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

Environmental Assessment for the Swiftwater Field Office

Saddle Up To Paradise
Commercial Thinning & Density Management
EA #OR – 104 – 07 – 03

This environmental assessment analyzes the environmental impacts associated with the Swiftwater Field Office's proposal for a commercial thinning and density management project. The proposed commercial thinning and density management would occur on two units (approximately 206 acres) of mid-seral, second-growth forest located in the Elk Creek Fifth-Field Watershed in Section 27; T21S, R07W; W.M. Of the 206 acres of treatment, approximately 11 acres would be removed for the development of spur roads. This project is within the General Forest Management Area, Riparian Reserve, and unmapped Late-Successional Reserve Land Use Allocations. This project is designed to contribute to the Roseburg District's annual allowable sale quantity of 45 million board feet as declared in the Roseburg District *Record of Decision and Resource Management Plan* (ROD/RMP, pg. 8) and help forest stands develop late-successional characteristics and conditions. This project is in conformance with management direction from the ROD/RMP.

Project Lead: Jay Bernards

Preparer: Rex McGraw
Roseburg District, BLM
777 NW Garden Valley Blvd.
Roseburg, OR 97470
541-464-3461

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U.S. Department of the Interior, Bureau of Land Management
Roseburg District Office
777 NW Garden Valley Blvd.
Roseburg, Oregon 97470

Comments on this environmental assessment, including the names and street addresses of respondents, will be made available for public review at the above address during regular business hours, 8:00 A.M. to 4:30 P.M., Monday through Friday, except holidays.

Individual respondents may request confidentiality. Such requests will be honored to the extent allowed by the law. If you wish to withhold your name or street address from public review or from disclosure under the Freedom of Information Act, you must state this prominently at the beginning of your written comment. Submissions from organizations, businesses, and individuals identifying themselves as representatives or officials of organizations or businesses, will be made available for public inspection in their entirety.

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Chapter 1. Purpose and Need for Action

A. Background

Saddle Up To Paradise commercial thinning and density management is proposed as part of the FY2007 timber sale plan to be analyzed by the Swiftwater Field Office.

B. Proposed Action

The Bureau of Land Management (BLM), Swiftwater Field Office proposes commercial thinning and density management of four mid-seral forest stands, 33-64 years old, in two treatment units (27A and 27B) totaling 206 acres in the Elk Creek/Umpqua River Fifth-field Watershed. Within these 206 acres, approximately 11 acres would be removed for the development of spur roads. Saddle Up To Paradise is within the General Forest Management Area (GFMA), Riparian Reserve, and unmapped Late-Successional Reserve (LSR) Land Use Allocations. This project is located in Section 27; T21S, R07W; Willamette Meridian, and is within Revested Oregon and California Railroad Lands (O&C Lands).

The Swiftwater Field Office analyzed potential harvest of approximately 396 acres. After interdisciplinary team review, approximately 190 acres were dropped from consideration in order to maintain habitat-integrity immediately around an occupied marbled murrelet (*Brachyramphus marmoratus*) site and because 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 unit to 206 acres. Table 1 below provides a summary of the proposed action. Chapter 2 (pgs. 6-9) of this EA provides a detailed description of the proposed action alternative.

It is anticipated that the proposed action would yield approximately 3.184 million board feet (MMBF) of timber in support of local and regional manufacturers and economies. Volume derived from treatments in the GFMA land use allocation would contribute toward the annual allowable sale quantity (ASQ) of 45 MMBF for the Roseburg District, supporting socio-economic benefits envisioned in the PRMP/EIS (Vol. 1, p. xii). Timber volume derived from density management in Riparian Reserves and the unmapped LSR would not be chargeable towards this objective.

Table 1. Saddle Up To Paradise Activity Summary.

Activity		Total
Timber Harvest	Commercial Thinning General Forest Management Area	104 acres
	Density Management Riparian Reserves Unmapped Late-Successional Reserve	20 acres 82 acres
	Temporary Spur Right-of-Way	11 acres
Yarding	Cable	115 acres

	Ground Based*	91 acres
Hauling	Wet Season	7.50 miles
	Dry Season	3.76 miles
	Total Haul	11.26 miles
Road Activities	Roads to be Constructed	1.98 miles
	Renovation of Existing Roads	1.78 miles
	Maintenance of Existing Roads	7.50 miles
	Road Decommissioning with subsoiling	0.67 miles
	Road Decommissioning without subsoiling	2.04 miles
Fuel Treatment	Machine Pile and Burn at Landings	6 acres

*Up to 10 acres of additional, incidental ground-based logging could occur in areas designated for cable logging for a total of 101 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); and

- 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)

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).

