant trees may be present, but are not the numerically predominant stand components or the focus of thinning and density management treatments. Large remnant trees would be retained to the greatest degree practicable. Circumstances under which these trees could be cut would be limited to: road rights-of-way; clearing landing areas; and operational safety concerns subject to Oregon State laws and regulations. Conversely, since treatments would focus on removal of intermediate and suppressed canopy layers, it is possible that suppressed trees designated for cutting may include trees older than the prevailing stand age.

The marking prescription for the proposed units is to retain approximately 100-120 square feet of basal area in the upland treatment area (132 acres; Table 2) and 120-140 square feet of basal area in the Riparian Reserves (19 acres; Table 2). This prescription is designed to maintain full site occupancy of commercial species in the uplands, and provide trees that will contribute to snags and coarse woody debris in the Riparian Reserves. Minor conifer species and hardwoods greater than 8 inches diameter breast height would be retained in uplands and reserves.

The Riparian Reserves will be surveyed two years post treatment to determine the need for snags and CWD. If surveys indicate there is a deficiency in snags and CWD they will be created using dominant and co-dominant trees. This work would be performed within one year of the completion of surveys.

Table 2. Silvicultural Prescription Summary.

Project Unit	Acres	Silvicultural Prescription		Right-of Way Harvest (acres)
		Upland Treatment (acres)	Riparian Reserve Treatment (acres)	
14A	29	24	5	2.0
23A	92	82	10	0.2
27A	13	9	4	0
27B	17	17	0	0
Total	151	132	19	2.2

b) Stream Buffers

Within Riparian Reserves, variable-width “no-harvest” buffers would be established to protect stream bank integrity, maintain streamside shade and provide a filtering strip for overland run-off. Variable buffer width would be based on slope break and would have a width between 20 to 50 feet measured from the center of the stream channel. Actual widths would vary subject to an on-the-ground evaluation and consideration of factors such as unique habitat features, streamside topography and vegetation. The perennial, non-fish bearing stream in Unit 23A would have a minimum variable-width buffer of 40 feet.

No equipment operation would be allowed within the “no-harvest” buffers. If necessary to fell trees within the “no-harvest” buffers for operational purposes, the felled trees would be left in place to provide in-stream wood and protection for stream banks.

c) Timber Cruising

Timber cruising would employ methods that could include the felling of sample trees in upland stands to formulate local volume tables. The environmental effects of sample tree felling would be consistent with those described in the Roseburg District 3P Fall, Buck and Scale EA (USDI, BLM 2000). Felled sample trees would become part of the offered sale volume. This project would yield approximately 2.5 MMBF of timber towards the Roseburg District's annual harvest commitment of 45 MMBF.

A small amount of additional timber could potentially be included as a modification to this project. These additions would be limited to the removal of individual trees or small groups of trees that are blown down, injured from logging, are a safety hazard, or trees needed to facilitate the proposed action. Historically, this addition has been less than ten percent of the estimated sale quantity.

d) Firewood

Firewood cutting and salvaging of logging debris (slash) could occur in cull decks, logging landings, and near roads after the commercial thinning and density management activities are completed.

2. Timber Yarding

The Proposed Action would require a mix of skyline cable yarding (72 acres) and ground-based tractor yarding (79 acres; Table 3). Up to 10 acres of additional, incidental ground-based logging may be necessary (i.e. removal of guyline anchor trees, isolated portions of units, etc.) and would occur on gentle slopes (less than 35 percent), during the dry season.

Table 3. Timber Yarding Summary.

Project Unit	Yarding Method (acres)		
	Aerial	Cable	Ground
14A	0	24	5
23A	0	48	44
27A	0	0	13
27B	0	0	17
Total	0	72	79+10*

* Up to 10 acres of additional, incidental ground-based yarding may occur.

3. Timber Hauling

Approximately 6.15 miles of rocked road and 0.47 mile of unsurfaced road would be used for the hauling of timber, for a total of 6.62 miles of haul route. A total of 5.59 miles of existing road would be renovated (brought back to its original design) and utilized for wet-season haul. Approximately 0.56 miles of existing road would be improved (improved beyond its original design) and used for wet-season haul. Approximately 0.47 miles of newly constructed natural surfaced spurs would be used for dry-season haul.

4. Fuel Treatment

Prescribed burning of slash (burning under the direction of a written site specific prescription or “Burn Plan”) would occur at machine-piled piles at logging landings. Remaining fine fuels generated during the thinning process would be scattered throughout the treatment units.

5. Road Activities (Construction, Improvement, Renovation, and Decommissioning)

The proposed project would include dry season and wet season logging activities and use existing roads to the greatest extent practical. Following the PDFs described on pg. 12, road construction, improvement, renovation, and decommissioning would be restricted to the dry season (normally May 15 to Oct. 15).

a) Construction

Approximately 0.47 miles of new spur roads (Spurs #2, #3, and #4) would be constructed. A majority of temporary road construction would take place within the units. Approximately 350 feet of Spur #4 would be constructed outside of treatment unit boundaries (i.e. 250 feet on BLM administered lands but within the same stand proposed for treatment and 100 feet on private, industrial timber lands). Spur #4 is proposed as a natural surface road for economic reasons, but the purchaser may surface this spur with a minimum of 6-8 inches of rock, that meets BLM specifications, at the purchaser’s expense.

b) Improvement

Approximately 0.56 miles of existing road (road no. 22-7-27.2 and 22-7-23.0) would be improved. Road improvement would consist of stabilizing cut and fill slopes, installing or maintaining drainage structures (culverts and drainage ditches), reshaping the road surface, installing eight inches of rock for the base course, surfacing with four inches of rock, and brushing road shoulders.

c) Renovation

Approximately 5.59 miles of existing roads would be renovated (road no. 22-7-20.0, 22-7-22.0, 22-7-22.2, 22-7-22.4, 22-7-23.0, 22-7-23.2, 22-7-23.4, 22-7-23.6, and 22-7-23.8). Road renovation would consist of installing or maintaining drainage structures (culverts and drainage ditches), reshaping the road surface, surfacing with four inches of rock where deficient, and brushing road shoulders.

d) Culverts

A total of seven existing stream culverts (on two perennial, four intermittent, and one ephemeral stream) would be replaced. A total of 27 new ditch-relief/cross-drain culverts would be installed or replaced.

e) Decommissioning

Natural surfaced Spurs #2 and #3 would be decommissioned by blocking with trench barriers, water-barring, subsoiling, and mulching with logging slash where available or with straw if logging slash is not available (0.04 miles). Spur #4 would be decommissioned by blocking with a trench barrier, water-barring, and mulching with logging slash where available or with straw if logging slash is not available (0.43 miles). Spur #4 would not be subsoiled since it is anticipated that it would be needed for future harvest operations.

C. Project Design Features as part of the Action Alternative

1. To protect riparian habitat:

- a. To protect aquatic resources within riparian areas a variable width streamside no-harvest buffer has been established along all streams. The buffer width would be between 20 to 50 feet measured from the center of the stream channel for all intermittent, non-fish bearing streams. The perennial, non-fish bearing stream in Unit 23A would have a minimum variable-width buffer of 40 feet.
- b. No equipment operation would be allowed within the “no-harvest” buffers. If necessary to fell trees within the “no-harvest” buffers for operational purposes, the felled trees would be left in place to provide in-stream wood and protection for stream banks.
- c. The integrity of the riparian habitat would be protected from logging damage by directionally felling trees away from or parallel to the Riparian Reserve (BMP I B2; RMP, pg. 130). No road building would take place within the Riparian Reserve
- d. Prior to attaching any logging equipment to a reserve tree, precautions to protect the tree from damage shall be taken. Examples of protective measures include cribbing (use of sound green limbs between the cable and the bole of the tree to prevent girdling), tree plates, straps, and plastic culvert. If, for safety reasons, it would be necessary to fall a reserve tree then it would be left as coarse woody debris.

2. To minimize soil erosion as a source of sedimentation to streams and to minimize soil productivity loss from soil compaction, loss of slope stability or loss of soil duff layer:

a. Measures to limit soil erosion and sedimentation from roads would consist of:

- (1) Maintaining existing roads (see Appendix B) to fix drainage and erosion problems. This would consist of maintaining existing culverts, installing additional culverts, stabilizing unstable cut and fill slopes, and replenishing road surface with crushed rock where deficient (BMP II H; RMP, pg. 137). Approximately six additional cross drains would be installed to reduce the effective stream extensions due to ditchline and associated sediment delivery and one stream-crossing culvert would be replaced. In-stream work would be limited to periods of low or no flow (between July 1st and September 15th).
- (2) New spur roads would be located outside of Riparian Reserves (BMP II B1; RMP, pg. 132), located on ridge tops and geologically stable (0 – 20 percent slope) areas (BMP II B2; RMP, pg. 132), and would be constructed with minimal width of 14 feet to minimize soil disturbance (BMP II C6; RMP, pg. 132).
- (3) Restricting road work and log hauling on naturally surfaced roads to the dry season (normally May 15th to October 15th). Operations during the dry season would be suspended during periods of heavy precipitation. This season could be adjusted if unseasonable conditions occur (e.g. an extended dry season beyond October 15 or wet season beyond May 15).

(4) Restricting improvement and renovation on rocked roads to the dry season (normally May 15th to October 15th). Operations during the dry season would be suspended during periods of heavy precipitation. This season could be adjusted if unseasonable conditions occur (e.g. an extended dry season beyond October 15th or wet season beyond May 15th).

(5) Prior to any wet season haul on surfaced roads, sediment reducing measures (e.g., placement of straw bales and/or silt fences) would be placed near stream crossings, if sediment is reaching the streams.

(6) Over-wintering natural surface spur roads in a condition that is resistant to sedimentation. This would be done by building, using and winterizing natural surface spur roads prior to the end of the operating season. Winterization would include: installation of waterbars, mulching the running surface with straw, seeding and mulching bare cut and fill surfaces with native species (or a sterile hybrid mix if native seed is unavailable), and blocking. Implementation of over-wintering measures would be restricted to the dry season (normally May 15th to October 15th).

For all spur construction, new cut and fill slopes would be mulched with sterile straw, or equivalent, and seeded with a native or sterile hybrid mix.

b. Measures to limit soil erosion and sedimentation from logging would consist of:

(1) Use of cable logging systems that limits ground disturbance. This would include the use of partial suspension (BMP I C1a; RMP, pg. 130). Partial suspension lifts or suspends the front end of the log during in-haul to the landing, thereby lessening the “plowing” action that disturbs the soil. In some limited, isolated areas, partial suspension may not be physically possible due to terrain or lateral yarding. Excessive soil furrowing would be hand waterbarred and filled with limbs or other organic debris.

(2) Limiting ground-based logging to the dry season as described above (BMP I C2d; RMP, pg. 131).

c. Measures to limit soil compaction (RMP, pg. 37) would consist of:

(1) Limiting ground-based logging in all units and subsoiling to the dry season (May 15 to Oct. 15) when soils are least compactable (BMP I C2d; RMP, pg. 130). However, this season could be adjusted if unseasonable conditions occur (e.g., an extended dry season or wet season). Also, operations would be suspended during dry season periods of unseasonably wet soil moisture if detrimental soil displacement and compaction would occur (i.e. 15 percent or more gain in bulk density and alteration of the soil surface structure to a depth greater than four inches).

(2) Machines used for incidental ground-based logging would be limited to a track width no greater than 10.5 feet (BMP I C2j; RMP, pg. 131); skid and forwarder trails would be limited to slopes less than 35 percent (BMP I C2b; RMP, pg. 131); yarding would be confined to designated skid and forwarder trails (BMP I C2c; RMP, pg. 131), and skid trails would have an average spacing of at least 150 feet apart and harvester/forwarder trails would be spaced at least 50 feet apart where topography allows.

(3) Harvesters would cut trees no further than twelve inches from the ground so that there

would be enough stump clearance for subsoiling excavators. Harvesters would delimb trees in the trails in front of their advance to cushion against compaction.

(4) All main ground-based trails that have more than 50 percent exposed mineral soil would be subsoiled after thinning operations are complete. Trails that have less than 50 percent exposed mineral soil would also be subsoiled unless field evaluation shows that detrimental compaction (e.g. 15 percent or more gain in bulk density and alteration of the soil surface structure to a depth greater than four inches) is not extensive enough to need subsoiling.

d. Measures to protect the duff and surface soil layer (RMP, pg. 36) would consist of:

(1) Burning of slash during the late fall to mid-spring season when the soil and duff layer (soil surface layer consisting of fine organic material) moisture levels are high (BMP III D1b, pg. 140) and the large down logs have not dried. This practice would protect the soil duff layer and down logs from being totally consumed by fire and the surface layer from being negatively altered (i.e., loss of organic matter, erosion, change of soil physical properties, alteration of soil ecology and soil nutrients).

e. Measures to protect slope stability would consist of:

(1) Locating new roads in stable locations (BMP II B2; RMP, pg. 132) with sufficient drainage structures (BMP II D; RMP, pg. 133). Partial suspension and waterbarring yarding trails that are excessively furrowed (as described above under “Measures to limit soil erosion and sedimentation from logging”) would also reduce the risk of slope failure and limit erosion.

(2) On the potentially unstable area (six acres with 65 to 90 percent slopes) in the southeast portion of Unit 23A, no cable yarding shall be permitted from November 15th - April 15th, both days inclusive, or during other periods when soil moisture is high (greater than 30 percent), unless waived by the Authorized Officer.

3. To retain biological legacies for present and future wildlife components:

a. Within the density management treatment in Riparian Reserve, snags and coarse woody debris would be retained or created in the following manner:

(1) Snags that are greater than 20 inches DBH and greater than 16 feet tall would be retained. Tree marking was designed to protect existing snags to the extent possible. Those that pose a safety concern would be cut and left for coarse woody debris.

(2) Within two years of the completion of harvest activities, if there are less than three snags/acre on north slopes and one snag/acre on south slopes, snags would be created on a per acre basis to meet the minimum interim needs. Trees damaged from the harvest would be preferentially selected for girdling and recruited as snags.

(3) All existing coarse woody debris would be retained.

(4) Within two years of the completion of harvest activities, up to two trees per acre (38 trees) would be felled for additional coarse woody debris recruitment. Trees damaged from the harvest would be preferentially selected for falling and recruited as coarse

woody debris.

b. Within the upland portions of the harvest units (i.e. outside of Riparian Reserves), snags and coarse woody debris would be retained or created in the following manner:

(1) Snags that are greater than 20 inches DBH and greater than 16 feet tall would be retained. Tree marking was designed to protect existing snags to the extent possible. Those that pose a safety concern would be cut and left for coarse woody debris. The residual stand following harvest would provide a pool of candidate trees for future snag recruitment and additional snags may be created incidentally through the harvest operations.

(2) During partial harvests early in the rotational cycle it is not necessary to fall the larger dominant or co-dominant trees to provide coarse woody debris logs (USDI, 2005a; pg. 51).

(3) The residual stand following harvest would provide a pool of candidate trees for future coarse woody debris recruitment and additional woody debris may be created incidentally through the harvest operations.

4. To protect air quality:

All slash burning would have an approved “Burn Plan” and be conducted under the requirements of the Oregon Smoke Management Plan and done in a manner consistent with the requirements of the Clean Air Act (ODEQ, 1992).

5. To prevent and/or control the spread of noxious weeds:

Logging and construction equipment would be required to be clean and free of weed seed prior to entry on to BLM lands (BLM Manual 9015-Integrated Weed Management).

6. To protect cultural resources:

If any objects of cultural value (e.g. historic or prehistoric ruins, graves, fossils or artifacts) are found during the implementation of the proposed action that were not found during pre-harvest surveys, operations would be suspended until the site has been evaluated for implementation of appropriate mitigation.

7. To protect Special Status, and SEIS Special Attention Plants and Animals:

a. Special Status (Threatened or Endangered, proposed Threatened or Endangered, Candidate Threatened or Endangered, State listed, Bureau Sensitive, Bureau Assessment, or Special Provision) and Special Attention plant and animal sites would be protected where needed to avoid listing of species and conserve candidate species, according to established management recommendations (RMP, pg. 40).

b. If during implementation of the proposed action, any Special Status Species are found that were not discovered during pre-disturbance surveys; operations would be suspended and appropriate protective measures would be implemented before operations would be resumed.

c. There are currently no known sites, activity centers, or unsurveyed suitable habitat within 65 yards of Units 14A, 23A, 27A, or 27B. Therefore, harvest activities (e.g. falling, bucking, yarding) are not seasonally restricted due to northern spotted owl concerns, unless future surveys locate a nest site within 65 yards of the proposed project area.

d. Prescribed burning would not occur within 440 yards of any unsurveyed suitable habitat, known northern spotted owl nest site, or activity center from March 1st through June 30th, unless current calendar year surveys indicate: 1) spotted owls not detected, 2) spotted owls present, but not attempting to nest, or 3) spotted owls present, but nesting attempt has failed. Waiver of seasonal restriction is valid until March 1 of the following year. Prescribed burning is proposed within 440 yards and is therefore seasonally restricted.

8. To prevent and report accidental spills of petroleum products or other hazardous material and provide for work site cleanup:

The operator would be required to comply with all applicable State and Federal laws and regulations concerning the storage, use and disposal of industrial chemicals and other hazardous materials. All equipment planned for instream work (stream culvert replacement) would be inspected beforehand for leaks. Accidental spills or discovery of the dumping of any hazardous materials would be reported to the Authorized Officer (Sale Administrator) and the procedures outlined in the “Roseburg District Hazardous Materials (HAZMAT) Emergency Response Contingency Plan” would be followed. Hazardous materials (particularly petroleum products) would be stored in durable containers and located so that any accidental spill would be contained and would not drain into watercourses. All landing trash and logging and construction materials would be removed from the project area.

D. Monitoring

The RMP (pg. 85) specifies that management activities would be monitored and the results reported on an annual basis. Monitoring would be done in accordance with the RMP guidelines outlined in Appendix I.

E. Resources that Would be Unaffected by Either Alternative

1. Resources Not in Project Area

The following resources or concerns are not present and would not be affected by either of the alternatives:

- Special areas (Areas of Critical Environmental Concern, Research Natural Areas, etc...)
- Minority populations or low income populations
- Farm Lands (prime or unique)
- Floodplains/ Wetlands
- Hazardous Waste
- Wild and Scenic Rivers
- Wilderness

2. Cultural Resources

The project area was inventoried (October 2006) for cultural resources and none were discovered. It was determined that there would be no effect to any cultural resources since none were identified in the Bell Mountain project area. Cultural resources will not be discussed further.

3. Native American Religious Concerns

No Native American religious concerns were identified by the interdisciplinary team or through correspondence with local tribal governments.

4. Indian Trust Resources

Secretarial Order No. 3175 (November 8, 1993) requires that any significant impact to Indian trust resources be identified and addressed in NEPA documents. There are no known Indian trust resources on the Roseburg District. Therefore, this project is expected to have no impacts to Indian Trust resources and will not be discussed further.

5. Environmental Justice

The proposed action is consistent with Executive Order 12898 which addresses Environmental Justice in minority and low-income populations. The BLM has not identified any potential impacts to low-income or minority populations, either internally or through the public involvement process, arising from this type of activity.

6. National Energy Policy

Executive Order 13212 provides that all decisions made by the BLM will take into consideration adverse impacts on the President's National Energy Policy. This project would not have a direct or indirect adverse impact on energy development, production, supply, and/or distribution and therefore would not adversely affect the President's National Energy Policy. Therefore, the President's National Energy Policy will not be discussed further in this EA.

7. Healthy Lands Initiative

This project would be consistent with the Healthy Lands Initiative. This project would be in compliance with the Roseburg District ROD/RMP which has been determined to be consistent with the standards and guidelines for healthy lands (43 CFR 4180.1) at the land use plan scale and associated time lines. Therefore, the Healthy Lands Initiative will not be discussed further in this EA.

8. Recreation

Recreation would not be impacted by the proposed action because there are no designated recreation sites in or near the Bell Mountain project area. Access into the project area is limited (Units 27A and 27B) due to gates on the 22-7-22.0 road and the 27-2-22.2 road. There is still access to portions of the project area through other routes. The proposed action would not alter the existing recreational opportunities (e.g. hunting and hiking) within the project area.

9. Visual Resources

The Bell Mountain timber sale is located on lands classified in the Roseburg District ROD/RMP as Visual Resource Management Classes IV, which, "... allows for major modification of the landscape." (ROD/RMP p. 52). Visual modification through commercial thinning and density management activities as described by the proposed action is consistent with ROD/RMP

management direction.

10. Critical Elements of the Human Environment

“Critical Elements of the Human Environment” is a list of elements specified in BLM Handbook H-1790-1 that must be considered in all EA's. These are elements of the human environment subject to requirements specified in statute, regulation, or Executive Order. Consideration of “Critical Elements of the Human Environment” is given in Appendix C of this EA.

Chapter 3. Affected Environment & Consequences by Resource

This chapter discusses specific resource values that may be affected, the nature of the short-term and long-term effects, including those that are direct, indirect and cumulative, that may result from implementation of the alternatives. The discussion is organized by individual resources. It addresses the interaction between the effects of the proposed thinning and density management with the current environment, describing effects that might be expected, how they might occur, and the incremental effects that could result.

The Council on Environmental Quality (CEQ) provided guidance on June 24, 2005, as to the extent to which agencies of the Federal government are required to analyze the environmental effects of past actions when describing the cumulative environmental effect of a proposed action in accordance with Section 102 of the National Environmental Policy Act (NEPA). CEQ noted the “[e]nvironmental analysis required under NEPA is forward-looking,” and “[r]eview of past actions is only required to the extent that this review informs agency decision making regarding the proposed action.” This is because a description of the current affected environment inherently includes effects of past actions. Guidance further states that “[g]enerally, agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historic details of individual past actions.”

The cumulative effects of the BLM timber management program in western Oregon have been described and analyzed in the PRMP/EIS and FSEIS, incorporated herein by reference.

A. Forest Vegetation

1. Affected Environment

The dominant conifer species is Douglas-fir. Other conifer species in association includes incense-cedar, western hemlock, western red cedar, and grand fir. The following hardwoods and ground vegetation are common when there is sufficient light available: Pacific madrone, golden chinkapin, big leaf maple, salal, Oregon grape and sword fern.

The Forest Operations Inventory states that the stands proposed for treatment were established (date of birth) in the 1950's or 1960's. Unit 23A was pre-commercially thinned in the 1980's. Stands are exhibiting signs of being overstocked by decreased crown ratios (Table 5) and low amounts of ground cover within the stands proposed for treatment.

Stand exams were done in 2006 for Unit 14A, in 1997 for Units 23A and 27B, and in 1986 for Unit 27A. Using the stand exam data that was collected at different time periods, the current condition of the stands were modeled in ORGANON version 8.1 (shown in Table 4). Based on stand exam plot data, there is no decay class 1 or 2 coarse woody debris that is typical of the development cycle of the stand (i.e. logs 10-16 inches diameter). However, there is approximately 342 linear feet per acre of decay class 1 or 2 logs 3-8 inches diameter.

Table 4: Current Conditions of Stands Proposed for Treatment.