Timber management on 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 GFMA 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; Figure 2-3 pg. 21) identified the Saddle Up To Paradise harvest units as high priority for commercial thinning. The growth rates in these mid-seral forest stands are slowing while natural tree mortality is increasing. Thinning would bring a financial return on the planting, fertilizing, and pre-commercial thinning investments from previous years in the managed stands. Commercial thinning and density management would also provide raw materials for local mills, meet annual sale goals, and develop forest habitat favorable for late-successional and aquatic species. (USDI, 2004; pg. 61).

D. Objectives

The objectives of the proposed action are to:

1) 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…"

2) Implement the following management direction from the ROD/RMP, pertaining to timber management on lands in the General Forest Management Area (GFMA) land use allocation.

- Contribute timber volume toward a sustainable supply of timber and an annual allowable sale quantity for the Roseburg District of 45 MMBF for fiscal year 2007 (pgs. 8, 33, and 60);

- Perform commercial thinning on forest stands less than 80 years of age. Design commercial thinning to assure high levels of volume productivity. (ROD/RMP, pg. 151).

3) Implement the following management direction from the ROD/RMP, pertaining to timber management in the Riparian Reserve and Late-successional Reserve land use allocations.

- Apply silvicultural treatments to restore large conifers in Riparian Reserves (ROD/RMP, pg. 21);

- Perform density management to help forest stands develop late-successional characteristics and attain forest conditions that contribute to the Aquatic Conservation Strategy. (ROD/RMP, pgs. 151-152).

4) Design the timber sale harvest and haul methods to be as cost effective as possible while addressing issues of effects to special status species (wildlife, aquatic, and botanical), soils, watershed condition, and other specified resources. Also provide a harvest plan flexible enough to facilitate harvesting these acres within a three year timber sale contract.

5) Manage residual logging debris (branches, limbs, etc.) to reduce the risk of catastrophic wildfire.

E. Decision Factors

Factors to be considered when selecting among alternatives will include:

- The degree to which the objectives previously described would be achieved;

- 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, O&C Act, National Historic Preservation Act, and Special Status Species program.

- Provide revenue to the government from the sale of timber resources in a cost efficient manner.

- Partial recovery of the investment already made by the BLM in the Saddle Up To Paradise forest stands. These past investments include planting, pre-commercial thinning, analysis and pre-project surveys and field work.

Chapter 2. Discussion of Alternatives

This section describes the No Action and Proposed Action Alternatives, 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 or treatment of the mid-seral stands 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 3.184 MMBF of timber. The proposed action consists of the following activities (for a summary listing of these actions, see Table 1).

1. Timber Harvest

a) Treatment Prescription

Units 27A and 27B would be commercially thinned and have density management treatments applied (refer to Appendix A & B for maps of the location of the proposed units). These units consist of approximately 206 acres of mid-seral forest, aged 33 to 64 years. The harvest area is divided amongst: GFMA (104 acres), unmapped LSR (82 acres), and Riparian Reserves (20 acres). Within the 206 acres, approximately 11 acres would be removed for the development of spur roads.

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. These treatments would be developed consistent with management objectives for the individual land use allocations. Trees would primarily be removed from the suppressed and intermediate canopy classes, although

some co-dominant and dominant trees would be removed where necessary to meet specific density objectives. Unit 27B (approximately 23 acres) is a forest stand that is approximately 64 years old and is being thinned for the second time. This unit will have many of the dominant and co-dominant trees removed since they were the primary retention trees from the first thinning. Unit 27A is between 33 and 44 years old.

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 operational safety concerns subject to Oregon State laws and regulations. Since treatments would focus on removal of intermediate and suppressed canopy layers in the majority of the unit, it is possible that suppressed trees designated for cutting may include trees older than the prevailing stand age.

Stands in the GFMA would be thinned by removing approximately 35 to 45 percent of the basal area, leaving 100-120 square feet of basal area. Canopy closure would be reduced to 65-75 percent. A variable spacing marking prescription would be used. Minor conifer and hardwoods species would be retained where possible to maintain stand diversity.

Density management in the unmapped LSR and Riparian Reserve would be treated by removing approximately 40 to 60 percent of the basal area, leaving 80 square feet of basal area in Unit 27A. Unit 27B would be treated by retaining approximately 120 square feet of basal area. Canopy closure would be reduced to 49 to 74 percent in the reserves. Creating or enlarging canopy openings would be encouraged to maintain trees with large limbs and full crown, promote tree regeneration, shrubs, and forbs.

Minor conifer and hardwoods would be retained where possible. Trees that are marked with orange "Wildlife Habitat" or "Wildlife Tree" tags are reserved from cutting and would not be felled or removed to facilitate logging.

Conifer and hardwood snags 10 inches or larger in diameter breast height and at least 16 feet in height would be marked for retention in the GFMA, unmapped LSR, and Riparian Reserve. The target level for coarse woody debris and snag retention in the unmapped LSR and Riparian Reserve is: two trees per acre for coarse woody debris and one snag per acre on the predominantly southerly aspect of Unit 27A. The unmapped LSR and Riparian Reserve would be surveyed two years post treatment to determine the need for snags and coarse woody debris. 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.

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 100 feet measured from the edges 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, vegetation, and fish presence.

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.

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 (115 acres) and ground-based yarding (91 acres). 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) within the proposed units, during the dry season.

3. Timber Hauling

Approximately 5.50 miles of rocked road, 2.00 miles of paved (asphalt) road, and 3.76 miles of natural surfaced roads and spurs would be used for the hauling of timber, for a total of 11.26 miles of haul route. Rocked and paved roads would be either dry-season or wet-season haul while natural surface roads and spurs would be limited to dry-season haul. 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.

4. 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. 10, road construction, improvement, renovation, and decommissioning would be restricted to the dry season (normally May 15 to Oct. 15).

a) Construction

Approximately 1.98 miles of new spur roads (Spurs #1-6) would be constructed. A majority of temporary road construction would take place within Unit 27A. Three-hundredths of a mile (0.03 miles, Spur #6) would be constructed outside of treatment unit boundaries on private,

industrial timber lands. Spur #4 (0.17 miles) would not be rocked under the Proposed Action Alternative due to economic considerations but could be rocked at the purchaser's expense and used for wet-season haul.

Placement of rock on the surface of Spurs #3, #4, and a portion of Spur #1 (in GFMA) was considered but would not be permitted since the spurs are designed with a 14 foot subgrade for natural surface, dry season haul. As analyzed, this subgrade would not meet BLM standards for surfacing with rock for winter haul without additional engineering and excavation.

Spurs #2 and #6 would not be rocked since they are within the unmapped LSR and it is not anticipated that they would be used in the future. Spur #5 would not be rocked since the mainline road that it ties into (21-7-35.1 road) is natural surface and not suitable for winter haul.

b) Maintenance

Approximately 7.50 miles of existing road (22-7-2.0 and 22-7-14.0 roads) would be maintained. Road maintenance might consist of maintaining drainage structures (culverts and drainage ditches), reshaping the road surface, surfacing with rock where needed, and brushing road shoulders.

c) Renovation

A total of 1.78 miles of the existing 21-7-35.1 natural surface road would be renovated by brushing, grading, and installing drainage structures.

d) Decommissioning

Natural surfaced spurs (Spurs #2, #6, and a portion of Spur #1) within the unmapped LSR and Riparian Reserve 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 (0.67 miles)

Natural surfaced spurs (Spurs #3, #4, #5, a portion of Spur #1, and a portion of 21-7-35.1) outside of reserves would be decommissioned by blocking with trench barriers, water-barring, and mulching with logging slash where available or with straw if logging slash is not available (1.87 miles). Spurs #3, #4, #5, and a portion of Spur #1 would not be subsoiled since it is anticipated that they would be needed for future harvest operations. If Spur #4 is rocked at the purchaser's expense, then it would be decommissioned by blocking with trench barriers and water-barring (0.17 miles).

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 60 feet measured from the edges of the stream channel for all intermittent and perennial, non-fish bearing streams. A 100 foot no harvest buffer has been established for the fish-bearing stream (i.e. Saddle Butte Creek).