Unit	Stand Age	Trees per Acre	Basal Area in sq. ft.	Quadratic Mean Diameter in inches	Relative Density Index	Percent Canopy Closure	Average Crown Ratio
14A	54	243	350	16.3	.99	188	0.31
23A	47	196	250	15.3	.73	154	0.42
27A	55	328	292	12.8	.92	191	0.31
27B	47	477	259	10.0	.90	200	0.30

2. No Action Alternative

In the absence of thinning, relative stand densities would continue to increase with a corresponding increase in suppression mortality among trees in the suppressed and intermediate crown classes. Over time, canopies would remain closed and the crowns of individual trees would continue to recede, resulting in increased suppression and stagnated tree growth.

Live crown ratios of the overstory trees would continue to recede from the current levels to less than 30 percent, in most instances, with a corresponding decline in vigor and stagnation in growth. Closely spaced trees with small crowns have a reduced photosynthetic capacity which results in decreased diameter growth and diminished resistance to disease and insects. As trees increase in height with little increase in diameter, they become unstable and more susceptible to wind damage (Oliver and Larson, 1996). The likelihood of a favorable response to any future thinning treatments would also decrease.

An objective for management of Riparian Reserves is the development of late-successional forest characteristics. Single-storied stands would not develop into multi-storied stands without altering the present growth and developmental trajectories. In the absence of disturbance, shade-tolerant species (i.e. grand fir, western red cedar) remain suppressed in the understory and there would be insufficient sunlight to allow conifer and hardwood regeneration. As snags deteriorate and fall, their numbers would decline. As large down wood decays, its availability would also decline. Suppression mortality would primarily occur in smaller trees and not provide a continuum of the larger material that would persist over time.

Failure to treat Riparian Reserves would result in the largest trees being at a distance from streams where there would be little potential for in-stream recruitment. Suppression and elimination of hardwoods from the Riparian Reserves would further simplify the vegetative composition of the stands, inconsistent with ACS objectives.

3. Proposed Action Alternative

In the General Forest Management Area and Connectivity/Diversity Block units thin from below to retain approximately 100-120 square feet of basal area in the upland treatment area and 120-140 square feet of basal area in the Riparian Reserves. This prescription is designed to maintain full site occupancy of commercial species in the uplands, and provide trees that will contribute to snags and coarse woody debris in the Riparian Reserves. Minor conifer species and hardwoods greater than 8 inches diameter breast height, existing snags, CWD, and large remnant trees would be retained. Generally, trees selected for retention would have at least a 30 percent live crown ratio so that live crown expansion and accelerated diameter growth would be more likely

following thinning (Daniel, et. al. 1979).

The higher retention in the Riparian Reserve would allow for follow up treatments to create coarse woody debris and snags if necessary. Post-harvest surveys on treated stands would determine levels of coarse woody debris and snags. A follow-up treatment would occur to fell and girdle trees to meet the goal of: 2 trees per acre for CWD and 3 trees per acre on the North aspects and 1 tree per acre on the South aspect for snags.

4. Cumulative Effects

Logging, road building and planting have converted much of the original forest into young Douglas-fir plantations. The BLM manages 45,000 acres in the Elk Creek fifth-field watershed, representing 24 percent of all ownership. It is estimated that approximately 20,000 acres or 44 percent of BLM lands within Elk Creek watershed were clear-cut harvested, the vast majority of these occurring between 1945 and 1995. Between 1972 and 2002, 20 percent of the total watershed lands had a major vegetation change due to timber harvesting. Three percent of this has been on federal lands and the other 17 percent has been on private. (Elk Creek/Umpqua River Watershed Analysis, pgs. 10-14).

Conifer forest accounts for 72 percent of the watershed. In 2002, the age class distribution of these forest lands was: 40,000 acres of early-seral forest, less than 30 years of age, representing 21 percent of all early seral forest in the Elk Creek fifth-field watershed; 74,000 acres of mid-seral stands, 30 to 80 years of age, representing 40 percent of all mid-seral forest in the Elk Creek fifth-field watershed; and 20,000 acres of mature forest, greater than 80 years of age, representing 11 percent of all mature forest in the Elk Creek fifth-field watershed. (Elk Creek/Umpqua River Watershed Analysis, pg. 15).

Within the Elk Creek/Umpqua River watershed, harvest on private lands is estimated to be on a 40 to 50 year rotation (Elk Creek/Umpqua River Watershed Analysis, pg. 11). It is estimated that 20,000 to 30,000 acres of mid-seral forests will be converted to early seral forest in the next decade from timber harvest on private lands. During this time period it is estimated that the same amount of early seral forests will grow and become mid-seral forests maintaining similar amounts of early and mid-seral forest habitat within the watershed.

Currently, BLM is commercially thinning about 470 acres of mid-seral forests and is in the planning phase for commercially thinning another 7,000 to 8,000 acres over the next decade. Commercial thinning would not change the amount of mid-seral forest on BLM administered lands.

B. Wildlife

1. Federally Threatened & Endangered Wildlife Species

a) Bald Eagle

(1) Affected Environment

There are no known bald eagle nest sites within the proposed project area. Based on current surveys (2006) the nearest known bald eagle nest site (Brads Creek) is

approximately 3.4 miles to the south. There have been repeated bald eagle sightings within the action area, indicating possible nesting within the vicinity between the Umpqua River and Elk Creek.

There is no critical habitat designated for the bald eagle. The proposed project area is located outside of the Umpqua River Corridor Bald Eagle Management Area.

(2) No Action Alternative

Under the no action alternative, 151 acres of mid-seral habitat within the proposed harvest units would remain in its current condition for the foreseeable future. The long-term effects would be the delayed development of stand characteristics associated with late-successional forests for at least 150 years, in the absence of a major natural disturbance, such as wildfire or wind storm. The natural development of these forest stands would maintain single layered relatively homogeneous canopies, and would not develop the desired characteristics (i.e. large trees with large limbs to support nesting platforms and roosting and large snags) needed by bald eagles.

(3) Proposed Action Alternative

The proposed action alternative would reduce tree densities, thus facilitating the development of future nesting and roosting habitat by increasing tree and limb growth rates. Commercial thinning would cause an indirect beneficial effect by acceleration of the development of late-successional elements used by bald eagles, such as large diameter trees with large limbs and multiple canopy layers. Thinning would facilitate the development of late-successional characteristics, thereby increasing the amount of suitable habitat available earlier than through natural stand development.

b) *Marbled Murrelet*

(1) Affected Environment

The proposed project area is located approximately 35-36 miles from the coast. Proposed units 14A, 23A, and 27A occur within the Marbled Murrelet Inland Management Zone 2 (35-50 miles from the coast) and within the 1.3 mile Restriction Corridor (USFWS, August 2005). Proposed unit 27B occurs within Zone 2, outside the Restriction Corridor. All suitable marbled murrelet habitat within 0.25 miles of the project area was surveyed in 2000-2001 following the 2000 survey protocol (Pacific Seabird Group, Marbled Murrelet Technical Committee). No murrelets were detected during the intensive survey effort.

The proposed project does not occur within Critical Habitat designated for the marbled murrelet. Therefore, there are no concerns for marbled murrelet Critical Habitat.

(2) No Action Alternative

Under the no action alternative, 151 acres of mid-seral habitat within the proposed harvest units would remain in its current condition for the foreseeable future. The long-term effects would be the delayed development of stand characteristics associated with late-successional forests for at least 150 years, in the absence of a major natural disturbance, such as wildfire or wind storm. The natural development of these forest

stands would maintain single layered relatively homogeneous canopies, and would not develop the desired characteristics (i.e. large limbs > 4", large crown depths, and large diameter trees) needed by murrelets.

(3) Proposed Action Alternative

The proposed action alternative would reduce tree densities, thus facilitating the development of future nesting habitat by increasing tree and tree-limb growth rates. In addition, reducing tree densities around the older, large limbed trees would allow murrelets greater access for nesting, thus providing an opportunity for murrelets to occupy these stands earlier.

c) **Northern Spotted Owl**

(1) Affected Environment

There are five spotted owl sites, which includes fourteen activity centers, within 1.5 miles (provincial home range) of the harvest units. Of the five spotted owl sites, two (Bell Mountain [IDNO 3263, A-B] and Hancock Creek [IDNO 1816, A-C]) are located adjacent to the proposed units. These two sites include eight activity centers. The closest activity center is located 129 yards from the boundary of unit 27B. The other seven activity centers are located 316 yards or more from the proposed unit boundaries.

Known Owl Activity Centers (KOAC) have been designated to minimize impacts and protect nest sites found before 1994 (USDI, 2005b). There are two KOACs adjacent to proposed units. The Bell Mountain KOAC is immediately adjacent to proposed unit 14A and the Hancock Creek KOAC is nearly adjacent to unit 27B as it is separated by 55 yards (50 meters) of dispersal habitat.

This project does not occur within spotted owl designated Critical Habitat (a specific geographical area designated by the US Fish and Wildlife Service as containing habitat essential for the conservation of a Threatened and Endangered species). Therefore, there is no concern for Critical Habitat for the spotted owl.

(i) *Red Tree Voles as Prey Item for Northern Spotted Owls*

Northern spotted owls are known to prey upon red tree voles but their importance as a prey item varies among geographic regions and individual owl pairs (Forsman et al., 2004). In the South Coast Range, which includes the Bell Mountain project area, red tree voles comprised 18.2 percent of the spotted owl diet based on number of prey items consumed and 4.2 percent of the diet based on biomass of prey items consumed (Forsman et al., 2004). By comparison, the predominant prey item in the South Coast Range is the Northern flying squirrel which comprised 36.0 percent of the spotted owl diet based on number of prey items consumed and 38.6 percent of the diet based on biomass of prey items consumed (Forsman et al., 2004). The woodrat also comprises 18.2 percent of the spotted owl diet based on number of prey items consumed, but was the secondary food source based on biomass of prey consumed which comprised 37.1 percent of the diet (Forsman et al., 2004). In this portion of the Northern spotted owl range, red tree voles are not a primary source of prey in the Northern spotted owl prey base. Any effects this project may have on red tree voles would therefore not have a significant effect on the northern spotted owl.

The Bell Mountain commercial thin timber sale was included in the Biological Analysis as part of the consultation package with the U. S. Fish and Wildlife Service regarding the *FY2003-2008 Programmatic Assessment for Disturbance Activities and Management Activities Which Remove Habitat* (USDI, 2005b). The effect on Northern spotted owls by modifying dispersal habitat in the Bell Mountain timber sale through commercial thinning was determined to be “may affect: not likely to adversely affect.” (USDI, 2005c).

(2) No Action Alternative

Under the no action alternative, 151 acres of dispersal habitat for the Northern spotted owl would remain in its current condition for the foreseeable future. Spotted owls would continue to disperse and forage at their current levels within the harvest units themselves, as well as within the additional dispersal habitat and suitable habitat within the vicinity of the project area.

The long-term effects would be the delayed development of stand characteristics associated with late-successional forests for at least 150 years, in the absence of a major natural disturbance, such as wildfire or wind storm. The natural development of these forest stands would maintain single layered relatively homogeneous canopies, and would not develop the desired characteristics (i.e. large diameter trees with nesting cavities or platforms, large snags and down woody debris, and multiple canopy layers) needed by the spotted owl. The ability of these stands to function as spotted owl dispersal habitat would continue to be marginal due to high tree densities which limits the mobility of the spotted owl within these mid-seral stands. Natural development of these stands would result in slower expansion of suitable habitat components for the spotted owl. Late-successional habitat characteristics would not be expected to develop for at least 150 years, depending on the degree of natural disturbance from wildfire, wind storms, insects and disease.

(3) Proposed Action Alternative

Local, project specific impacts to Northern spotted owls due to commercial thinning activities would include the modification of 151 acres of dispersal habitat. Details of impacts to dispersal habitat within each of the northern spotted owl activity centers are summarized in Appendix D. Based on the high residual density of trees remaining following treatment, dispersal habitat would not be reduced below 60 percent canopy cover. Therefore, the capability of the habitat to function for dispersing spotted owls would be maintained.

Treatment of the mid-seral stands would improve the quality of dispersal habitat within five to ten years by reducing stand densities, thus creating habitat conditions favorable for the development of a multi-canopy understory. Additionally, project design features for snag and coarse woody debris (pgs. 13-14) would help minimize adverse impacts to spotted owl prey species that utilize these features. Commercial thinning and density management would accelerate the development of late-successional characteristics used by spotted owls (e.g. large diameter trees, multiple canopy layers, and hunting perches) over the long term, thereby increasing the amount of suitable habitat available to spotted owl sites earlier than through natural stand development.

Based on current survey data, there are no spotted owl nest sites within 65 yards of the proposed units, thus seasonal restrictions would not be applied to the units. However, if future surveys locate an activity center or nest within 65 yards (60 meters) of the proposed units, seasonal restrictions from March 1st through June 30th would be applied to the known nest site to mitigate disturbance impacts to nesting spotted owls and pre-dispersal fledglings. These seasonal restrictions would then be implemented unless current calendar year surveys indicate: 1) spotted owls not detected, 2) spotted owls present, but not attempting to nest, or 3) spotted owls present, but nesting attempt has failed. Waiver of seasonal restriction is valid until March 1 of the following year.

As discussed in Appendix E, the BLM, U.S. Forest Service, and the U.S. Fish and Wildlife Service have conducted a coordinated review of four recently completed reports containing information on the northern spotted owl. The reports included *Scientific Evaluation of the Status of the Northern Spotted Owl* (Courtney et al. 2004), *Status and Trends in Demography of Northern Spotted Owls, 1985-2003* (Anthony et al. 2004), *Northern Spotted Owl Five Year Review: Summary and Evaluation* (USFWS, November 2004), and *Northwest Forest Plan – The First Ten Years (1994-2003): Status and trend of northern spotted owl populations and habitat, PNW Station Edit Draft* (Lint, Technical Coordinator, 2005).

Based on this evaluation, the Roseburg District Manager found that effects on NSO populations identified in the four reports are within those anticipated in the PRMP/EIS, and that the RMP goals and objectives are still achievable in light of the information from the reports. As such, it was also found that the latest information on the NSO does not warrant a change in RMP decisions pertinent to the NSO, and therefore does not warrant amendment or revision of the Roseburg District RMP. It was also found that the underlying analysis in the EIS remains adequate for purposes of tiering NEPA analyses of NSO effects from proposed actions implementing the RMP.

2. Wildlife Bureau Sensitive, Assessment, & Tracking Species

Those Bureau Sensitive (BS) and Bureau Assessment (BA) species that are suspected to occur within the project area and may be affected by the proposed action are discussed below. The remaining BS and BA species, as well as Bureau Tracking species, are discussed briefly in Appendices F and G.

a) Northern Goshawk (BS)

(1) Affected Environment

There are currently no known Northern goshawk nest sites within the project area. Nesting habitat for the Northern goshawk is typically open stands of mature and late successional conifers and foraging habitat for this species tends to be in stands of open conifers. The proposed units do not contain suitable nesting or foraging habitat for the goshawk. There are no known goshawk territories within the proposed project area. However, goshawk surveys have not been conducted within the vicinity of the proposed project area, thus Northern goshawks may be present in late-successional habitat adjacent to proposed units.

(2) No Action Alternative

Northern goshawks tend to forage in more open forest stands with lower tree densities than currently found in the proposed project. High tree densities make it difficult for goshawks to maneuver through the canopy and understory while in pursuit of prey. Therefore, the current tree densities within the proposed harvest units would remain less than ideal for foraging goshawks.

(3) Proposed Action Alternative

The harvest units proposed in this project would modify 151 acres by reducing tree densities within even-aged stands. Lowering the tree density within the stands in the project area would increase the amount of foraging and roosting habitat available to the Northern goshawk.

b) Purple Martin (BS)

(1) Affected Environment

Purple martins nest in colonies within snag cavities located in forest openings, meadows, and other open areas. Although the project area does contain snags they are not located in open areas typical of purple martin colonies. There are currently no known purple martin sites within the project area and the nearest known purple martin colony is approximately ten miles east of the proposed project area. Purple martins would be expected to forage above the canopies within the project area.

(2) No Action Alternative

Purple martins would not colonize stands within the proposed harvest units, barring a stand-replacing event. The harvest units do not have the open areas typical of purple martin colonies even though snags may be present. Without a stand-replacing event, large openings that would foster the colonization and dispersal of purple martins would not be created within the harvest units.

(3) Proposed Action Alternative

Snags are expected to be retained in the proposed units due to the protection afforded snags in the project design features. Additional snags would be created post-harvest. However, unless windthrow or other catastrophic events occur that create openings around these snags, the project units would continue to be unsuitable for purple martins to colonize the snags. Purple martins would continue to forage above the canopies within the units post-harvest.

c) Townsend's Big-eared Bat (BS) & Fringed Myotis (BA)

(1) Affected Environment

The fringed myotis and Townsend's big-eared bat can roost in snags or trees with deeply furrowed bark, loose bark, cavities, or with similar structures, typically in late-successional conifers. Surveys are not practical since potential bat roosts are typically located within the overstory canopy, thus it is unknown if the Townsend's big-eared bat

or the fringed myotis is present within the proposed project area. No caves were found within the harvest units during field review.

(2) *No Action Alternative*

The existing snag habitat would continue to progress through the various stages of decadence and new snags would be recruited by insects, disease, storm events, or other sources of mortality.

(3) *Proposed Action Alternative*

An unknown number of potential bat roosting trees are expected to occur in the proposed units. Existing snag habitat is expected to be retained in the harvest units due to the protection afforded them by the project design features. As described in the project design features, additional snags may be created following harvest operations, thus providing additional snag recruitment as future habitat for bats.

3. Wildlife Survey & Manage Species

The Swiftwater Field Office is aware of the August 1, 2005, U.S. District Court order in Northwest Ecosystem Alliance et al. v. Rey et al. which found portions of the *Final Supplemental Environmental Impact Statement to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines* (January, 2004) (EIS) inadequate. Subsequently in that case, on January 9, 2006, the Court ordered:

- set aside the 2004 Record of Decision *To Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines in Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern spotted Owl* (March, 2004) (2004 ROD) and
- reinstate the 2001 *Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measure Standards and Guidelines* (January, 2001) (2001 ROD), including any amendments or modifications in effect as of March 21, 2004.

The Swiftwater Field Office is also aware of the November 6, 2006, Ninth Circuit Court opinion in Klamath-Siskiyou Wildlands Center et al. v. Boody et al., No. 06-35214 (CV 03-3124, District of Oregon). The court held that the 2001 and 2003 Annual Species Reviews (ASRs) regarding the red tree vole are invalid under the Federal Land Policy and Management Act (FLPMA) and National Environmental Policy Act (NEPA) and concluded that the BLM's Cow Catcher and Cotton Snake timber sales violate federal law.

This court opinion is specifically directed toward the two sales challenged in this lawsuit. The BLM anticipates the case to be remanded to the District Court for an order granting relief in regard to those two sales. At this time, the ASR process itself has not been invalidated, nor have all the changes made by the 2001-2003 ASR processes been vacated or withdrawn, nor have species been reinstated to the Survey and Manage program, except for the red tree vole. The Court has not yet specified what relief, such as an injunction, will be ordered in regard to the Ninth Circuit Court opinion. Injunctions for NEPA violations are common but not automatic.

We do not expect that the litigation over the Annual Species Review process in Klamath-Siskiyou Wildlands Center et al. v. Boody et al will affect this project, because the development and design of this project exempts it from the Survey and Manage program. In Northwest

Ecosystem Alliance et al. v. Rey et al the U.S. District Court modified its order on October 11, 2006, amending paragraph three of the January 9, 2006 injunction. This most recent order directs:

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

- (a) Thinning projects in stands younger than 80 years old;
- (b) Replacing culverts on roads that are in use and part of the road system, and removing culverts if the road is temporary or to be decommissioned;
- (c) Riparian and stream improvement projects where the riparian work is riparian planting, obtaining material for placing in-stream, and road or trail decommissioning; and where the stream improvement work is the placement large wood, channel and floodplain reconstruction, or removal of channel diversions; and
- (d) The portions of project involving hazardous fuel treatments where prescribed fire is applied. Any portion of a hazardous fuel treatment project involving commercial logging will remain subject to the survey and management requirements except for thinning of stands younger than 80 years old under subparagraph a. of this paragraph."

Bell Mountain is a commercial thinning and density management of 151 acres forest stands aged 47 to 55 years. For the foregoing reason, the Bell Mountain Commercial Thinning and Density Management meets exemption (a) above. Therefore, the decision to eliminate Survey and Manage is effective on this project.

In addition, activities associated with the proposed thinning and density management treatments include spur road construction, improvement, renovation, and decommissioning as described on previously in Chapter 2 (refer to pgs. 10-11). Spur road construction either would occur within the treated stands, where right-of-way widths would be typically less than the tree-spacing following harvest, or on private industrial forest lands, where Survey and Manage standards and guidelines do not apply. Road improvement, renovation, and decommissioning activities would occur on existing road facilities where habitat for Survey and Manage species is absent and would not be considered habitat disturbing.

4. Wildlife Cumulative Effects

Availability of late-seral forest habitat is the primary wildlife concern in the Elk Creek/Upper Umpqua fifth-field watershed. Stands in this area begin functioning as late-seral habitat at approximately 80 years of age when characteristics like large diameter trees, a secondary canopy layer, snags, and cavities have developed. Early and mid-seral habitat is expected to be abundant on private lands as a result of past and future timber harvest.

The BLM manages 41,700 acres of conifer forest lands in the Elk Creek/Upper Umpqua fifth-field watershed (Table 5). Of this total, there are 16,805 acres of late-seral stands representing 40 percent of forest lands managed by the BLM. At present, in the Elk Creek/Upper Umpqua fifth-field watershed there are approximately 15,965 acres of mid-seral forest stands managed by the BLM that would develop into late-seral forest stands over the next 20 to 30 years.

At present, of the 92,300 acres of forested land in private ownership within the Elk Creek/Upper Umpqua fifth-field watershed there are approximately 3,200 acres of late-seral forest (Table 5). The PRMP/EIS assumed (Vol. I, pg. 4-4) that “. . . most private forest lands would be intensively managed with final harvest on commercial economic rotations averaging 50 years.” If timber harvest on private forest lands continues at a rate comparable to that noted above (pg. 40), late-seral forest habitat would be unavailable on private lands within the next 40 years.

Because BLM-administered Matrix lands are managed on harvest rotations longer than those employed on private forest lands (i.e. regeneration harvest at 80 to 110 years of age in the GFMA and regeneration harvest on a 150-year area control rotation for stands in Connectivity/Diversity Blocks) and because Late-Successional Reserves and Riparian Reserves are not scheduled for regeneration harvest, overall age-class distribution of forest lands managed by the Roseburg District BLM will tend toward older seral stages, as illustrated in the PRMP/EIS (Chapter 4 – 27 & 28).

Reasonably foreseeable timber management actions by the BLM in the Elk Creek/Upper Umpqua fifth-field watershed include commercially thinning/density management of about 470 acres of mid-seral forests and planning for commercially thinning/density management of another 7,000 to 8,000 acres over the next decade (previously stated, pg. 21).

While thinning and density management would reduce tree densities in the treated stands, it would not affect overall stand ages, the ability of the stands to grow and develop into late seral habitat, or the current availability of late-seral forest habitat in the Elk Creek/Upper Umpqua fifth-field watershed. Thinning treatments may temporarily reduce the utility of some of the units for certain wildlife species by removing canopy cover and horizontal structure, but canopy cover would return to pre-treatment levels within 10 to 15 years.

Over a period of 100 years, implementation of management direction from the ROD/RMP is projected to result in a 51 percent increase in the amount of old-growth forest managed on the Roseburg District (PRMP/EIS, Chapter 4 – 29). This is projected to provide an additional 131,000 acres of nesting, roosting and foraging habitat for the northern spotted owl, and habitat for those other species dependent on late-successional forest habitat (PRMP/EIS, Chapter 4 – 57).

Table 5. Forest Habitat within the Elk Creek/ Umpqua River Fifth-Field Watershed.^{1, 2}

Forest Habitat	Private Lands ¹ (acres)	Federal Lands: Available for Harvest ² (acres)	Federal Lands: Reserved from Harvest ² (acres)	Total ¹ (acres)
Late-Seral Forest (QMD ≥ 20")	3,200	3,330	13,475	20,000
Mid-Seral Forest (10" ≤ QMD < 20")	58,030	6,170	9,795	74,000
Early-Seral Forest (QMD < 10")	31,070	3,145	5,785	40,000
Non-Forest Lands	46,990	65	355	47,410
Total	139,290	12,710	29,410	181,410

¹ Acres estimated based on the 1997 Interagency Vegetation Management Project dataset and forest change detection since 1972 (Elk Creek/Umpqua River WA, March 2004, pp. 15-16).

² Data obtained (April 2005) from Biological Assessment for the Roseburg District BLM FY2005-2008, Appendix B- Table B-3 (pp. 139-140). Analysis determined using Forest Operations Inventory data.

C. Fire and Fuels Management

1. Affected Environment

The current fuel conditions for Units 14A, 23A, and 27A, prior to harvest treatment, are best described as residue descriptive code 1-MC-3 in the *Photo Series for Quantifying Natural Residues in Common Vegetation Types of the Pacific Northwest* (Maxwell and Ward, 1980). The down woody debris component of this stand (i.e. the material accumulated on the ground) is approximately 11 tons per acre.

For unit 27B, the best description of current fuel conditions is photo 3-WF-3 in the *Photo Series for Quantifying Natural Forest Residues: Southern Cascades, Northern Sierra Nevada* (Blonski and Schramel, 1981). This photo description focuses on White Fir rather than Douglas fir but closely describes the unit parameters and has a down woody debris component of approximately 18 tons per acre. This unit has a large number of trees that have fallen under natural conditions, contributing greatly to the fuel load.

Units 14A, 23A, and 27A currently have a low risk of wildfire due to low levels of accumulated down woody debris (i.e. 11 tons per acre), tree spacing, and the lack of low limbs and shrubs that can carry the fire from the surface to the crowns of the trees. Unit 27B is at moderate risk for wildfire due to moderate accumulations of woody debris (i.e. 18 tons per acre) but is inaccessible to most of the public, decreasing the risk of ignition.

2. No Action Alternative

Downed fuels would continue to gradually accumulate adding to the existing fuel conditions of 11 tons per acre in Units 14A, 23A, and 27A or 18 tons per acre in Unit 27B. The risk of wildfire would also gradually increase beyond its current risk of low to moderate as fine fuels continue to accumulate.

3. Proposed Action Alternative

After commercial thinning and density management, the down woody debris in Units 14A, 23A, and 27A would increase to 15 tons per acre as depicted in the photo 2-DF-3-PC from *Photo Series for Quantifying Forest Residues in the Coastal Douglas-Fir – Hemlock Type* (Maxwell and Ward, 1976). Down woody debris in Unit 27B would increase to approximately 27 tons per acre as described in photo 3-DF-3-PC from the same photo series.

4. Cumulative Effects

Machine generated piles at landings would be burned to reduce concentrated fuel loads. Remaining fuels generated would be predominately small, less than 3 inches in diameter, and would be scattered over the harvest area. This amount would not dramatically increase the fire risk to the area for several reasons:

- scattered tops and limbs would decrease the recreational off-highway vehicle use in the areas accessible to the public which is a source of ignition for wildfires;
- the scattered slash would suppress underbrush which could increase risk;

- Units 27A and 27B are not readily accessible to most of the public as they are located behind gated access roads;
- although the proposed units are located within the Wildland Urban Interface boundary described in the Roseburg District Fire Management Plan, homes in the area currently have at least 30 feet of defensible space (K. Kosel, 2006, pers. obs.);
- all homes in the Wildland Urban Interface are at least 0.3 miles away from the proposed units; and
- most of the fine fuels, less than 1 inch diameter, would degrade within two years after harvest which would dramatically decrease the risk of a fire building in intensity to consume larger diameter fuels.

D. Hydrology

1. Stream Temperature, Water Quality, & Beneficial Uses

a) Affected Environment

There are seven first-order headwater streams adjacent to the proposed units with associated Riparian Reserves within the proposed units. Elk Creek has been placed on the Oregon 303(d) list for excessive summer temperature, fecal coliform bacteria, and dissolved oxygen (ODEQ, 2003 [a] and [b]). The 303(d) listed portion of Elk Creek is less than one mile downstream of the nearest proposed thinning unit (Unit 23A).

The affected beneficial uses of water are resident fish and aquatic life, salmonid fish spawning and rearing, and water contact recreation. Beneficial uses of water downstream of the project area consist primarily of livestock watering, domestic water supply, irrigation, and fish and aquatic life.

No surface water rights for domestic use exist within one mile downstream of the proposed thinning units. No effect to domestic water users is expected as a result of the project and water rights will not be discussed further in this document. The drinking water intakes for the cities of Drain, Elkton, and Yoncalla are upstream of the project area.

b) No Action Alternative

There would be no change to stream temperature, water quality, or Beneficial Uses of Water under the No Action Alternative.

c) Proposed Action Alternative

Water temperature is a key factor affecting growth and survival of aquatic organisms. The effect of stream temperature on fish, amphibians, macro-invertebrates, etc. varies by species and within the life cycle of individual species (Lantz 1971; ODEQ 1995). Factors influencing water temperature include elevation, slope aspect, local topography, distance from stream headwaters, solar potential, stream flow patterns, channel geometry, vegetation, and stream shading.

The most common cause of elevated stream temperatures associated with timber harvest is a reduction in streamside shading that can cause streams to be more susceptible heating by solar radiation reaching the stream surface (Moore and Miner 1997).

Density management in Riparian Reserves would have the potential to increase stream temperature by temporarily creating openings in the canopy and reducing streamside shade. Shade from trees near the stream channel is important for reducing direct solar radiation and preventing elevation of stream temperatures.

Variable width “no-harvest” buffers would be established along streams to retain direct shading as necessary for maintenance of water temperatures. The final width of the “no-harvest” buffers would be based on consideration of factors such as unique habitat features, streamside topography and vegetation, the nature of the stream, (intermittent or perennial), fish presence, and susceptibility to solar heating. Minimum “no harvest” buffer widths are 20 feet from the center of the stream channel (refer to pg. 9 above). Vegetation that provides primary shading for stream channels would be protected by the “no-harvest” buffers. Consequently, stream shading would not be affected by thinning or density management and therefore stream temperatures would not be affected.

Density management in Riparian Reserves can cause localized soil disturbance and the short-term potential for erosion, primarily associated with yarding operations. However, “no-harvest” buffers would be established for all streams adjacent to proposed units. These “no harvest” buffers would prevent disturbance to stream channels and stream banks and would intercept surface run-off allowing for deposition of any sediment transported by overland flow before it reached active waterways.

According to Reid (1981) and Reid and Dunne (1984), forest roads can be a major contributor of fine sediment to streams, through down cutting of ditch lines and erosion of unprotected road surfaces by overland flow.

The proposed road construction is located outside of Riparian Reserves in stable locations. These new roads would not be connected to the drainage network. Since road segments must be connected directly to channels in order to deliver sediment-laden water, these roads would have no effect on stream sediment.

Timber hauling could occur in both the dry and wet seasons of operation. Haul during dry season would not generate nor deliver road-derived sediment to live stream channels, because absent precipitation there would be no mechanism for the transport of fine sediment into adjacent or nearby streams.

Effects of sediment generated by road related activities, particularly timber hauling in wet weather, would be short term and limited to the immediate vicinity of stream crossings. Also, prior to log hauling, sediment-control devices such as silt fences and hay bales may be placed in ditch lines and at cross drain outlets to trap sediment locally and prevent migration into streams.

2. Stream Flow (Water Yield & Peak Flow)

a) Affected Environment

Average annual precipitation in the Elk Creek Watershed (5th Field HUC) ranges from 50 to 60 inches, occurring primarily between October and April. Precipitation occurs mostly as rainfall

since little of the watershed is above 2,000 feet. Therefore, more of the annual streamflow is concentrated to this period (Harr, et. al., 1979).

The area between 2,000 to 5,000 feet elevation receives alternating rain and snow during the winter and is called the transient snow zone (TSZ) (USDI, 2004). If a large acreage of timber harvest or burned area is within the TSZ, there may be increased peak flows due to the TSZ effect (Chirstner and Harr, 1982, pg. 15; Moody and Martin, 2001, pg. 2,990). The TSZ effect is the effect of warm rain-on-melting snow in openings created within the TSZ where there is less vegetation to intercept precipitation. Peak flows should not be affected by changes in canopy conditions because less than 2 percent of the Elk Creek Watershed is located within the TSZ. Furthermore, the proposed thinning and density management is not located within the TSZ.

Roads may affect the hydrologic function of a watershed in a number of ways. They can increase the drainage density of a watershed and act as a preferential pathway for surface runoff, decreasing the volume of overland flow that infiltrates into groundwater or soil water storage. This increases the rate at which runoff leaves a basin, which can result in higher peak flows and decreasing the time between precipitation and peak runoff (Harr, et.al., 1975).

Water yield and peak flows are dependent upon the capture, storage, and runoff of precipitation. Water yield is the total amount of water that comes out of a watershed or drainage measured over a period of time. Timber harvest can result in increases in water yield due to a decrease in evapotranspiration and interception (Satterlund and Adams, 1992). After examining 94 watershed experiments conducted worldwide, Bosch and Hewlett (1982) concluded that water yield increases are usually only detectable when at least 20 percent of the forest cover has been removed. This would include areas where the forests are less than 30 years of age, and forested lands that have been converted to agriculture.

The percentage of canopy cover removal in the affected drainages was evaluated using the Equivalent Clearcut Acre (ECA) methodology developed by Galbraith (1975). Drainages analyzed are the Watershed (5th Field HUC), Subwatersheds (6th Field HUC), and Drainages (7th Field HUC) where thinning is proposed. As displayed in Table 6, one of the drainages where thinning is proposed (Hancock Creek 7th field HUC) currently has greater than 20 percent forest canopy removal. The majority of canopy removal in the Hancock Creek drainage is land that has been converted from forest to agriculture. Therefore, the amount of water yield from this drainage would be expected to have a slightly elevated base flow compared to drainages with forested conditions.

Table 6. Equivalent Clearcut Acres (ECA) for Affected Drainages

Drainage Name	Acres	ECA resulting from Agricultural lands (%)	Total ECA (%)
Elk Creek Watershed (HUC 5)	187,098	7.2%	15.1%
Lower Elk Creek Subwatershed (HUC6)	12,594	12.9%	19.4%
Hancock Creek Drainage (HUC 7)	2,519	20.7%	25.8%
Hancock Mountain Drainage (HUC7)	3,480	4.6%	11.4%

Brush Creek Subwatershed (HUC 6)	13,470	0.3%	6.6%
Lower Brush Creek Drainage (HUC 7)	1,250	2.4%	13.5%

b) No Action Alternative

Assessment of the present risk of increased peak flows due to current conditions of the project drainages were evaluated using a model developed for the Oregon Watershed Assessment Manual (Watershed Professional Network, 1999, pg. IV-11). Peak flow was evaluated because increases in peak or storm flows in winter and spring can alter channel morphology by flushing smaller substrate, causing the channel to downcut and increase stream bank failures.

With the Oregon Watershed Assessment Manual model, a small portion of land in the TSZ, combined with a small portion of land in the TSZ with less than 30 percent canopy closure, would result in a low risk of enhanced peak flow (WPN, 1999, pg. IV-11). Peak flow was analyzed at the Watershed (HUC 5) and the Subwatershed (HUC 6) scale. Drainages (HUC 7) and Lower Elk Creek Subwatershed (HUC 6) were not analyzed because the affected drainages do not contain any land within the TSZ elevation. Results of the model indicate that there should be no measurable peak flow increase during rain-on-snow events due to previous harvest activities in the Elk Creek Watershed and Brush Creek Subwatershed.

Roads and landings may modify storm peaks by reducing infiltration on compacted surfaces, allowing rapid surface runoff, or by intercepting subsurface flow and surface runoff, and channeling it more directly into streams (Ziemer, 1981, pg. 915). However, the effects from peak flows have been shown to increase significantly only when roads occupy at least 12 percent of the watershed. However, roads occupy only three percent of the land within the Elk Creek Watershed. Therefore, no statistically significant increase in peak flows would be expected to occur from roads.

c) Proposed Action Alternative

The impact of vegetation removal could result in a short and long-term increase in water yield due to a decrease in evapotranspiration. Removal of trees tends to increase soil moisture and base stream flow in summer when rates of evapotranspiration are high. These summertime effects only last a few years (Ziemer and Lisle, 1998, pg. 61). Slight increases in summer flow would benefit riparian areas, which are often moisture limited in the summer.

The ECA method (Galbraith, 1975) was used as a means to assess for the risk of increased water yield in watersheds dominated by rain-on-snow events. The Elk Creek fifth-field watershed is not dominated by rain-on-snow events, but does contain some land within the TSZ elevation. The ECA analysis accounts for acres of created forest openings and uses partial recovery coefficients for regrowth of young forest stands that have either been harvested or burned. In this analysis, ECA was coupled with an Aggregate Recovery Percentage (ARP) which also accounts for other open areas in the watershed that have the potential to increase water yield such as agricultural land, urban areas and roads. An increasing percentage of the watershed harvested indicates a risk of increased annual water yield. Results of the ECA model indicate there would be no detectable increase in water yield at the drainage area scale from the proposed action (Table 7 and Appendix H).

Table 7: Equivalent Clearcut Acres for Affected Drainages.

Drainage Name	ECA No Action Alternative	ECA Action Alternative
Elk Creek Watershed (HUC 5) ¹	15.5%	15.6%
Lower Elk Creek Subwatershed (HUC6)	19.4%	20.1%
Hancock Creek Drainage (HUC 7)	25.8%	26.5%
Hancock Mountain Drainage (HUC7)	11.4%	13.6%
Brush Creek Subwatershed (HUC 6) ²	7.0%	7.0%
Lower Brush Creek Drainage (HUC 7)	13.5%	13.6%

¹ Includes Broken Buck, Yoncalla West, Elk Head, Buck Creek and Saddle Up to Paradise Timber Sales.

² Includes Broken Buck Timber Sale.

Bosch and Hewlett (1982, pg. 16) concluded that water yield increases are usually only detectable when at least 20 percent of the forest cover has been removed. Stednick (1996, pg. 88) evaluated twelve studies in the Pacific Coast hydrologic region and determined there is no measurable annual yield increase until at least 25 percent of the watershed is harvested.

No measurable effect to peak flow would be anticipated as a result of the proposed action because the project would involve only partial removal of vegetation on areas constituting less than three percent of each affected drainage. Furthermore, 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. The proposed commercial thinning is located below the TSZ elevation and would therefore have no potential to impact amount or timing of snow-melt runoff.

New road construction, would be primarily located on ridge tops and would be outside of Riparian Reserves. Consequently, the roads would be entirely disconnected from the drainage network and would have no potential for affecting stream flow magnitude or timing.

3. Cumulative Effects

Reasonably foreseeable future actions within the Elk Creek Watershed (5th Field HUC) include continued private and Federal forest management. Future timber harvest under consideration by the BLM within the Elk Creek Watershed include Broken Buck, Yoncalla West, and Elk Head regeneration harvest as well as Saddle up to Paradise and Buck Creek commercial thinning/density management.

In the case that sufficient harvest has occurred to increase water yield, several studies have shown that the first storms of fall have the most increase in peak flow from pre-logging conditions (Rothacher 1973, Harr et al. 1975, Harr et al. 1979, Ziemer 1981). These fall storms are generally small and geomorphically inconsequential (Harr 1976). Large peak flows occur

mid-winter after soil moisture deficits are satisfied in both logged and unlogged watersheds (Ziemer and Lisle, 1998, pg.60). Increases in peak or storm flows in winter and spring can alter channel morphology by flushing smaller substrate, causing the channel to downcut and increase stream bank failures. Studies on increased peak flows are varied in their findings on how much increase in flow would result from a given amount of timber harvest. Most studies agree that the effects of harvest treatment decreases as the flow event size increases (Rothacher, 1971, pg. 51; Rothacher 1973, pg. 10; Wright et al., 1990) and is not detectable for flows with a two year return interval or greater (Harr, et al., 1975, pg. 443; Ziemer, 1981, pg.915; Thomas and Megahan, 1998, pg. 3402; Thomas and Megahan, 2001, pg. 181). At the drainage scale (7th Field HUC), there may be short- and long-term increases in peak flows of smaller (less than two year return interval) storm events; this effect would decrease over time. As small streams form larger drainage networks, the ability of individual small watersheds to affect flow decreases (Garbrecht, 1991). As a result, peak flow increases following harvesting or other forest practices at the drainage level are likely to be undetectable farther downstream.

Road densities and condition within the Elk Creek Watershed would remain the same into the reasonably foreseeable future. At present, the road densities within the watershed are not sufficient to cause a measurable increase in peak flows (refer to pg. 34).

“No-harvest” buffers would be established on all streams adjacent to the proposed units. These “no-harvest” buffers would prevent disturbance to stream channels and stream banks. They would also intercept surface run-off and prevent sedimentation of streams, such that there would be no cumulative degradation of water quality in the Elk Creek Watershed.

E. Soils

1. Soil Productivity

a) Affected Environment

The soils formed in the sandstones and siltstones of the Tye Formation and are on slopes ranging from 10 to 90 percent (gentle to very steep) within the units. The units are mostly in old dormant slump-earth flow topography where gently sloping benches and moderate slopes occur below steep to very steep scarps. The benches are commonly hummocky.

The in-unit slopes ranging from 10 to 65 percent cover about 145 acres. The soils on these slopes are moderately deep to very deep (20 to greater than 60 inches) to soft bedrock and are well drained except for a scattering of wetter soils in low depressions up to 0.2 acre in size. These soils are highly susceptible to compaction under moist conditions because of their silt loam and silty clay loam surfaces and silty clay subsoils. A dense pattern of old, naturally surfaced roads, skid trails and landings with various degrees of soil displacement and light to heavy residual compaction occur in all units on these soils. There are a few trails in Unit 23A that are experiencing compaction and erosion by off-highway vehicle use.

In Unit 27A, these soil types are experiencing mild creep where the terrain is hummocky and would be classified under the Timber Production Capability Classification (TPCC) system as soils considered fragile due to deep-seated mass movements but suitable for forest management (FPR) (Appendix I, Table A). No apparent landslide activity has occurred on these slopes since

clear-cut harvest occurred approximately 55 years ago.

The slopes greater than 65 percent cover about 1.5 acre in the northern tip of Unit 14A and about eight acres in the southeast corner of Unit 23A. The soils here are well drained and loamy and typically are shallow to moderately deep (10 to 40 inches) over brittle, somewhat hard sandstones. About six of the eight acres in Unit 23A have locations that are potentially unstable and the soils there would be classified under the TPCC system as soils considered fragile due to slope gradient but suitable for forest management with mitigation for surface erosion and landslides (FGR) (Appendix I, Table A). Three harvest-caused debris avalanches, 0.05 to 0.20 acre in size, occurred shortly after clear-cut harvest (approximately 47 years ago) on these slopes in Unit 23A. There is also a 600 feet segment of an old, naturally-surfaced mid-slope road that has two small, cut slope back-wasting failures.

b) No Action Alternative

Changes in soil productivity would be inconsequential in the absence of either a stand-replacing fire or a large landslide, which has a very low probability of occurring. Soil productivity would continue to be impaired compared to pre-harvest levels from more than 60 years ago. The healing of compaction and topsoil development would continue very slowly on old skid trails, unsurfaced and unused roads, and landings within the proposed units.

c) Proposed Action Alternative

Road Effects

About 1.2 acres of new spur construction would occur. Of this 1.0 acre in Unit 14A (Spur #4) and 0.1 acres in Unit 23A (Spurs #2 and #3) would be located where there is not a perceptible imprint of old roads or trails. Approximately 0.9 acres soil disturbance associated with Spur #4 would be considered an irretrievable loss of soil productivity. This is because Spur #4 would not be subsoiled since it is anticipated that it would be needed for future harvest operations.

Approximately 0.4 acres of spur roads and old road beds in Unit 23A would be subsoiled, shattering up to 80 percent of the compaction (Andrus, 1983; pg. 8). Subsoiling in conjunction with mulching the spur road with logging slash and some topsoil would restore much of the soil productivity lost to these roadbeds in the long-term. The organic debris would provide a nutrient reservoir and a medium for growth of organisms beneficial to the soil.

Small, inconsequential levels of erosion would occur during the first season flush following construction and would then decrease thereafter. Soil productivity loss from landslides is very unlikely because construction would be confined to stable ridge top locations at and near ridge tops on slopes less than 55 percent.

In-Unit Effects

Ground based logging is proposed on 79 acres where slopes are generally less than 35 percent. There are short slope pitches of 35 to 55 percent up to 120 feet in length where ground-based operations are designated. The high clay content soils on these slopes can be easily compacted under moist soil conditions.

Tractor/rubber-tired yarding and harvester-forwarder operations would most likely be the ground-based harvesting methods used. Tractor yarding would create detrimental compaction on approximately seven percent of the ground it is used on while harvester/forwarder yarding would

create approximately two to six percent detrimental compaction, depending on site specific conditions, slash levels and soil moisture (D. Cressy, 2006; pers. obs.). Detrimental compaction is defined in this analysis as an increase in bulk density of 15 percent or more and an alteration of soil structure to a depth of four inches or more.

Old skid trails and roads, with existing detrimental compaction, would be utilized to the extent practical so the amount of compaction created by the proposed action could be lessened by an undetermined amount from the figures given above. With either tractor or harvester/forwarder yarding, the total area subjected to detrimental compaction is below the ten percent standard under the ROD/RMP (Plan Maintenance for FY2001 [USDI, 2005a; pg. 59])

Detrimental compaction could retard the growth of adjacent trees by approximately ten percent (Adams, 2003 presentation). Trail segments with substantial amounts of detrimental compaction would be subsoiled and mulched with logging slash and topsoil to lessen the impact to tree growth due to compaction. Soil productivity would be maintained or improved slightly by this action because approximately 5 acres of old, compacted surfaces (trails and roads) would be subsoiled (Appendix I, Table C).