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).

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 to fix drainage and erosion problems. This would consist of maintaining existing culverts, installing additional culverts, constructing drainage-relief ditchouts, stabilizing unstable cut and fill slopes, and replenishing road surface with crushed rock where deficient (BMP II H; RMP, pg. 137). In-stream work would be limited to periods of low or no flow (between July 1st and September 15th).

(2) Restricting road work (including construction, renovation, improvement, and decommissioning) and log hauling on naturally surfaced roads to the dry season which is 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).

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

(4) 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 necessary, to prevent sediment from reaching the streams.

(5) Over-wintering natural surface spur roads in a condition that is resistant to erosion and 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 weed-free 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).

(6) During the same dry season as logging, 0.95 miles of spurs (part of Spur #1 and all of Spurs #3, #4, and #5 as well as the last 0.70 miles of the 21-7-35.1 road) accessing Matrix land would be decommissioned by removing culverts, blocking with trench

barriers, water-barring, and mulching with logging slash where available or with straw if logging slash is not available (BMP II I; ROD/RMP, pg. 138).

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 or full 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. 131). However, this season would be adjusted (e.g. an extended dry season or wet season) if unseasonable soil moisture levels would cause detrimental compaction (both old and new) to exceed 10 percent or more of the ground-based area. Also, operations would be suspended during unseasonably wet weather during the dry season. The soil scientist and the contract administrator would monitor soil moisture and compaction during unseasonably wet weather and would determine when operations may need to be suspended. Detrimental compaction is defined as a 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. Old trails would be used to the greatest extent practical.

(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 when 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.

(5) During the same dry season as logging, approximately 0.80 miles of spurs not needed for future access in the reserves (Spurs #2, #6, and a portion of Spur #1) 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. Mulching would cover about 25 percent of the road bed.

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) New spur roads, with one exception (see below), would be located on geologically stable areas with slopes of 5 to 45 percent (BMP II B2; RMP, pg. 132), and would be constructed with a maximum width of 14 feet to minimize soil disturbance (BMP II C6; RMP, pg. 132). The exception is one segment of Spur #1 approximately 300 feet long that would be on a 75 percent planar slope. This segment would be necessary to access 65 acres in the western portion of the unit. To keep the risk of landslides low, this segment would be: (1) located below an overlying bench to minimize the steep-sloped drainage area above the road-bed, (2) constructed full-bench to a maximum width of 14 feet with no sidecasting of material, and (3) in-sloped to prevent any cut-slope failures from disrupting drainage. This segment of Spur #1 would also have closely spaced water bars necessary for over-wintering (if necessary) and for decommissioning after harvest.

(2) On the very steep slopes (75 percent and greater) accessed by the paved 22-7-2.0 road no cable yarding shall be permitted when soils are saturated, soil pores and voids between soil particles are filled with water, surface flow can be seen, or when water can be squeezed from a hand full of soil.

(3) Partial suspension for cable yarding and constructing waterbars in yarding corridors that are excessively furrowed (as described previously under "Measures to limit soil erosion and sedimentation from logging" [2.b.1]) would also reduce the risk of slope failure and limit erosion.

(4) A 0.12 acre patch of trees within Unit 27A would be retained inside a large, old cut-slope failure of the 22-7-2.0 road where the slide could be reactivated.

(5) Potentially unstable fill at the landing at the end of Spur #3 would be pulled back after harvest to eliminate the risk failure.

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

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

(1) Snags that are greater than 10 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 per acre on north slopes and one snag per acre on south slopes, snags would be created on a per acre basis to meet the minimum interim needs. Units 27A and 27B are considered to be a predominantly southerly aspect. 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 (204 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 GFMA portions of the harvest unit (i.e. outside of Riparian Reserves and unmapped LSR), snags and coarse woody debris would be retained or created in the following manner:

(1) Snags that are greater than 10 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, 2007; 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 prescribed burning (i.e. slash piles) 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 northern spotted owl sites, activity centers, or unsurveyed suitable habitat within 65 yards of the Unit 27A or 27B boundaries. 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 (i.e. slash piles) would not occur within 440 yards of any unsurveyed suitable northern spotted owl 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.

e. There is an occupied marbled murrelet site in the south half of Section 27; T21S, R07W; Willamette Meridian. Therefore, harvest activities in Unit 27A and 27B would be seasonally restricted within 100 yards of occupied habitat from April 1st through August 5th and Daily Operating Restrictions (activities may occur between two hours after sunrise and two hours before sunset) from August 6th through September 15th.

f. Prescribed burning would not occur within 440 yards of the occupied marbled murrelet site from April 1st through August 5th and Daily Operating Restrictions from August 6th through September 15th.