Skyline cable-yarding corridors would cover about three percent of the surface (Adams, Oregon BLM Soil Scientist Annual Meeting, 2003). Compaction would typically be none to light in the cable-yarding corridors with little soil displacement (D. Cressy, pers. obs.). Heavier compaction would be confined largely to the topsoil and would eventually heal satisfactorily without mitigation (D. Cressy, pers. obs.). There may be some shallow chutes and gouging where soils are moist or one end-suspension would not be achieved. Water channeling and erosion in the shoots and gouges would be mitigated by hand-built waterbars and placing logging slash in and below them to intercept rain-drop energy, reduce flow velocity, and trap sediment.

2. Landslides

a) Affected Environment

Refer to “Affected Environment” described under soil productivity previously (pg. 36-37).

b) No Action Alternative

In-unit landslides on FGR and FPR areas would have a low probability of occurring (less than ten percent chance) and if they did occur they would likely be small in size (less than 0.1 acre). This is based on the following:

- Landslide activity appears to be the least under mid-seral canopies (ODF Storm Impacts and Landslides of 1996, p. 64).
- There has been no apparent landslide activity on the FGR slopes of Unit 23A since ten years after harvest (approximately 37 years ago).
- There has been no apparent landslide activity on the FPR slopes of Unit 27A following harvest based on aerial photo landslide inventory and field observations.
- No tension cracks signifying active slope failing were discovered (D. Cressy, 2006, pers. obs.).
- The largest landslide under mid-seral conditions would likely be smaller than the largest one under clear-cut conditions (0.20 acre in Unit 23A).

A small landslide occurring on two acres of FGR soils in Unit 14A would have a chance of reaching a small first order stream.

c) Proposed Action Alternative

Slump-earth flow activity due to thinning is very unlikely on FPR slopes in Unit 27A since harvesting rarely effects deep-seated movements. Thinning would result in a slight short-term increase (about 10 years) in the risk of debris avalanches on the very steep FGR slopes of Unit 23A because of a temporary decrease in canopy interception of precipitation and a decrease in root strength. The probability of failure would still be in the low range (less than 10 percent) as under the no action alternative. Landslides that might occur on the lower slopes of the potentially unstable area in the southeast portion of Unit 23A (refer to “Landslides” section below, pgs. 38-39) would be captured on a gently sloping bench or in a gentle-graded swale bottom 800 feet upgrate from a second order stream. There is no potential for a debris flow so this stream would not be affected. The consequences to soil productivity from the proposed action would be minor.

3. Erosion & Sedimentation

a) Affected Environment

Some erosion and sediment delivery from uplands also occurs, especially during large storm events (i.e., 20-year and larger storm recurrence). The natural background rate is estimated to be in the range of 0.45 cf/ac/year (Benda, 1997) to 1.4 cf/ac/year. Inside the Bell Mountain units, few trail and road disturbances are now perceptibly eroding. The notable exceptions would be trails that are being impacted by off-highway vehicle traffic in Unit 23A. Runoff traveling down road beds can be highly erosive as it passes over non-vegetated surfaces.

b) No Action Alternative

In-unit surface erosion would remain at very low levels with little of the soil leaving the site.

c) Proposed Action Alternative

The effects of in-unit surface erosion to soil productivity due to soil disturbance would be negligible because nearly all of the low levels of sediment produced would be deposited inside the units. This is due to:

- high soil infiltration;
- the cover provided by duff, slash, and understory vegetation on the steeper slopes;
- the water-barring of skyline cable-yarding corridors on steeper slopes and ground-based trails that can channel water;
- the hummocky nature of the less steep slopes;
- subsoiling compacted trails;
- subsoiling, waterbarring, and muching with logging slash Spurs 2 and 3 after use; and
- waterbarring Spur 4 after use.

4. Cumulative Effects

Soil productivity would be maintained at the watershed level on federal lands as the proposed action and other federal actions are implemented.

Soil Productivity

As stated previously (pg. 38), soil productivity would be maintained or slightly improved at the project level in the short-term. In the long-term (one harvest rotation or more) at watershed scales on BLM administered lands, soil productivity is also expected to be maintained or slightly improved because of the combination of the slow, natural healing and active amelioration of old ground-based and road impacts by the BLM on future projects. Amelioration would primarily occur during future timber harvest actions. The affects of forest management on private timber lands in the watershed would be highly variable based on past history.

Landslide

The Elk Creek/Umpqua River Watershed Analysis (pg. 36) reported an overall downward trend in landslide incidence over the past 50 years that is associated with improved management practices. Fluctuations in this downward trend are due to variations in weather and levels of management activity.

The rate of harvest-related landslides has declined to a lesser degree. Because of Best Management Practices with timber harvest and road building under the Northwest Forest Plan, landslides on BLM-administered lands are expected to continue to decline. Future landslides on BLM lands, mostly during large storm events, are expected to deliver large wood and rock fragments to lower-gradient streams because of BLM Riparian Reserves. The distribution of landslides in-time and -space and their effects would more closely resemble those within relatively unmanaged forests (Skaugset and Reeves, 1998).

The contribution of landslides by the proposed action to cumulative soil productivity loss at both project level and watershed scales would be inconsequential because of their low probabilities of occurrence and likely small sizes (less than 0.1 acre) when project design features are applied.

F. Fish Populations & Habitat

1. Affected Environment

Oregon Coast coho salmon, Oregon Coast steelhead, coastal cutthroat trout, Oregon Coast chinook salmon, Pacific lamprey, and Umpqua chub are present in the Elk Creek fifth-field watershed (see Appendix J). The National Marine Fisheries Service determined that the Oregon Coast coho Ecologically Significant Unit does not warrant listing under the ESA at this time and therefore withdrew the proposed listing (Fed. Reg., Vol. 71 No. 12, Jan. 19, 2006). However, under OR/WA BLM guidelines the Oregon Coast Coho is considered Bureau Sensitive.

There is one fish bearing stream adjacent to Unit 27A. The shortest distance from the unit to the fish bearing stream is approximately 0.1 miles. The shortest distance from any of the other proposed units and a fish bearing stream is approximately 0.45 miles (see fisheries map, Appendix K).

The proposed haul route for Units 14A and 23A has three perennial non-fish bearing stream crossings and five intermittent stream crossings. The proposed haul route from Unit 27A is parallel to Hancock Creek, which is a fish-bearing stream. The shortest distance from the stream to the road is 200 feet along this route. This haul route has five intermittent stream crossings. The haul route from unit 27B crosses one perennial non-fish bearing stream and three intermittent streams. The haul route ditch lines are well vegetated or armored and would remain

ungraded. The portions of the haul route in close proximity to fish habitat are located in the valley bottom. These areas lie on relatively flat topography and the well vegetated ditch lines are filtering and trapping any road-derived sediment.

The Oregon Department of Fish and Wildlife (ODFW, 1994) has conducted stream habitat surveys in the Elk Creek/Umpqua River watershed. These surveys generally show that fish-bearing streams within the watershed lack large wood, contain a high percentage of fine sediment within the stream channels, and have substrates dominated by bedrock (Elk Creek WA, Chart 7-2).

With the exception of Hancock Creek, streams within the project area consist of high gradient, non-fish bearing, intermittent streams of the first and second order. Observations of Hancock Creek in the field indicate that it is dominated by gravel and cobble, has sufficient amounts of large woody debris, and has a good riparian conifer density. The reach of Hancock Creek adjacent to Unit 27A is a stable, high gradient system with sufficient riparian vegetation to prevent stream bed and bank erosion caused by high stream flow.

2. No Action Alternative

Fish species and populations would remain relatively unchanged from current trends. The riparian habitat adjacent to the aquatic environment on both fish-bearing and non-fish bearing streams consists primarily of dense mid-seral stands of Douglas-fir. These stands would continue to mature and develop late-successional characteristics over time. However, due to the high tree density late-seral forest characteristics would develop slowly, resulting in the continued development of coarse woody debris components that are small in size and structure.

Current stream temperature, sediment inputs, woody debris, and hydrologic processes would be expected to recover gradually as culvert replacements, road treatments, road decommissioning, and fisheries habitat improvement projects occur across the fifth-field. Occasional pulses of increased sediment and woody material would enter the aquatic system as a result of stochastic events (e.g. large wind and/or rain events).

3. Proposed Action Alternative

a) Large Woody Debris and Stream Temperature

The proposed action would maintain existing levels of large woody debris and protect the mechanisms for future recruitment to benefit aquatic organisms due to establishment of Riparian Reserves and variable stream buffers along streams. The variable width buffers of at least 20 feet would maintain stream shade on the intermittent streams within the project area.

b) Channel Geometry

Results from the ECA model indicate that there would be no detectable increases in water yield at the drainage area scale from the proposed action (refer to pgs. 34-35). Therefore, there would be no measurable impact to fisheries or aquatic organisms from peak flows capable of altering the channel geometry.

c) Fine Sediment and Substrate

The proposed road construction is located outside of Riparian Reserves in stable locations and would not be connected to the drainage network. Since road segments must be connected

directly to channels in order to deliver sediment-laden water, these roads would have no effect on stream sediment (refer to pg. 31).

Timber hauling could occur in both the dry and wet seasons of operation. Haul during dry season would not generate nor deliver road-derived sediment to live stream channels, because absent precipitation there would be no mechanism for the transport of fine sediment into adjacent or nearby streams.

Effects of sediment generated by road related activities, particularly timber hauling in wet weather, would be short term and limited to the immediate vicinity of stream crossings. Also, prior to log hauling, sediment-control devices such as silt fences and hay bales may be placed in ditch lines and at cross drain outlets to trap sediment locally and prevent migration into streams (pgs. 31).

Therefore, there would be no effect to substrate as a result of sediment.

d) Fish Passage

There are no stream crossings over fish-bearing streams in the haul route, all of the stream crossings are over perennial or intermittent non-fish bearing streams. The haul route on BLM Road 22-7-22.2 parallels a fish-bearing stream (Hancock Creek), but is at least 200 feet from the stream.

4. Cumulative Effects

Sediment regime, stream temperature, water chemistry, peak flows, and water yield together influence fish habitat or aquatic species. Since stream temperature and water chemistry would not be influenced by the proposed action; and changes in sediment would be immeasurable and would not extend to the fish-bearing streams downstream, fish habitat and aquatic species would not be affected.

Changes in peak flows and water yield from the project do not have the capacity to alter channel morphology and effects would be indistinguishable from background levels at the fish-bearing streams downstream. Therefore, fish habitat and aquatic species populations would not be incrementally affected by the proposed action at the project level nor would they add to the cumulative effects at the fifth-field watershed.

5. Aquatic Conservation Strategy

The proposed action meets the objectives of the Aquatic Conservation Strategy (ACS) as described in the ROD/RMP (pg. 19) based on the following rationale:

(1) Riparian Reserves (ACS Component #1)

Riparian Reserves were established. The ROD/RMP (pg. 24) specifies Riparian Reserve widths equal to the height of two site potential trees on each side of fish-bearing streams and one site-potential tree on each side of perennial or intermittent non-fish bearing streams, wetlands greater than an acre, and constructed ponds and reservoirs. The height of a site-potential tree for the Elk Creek Watershed has been determined to be the equivalent of 200 feet. (Elk Creek Watershed Analysis, pg. 2).

(2) Key Watersheds (ACS Component #2)

Key Watersheds were established “as refugia . . . for maintaining and recovering habitat for at-risk stocks of anadromous salmonids and resident fish species [RMP, pg. 20].” This project is not in a Key Watershed.

(3) *Watershed Analysis (ACS Component #3)*

The Elk Creek/Umpqua River Watershed Analysis was used in this assessment and is available for public review at the Roseburg District office or can be viewed under “Plans & Projects” on the Roseburg District website at www.blm.gov/or/districts/roseburg/index.htm.

(4) *Watershed Restoration (ACS Component #4)*

Restoration associated with this project includes the improvement of approximately 6.0 miles of existing roads to reduce sedimentation to streams and the treatment of riparian reserves to increase the quality and quantity of large wood available to streams in the future. Within the Elk Creek watershed, approximately 10 miles of roads have been decommissioned or improved to reduce the risk of landslides and erosion (Elk Creek WA, table 5-1). Approximately 13 culverts have been replaced or removed to improve fish passage, and two miles of stream habitat improvement projects have been implemented. More culvert replacements and habitat improvement projects are planned and will be implemented as budgets allow.

6. Essential Fish Habitat

Essential Fish Habitat (EFH) is designated by the Magnuson-Stevens Fishery Conservation and Management Act of 1996 as habitat that is currently or was historically available to Oregon Coast coho and chinook salmon (Federal Register 2002 Vol. 67, No. 12). The nearest EFH is located approximately 0.10 miles downslope of Unit 27A.

The following components were analyzed to assess the effects of the proposed project on EFH and the appropriate page(s) of this document are referenced:

Water quality/Water quantity – There would be no measurable effect to water quality (pgs. 32-33) or water quantity (pgs. 31, 33-35) as a result of the proposed action.

Substrate characteristics – There would be no measurable effect to substrate as a result of sediment (pgs. 31, 41).

Large woody debris (LWD) within the channel and LWD source areas – There would be no effect to large woody debris or large woody debris source areas (pg. 40).

Channel geometry – There would be no measurable impact to fisheries or aquatic organisms from peak flows capable of altering the channel geometry (pg. 41).

Fish passage – There would be no effect to fish passage. There are no new crossings along fish bearing streams and culverts currently impassable to fish would remain unaffected (pg. 41).

Forage species (aquatic and terrestrial invertebrates) – Forage for coho and Chinook salmon would remain unaffected. Riparian vegetation would continue to provide sources

of terrestrial invertebrates. Aquatic invertebrate populations would be unaffected since there is no measurable effect to water quality (pgs. 31) or substrate (pgs. 31, 41).

Federal agency conclusions regarding the effects of the action on EFH:

The proposed action “*Will Not Adversely Effect*” (WNAE) EFH for coho or Chinook salmon in Hancock Creek, Elk Creek, or their tributaries.

Proposed mitigation (if applicable):

Without any mechanisms for an adverse affect on EFH, there are no mitigation measures proposed.

G. Botany

1. Botanical Special Status Species

a) Affected Environment

The following analysis considers Special Status Plants whose known range is within the project area, are documented or suspected to occur in the project area, and whose habitat is documented or suspected to occur within the project area. The project area is within the known range of Kincaid’s Lupine (*Lupinus sulphureus* ssp. *kincaidii*), a federally threatened plant, and the rough popcorn flower (*Plagiobothrys hirtus*), a federally endangered plant. The project contains suitable habitat for Kincaid’s Lupine but not for the rough popcorn flower.

Field surveys were conducted in the fall and winter of 1997, and the spring and summer of 1998. Other field surveys were performed in May and June of 2006, to comply with the 2001 ROD for Survey and Manage Botany Species (see below). There were no Special Status Plants detected, including Kincaid’s lupine or the rough popcorn flower, in the Bell Mountain Project Area. Therefore, special status plants will not be discussed further.

2. Botanical Survey & Manage Species

a) Affected Environment

As discussed previously under “Wildlife Survey & Manage Species” (pgs. 26-28), Bell Mountain meets exemption (a) from the U.S. District Court Order on October 11, 2006 regarding Northwest Ecosystem Alliance et al. v. Rey et al., amending paragraph three of the January 9, 2006 injunction. The decision to eliminate Survey and Manage is effective on this project.

We do not expect that the litigation over the ASR process in Klamath-Siskiyou Wildlands Center et al. v. Boody et al will affect this project, because the development and design of this project complies with the Northwest Forest Plan prior to the ASR process. The Swiftwater Field Office conducted botanical surveys and provided management prescriptions consistent with Survey and Manage protocol and management recommendations in effect as of the 2001 ROD for Survey and Manage species whose range is in the project area.

Prior to the modification of the Court Order, pre-disturbance surveys for *Leptogium cyanescen* (a lichen) and *Eucephalis vialis* (a vascular plant) were completed June 2006 in accordance with the reinstated 2001 *Record of Decision and Standards and Guidelines for Amendments to the Survey*

and Manage, Protection Buffer, and other Mitigation Measure Standards and Guidelines (January, 2001) (2001 ROD), including any amendments or modifications in effect as of March 21, 2004. No known sites of Survey and Manage botanical species were found in the proposed project area.

Therefore, the decision for the Bell Mountain Commercial Thinning and Density Management project is neither altered by changes made through the ASR process or the 2004 decision to eliminate the Survey and Manage program.

3. Noxious Weeds

a) Affected Environment

There are infestations of noxious weeds scattered throughout the project area (Tables 8a and 8b). Infestations range from low to high, and are mostly located within the road prisms or previously used logging landings.

The project area has been treated in the past (2002) and will receive future treatment (2006-2007) under the Roseburg District Integrated Weed Control Plan (USDI, 1995a). Treatments have been and will continue to be performed by manual removal and/or application of an approved herbicide.

Table 8a. Noxious Weed Locations in Township 22S, Range 7W, Section 23.

Weed Name (National Code)	Weed Density*	Infestation Location(s)
Scotch broom (CYSC)	Mod.- High	22-7-23.2 road
Himalayan blackberry (RUDI2)	Moderate	22-7-23.4 road
		22-7-22.0 road
		22-7-23.0 road

* Low ≤ 50 weeds; Moderate = 50 to 1,000 weeds; High ≥ 1,000 weeds per infestation.

Table 8b. Noxious Weed Locations in Township 22S, Range 7W, Section 27.

Weed Name (National Code)	Weed Density*	Infestation Location(s)
Scotch broom (CYSC)	Mod.- High	22-7-20.0 road 22-7-27.2 road 22-7-22.4 road
Himalayan blackberry (RUDI2)	Mod. - High	
Senecio (SEJA)	Moderate	
Bull thistle (CIVU)	Moderate	
Canada thistle (CIAR4)	Moderate	
Cutleaf blackberry (RULA)	Low	
Pennyroyal (MEPU)	Low	

* Low ≤ 50 weeds; Moderate = 50 to 1,000 weeds; High ≥ 1,000 weeds per infestation.

b) No Action Alternative

Noxious weeds currently located in the project area are being controlled with either the application of approved herbicides, or by manual removal (USDI Roseburg District Integrated Weed Control Plan, as amended. 1995; EA #OR-100-94-11). Over time, the distribution and abundance of noxious weeds in the project area would decline due to continued and repeated treatments in accordance to the Weed Control Plan.

c) Proposed Action Alternative

There would be a short term increase in the distribution and abundance of noxious weeds in the project area following commercial thinning and density management. Soil disturbance related to the proposed action (e.g. ground based yarding, cable yarding corridors, spur construction, slash pile burning, etc...) would create areas of exposed mineral soil which could serve as habitat for noxious weeds. New infestations on exposed mineral soils would be expected to be short lived (less than 10 years), as the conifer canopy closes and native species would eventually overtop and out-compete weeds for sunlight, soil moisture, and soil nutrients.

In addition, as stated in the PDFs (pg. 14), logging and construction equipment would be required to be clean and free of weed seed prior to entry on to BLM lands to help control or prevent the spread of noxious weeds in the project area. The project area would be monitored following implementation of the proposed action, and new weed infestations would be treated in accordance with the Roseburg District Integrated Weed Control Plan.

Chapter 4. Contacts, Consultations, and Preparers

A. Agencies, Organizations, and Persons Consulted

The Agency is required by law to consult with certain federal and state agencies (40 CFR 1502.25).

1. Threatened and Endangered (T&E) Species Section 7 Consultation - The Endangered Species Act of 1973 (ESA) requires consultation to ensure that any action that an Agency authorizes, funds or carries out is not likely to jeopardize the existence of any listed species or destroy or adversely modify critical habitat.

a. A Letter of Concurrence was received from the US Fish and Wildlife Service (USFWS) (*Reinitiation of consultation on Roseburg District Bureau of Land Management FY 2005-2008 Management Activities* [Ref. # 1-15-05-I-0511]) dated June 24, 2005 which concurred with the Roseburg District's conclusion that the proposed commercial thinning or density management activities are not likely to adversely affect Northern spotted owls and are not likely to adversely affect the Northern spotted owl as a result of disturbance (pgs. 19-20). The USFWS also concurred with the Roseburg District's conclusion that the proposed commercial thinning and density management activities are not likely to adversely affect the marbled murrelet within Zone 2 and within the 1.3 mile Restriction Corridor (pgs.8-11, Ref. # 1-15-05-I-0511).

In addition, A Letter of Concurrence was received from the USFWS (*Reinitiation of consultation on Roseburg District Bureau of Land Management FY 2005-2008 Management Activities. Disturbance to marbled murrelets* [Ref. # 1-15-05-I-0596]) dated July 20, 2005 which concurred with the Roseburg District's conclusion that the proposed commercial thinning and density management activities are not likely to adversely affect the marbled murrelet as a result of disturbance within Zone 2 and within the 1.3 mile Restriction Corridor (pg. 7).

b. The Swiftwater Field Office determined that the proposed action "*Will Not Adversely Effect*" EFH for coho or Chinook salmon in Hancock Creek, Elk Creek, or their tributaries (pg. 43). There are currently no listed, or proposed for listing, fish species in the Roseburg District. There are currently, no further consultation obligations with the National Marine Fisheries Service.

2. Cultural Resources Section 106 Compliance – Compliance with Section 106 of the National Historic Preservation Act under the guidance of the 1997 National Programmatic Agreement and the 1998 Oregon Protocol has been documented with a Project Tracking Form dated October 18, 2006. A "No Effect" determination was made.

B. Public Notification

1. Notification was provided (October 20, 2006) to affected **Tribal Governments** (Confederated Tribes of Grand Ronde, Confederated Tribes of Siletz, and the Cow Creek Band of Umpqua Tribe of Indians). No comments were received.

2. A letter was sent (October 20, 2006) to nine **adjacent landowners**. Two comments were

received. One commenter requested to be added to the mailing list for future documents regarding this project and another expressed general support of the proposed project.

3. The **general public** was notified via the *Roseburg District Planning Update* (Winter 2006) which was sent to approximately 150 addressees. These addressees consist of members of the public that have expressed interest in Roseburg District BLM projects. Comments were received from one local organization requesting additional information about the project.

4. This EA, and its associated documents, would be provided to certain **State, County and local government** offices including: USFWS, NMFS, Oregon Department of Environmental Quality, and the Oregon Department of Fish and Wildlife. If the decision is made to implement this project, it will be sent to the aforementioned State, County, and local government offices.

5. A 30-day **public comment period** would be established for review of this EA. A Notice of Availability would be published in *The News-Review*. The public comment period will begin with publication of the notice published in *The News-Review* on January 09, 2007 and end close of business February 08, 2007. Comments must be received during this period to be considered for the subsequent decision. This EA and its associated documents will be sent to all parties who request them. If the decision is made to implement this project, a notice will be published in *The News-Review* and notification sent to all parties who request them.

C. List of Preparers

Core Team

Tim Sell	Project Lead / Layout
Jeff McEnroe	Fisheries
Dan Cressy	Soils
Jill Ralston	Hydrology
Krisann Kosel	Fuels Management
Elizabeth Gayner	Wildlife
Rex McGraw	Planning & Environmental Coordinator / EA Preparer
Trixy Moser	Silviculture
Judy Hyde	Engineering
Evan Olson	Botany

Expanded Team (Consulted)

Isaac Barner	Cultural Resources
Erik Taylor	Recreation / Visual Resource Management

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Acronyms

ACS	-	Aquatic Conservation Strategy
BLM	-	Bureau of Land Management
BMP	-	Best Management Practice
CWD	-	Coarse Woody Debris
cy	-	Cubic Yard
cu ft	-	Cubic Foot
EA	-	Environmental Assessment
EIS or FSEIS	-	Environmental Impact Statement / Final Supplemental EIS
FEMAT	-	Forest Ecosystem Management Assessment Team
DBH	-	Diameter at Breast Height
GFMA	-	General Forest Management Area
LWD	-	Large Woody Debris
NEPA	-	National Environmental Policy Act
NFP or NWFP	-	Northwest Forest Plan
PDF	-	Project Design Features
RMP	-	Resources Management Plan
ROD	-	Record of Decision
S&G	-	Standards & Guidelines (NFP)
T&E	-	Threatened or Endangered

Definitions

Coarse Woody Debris: Those portions of trees that has fallen to the ground at least 20” in diameter.

Early-Seral (Successional) Forest: Stage in forest development from disturbance to crown closure, usually 0-15 years. Grass, herbs, and brush are plentiful.

Intermittent Stream: Any nonpermanent flowing feature having a definable channel and evidence of scour and deposition. Normally streams with seasonal flow.

Large Woody Debris (LWD): Large woody debris is fallen trees within the riparian areas that are at least 2 feet (0.6m) in diameter and 33 feet (10m) in length (ODFW, Methods for Stream Habitat Surveys).

Late-Seral (Successional) Forest: Stage in forest development that includes mature and old-growth forest, generally 80 years and greater (FEMAT, pg IX-18).

Regeneration harvest: Harvest of timber to allow the re-establishment of a new forest stand (RMP, pg. 110).

Relative Density Index: Compares the current density of a stand with the theoretical maximum density. In general terms it means that for a given average diameter, a stand can support a maximum number of trees per acre. Conversely, for a given number of trees per acre, there is a maximum average diameter possible. Relative density indicates whether the stand is growing well, is in need of thinning, can support an understory, or is experiencing suppression mortality.

Peak Flow: The highest of stream or river flow occurring in a year or from a single storm event (FEMAT, pg IX-25).

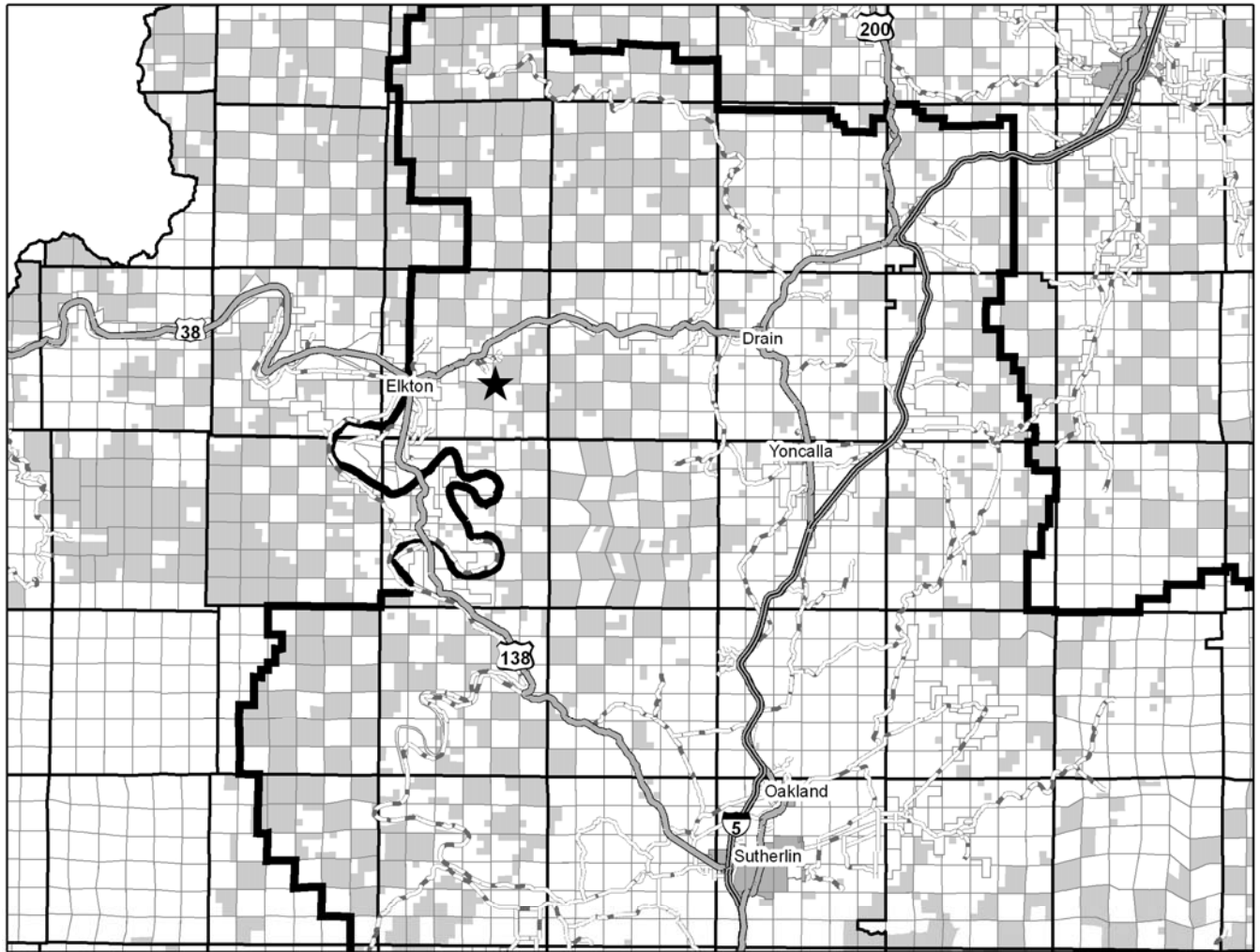
Perennial Stream: A stream that typically has running water on a year-round basis (FEMAT, pg IX-26.).

Snag: Standing dead or partially dead trees at least 10 inches in diameter at breast height, and at least six feet tall (FEMAT, pg IX-33).

Subsoiling: The practice that shatters soil compaction, thereby reducing the effects to soil productivity and improving water infiltration. This is accomplished by a device known as a winged subsoiler which is a pulled by or attached to a crawler tractor, or mounted to the arm of an excavator.

Appendix A. Project Vicinity Map

Bell Mountain Commercial Thinning & Density Management



No warranty is made by the Bureau of Land Management as to the accuracy, reliability or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources. This information may not meet National Map Accuracy standards. This product was developed through digital means and may be updated without notification.

Roseburg District
Bureau Of Land Management
777 Garden Valley Blvd.
Roseburg, Oregon 97470



Transportation
 Interstate Highway
 State Highway
 County Road

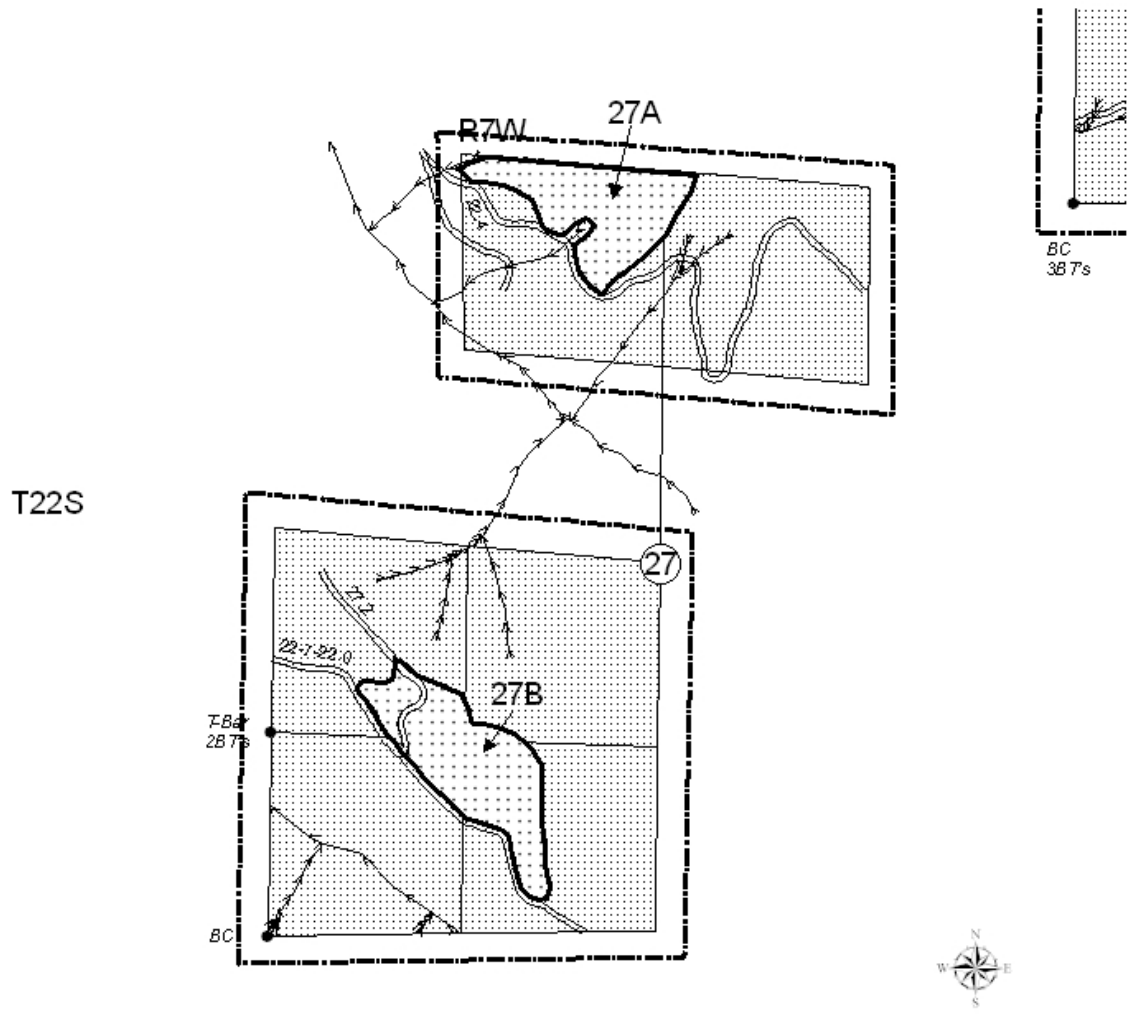
Other Features
 BLM Administered Land
 Roseburg District Boundary
 Bell Mountain Timber Sale

Map Projection UTM
North American Datum 1983

Appendix B. Project Location Maps











Bell Mountain CT

District	Township	Range	Section	Meridian
ROSEBURG	22S	7W	27	WILLAMETTE



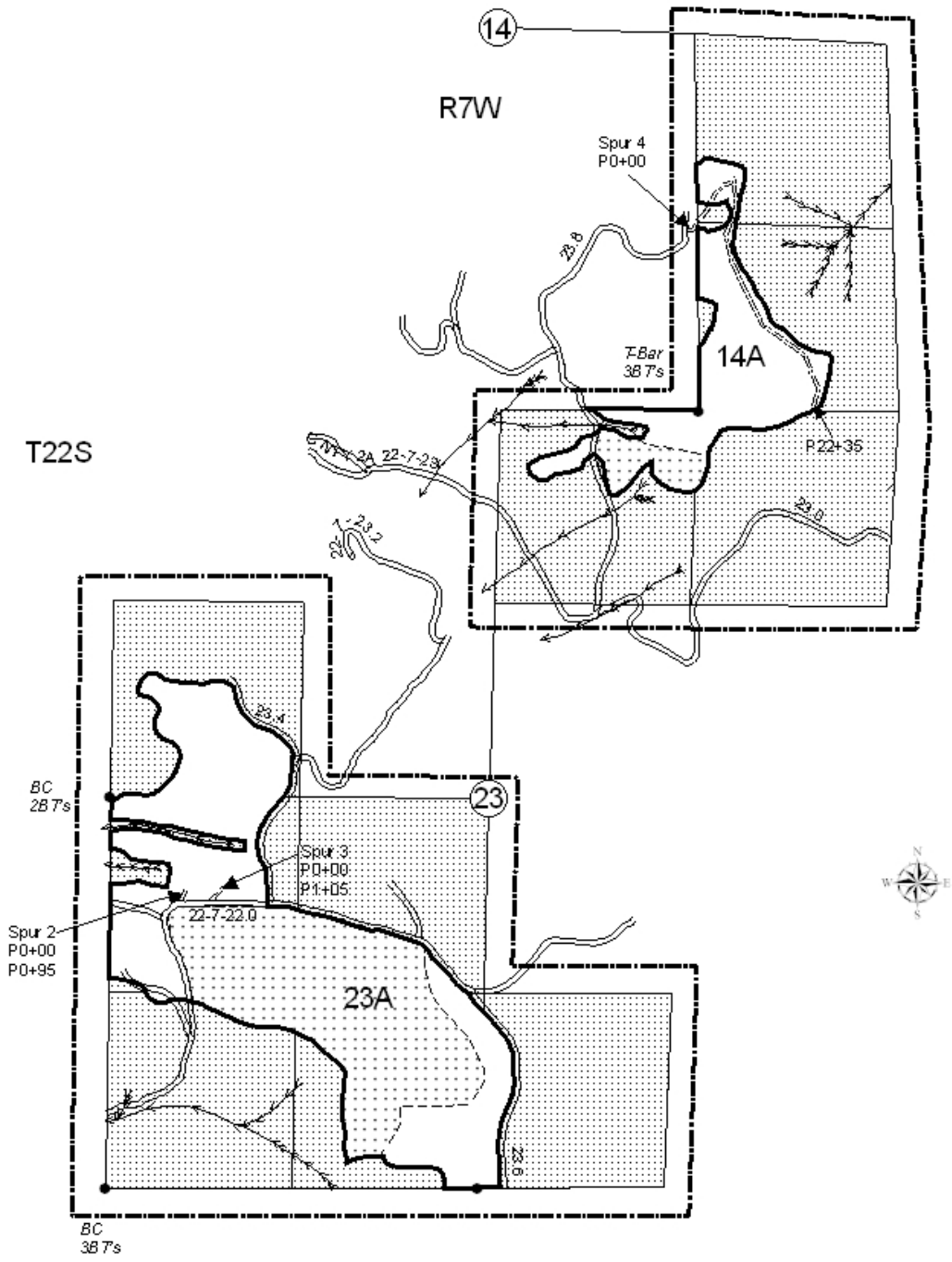
LEGEND

Scale: 1= 1000 Ft.

- | | |
|--|--|
| <ul style="list-style-type: none">  Harvest Area - Cable Yarding  Harvest Area - Ground Based  Reserve Area  Wet Area/Pond | <ul style="list-style-type: none">  Existing Road  Spur To Be Constructed  Boundary of Cutting Area  Boundary of Contract Area  Stream  Found Corner |
|--|--|

Bell Mountain CT

District	Township	Range	Section	Meridian
ROSEBURG	22S	7W	27	WILLAMETTE



Appendix C. Critical Elements of the Human Environment

Element	Relevant Authority	Environmental Effect
Air Quality	The Clean Air Act (as amended)	Impacts to areas designated for attainment of federal Clean Air standards is not considered likely since the units would be burned under parameters of the Oregon Smoke Management Plan which prescribes smoke emission reduction measures (e.g., rapid ignition and aggressive mop-up) and directs burning under conditions when smoke would rise high in the atmosphere and be transported away from designated areas.
Areas of Critical Environmental Concern	Federal Land Policy and Management Act of 1976 (FLPMA)	None - Project area is not within or near a designated or candidate ACEC.
Cultural Resources	National Historic Preservation Act of 1966 (as amended)	"No Effect" - See Project Tracking Form (Oct. 18, 2006).
Environmental Justice	E.O. 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (Feb. 02, 1994). <i>This EO requires that agencies insure that adverse health or environmental effects do not disproportionately affect minority or low-income populations.</i>	None - The proposed project areas are not known to be used by, or disproportionately used by, Native Americans, minorities or low-income populations for specific cultural activities, or at greater rates than the general population. According to 2004 U.S. Census Bureau data approximately six percent of the population of Douglas County was classified as minority status. It is estimated that approximately 14% of the county is below the poverty level (2003 U.S. Census Bureau data).
Farm Lands (prime or unique)	Surface Mining Control and Reclamation Act of 1977. <i>This act seeks to identify and restore prime farmlands and other unique federal land characteristics.</i>	None - "No discernable effects are anticipated" (PRMP, pgs. 1-7).
Floodplains	E.O. 11988, as amended, Floodplain Management (May 24, 1977). <i>This EO requires agencies to determine if a proposed action will occur in a floodplain and that the action will avoid adverse impacts associated with occupancy and modification of floodplains and avoids floodplain development.</i>	None - Project is not within 100 yr. floodplain.

Element	Relevant Authority	Environmental Effect
Invasive and Nonnative Species	<p>Lacey Act, as amended; Federal Noxious Weed Act of 1974 as amended; Endangered Species Act of 1973, as amended; and EO 13112 on Invasive Species dated Feb. 03, 1999.</p> <p><i>This EO requires the prevention of introduction of invasive species and to provide for their control to minimize their economic, ecological, and human health impacts.</i></p>	<p>Infestations of noxious weeds are being treated under the Roseburg District Integrated Weed Control Plan (1995).</p> <p>Project design features are included in the proposed action to prevent or control the spread of noxious weeds (EA, pg. 14).</p>
Native American Religious Concerns	<p>American Indian Religious Freedom Act of 1978.</p> <p><i>This act seeks to protect and preserve for American Indians the right of exercise of traditional religion including access to religious sites.</i></p>	<p>No concerns were noted as the result of public and tribal contact including impacts to Indian Trust Resources.</p>
Threatened or Endangered Species	<p>Endangered Species Act of 1973 (as amended); The Pacific Coast Recovery Plan for the American Peregrine Falcon (1982); Columbian White-tailed Deer Recovery Plan (1983); Recovery Plan for the Pacific Bald Eagle (1986); and Recovery Plan for the Marbled Murrelet (1997).</p>	<p>Botany – Surveys were performed in 1997-1998 and 2006 and Kincaid’s Lupine (federally threatened) and the rough popcorn flower (federally endangered) were not detected (EA, pg. 44).</p> <p>Wildlife – The USFWS concurred with the Roseburg District’s determination that the proposed action is not likely to adversely affect the marbled murrelet or northern spotted owl (EA, pg. 49). The proposed action has no effect on the bald eagle. (EA, pg. 21-22).</p> <p>Fisheries – The proposed action “Will Not Adversely Effect” EFH for coho or Chinook salmon in Hancock Creek, Elk Creek, or their tributaries. There are currently no listed or proposed fish species in the project area (EA, pg. 43)</p>
Wastes, Hazardous or Solid	<p>Resource Conservation and Recovery Act of 1976; Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (as amended).</p> <p><i>These laws regulate hazardous waste that endangers public health or the environment.</i></p>	<p>None - Applicable HazMat policies would be in effect.</p>
Water Quality, Drinking / Ground	<p>Clean Water Act of 1987; Safe Drinking Water Act Amendments of 1996; EO 12088, Federal compliance with pollution control standards (Oct. 13, 1978); EO 12589 on Superfund implementation (Feb. 23, 1987); and EO 12372 Intergovernmental review of federal programs (July 14, 1982).</p>	<p>None - Project is not in a municipal watershed covered under a Memorandum of Understanding. No domestic water users have been identified within one mile downstream from the project area.</p>
Wetlands/Riparian Zones	<p>E.O. 11990, Protection of Wetlands (May 24, 1977).</p> <p><i>This EO requires federal agencies to avoid destruction or modifications of wetlands and to avoid undertaking or providing assistance for new construction located in wetlands.</i></p>	<p>None - "The selected alternative [of the FEIS] complies with [E.O. 11990]..."(ROD p. 51, para.7).</p>

Element	Relevant Authority	Environmental Effect
Wild and Scenic Rivers	Wild and Scenic Rivers Act of 1968 (as amended); The North Umpqua Wild and Scenic River Plan (July 1992).	None - Project is not within the North Umpqua Scenic River corridor.
Wilderness	Federal Land Policy and Management Act of 1976; Wilderness Act of 1964.	None - "There are no lands in the Roseburg District which are eligible as Wilderness Study Areas." (ROD/RMP pg. 54).

OTHER RESOURCES CONSIDERED

Resource	Environmental Effect / Concerns
Land Use (Leases, Grazing etc.)	None – The proposed project has no conflicting land uses. Roads are encumbered under Right-of-Way Agreement #R-676 (Lone Rock Timber).
Minerals	None - Project has no mining claims or leases of record.
Recreation	Minimal short-term impacts – The proposed action would not alter the existing recreational opportunities within the project area (EA, pg. 17).
Visual Resources	None - The VRM classification for this area is IV. This classification allows major modification of the landscape. The proposed action would be consistent with ROD/RMP direction (EA, pg. 17).
Other (Adjacent Landowners)	None - Adjacent landowners in the vicinity of this sale were notified (Oct. 20, 2006) and two comments were received. One requested to be added to the mailing list for future documents regarding this project and one request for additional information (EA, pg. 48).

Appendix D. Northern Spotted Owl Habitat

Roseburg District BLM – Swiftwater Field Office

Project Name: Bell Mountain
Project Type: Commercial Thinning & Density Management
Location: T22S-R07W-Sections 14, 23, and 27

Prepared By: Elizabeth Gayner
Date: September 28, 2006

Table 2a. Northern Spotted Owl Habitat Modified or Removed within the Project Units and Currently Present in the Elk Creek/ Umpqua River Fifth-Field Watershed. Habitat acreage calculations were completed before proposed unit configuration was finalized. In these calculations 160 acres proposed whereas in the EA the final unit configuration is 151 acres.

Project Area						5 th -Field Watershed ⁴		
Project Unit	Suitable NRF Habitat ¹ (acres)		Dispersal Habitat ² (acres)		Critical Habitat ³ (acres)	Suitable Habitat ⁴ (acres)	Dispersal Habitat ^{2,5} (acres)	Critical Habitat ³ (acres)
	Modified	Removed	Modified	Removed				
<i>Commercial Thinning Harvest Units</i>						17,700	24,800	38,400
14A	0	0	30	0	0			
23A	0	0	97	0	0			
27A	0	0	16	0	0			
27B	0	0	17	0	0			
Total	0	0	160	0	0			

1. NRF- Nesting, Roosting, and Foraging Habitat on federal lands. For analysis purposes is considered stands ≥ 80 years of age based on FOI ($0 < DK \leq 1925$).

2. Suitable Dispersal Habitat on federal lands, for analysis purposes, is considered stands aged 40 to 79 years based on FOI ($1925 < DK \leq 1965$).

3. Designated Critical Habitat includes habitat that supports Northern spotted owl nesting, roosting, foraging, and dispersal activities on federal lands. Critical Habitat also includes habitat that is currently unsuitable, but has the capability of becoming suitable habitat in the future.

4. Information obtained from Appendix Table B-17 in the Biological Opinion for the Roseburg District Programmatic Activities FY 2005-2008 (1-15-05-F-0512 [August 29, 2005]). The primary expectation for private lands is their contribution to demographic support [dispersal habitat] and/or connectivity with other lands (pg. 40, Ref. # 1-15-05-F-0512 [Aug. 29, 2005]).

5. Suitable NRF habitat also functions as dispersal habitat and is included in the total dispersal acres.

Table 2b. Direct impacts to Northern Spotted Owl habitats under the Action Alternative (Commercial Thin) within the Coast Range Provincial Home Range (1.5 miles = 4,524 acres) of Known Northern Spotted Owl Sites. The acres (federal land only) of available habitat types within each home range are provided in the table. Habitat acreage calculations were completed before proposed unit configuration was finalized. In these calculations 160 acres proposed whereas in the EA the final unit configuration is 151 acres.

Northern Spotted Owl Site Identification Number (id #s)		Bell Mountain ⁵ (3263, A, B)	Bell Mountain (3263C)	Deadman Butte (0267B)	Deadman Butte (0267C)	Elk Bend (2049, A, B)	Hancock Creek (1816)
Known Owl Activity Center (KOAC) [size (acres)]		110	None	On Private	None	None	None
Total Acres of Federal Lands within Home Range		1196	913	1946	2764	1502	2016
Suitable NRF (acres)¹ (0 < stand birth date ≤ 1925) (acres)	pre-harvest	619	505	1412	1687	497	947
	post-harvest	619	505	1412	1687	497	947
Suitable Dispersal-only Habitat (acres)² (1925 < stand birth date ≤ 1965) (acres)	pre-harvest	315	246	479	813	700	736
	post-harvest	315	246	479	813	700	736
Critical Habitat (acres)³	pre-harvest	0	0	0	0	0	0
	post-harvest	0	0	0	0	0	0
Dispersal Habitat degraded (% dispersal degraded)⁴ (acres)		130 (14%)	77 (10%)	18 (0.1%)	5 (0.4%)	25 (2%)	143 (8%)

Northern Spotted Owl Site Identification Number (id #s)		Hancock Creek (1816A -C)	Whipples Haven (4655)
Known Owl Activity Center (KOAC) [size (acres)]		104	On Private
Total Acres of Federal Lands within Home Range		1942	398
Suitable NRF (acres)¹ (0 < stand birth date ≤ 1925) (acres)	pre-harvest	698	275
	post-harvest	698	275
Suitable Dispersal-only Habitat (acres)² (1925 < stand birth date ≤ 1965) (acres)	pre-harvest	890	42
	post-harvest	890	42
Critical Habitat (acres)³	pre-harvest	0	0
	post-harvest	0	0
Dispersal Habitat degraded (% dispersal degraded)⁴ (acres)		127 (8%)	10 (3%)

¹ Suitable habitat is not expected to be modified (neither degraded nor downgraded) in the proposed action.

² Dispersal habitat is expected to be degraded by the density management prescription but is not expected to lose any functionality.

³ Acreage of critical habitat will not be changed by the proposed action and the proposed action is not expected to degrade functionality of dispersal habitat.

⁴ Percentage degraded is calculated using *total* acres of dispersal habitat (suitable NRF + dispersal-only habitat).

⁵ If activity centers occurred within the same contiguous stand, the activity centers were analyzed together as one site using the activity center that best represents the stand for this analysis.

Appendix E. Evaluation of Northern Spotted Owl Reports

File Code 1730/6840A

Evaluation of the Roseburg District Resource Management Plan Relative to Four Northern Spotted Owl Reports September 12, 2005

I. Introduction

The Roseburg District Record of Decision (ROD) and Resource Management Plan (RMP), June 1995, incorporates and adopts the Northwest Forest Plan ROD (April 1994) based on the Interagency (BLM and Forest Service) Final Supplemental Environmental Impact Statement (February 1994) and the Roseburg District Proposed Resource Management Plan/Final Environmental Impact Statement (PRMP/EIS)(October 1994).

The overall objectives of the Northwest Forest Plan (NFP) and the Roseburg District RMP/ROD are to manage for healthy forest ecosystems with habitat that will support populations of native species, particularly those associated with late-successional habitat, and respond to the need for a sustainable supply of timber and other forest products. In addition, these plans are based on the principles of adaptive management. Adaptive management is a continuing process of monitoring, research, evaluation and adjusting, as determined necessary, with the objectives of improving the implementation and achieving the goals of the RMP/ROD. Under the concepts of adaptive management new information is evaluated and a decision is made to determine if adjustments or changes are deemed necessary (Roseburg RMP/ROD, June 1995).

The Bureau of Land Management (BLM), Forest Service (FS), and US Fish and Wildlife Service (USFWS) have conducted a coordinated review of four recently completed reports containing information on the NSO. The reviewed reports (hereinafter collectively referred to as “the reports”) include the following:

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

The interagency review and summary of the findings from those reports is described below.

The BLM planning regulations require that , “The District Manager shall be responsible for monitoring and evaluating the plan at “established intervals . . . and at other times as appropriate

to determine whether there is sufficient cause to warrant amendment or revision of the plan” (see 43 CFR 1610.4-9).

As a key element of the Northwest Forest Plan monitoring strategy, completion of the NSO status and trend portion of *The First Ten Years* monitoring report, as well as the other timely studies pertinent to the NSO, is considered appropriate to warrant this focused evaluation. The monitoring report and this evaluation carry out the process of monitoring (ROD/RMP pp. 84-86 and adaptive management (ROD/RMP pp. 79-80) envisioned by the Northwest Forest Plan (NWFP), as adopted and implemented through the Roseburg District RMP.

Following is the interagency review and summary of key findings from the four reports regarding the NSO. This summary has been reviewed by report authors Dr. Steven P. Courtney and Dr. Robert G. Anthony to ensure that it accurately reflects their findings. In addition, agency representatives Terry Rabot and Joseph Lint reviewed the document to verify that the USFWS five-year review and the ten-year NSO status and trend report, respectively, were appropriately incorporated.

II. Review and Summary of Key Findings Regarding the Northern Spotted Owl

The most important conservation concerns addressed in the reports are: 1) the precipitous NSO population declines in Washington, and declining trends in the three northern Oregon demographic areas, as described by Anthony et al. (2004); and 2) the three major current threats identified by Courtney et al. (2004), i.e., lag effects from prior harvest of suitable habitat, habitat loss due to wildfire in portions of the range, and competition from barred owls.

Anthony et al. (2004) indicated that NSO populations were doing poorest in Washington, with precipitous declines on all four study areas. The number of populations that declined, and the rate at which they declined, were noteworthy (Anthony et al. 2004). In northern Oregon, NSO population declines were noted in all three study areas. The declines in northern Oregon were less than those in Washington, except in the Warm Springs study area, where the decline was comparable to those in Washington (Anthony et al. 2004). The NSO has continued to decline in the northern portion of its range, despite the presence of a high proportion of protected habitat on federal lands in that area. Although Courtney et al. (2004) indicated that population declines of the NSO over the past 14 years were expected, they concluded that the accelerating downward trends on some study areas in Washington where little timber harvest was taking place suggest that something other than timber harvest is responsible for the decline. Anthony et al. (2004) stated that determining the cause of this decline was beyond the scope of their study, and that they could only speculate among the numerous possibilities, including competition from barred owls, loss of habitat from wildfire, timber harvest including lag effects from prior harvest, poor weather conditions, and defoliation from insect infestations. Considering the fact that the NSO is a predator species, Anthony et al. (2004) also noted the complexities of relationships of prey abundance on predator populations, and identified declines in prey abundance as another possible reason for declines in apparent survival of NSO.

In southern Oregon and northern California, NSO populations were more stationary than in Washington (Anthony et al. 2004). The fact that NSO populations in some portions of the range were stationary was not expected within the first ten years, given the general prediction of

continued declines in the population over the first several decades of NWFP implementation (Lint 2005). The cause of the better demographic performance on the southern Oregon and northern California study areas, and the cause of greater than expected declines on the Washington study areas are both unknown (Anthony et al. 2004). Courtney et al. (2004) noted that a rangewide population decline was not unexpected during the first decade, nor was it a reason to doubt the effectiveness of the core NWFP conservation strategy.

Lint (2005) indicated that loss of NSO habitat did not exceed the rate expected under the NWFP, and that habitat conditions are no worse, and perhaps better than expected. In particular, the percent of existing NSO habitat removed by harvest during the first decade was less than expected. Courtney et al. (2004) indicated that models of habitat growth suggest that there is significant ingrowth and development of habitat throughout the federal landscape. Courtney et al. (2004) also noted that management of matrix habitat has had a lower impact on NSO populations than predicted. Owls are breeding in substantial numbers in some matrix areas. The riparian reserve strategy and other habitat management guidelines for the matrix area appear to preserve more, better, and better-distributed dispersal habitat than earlier strategies, and there is no evidence to suggest that dispersal habitat is currently limiting to the species in general (Courtney et al. 2004). Anthony et al. (2004) noted declining NSO populations on some study areas with little harvest, and stationary populations on other areas with consistent harvest of mature forest. No simple correlation was found between population declines and timber harvest patterns (Courtney et al. 2004). Because it was not clear if additional protection of NSO habitat would reverse the population trends, and because the results of their study did not identify the causes of those trends, Anthony et al. (2004) declined to make any recommendations to alter the current NWFP management strategy.

Reductions of NSO habitat on federal lands are lower than those originally anticipated by the Service and the NWFP (Courtney et al. 2004). The threat posed by current and ongoing timber harvest on federal lands has been greatly reduced since 1990, primarily because of the NWFP (Courtney et al. 2004). The effects of past habitat loss due to timber harvest may persist due to time-lag effects. Although noting that it is probably having a reduced effect now as compared to 1990, Courtney et al. (2004) identified past habitat loss due to timber harvest as a current threat. The primary current source of habitat loss is catastrophic wildfire (Courtney et al. 2004). Although the total amount of habitat affected by wildfires has been small, there is concern for potential losses associated with uncharacteristic wildfire in a portion of the species range. Lint (2005) indicated that the NWFP recognized wildfire as an inherent part of managing NSO habitat in certain portions of the range. Courtney et al. (2004) stated that the risk to NSO habitat due to uncharacteristic stand replacement fires is sub-regional, confined to the dry eastern and to a lesser extent the southern fringes of the NSO range. Wildfires accounted for 75 percent of the natural disturbance loss of habitat estimated for the first decade of NWFP implementation (Courtney et al. 2004). Lint (2005) cautioned against relying solely on the repetitive design of the conservation strategy to mitigate effects of catastrophic wildfire events, and highlighted the potential to influence fire and fire effects through active management.

Anthony et al. (2004) indicated that there is some evidence that barred owls may have had a negative effect on NSO survival in the northern portion of the NSO range. They found little evidence for such effects in Oregon or California. The threat from barred owl competition has

not yet been studied to determine whether it is a cause or a symptom of NSO population declines, and the reports indicate a need to examine threats from barred owl competition. The synergistic effects of past threats and new threats are unknown. Though the science behind the NWFP appears valid, new threats from barred owls, and potential threats¹ from West Nile virus and Sudden Oak Death may result in NSO populations in reserves falling to lower levels (and at a faster rate) than originally anticipated. If they occur, such declines could affect NSO recovery (Courtney et al. 2004). According to Courtney et al. (2004), there exists a potential for habitat loss due to Sudden Oak Death in the southern portion of the range, however the threat is of uncertain proportions. In addition, Courtney et al. (2004) indicated there is no way to predict the impact of West Nile virus, which is also identified as a potential threat. The reports do not provide supporting analysis or recommendations regarding how to deal with these potential threats. Courtney et al. (2004) concluded that the risks currently faced by the NSO are significant, and their qualitative evaluation is that the risks are comparable in magnitude to those faced by the species in 1990.

According to the USFWS (November 2004), the current scientific information, including information showing declines in Washington, northern Oregon, and Canada, indicates that the NSO continues to meet the definition of a threatened species. Populations are still relatively numerous over most of the species' historic range, which suggests that the threat of extinction is not imminent, and that the subspecies is not endangered even in the northern part of its range where greater than expected population declines were documented (USFWS, November 2004). The USFWS (November 2004) did not consider the increased risk to NSO populations due to the uncertainties surrounding barred owls and other factors sufficient to reclassify the species to endangered at this time.

In summary, although the agencies anticipated a decline of NSO populations under land and resource management plans during the past decade, the reports identified greater than expected NSO population declines in Washington and northern portions of Oregon, and more stationary populations in southern Oregon and northern California. The reports did not find a direct correlation between habitat conditions and changes in NSO populations, and they were inconclusive as to the cause of the declines. Lag effects from prior harvest of suitable habitat, competition with barred owls, and habitat loss due to wildfire were identified as current threats; West Nile virus and Sudden Oak Death were identified as potential new threats. Complex interactions are likely among the various factors. The status of the NSO population, and increased risk to NSO populations due to uncertainties surrounding barred owls and other factors, were reported as not sufficient to reclassify the species to endangered at this time. The reports did not include recommendations regarding potential changes to the basic conservation strategy underlying the NWFP, however they did identify opportunities for further study.

The full reports are accessible on the internet at the following addresses:

- Courtney et al. 2004:
<http://www.sei.org/owl/finalreport/finalreport.htm>

¹ Courtney et al. (2004) distinguish between operational threats (perceived as currently negatively influencing the status of the NSO) and potential threats (factors that could become operational threats in 15-20 years, or factors that may be threatening the NSO currently and for which the extent of the threat is uncertain).

- Anthony et al. 2004:
<http://www.reo.gov/monitoring/trends/Compiled%20Report%20091404.pdf>
- USFWS, November 2004:
<http://www.fws.gov/pacific/ecoservices/endangered/recovery/5yearcomplete.html>
- Lint, Technical Coordinator, 2005:
http://www.reo.gov/monitoring/10yr-report/northern-spotted-owl/documents/owl_text%20and%20tables.pdf

III. Comparative Evaluation of the Roseburg District Resource Management Plan with the Four, Previously Referenced, Reports on the Northern Spotted Owl.

Following are excerpts from the Roseburg District RMP, the supporting Roseburg District Proposed Resource Management Plan/Environmental Impact Statement (PRMP/EIS) 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). These excerpts form the basis for short discussions of consistency of the report findings with effects described for the NSO in the PRMP/EIS and FSEIS, and the ability to meet RMP goals and objectives.

The Roseburg District PRMP/EIS summarizes discussions from the FSEIS regarding NSO populations. “The overall results [declining populations across much of their range] of the demographic analysis were not surprising since the data was gathered during a time of habitat decline that was of sufficient concern to serve as the primary reason for listing of the owl as a threatened species” and “the result that should be of most concern is the declining rate of adult survival”. “While there is strong reason to believe that the owl populations have declined across much of their range there is ample reason to believe that the pattern of population change is not the same everywhere” and “It is unlikely that a single factor, with the exception of habitat loss, is primarily responsible for the declines in owl populations across its range” (PRMP/EIS pp. 4-63 – 4-64). Also as stated in the FSEIS under the strategies proposed, both the Interagency Scientific Committee (Thomas et al 1990) and the Northern Spotted Owl Recovery Team (USDI 1992) projected that owl habitat and owls would continue to decline for up to 50 years before reaching a new equilibrium.

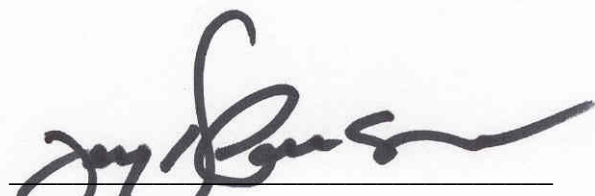
The continuing decline in NSO populations was anticipated and is consistent with the analysis in the Roseburg PRMP/EIS and Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl (FSEIS) (USDA; USDI, 1994a). The Roseburg PRMP/EIS incorporated by reference (PRMP/EIS 4-54, 4-63) the discussion and conclusions of the FSEIS relating to the analysis of the spotted owl population trends (FSEIS Chapter 3&4, pages 3&4-212 to 245 and Appendix J3). The discussion and conclusions in the FSEIS and the Roseburg PRMP/EIS anticipate that NSO populations had declined throughout much of their range and would continue to decline for the first few decades of the NFP implementation. It also concluded that the effects or rate of decline from implementation would not be the same everywhere across the range and for all habitat types. These conclusions are consistent with the information in Section II of this evaluation in that the reports did not find a direct correlation between habitat conditions and changes in NSO populations and were also inconclusive as to the cause of the population declines.

Lint (2005) indicated that the NWFP recognized wildfire as an inherent part of managing NSO habitat in certain portions of the range. Courtney et al. (2001) also added “The Forest Plan acknowledges the potential for the loss of owls and habitat from catastrophic events such as wildfire, particularly in the East Cascade Provinces and the Klamath Province.” (pp 6_25) Even though stand replacing wildfire is identified as a continuing threat to NSO suitable habitat in the reports, it is not considered a widespread threat throughout the range of the NSO. Stand replacing wildfire did have some local negative effects, but these were most notable in the Klamath Provinces in northern California and southern Oregon.

The threat from barred owls competition was not considered specifically in the Roseburg PRMP/EIS or the FSEIS although it did consider other factors outside of habitat loss. It was a concern that other factors may be responsible for population decline outside of those that could be managed under land management practices. “... it is unlikely that a single factor, with the exception of habitat loss, is primarily responsible for the declines in [Northern spotted] owl populations across the range” (PRMP/EIS 4-64). Anthony et al indicated that there is some evidence that barred owls may have had a negative effect on NSO survival in the northern portion of the range. They have found little evidence for such effects in Oregon and California. The threat from barred owl competition has not yet been studied to determine whether it is a cause or a symptom of NSO declines, and the reports indicate a need to examine these threats from barred owl competition.

IV. Conclusions/Findings

Based on the above evaluation of pertinent elements of the Roseburg District ROD/RMP and its associated PRMP/EIS, I find that effects on NSO populations identified in the four reports are within those anticipated in the PRMP/EIS, and that the RMP goals and objectives are still achievable in light of the information from the reports. As such, I find that the latest information on the NSO does not warrant a change in RMP decisions pertinent to the NSO, and therefore does not warrant amendment or revision of the Roseburg District RMP. I also find that the underlying analysis in the EIS remains adequate for purposes of tiering NEPA analyses of NSO effects from proposed actions implementing the RMP.



Jay K. Carlson
District Manager, Roseburg District

9/12/05
Date

References

USDA; USDI, 1994a. U.S. Department of Agriculture, Forest Service; U.S. Department of Interior, Bureau of Land Management, February 1994. 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.

USDA; USDI, 1994b. U.S. Department of Agriculture, Forest Service; U.S. Department of Interior, Bureau of Land Management, April 1994. Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl.

Appendix F. Bureau Sensitive, Assessment, & Tracking Wildlife Species.

Roseburg District BLM – Swiftwater Field Office

Project Name: Bell Mountain
Project Type: Commercial Thinning & Density Management
Location: T22S-R07W-Sections 14, 23, and 27

Prepared By: Elizabeth Gayner
Date: September 28, 2006
SSSP List Date: March 14, 2005

The following tables include those species which are documented or suspected to occur within the Roseburg District BLM. Those Bureau Sensitive or Bureau Assessment species which are suspected or documented to occur within the project area are detailed in **Table 1: Wildlife Summary** and may be further discussed in the body of the EA as appropriate.

Table 3a. Bureau Sensitive & Bureau Assessment Species. BLM districts are responsible to assess and review the effects of a proposed action on *Bureau Sensitive* and *Bureau Assessment* species. To comply with Bureau policy, Districts may use one or more of the following techniques:

- a. Evaluation of species-habitat associations and presence of potential habitat.
- b. Application of conservation strategies, plans, and other formalized conservation mechanisms.
- c. Review of existing survey records, inventories, and spatial data.
- d. Utilization of professional research and literature and other technology transfer methods.
- e. Use of expertise, both internal and external, that is based on documented, substantiated professional rationale.
- f. Complete pre-project survey, monitoring, and inventory for species that are based on technically sound and logistically feasible methods while considering staffing and funding constraints.

When Districts determine that additional conservation measures are necessary, options for conservation include, but are not limited to: modifying a project (e.g. timing, placement, intensity), using buffers to protect sites, or implementing habitat restoration activities (IM-OR-2003-054).

Species	Status ¹	Present in Project Area? ¹	General Habitat Requirements
BUREAU SENSITIVE			
American Peregrine Falcon <i>Falco peregrinus anatum</i>	BS, SE	No Habitat	Cliffs, rock outcrops; open habitats for hunting birds
Chace Sideband <i>Monadenia chaceana</i>	BS	Out of Range	Rocky, talus habitats in the Klamath Province and southwards
Columbian White Tailed Deer <i>Odocoileus virginianus leucurus</i>	BSO, CR	No Habitat	Bottomlands, oak/hardwood forests; cover for fawning
Crater Lake Tightcoil <i>Pristiloma arcticum crateris</i>	BSO	Out of Range	Perennially wet areas in late seral forests above 2000ft elevation and east of Interstate-5; seeps, springs, riparian areas
Green Sideband <i>Monadenia fidelis beryllica</i>	BSO	No Habitat	Coast Range, riparian forests at low elevations; deciduous trees & shrubs in wet, undisturbed forest
Klamath Tail-Dropper <i>Prophysaon sp. nov.</i>	BS	Out of Range	Moist, open areas along streams or springs in Ponderosa Pine forests; as far North as Crater Lake
Lewis' Woodpecker <i>Melanerpes lewis</i>	BSO, CR	No Habitat	Open woodland habitat near water: open woodland canopy and large diameter dead/dying trees, snag cavities
Northern Goshawk <i>Accipiter gentilis</i>	BSO, XC, CR	Suspected	Mature and older conifer forests; multi-storied canopies and great structural diversity
Northwestern Pond Turtle <i>Clemmys marmorata marmorata</i>	BSO, XC, CR	No Habitat	Ponds, low gradient rivers; upland over-wintering habitat, CWD
Oregon Shoulderband <i>Helminthoglypta hertleini</i>	BSO	No Habitat	Talus and rocky substrates, grasslands or other open areas with low-lying vegetation

Species	Status ¹	Present in Project Area? ¹	General Habitat Requirements
Oregon Vesper Sparrow <i>Poocetes gramineus affinis</i>	BSO, CR	No Habitat	Open habitats such as grasslands, meadows, farmlands
Purple Martin <i>Progne subis</i>	BSO, CR	Suspected	Snags cavities in open habitats (e.g. grasslands, brushlands, open woodlands)
Rotund Lanx <i>Lanx subrotundata</i>	BSO	No Habitat	Major rivers and large tributaries with cold, well-aerated water and rocky substrate
Scott's Apatanian Caddisfly <i>Allomyia scotti</i>	BSO	Out of Range	High-elevation (>4,000ft), cold streams in the mountainous regions of Oregon
Spotted Tail-dropper <i>Prophyaon vannattaie pardalis</i>	BS	No Habitat	Mature conifer forests in the Coast Range; associated with significant deciduous tree/shrub component
Townsend's Big-eared Bat <i>Corynorhinus townsendii</i>	BSO, XC, CR	Suspected	Late successional forests; Caves, mines, buildings, bridges, tunnels
BUREAU ASSESSMENT			
Foothill Yellow-legged Frog <i>Rana boylei</i>	BAO, XC, V	No Habitat	Low gradient streams/ponds; gravel/cobble, bedrock pools
Fringed Myotis <i>Myotis thysanodes</i>	BAO, XC, V	Suspected	Late-successional conifer forests, associated with water; caves, mines, bridges, rock crevices
Harlequin Duck <i>Histrionicus histrionicus</i>	BAO, XC, U	Out of Range	Mountain Streams in forested areas on west slope of the Cascade Mountains
Pacific Pallid Bat <i>Antrozous pallidus pacificus</i>	BA	No Habitat	Usually rocky outcroppings near open, dry open areas; occasionally near evergreen forests
Pallid Bat <i>Antrozous pallidus</i>	BA	No Habitat	Usually rocky outcroppings near open, dry open areas; occasionally near evergreen forests
White-Tailed Kite <i>Elanus leucurus</i>	BAO	No Habitat	Open grasslands, meadows, emergent wetlands, farmlands, lightly, wooded areas; wooded riparian habitats close to open hunting; tall trees and shrubs

¹ A "Suspected" species has not been documented, however based on literature review, species is expected to occur.

Table 3b. Bureau Tracking Species. To enable an early warning for species which may become threatened or endangered in the future, Districts are encouraged to collect occurrence data on species for which more information is needed to determine status within the state. Until status of such species changes, Bureau Tracking species will not be considered as Special Status Species for management purposes (IM-OR-2003-054).

Species	Status ¹	Present in Project Area? ¹	General Habitat Requirements	Source of Detection
BUREAU TRACKING				
Acorn Woodpecker <i>Melanerpes formicivorus</i>	BT	No Habitat	Mixed oak woodlands; snags	-
American Marten <i>Martes americana</i>	BTO, V	Suspected	Late-successional forest; large CWD, snags, uneven age stands with adequate cover	-
Brazilian Free-tailed Bat <i>Tadarida brasiliensis</i>	BTO	No Habitat	At low elevations where climatic conditions are warm; roosts in caves, mines, buildings	-
Broadwhorl Tightcoil <i>Pristiloma johnsoni</i>	BT	Suspected	Moist forest sites, typically with deciduous component; Coast/Cascades in WA, Coast Range in OR, as far south as Lane County	-
California Mountain Kingsnake <i>Lampropeltis zonata</i>	BT, V	No Habitat	Pine forests, oak woodlands, chaparral; rotting logs, loose soil	-
California Myotis <i>Myotis californicus</i>	BT	Suspected	Forested areas, shrub-steppe areas, arid grasslands; forage over water and tree canopies where insects congregate	-
Cascades Frog <i>Rana cascadae</i>	BT	No Habitat	Lakes, ponds, streams in meadows above elevations of 2600 feet; muddy or silty substrate of shallow waters	-
Clouded Salamander <i>Aneides Ferreus</i>	BTO, U	Suspected	Forested Habitats: CWD, talus	-
Common Kingsnake <i>Lampropeltis getula</i>	BT	No Habitat	Grassland, mixed oak woodlands; riparian	-
Common Nighthawk <i>Chordeiles minor</i>	BT	Suspected	Forest mountain clearings, open woodlands & meadows, urban areas; (nests on ground)	-
Del Norte Salamander <i>Plethodon elongates</i>	BT	Out of Range	Late-successional conifer forests; rock rubble or talus slopes	-
Great Gray Owl <i>Strix nebulosa</i>	BT, V	No Habitat	Coniferous forests; meadows and natural openings (>10ac) near late-seral nesting habitat	-
Hoary Bat <i>Lasiurus cinereus</i>	BT	Suspected	Open, grassy areas and/or lakes near forest lands; large trees for roosting and access to hatching aquatic insects are important features	-
Indian Paintbrush Bug <i>Polymerus castilleja</i>	BTO	No Habitat	Old-growth and late-successional conifer forests, mature riparian woodlands; Indian Paintbrush (<i>Castilleja spp.</i>)	-
Long-eared Myotis <i>Myotis evotis</i>	BT, XC, U	Suspected	Late-successional conifer forests, associated with water; roosts in caves, mines, bridges, snags	-
Long-legged Myotis <i>Myotis volans</i>	BT, XC, U	Suspected	Late-successional conifer forests, associated with water; roosts in caves, mines, bridges, loose bark, rock crevices	-
Northern Red-legged Frog <i>Rana aurora aurora</i>	BT	Documented	Low gradient streams/ponds with aquatic vegetation	ONHI 1992
Olive-sided Flycatcher <i>Contopus cooperi</i>	BTO, XC, V	Documented	Coniferous forests; uneven canopy with snags and tall trees	BLM 2000, 2001
Oregon Floater <i>Anodontia oregonensis</i>	BT	No Habitat	Slow-moving reaches of permanent streams; sand/gravel substrates in very cold, clear water w/o macrophytes; historically in Umpqua R. and	-

Species	Status ¹	Present in Project Area? ¹	General Habitat Requirements	Source of Detection
			major tribs.	
Oregon Megomphix <i>Megomphix hemphilli</i>	BTO	Suspected	Moist conifer/hardwood forests up to 3000ft; HWD leaf litter and decaying HWD matter under big leaf maple trees, sword fern	-
Oregon Red Tree Vole <i>Arborimus longicaudus longicaudus</i>	BTO, U	Suspected	Late-successional and mid seral Douglas-fir forests; arboreal platform structures	-
Pileated Woodpecker <i>Dryocopus pileatus</i>	BT, V	Documented	Forests 40 years and older; Large diameter snags, CWD	BLM 2000, 2001
Pristine Springsnail <i>Pristinicola hemphilli</i>	BT	No Habitat	Shallow, cold, clear springs/seeps; strongly spring-influenced streams, slow-moderate flow; Umpqua R. drainage	-
Ringtail <i>Bassariscus astutus</i>	BTO, U	Suspected	Coniferous forests, mixed woodlands; vertical structure to habitat. Streams and rivers	-
Sharp-tailed Snake <i>Contia tenuis</i>	BT, V	Suspected	Forested Habitats; CWD, talus, riparian	-
Silver-haired Bat <i>Lasionycteris noctivagans</i>	BTO, U	Suspected	Late-successional conifer forests, associated with water; caves/mines, bridges, loose bark, rock crevices, snags	-
Slender-billed Nuthatch <i>Sitta carolinensis aculeate</i>	BT	No Habitat	Open woodlands, preferring oak woodlands in Western OR; nests in cavities	-
Southern Torrent (Seep) Salamander <i>Rhyacotriton variegatus</i>	BTO, XC, V	Suspected	Springs and streams; riparian/wetland, CWD	-
Tailed Frog <i>Ascaphus truei</i>	BT	No Habitat	High gradient, perennial streams; cobbles/boulders	-
Western Bluebird <i>Sialia mexicana</i>	BT, V	Documented	Open habitats (incl. clearcuts), tree cavities	BLM 2001
Western Gray Squirrel <i>Sciurus griseus</i>	BTO, U	Suspected	Oak/hardwood forests, conifer forests, riparian; broad-leafed component in habitat	-
Western Pearlshell <i>Margaritifera falcata</i>	BT	No Habitat	Fast, clear, very cold streams with coarse substrate; hosts include Chinook salmon, trout, speckled dace; Umpqua R. and major tribs.	-
Western Ridgemussel <i>Gonidea angulata</i>	BT	No Habitat	Creeks, rivers, coarse substrates; Umpqua R. and possibly major tribs.	-
White-footed Vole <i>Arborimus albipes</i>	BTO, XC	Suspected	Riparian habitats within conifer forests in the Coast Range; small clearings supporting forb growth	-
Willow Flycatcher <i>Empidonax traillii brewsteri</i>	BT, XC, V	Suspected	Riparian, edges of forest clearings; willows brushy vegetation	-
Yellow-breasted Chat <i>Icteria virens</i>	BT	No Habitat	Dense streamside/riparian vegetation, marshes	-
Yuma Myotis <i>Myotis yumanensis</i>	BTO, XC	Suspected	Late-successional conifer forests, associated with water; roosts in caves, mines, bridges, buildings, snags	-

¹ A "Suspected" species has not been documented, however based on literature review, species is expected to occur.

Appendix G. Wildlife Summary

Roseburg District BLM – Swiftwater Field Office

Project Name: Bell Mountain
Project Type: Commercial Thinning & Density Management
Location: T22S-R07W-Sections 14, 23, and 27

Prepared By: Elizabeth Gayner
Date: September 28, 2006
SSSP List Date: March 14, 2005

Critical Habitat				Management Concerns				
Species	Present (Y/N)	Concern (Y/N)	Critical Habitat Unit(s) (CHU #)	Habitat Removal or Modification or Both?		Critical Habitat Affected by Project (acres)		
Marbled Murrelet	N	N	-	-		-		
Spotted Owl <i>(see also Table 2)</i>	N	N	-	-		-		
Species	Within Species Range?	Habitat Present?	Species Present? ²	Wildlife Concern ¹ ?	Reason for concern or no concern ¹	Mitigation Measures		
						Seasonal Restriction Required?	Daily Operating Restriction Required?	Buffers Required?
Threatened & Endangered Species								
Bald Eagle	Yes	N	N	N	No roost or nest sites	N	N	N
Canada Lynx	N	N	N	N	Out of species range	N	N	N
Fender's Blue Butterfly	Yes	N	N	N	No suitable habitat	N	N	N
Marbled Murrelet	Yes	Adjacent	N	N	Pre-project Surveys Completed 2000-2001; No murrelets detected	N	N	N
Northern Spotted Owl <i>(see also Table 2)</i>	Yes	Yes	Yes	Yes	Degradation of Dispersal Habitat	Refer to PDFs	N	N
Bureau Sensitive Species								
American Peregrine Falcon	Yes	N	N	N	No cliffs/ rock outcrops within units	N	N	N
Northern Goshawk	Yes	Adjacent	Suspected	N	No impact to adjacent suitable habitat	N	N	N
Northwestern Pond Turtle	Yes	N	N	N	No Suitable Habitat	N	N	N
Oregon Vesper Sparrow	Yes	N	N	N	No Suitable Habitat	N	N	N
Purple Martin	Yes	N	Suspected ³	N	No Suitable Habitat	N	N	N
Rotund Lanx	Yes	N	N	N	No Suitable Habitat	N	N	N
Spotted Tail-dropper	Yes	N	N	N	No measurable impact of treatment to habitat	N	N	N
Townsend's Big-eared Bat	Yes	Adjacent	Suspected	N	No impact to adjacent suitable habitat	N	N	Snag PDFs
Bureau Assessment Species								
Foothill Yellow-legged Frog	Yes	N	N	N	No aquatic effects due to PDFs	N	N	N
Fringed Myotis	Yes	Adjacent	Suspected	N	No impact to adjacent suitable habitat	N	N	Snag PDFs
Other Species of Interest								
None								

¹ Wildlife concerns and rationale are discussed more fully in Bell Mountain CT EA.

² Suspected = species has not been documented, however based on literature review, species is expected to occur.

³ Species would be expected to forage in the area if suitable habitat is present within one mile of the project area.

Appendix H. Hydrology

Roseburg District BLM – Swiftwater Field Office

Project Name: Bell Mountain
Project Type: Commercial Thinning & Density Management
Location: T22S-R7W-Sec. 14, 23 & 27

Prepared By: Jill Ralston
Date: Oct 16, 2006

ISSUE IDENTIFICATION:

Table A. Harvest Acreage Near Streams

Unit	Non-Fish Streams	Fish Streams
	Harvest Acreage Within 1 Site tree	Harvest Acreage Within 2 site trees
14A	5	0
23A	10	0
27A	5	0
27B	0	0

Table B. Changes in Peakflows based on Equivalent Clearcut Area (ECA) Model. Detectable increases in water yield usually only occur when at least 20% of the forest cover within a watershed has been removed (Bosch and Hewlett 1982).

Drainage Name	Elk Creek (HUC 5)	Lower Elk Creek (HUC 6)	Brush Creek (HUC 6)	Lower Brush Creek (HUC 7)	Hancock Creek (HUC 7)	Hancock Mountain (HUC 7)
Acres	187,098	12,594	13,470	1,250	2,519	3,480
ECA Existing Condition	15.1%	19.4%	6.6%	13.5%	25.8%	11.4%
ECA No Action Alternative	15.5%	19.4%	7.0%	13.5%	25.8%	11.4%
ECA Action Alternative	15.6%	20.1%	7.0%	13.6%	26.5%	13.6%
Potential Peak Flow Increase¹	No	Yes	No	No	Yes	No
Estimated Bankfull Discharge cfs²	n/a	690	n/a	n/a	156	n/a
Estimated Bankfull Discharge of Elk Creek at point of discharge cfs³	n/a	7,112	n/a	n/a	7,890	n/a
Contribution of flow from Drainage at Elk Creek⁴	n/a	10%	n/a	n/a	2%	n/a
Detectable increases in peakflows?	None Predicted	None Predicted	None Predicted	None Predicted	None Predicted	None Predicted

¹ Potential for Peak Flow Increase occurs only in those drainages which have an ECA of 20% or greater.

² Estimated Bankfull in cfs draining the catchment area based on regional curves of the South Umpqua Area (Kuck 2000)

³ Estimated Bankfull in cfs in Elk Creek upstream of the catchment discharge, based on regional curves of the South Umpqua Area (Kuck 2000).

⁴ Percent of flow at the point of confluence from the catchment area to Elk Creek. Based on GIS data.

Appendix I. Soils

Roseburg District BLM – Swiftwater Field Office

Project Name: Bell Mountain
Project Type: Commercial Thinning & Density Management
Location: T22S-R07W-Sec. 14, 23, 27

Prepared By: Dan Cressy
Date: October 25, 2006

ISSUE IDENTIFICATION:

Table A. Timber Production Capability Classification (TPCC).

Unit EA Unit (Ex. A Unit)	FGR ¹ (acres)	FPR ² (acres)	FSR ³ (acres)	FGNW ⁴ (acres)	FPNW ⁵ (acres)	Category 1 ⁶ (acres)
1	0	0	NA	0	0	NA
2	6	0	NA	0	0	NA
3	0	10	NA	0	0	NA
4	0	0	NA	0	0	NA
Total	6	10	NA	0	0	NA

¹ **FGR** = soils considered fragile due to slope gradient but suitable for forest management with mitigation for surface erosion and landslides. FGR soils comprise about 7 percent of the Bell Mountain sale area

² **FPR** = soils on moderate slopes that have slump-earth flow topography and are suitable for forest management with mitigation for slump-earth flow movements.

³ **FSR** = fragile soils due to moisture deficiencies caused by shallow, rocky soils on but are suitable for timber production with mitigation.

⁴ **FGNW** = soils considered fragile due to slope gradient and unsuitable for forest management even with mitigation for surface erosion and landslides; withdrawn from units.

⁵ **FPNW** = soils on moderate slopes that have slump-earth flow topography and are not suitable for forest management because of active movement; withdrawn from units.

⁶ **Category 1** = soils that are highly sensitive to broadcast burning due to shallow soil depths, that have A horizons less than 4 inches in depth and/or that are on slopes over 70 percent.

Table B. Mass Wasting & Landslides in the Action Area. The action area considered is within the Elk Creek/Upper Umpqua 5th Field Watershed and covers approximately 660 acres. An analysis of mass wasting events for both the BLM and private lands in the vicinity of the proposed activities was done using aerial photo interpretation covering 1958 to 2004 and field reconnaissance.

Timeframe	# Debris Torrents	# Landslides			
	Large (>0.5 acre)	Small (< 0.1 acre)	Medium (0.1-0.5 acre)	Large (> 0.5 acre)	All
Historical Perspective (1960-1999)	0	10 (51%)	4 (46%)	0	14 (1.5 acres)
Project Level Perspective ¹	0	3 (60%)	2 (40%)	0	5 (0.6 acres)
<i>Probability of occurrence expected within units:</i>					
No Action Alternative	none	low	low	low	low
Action Alternative (Harvest)	none	low-mod	low	low	low
Cumulative Effects	Unchanged ²	Unchanged ²	Unchanged ²	Unchanged ²	Unchanged ²

¹ All landslides were identified in Unit 23A. Three were harvest-related (1 small, 2 medium,) and two were road-related (both small). None of these landslides reached a stream, because nearly all of the very steep FGR slopes within the units are isolated from streams by gentle benches and moderate slopes. Dry season yarding (approximately May 15th – October 15th) will also help reduce the risk.

² "Unchanged" indicates that the current conditions and current probabilities of mass wasting or landslide events are expected to be essentially the same at the 6th field watershed scale.

Table C. Soil Productivity. The Spatial Extent of the short-term losses and subsequent short-term gains of soil productivity under the proposed action. The gains would be through amelioration that includes sub-soiling. A negative figure represents acres with a net loss in soil productivity. A positive figure represents acres with a gain.

Road Effects (Unit)	Losses to Soil Productivity due to the Action (prior to sub-soiling)				Improvements to Soil Productivity due to sub- soiling		Effective Net Change (acres)
	New Construction		Use of Existing Natural Surfaced Roads & Trails		Actual Sub-soiled Area ¹ (acres)	Effective Sub-soiled Area ² (acres)	
	Rocked Roads (acres)	Natural Surfaced Roads (acres)	Permanent Roads (acres)	Temporary Roads (acres)			
1	0	-0.92	0	0	0	0	-0.92
2	0	-0.10	0	0	+0.42	+0.40	+0.30
3	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0
Road Total	0	-1.02	0	0	+0.42	+0.40	-0.62
Unit Effects (Unit)	Harvest Operations				Actual Sub-soiled Area ¹ (acres)	Effective Sub-soiled Area ² (acres)	Effective Net Change (acres)
	Helicopter Yarding (acres)	Skyline Cable Yarding (acres)	Ground- based Yarding (acres)	Other Method?			
1	0	-0.05	-0.10	0	+0.13	+0.12	-0.03
2	0	-0.09	-2.35	0	+3.16	+2.95	+0.51
3	0	0	-0.66	0	+0.88	+0.82	+0.16
4	0	0	-0.75	0	+1.01	+0.82	+0.19
Unit Total	0	-0.14	-3.86	0	+5.18	+4.83	+0.83
Grand Total	-5.02				+5.60	+5.23	+0.21**

¹ The natural surfaced spurs in Unit 23A (0.04 miles), 0.23 miles of old-roadbed not used in this action, and, some trail segments, both old and new, with detrimental compaction (estimated 3.9 miles), and log deck areas along landings would be sub-soiled and surface organic debris and topsoil would be pulled back onto the sub-soiled surface.

² "Effective Sub-soiled Area" takes into account the effectiveness of sub-soiling in restoring soil productivity. For the purposes of this analysis, 80 percent short-term recovery is assigned to the subsoiling of trails and 60 percent to roads (based on the degree of shattering of the compaction given in subsoiling studies).

* Up to ten (10) acres of incidental ground-based yarding may be done within the project area and would increase the total acres of heavy ground-based compaction by up to 0.3 acres.

** The figures in this table are estimates based on assumptions made from three years of monitoring observations and data. They are meant to indicate the likelihood of Bell Mtn. CT maintaining or improving soil productivity. The "+0.21 acres" figure represents a net improvement to soil productivity after all of the subsoiling stated under footnote 1 is accomplished. Since many of the table figures are estimates, the correct interpretation would be that soil productivity would likely be maintained or slightly improved in the short-term. The sub-soiling amelioration would accelerate the long-term recovery of soil-productivity.

Appendix J. Fisheries

Roseburg District BLM – Swiftwater Field Office

Project Name: Bell Mountain
Project Type: Commercial Thinning & Density Management
Location: T22S-R7W-Sec. 14, 23, & 27

Prepared By: Jeff McEnroe
Date: October 16, 2006

ISSUE IDENTIFICATION:

Table A. Special Status Fish Species within the Project Area. The project area for fisheries analysis includes the proposed harvest units and associated haul routes where an effect to fisheries may occur.

Species	Status	Present in Project Area?	Source of Detection
THREATENED & ENDANGERED			
Or. Coast ESU Steelhead (Summer Run) <i>Oncorhynchus mykiss ssp.</i>	FCO ¹	Documented	Streamnet 2003
Or. Coast ESU Steelhead (Winter Run) <i>Oncorhynchus mykiss ssp.</i>	FCO ¹	Documented	Streamnet 2003
BUREAU SENSITIVE			
Chum Salmon <i>Oncorhynchus keta</i>	BSO	Out of Range ²	-
Umpqua Oregon Chub <i>Oregonichthys kalawatseti</i>	BSO	Suspected ³	-
BUREAU ASSESSMENT			
None	-	-	-
BUREAU TRACKING			
Coastal Cutthroat (Or. Coast) <i>Oncorhynchus clarki clarki</i>	BTO	Documented	Streamnet 2003
Pacific Lamprey <i>Lampetra tridentata</i>	BT	Suspected ³	-
Coho Salmon (North of Cape Blanco) <i>Oncorhynchus kisutch</i>	FTO ⁴	Documented	Streamnet 2003

¹ Oregon Coast ESU Steelhead is no longer considered a federally listed species, however, OC Steelhead is included in the current Bureau special status species list (March 14, 2005) and therefore it is included here for completeness.

² Chum Salmon are erroneously listed as "documented" in Roseburg District in the current Special Status Species list (March 14, 2005) but it is included here for completeness.

³ Umpqua Oregon Chub and Pacific Lamprey are documented in the watershed but have not been documented in the Project Area.

⁴ Oregon Coast ESU coho is no longer considered a federally listed species, however, OC coho are still identified as "Critical" by ODFW and also are on ONHP list 1. This confers Bureau Sensitive status to the species.

Table B. Nearest Location of Special Status Fish Species to the Proposed Units.

Unit	Stream Type At Unit	Stream Name	Location (T-R-S)	Distance to Proposed Units (miles)				
				OC Coho Salmon	OC Steelhead	Coastal Cutthroat Trout	Pacific Lamprey	Umpqua Chub
				Bureau Tracking	Bureau Tracking	Bureau Tracking	Bureau Tracking	Bureau Sensitive
14A	Intermittent	Elk Creek Tributary	22S-7W-14	0.4	0.4	0.4	Unknown	Unknown
23A	Intermittent	Elk Creek Tributary	22S-7W-23	0.5	0.5	0.5	Unknown	Unknown
27A	Intermittent	Hancock Creek	22S-7W-27	0.1	0.2	0.1	Unknown	Unknown
27B	Intermittent	Elk Creek Tributary	22S-7W-27	0.4	0.4	0.4	Unknown	Unknown

Table C. Proposed Haul Route (to paved roadway).

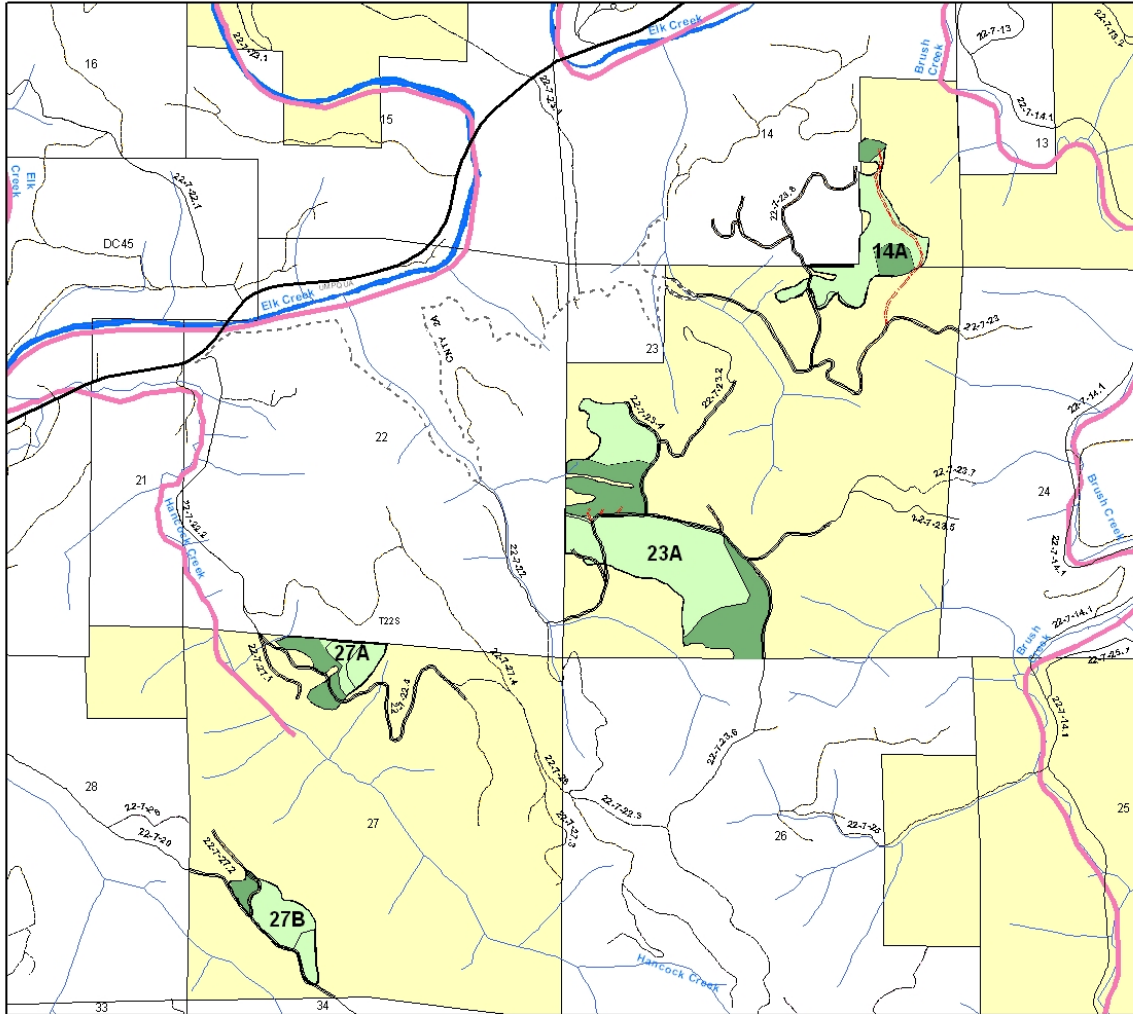
Haul Route		Stream Crossings		
Road Number	Haul Distance (miles)	Fish-Bearing	Perennial	Intermittent
22-7-23.0	0.4	0	0	2
22-7-23.8	0.7	0	0	0
22-7-23.6	0.3	0	0	0
22-7-23.4	0.3	0	0	0
22-7-22.0	1.2	0	0	3
22-7-22.2	1.2	0	0	5
22-7-20.0	1.9	0	1	3
County 2A	2.5	0	1	4

Table D. Essential Fish Habitat (EFH).

Unit	Nearest Location of EFH (miles)
14A	0.4
23A	0.5
27A	0.1
27B	0.4

Appendix K. Fish Presence Map

Bell Mountain Commercial Thin Fish Presence



Legend	
	BLM Lands
	Sections
	Cable logging
	Ground based logging
	Thinning Unit Boundary
	Spurs: New construction
	Streams 2nd Order +
	Anadromous Fish Distribution
	Interstate Highway
	State Highway
	County Road
	Paved Road
	Rocked Road
	Native Material or Unknown



No warranty is made by the Bureau of Land Management as to the accuracy, reliability or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources. This information may not meet National Map Accuracy standards. This product was developed through digital means and may be updated without notification.

Roseburg District
Bureau Of Land Management
Swiftwater Field Office
777 Garden Valley Blvd.
Roseburg, Oregon 97470



Appendix L. Botany Summary

Roseburg District BLM – Swiftwater Resource Area

Project Name: Bell Mountain Timber Sale
Project Type: Commercial Thinning & Density Management
Location: T22S-R07W-Sec. 14, 23, & 27

Prepared By: Evan Olson
Date: December 20, 2006

ISSUE IDENTIFICATION:

The following tables include those species which are documented or suspected to occur within the Roseburg District BLM. Those Bureau Sensitive or Bureau Assessment species which are suspected or documented to occur within the project area are detailed in **Table A** and may be further discussed in the body of the decision as appropriate.

Table A. Bureau Sensitive & Bureau Assessment Species. BLM districts are responsible to assess and review the effects of a proposed action on *Bureau Sensitive* and *Bureau Assessment* species. To comply with Bureau policy, Districts may use one or more of the following techniques:

- a. Evaluation of species-habitat associations and presence of potential habitat.
- b. Application of conservation strategies, plans, and other formalized conservation mechanisms.
- c. Review of existing survey records, inventories, and spatial data.
- d. Utilization of professional research and literature and other technology transfer methods.
- e. Use of expertise, both internal and external, that is based on documented, substantiated professional rationale.
- f. Complete pre-project survey, monitoring, and inventory for species that are based on technically sound and logistically feasible methods while considering staffing and funding constraints.

When Districts determine that additional conservation measures are necessary, options for conservation include, but are not limited to: modifying a project (e.g. timing, placement, and intensity), using buffers to protect sites, or implementing habitat restoration activities (IM-OR-2003-054).

Species	Within species range?	Habitat Present?	Species Present?	Reason for concern or no concern ¹	Surveys Completed	Mitigation Measures
Threatened & Endangered Species						
<i>Lupinus sulphureus</i> ssp. <i>kincaidii</i> Kincaid's lupine (T)	Yes	Yes	No	Surveys performed, not detected.	May-Aug. 1998, May-Oct. 2006	N/A
<i>Plagiobothrys hirtus</i> Rough popcorn flower (E)	Yes	No	No	No habitat present.	N/A	N/A
Bureau Sensitive						
<i>Chiloscyphus gemmiparus</i> Liverwort	Yes	No	No	No habitat present.	N/A	N/A
<i>Trematodon boasii</i> Moss	Yes	No	No	No habitat present.	N/A	N/A
<i>Arcangeliella camphorata</i> Fungus	Yes	No	N/A	Surveys Not Practical. ²	N/A	N/A
<i>Bridgeoporus nobilissimus</i> Giant polypore fungus	No	No	N/A	No habitat present.	N/A	N/A
<i>Dermocybe humboldtensis</i> Fungus	Yes	Yes	N/A	Surveys Not Practical. ²	N/A	N/A
<i>Phaeocollybia californica</i> Fungus	Yes	Yes	N/A	Surveys Not Practical. ²	N/A	N/A
<i>Phaeocollybia gregaria</i> Fungus	Yes	Yes	N/A	Surveys Not Practical. ²	N/A	N/A
<i>Phaeocollybia olivacea</i> Fungus	Yes	Yes	N/A	Surveys Not Practical. ²	N/A	N/A
<i>Phaeocollybia oregonensis</i> Fungus	Yes	Yes	N/A	Surveys Not Practical. ²	N/A	N/A

Species	Within species range?	Habitat Present?	Species Present?	Reason for concern or no concern ¹	Surveys Completed	Mitigation Measures
<i>Ramaria spinulosa</i> var. <i>diminutiva</i> Fungus	Yes	Yes	N/A	Surveys Not Practical. ²	N/A	N/A
<i>Rhizopogon chamalelotinus</i> Fungus	Yes	Yes	N/A	Surveys Not Practical. ²	N/A	N/A
<i>Rhizopogon exiguus</i> Fungus	Yes	Yes	N/A	Surveys Not Practical. ²	N/A	N/A
<i>Eucephalus vialis</i> Wayside aster	Yes	Yes	No	Surveys performed, not detected.	May-Aug. 1998, May-Oct. 2006	N/A
<i>Calochortus coxii</i> Crinite mariposa-lily	Yes	No	N/A	No habitat present.	N/A	N/A
<i>Calochortus umpquaensis</i> Umpqua mariposa-lily	Yes	No	N/A	No habitat present.	N/A	N/A
<i>Arabis koehleri</i> var. <i>koehleri</i> Koehler's rockcress	Yes	No	N/A	No habitat present.	N/A	N/A
<i>Bensoniella oregana</i> Bensonia	Yes	No	N/A	No habitat present.	N/A	N/A
<i>Cimicifuga elata</i> Tall bugbane	Yes	Yes	No	Surveys performed, not detected.	May-Aug. 1998, May-Oct. 2006	N/A
<i>Frasera umpquaensis</i> Umpqua swertia	Yes	No	N/A	No habitat present.	N/A	N/A
<i>Horkelia congesta</i> ssp. <i>congesta</i> Shaggy horkelia	Yes	No	N/A	No habitat present.	N/A	N/A
<i>Kalmiopsis fragrans</i> Fragrant kalmiopsis	Yes	No	N/A	No habitat present.	N/A	N/A
<i>Lathyrus holochlorus</i> Thin-leaved peavine	Yes	No	N/A	No habitat present.	N/A	N/A
<i>Limnanthes gracilis</i> var. <i>gracilis</i> Slender meadow-foam	Yes	No	N/A	No habitat present.	N/A	N/A
<i>Perideridia erythrorhiza</i> Red-rooted yampah	Yes	No	N/A	No habitat present.	N/A	N/A
<i>Romanzoffia thompsonii</i> Thompson's mistmaiden	Yes	No	N/A	No habitat present.	N/A	N/A
<i>Sisyrinchium hitchcockii</i> Hitchcock's blue-eyed grass	Yes	Yes	No	Surveys performed, not detected.	May-Aug. 1998, May-Oct. 2006	N/A
BUREAU ASSESSMENT						
<i>Crumia latifolia</i> Moss	Yes	No	N/A	No habitat present.	N/A	N/A
<i>Diplophyllum plicatum</i> Liverwort	Yes	No	N/A	No habitat present.	N/A	N/A
<i>Funaria muhlenbergii</i> Moss	Yes	No	N/A	No habitat present.	N/A	N/A
<i>Pseudoleskeella serpentinensis</i> Moss	Yes	No	N/A	No habitat present.	N/A	N/A
<i>Schistostega pennata</i> Moss	Yes	No	N/A	Outside of elevational range.	N/A	N/A
<i>Tayloria serrata</i> Moss	Yes	Yes	No	Surveys performed, not detected.	May 2006	N/A
<i>Tetraphis geniculata</i> Moss	Yes	No	N/A	No Habitat present.	N/A	N/A
<i>Tetraplodon mnioides</i> Moss	Yes	Yes	No	Surveys performed, not detected.	May 2006	N/A
<i>Tripterocladium</i>	Yes	No	N/A	No habitat present.	N/A	N/A

Species	Within species range?	Habitat Present?	Species Present?	Reason for concern or no concern ¹	Surveys Completed	Mitigation Measures
<i>Leucocladulum</i> Moss						
<i>Bryoria subcana</i> Lichen	No	N/A	N/A	No habitat present, outside of current known range.	N/A	N/A
<i>Calicium adspersum</i> Lichen	Yes	No	N/A	Surveys Not Practical. ²	N/A	N/A
<i>Lobaria linita</i> Lichen	Yes	No	N/A	No habitat present.	N/A	N/A
<i>Pannaria rubiginosa</i> Lichen	Yes	No	N/A	No habitat present.	N/A	N/A
<i>Pilophorus nigricaulis</i> Lichen	Yes	No	N/A	No habitat present.	N/A	N/A
<i>Stereocaulon spathuliferum</i> Lichen	Yes	No	N/A	No habitat present.	N/A	N/A
<i>Sulcaria badia</i> Lichen	Yes	Yes	No	Surveys performed, not detected	May-Oct. 2006	N/A
<i>Adiantum jordanii</i> California maiden-hair	Yes	No	N/A	No habitat present.	N/A	N/A
<i>Asplenium septentrionale</i> Grass-fern	Yes	No	N/A	No habitat present.	N/A	N/A
<i>Carex brevicaulis</i> Short stemmed sedge	Yes	No	N/A	No habitat present.	N/A	N/A
<i>Carex comosa</i> Bristly sedge	Yes	No	No	No habitat present.	N/A	N/A
<i>Carex gynodynamis</i> Hairy sedge	Yes	Yes	No	Surveys performed, not detected.	May-Aug. 1998, May-Oct. 2006	N/A
<i>Carex serratodens</i> Saw-tooth sedge	Yes	No	No	No habitat present.	N/A	N/A
<i>Cicendia quadrangularis</i> Timwort	Yes	No	N/A	No habitat present.	N/A	N/A
<i>Eschscholzia caespitosa</i> Gold poppy	Yes	Yes	No	Surveys performed, not detected.	May-Aug. 1998, May-Oct. 2006	N/A
<i>Festuca elmeri</i> Elmer's fescue	Yes	Yes	No	Surveys performed, not detected.	May-Aug. 1998, May-Oct. 2006	N/A
<i>Horkelia tridentata</i> ssp. <i>tridentata</i> Three-toothed horkelia	Yes	No	N/A	No habitat present.	N/A	N/A
<i>Iliamna latibracteata</i> California globe-mallow	Yes	Yes	No	Surveys performed, not detected.	May-Aug. 1998, May-Oct. 2006	N/A
<i>Pellaea andromedifolia</i> Coffee fern	Yes	No	N/A	No habitat present.	N/A	N/A
<i>Polystichum californicum</i> California sword-fern	Yes	No	N/A	No habitat present.	N/A	N/A
<i>Scirpus subterminalis</i> Water clubrush	Yes	No	N/A	No habitat present.	N/A	N/A
<i>Utricularia gibba</i> Humped bladderwort	Yes	No	N/A	No habitat present.	N/A	N/A
<i>Utricularia minor</i> Lesser bladderwort	Yes	No	N/A	No habitat present.	N/A	N/A
<i>Wolffia borealis</i> Dotted water-meal	Yes	No	N/A	No habitat present.	N/A	N/A
<i>Wolffia columbiana</i> Columbia water-meal	Yes	No	N/A	No habitat present.	N/A	N/A

¹ Botanical concerns and rationale are discussed more fully in the Decision Record.

² Surveys are considered not practical for these species (Category B) or their status is undetermined (Category E or F) based on the 2003 Annual Species Review (IM-OR-2004-034).

Table B. Bureau Tracking Species. Surveys are conducted for Bureau Tracking species. To enable an early warning for species which may become threatened or endangered in the future, Districts are encouraged to collect occurrence data on species for which more information is needed to determine status within the state. Until status of such species changes, Bureau Tracking species will not be considered as Special Status Species for management purposes (IM-OR-2003-054).

Scientific Name	ONHP Rank ¹	Roseburg Occurrence?	Occurrence in the Project Area?
Bryophytes			
<i>Cephaloziella spinigera</i>	3	Suspected	None Observed
<i>Fissidens grandifrons</i>	3	Suspected	None Observed
<i>Grimmia anomala</i>	3	Suspected	None Observed
<i>Scouleria marginata</i>	3	Suspected	None Observed
<i>Tortula mucronifolia</i>	3	Suspected	None Observed
Fungi			
<i>Albatrellus ellisii</i>	4	Documented	None Observed
<i>Cazia flexiascus</i>	3	Suspected	None Observed
<i>Choiromyces alveolatus</i>	3	Suspected	None Observed
<i>Clavariadelphus sachalinensis</i>	3	Suspected	None Observed
<i>Clavariadelphus subfastigiatus</i>	3	Documented	None Observed
<i>Cudonia monticola</i>	3	Documented	None Observed
<i>Endogone oregonensis</i>	3	Documented	None Observed
<i>Glomus pubescens</i>	3	Suspected	None Observed
<i>Gomphus bonarii</i>	3	Documented	None Observed
<i>Gomphus kauffmanii</i>	3	Documented	None Observed
<i>Gymnomyces monosporus</i>	3	Documented	None Observed
<i>Gyromitra californica</i>	2	Suspected	None Observed
<i>Helvella crassitunicata</i>	2	Suspected	None Observed
<i>Helvella elastica</i>	3	Documented	None Observed
<i>Helvella maculata</i>	3	Suspected	None Observed
<i>Hygrophorus albicarnaeus</i>	3	Suspected	None Observed
<i>Leucogaster citrinus</i>	3	Documented	None Observed
<i>Mycena quinaultensis</i>	3	Suspected	None Observed
<i>Nolanea verna</i> var. <i>isodiametrica</i>	3	Suspected	None Observed
<i>Otidea smithii</i>	3	Documented	None Observed
<i>Phaeocollybia attenuata</i>	4	Documented	None Observed
<i>Phaeocollybia dissiliens</i>	3	Suspected	None Observed
<i>Phaeocollybia piceae</i>	4	Suspected	None Observed
<i>Phaeocollybia pseudofestiva</i>	3	Suspected	None Observed
<i>Phaeocollybia scatesiae</i>	3	Suspected	None Observed
<i>Phaeocollybia sipei</i>	3	Suspected	None Observed
<i>Phaeocollybia spadicea</i>	3	Documented	None Observed
<i>Plectania milleri</i>	3	Suspected	None Observed
<i>Psathyrella quercicola</i>	3	Suspected	None Observed
<i>Ramaria abietina</i>	3	Documented	None Observed
<i>Ramaria amyloidea</i>	2	Suspected	None Observed
<i>Ramaria aurantiiscescens</i>	4	Suspected	None Observed
<i>Ramaria botrytis</i> var. <i>aurantiramosa</i>	3	Suspected	None Observed
<i>Ramaria concolor</i> f. <i>tsugina</i>	3	Suspected	None Observed
<i>Ramaria conjunctipes</i> var. <i>sparsiramosa</i>	3	Suspected	None Observed

Scientific Name	ONHP Rank ¹	Roseburg Occurrence?	Occurrence in the Project Area?
<i>Ramaria coulterae</i>	3	Suspected	None Observed
<i>Ramaria gelatinaurantia</i>	3	Suspected	None Observed
<i>Ramaria largentii</i>	3	Documented	None Observed
<i>Ramaria rubribrunnescens</i>	3	Suspected	None Observed
<i>Ramaria suecica</i>	3	Documented	None Observed
<i>Ramaria thiersii</i>	3	Suspected	None Observed
<i>Rhizopogon brunneiniger</i>	3	Suspected	None Observed
<i>Rhizopogon clavitisporus</i>	3	Suspected	None Observed
<i>Rhizopogon flavofibrillosus</i>	3	Documented	None Observed
<i>Rhizopogon truncatus</i>	4	Documented	None Observed
<i>Rhizopogon variabilisporus</i>	3	Suspected	None Observed
<i>Sarcodon fuscoindicus</i>	3	Documented	None Observed
<i>Sarcosoma latahense</i>	3	Suspected	None Observed
<i>Sowerbyella rhenana</i>	3	Documented	None Observed
Lichens			
<i>Buellia oidalea</i>	3	Suspected	None Observed
<i>Calicium abietinum</i>	4	Documented	None Observed
<i>Cetrelia cetrarioides</i>	3	Suspected	None Observed
<i>Chaenotheca ferruginea</i>	3	Documented	None Observed
<i>Chaenotheca furfuracea</i>	4	Documented	None Observed
<i>Chaenothecopsis pusilla</i>	3	Documented	None Observed
<i>Dermatocarpon luridum</i>	3	Documented	None Observed
<i>Hypogymnia duplicata</i>	3	Suspected	None Observed
<i>Lecanora pringlei</i>	3	Suspected	None Observed
<i>Lecidea dolodes</i>	3	Suspected	None Observed
<i>Leptogium cyanescens</i>	3	Documented	None Observed
<i>Leptogium rivale</i>	4	Documented	None Observed
<i>Leptogium teretiusculum</i>	3	Documented	None Observed
<i>Nephroma occultum</i>	4	Documented	None Observed
<i>Parmelina quercina</i>	3	Suspected	None Observed
<i>Peltula euploca</i>	3	Suspected	None Observed
<i>Platismatia lacunosa</i>	3	Documented	None Observed
<i>Pseudocyphellaria perpetua</i>	3	Suspected	None Observed
<i>Pseudocyphellaria rainierensis</i>	4	Documented	None Observed
<i>Pseudocyphellaria</i> sp. 1	3	Suspected	None Observed
<i>Usnea hesperina</i>	3	Suspected	None Observed
<i>Usnea longissima</i>	3	Documented	None Observed
<i>Veizdaea stipitata</i>	3	Documented	None Observed
Vascular Plants			
<i>Ammannia robusta</i>	3	Suspected	None Observed
<i>Astragalus umbraticus</i>	4	Documented	None Observed
<i>Botrychium minganense</i>	4	Suspected	None Observed
<i>Camissonia ovata</i>	3	Suspected	None Observed
<i>Carex barbarae</i>	3	Documented	None Observed
<i>Carex leptalea</i> ssp. <i>leptalea</i>	4	Suspected	None Observed
<i>Cypripedium californicum</i>	4	Documented	None Observed
<i>Cypripedium montanum</i>	4	Documented	None Observed

Scientific Name	ONHP Rank ¹	Roseburg Occurrence?	Occurrence in the Project Area?
<i>Dichelostemma ida-maia</i>	4	Documented	None Observed
<i>Enemion stipitatum</i>	4	Documented	None Observed
<i>Epilobium luteum</i>	3	Suspected	None Observed
<i>Epilobium palustre</i>	3	Suspected	None Observed
<i>Erigeron cascadenis</i>	4	Suspected	None Observed
<i>Euonymus occidentalis</i>	4	Documented	None Observed
<i>Hazardia whitneyi</i> var. <i>discoidea</i>	4	Suspected	None Observed
<i>Helianthella californica</i> var. <i>nevadensis</i>	3	Suspected	None Observed
<i>Lewisia cotyledon</i> var. <i>howellii</i>	4	Documented	None Observed
<i>Linanthus bakeri</i>	3	Suspected	None Observed
<i>Lycopodium annotinum</i>	4	Suspected	None Observed
<i>Mimulus douglasii</i>	4	Documented	None Observed
<i>Mimulus kelloggii</i>	4	Documented	None Observed
<i>Minuartia californica</i>	4	Suspected	None Observed
<i>Montia howellii</i> ²	4	Documented	None Observed
<i>Navarretia tagetina</i>	3	Suspected	None Observed
<i>Phacelia verna</i>	4	Documented	None Observed
<i>Sedum laxum</i> ssp. <i>heckneri</i>	4	Suspected	None Observed
<i>Sedum spathulifolium</i> ssp. <i>purdyi</i>	4	Documented	None Observed
<i>Sidalcea cusickii</i>	4	Documented	None Observed
<i>Vaccinium oxycoccos</i>	4	Suspected	None Observed
<i>Verbena hastata</i>	3	Suspected	None Observed

¹ ONHP = Oregon Natural Heritage Program Lists; List 3 = taxa for which more information is needed before status can be determined, but which may be threatened or endangered in Oregon or throughout their range; List 4 = taxa of concern which are not currently threatened or endangered (Bureau Tracking are generally ONHP Lists 3 and 4)

² *Montia howellii* is a candidate species for listing under the Oregon state threatened and endangered program.