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 in-stream work (e.g. 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 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 appropriate and compliant UL-Listed containers and located so that any accidental spill would be fully contained and would not escape to ground surfaces or drain into watercourses. Other hazardous materials such as corrosives and/or those incompatible with flammable storage shall be kept in appropriate separated containment. All construction materials and waste would be removed from the project area.

D. Monitoring

The ROD/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 for cultural resources and none were discovered (August 1998). It was determined that there would be no effect to any cultural resources since none were identified in the Saddle Up To Paradise project area (March 2007). The Oregon State Historic Preservation Office concurs with the Swiftwater Field Office's determination of "no effect" on cultural resources in a letter dated January 4, 1999. 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

Harvest activities could result in temporary closures of roads during active haul and/or yarding activities for safety reasons. This potential road closures would reduce the dispersed recreational activities available in the project area including: driving for pleasure, big and small game hunting, gathering forest products, and viewing wildlife. The harvest activities would not have long term impacts on the recreational use of the project area once the treatment has been completed.

9. Visual Resources

Proposed Units 27A and 27B fall within Visual Resource Management Class IV, where no specific visual management constraints apply. The character of the landscape with this sale would be altered when approximately half of the crown cover is removed. Management activities would be visible, but would not dominate the view. Harvest activities would present a disturbance to visual resources. However, the basic elements of form, line, color and texture as required by the ROD/RMP (pg. 52) would be maintained under the proposed action.

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.

F. Alternative Considered but not Analyzed in Detail

An additional 190 acre unit (23A) was considered for thinning and density management treatment in Section 23; T21S, R07W; W.M. This prospective unit is forest stand 32 years old with a quadratic mean diameter of 9.9 inches diameter breast height and a basal area of 170 square feet. Unit 23 A was dropped from further consideration because the unit would not be economical to treat at this time given the relatively small tree size and low basal area.

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

Unit 27A is composed of four predominant forest stands, each with their own Forest Operations Inventory (FOI) assigned number. The FOI data indicates that the three stands (FOI #30949, #30952, and #30953) that make up most of Unit 27A (approximately 144 acres of the 183 acres) were established in 1963 and 1974 (Table 2). Roughly half of this area was pre-commercially thinned in 1981. These three stands are exhibiting signs of being overstocked (i.e. decreased crown ratios and low amounts of ground cover within the stands proposed for treatment).

The predominant forest stand (FOI #30954) that makes up Unit 27B (approximately 23 acres) is an older stand type that was established in 1943. This stand was pre-commercially thinned in 1964 and most of the stand was commercially thinned in 1984.

Stand ages are established by one of two methods. Where previous harvest and reforestation have occurred, operational inventory data is used. If this data was not available, stand exams are the primary means for determining age and are derived based on the measured age of the dominant and co-dominant trees comprising the numerically predominant component of the stands that is the focus of thinning and density management. Stand exams were done between 1998 and 2007. ORGANON model 8.1 was used to model current conditions, apply silviculture prescriptions, and grow stands.

In all four stands, 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, bear grass, Oregon grape, and sword fern.

Table 2: Existing Stand Conditions.

FOI Stand Number	Acres	Stand Age (years)	Trees per Acre	Basal Area (sq. ft.)	Quadratic Mean Diameter (inches)	Relative Density Index	Canopy Closure (%)	Average Crown Ratio
30949	104	44	180	180	13.6	0.56	121	0.43
30952	7	33	215	175	12.2	0.56	117	0.27
30953	33	44	190	240	15.2	0.70	153	0.48
30954	26	64	95	190	19.4	0.51	90	0.33

2. No Action Alternative

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

Suppression mortality would occur primarily in the smaller size classes of trees and would therefore not provide a continuum of larger material for snag and coarse woody debris recruitment. Continued suppression would also lead to a reduction in the hardwood and shrub components, which would further simplify the vegetative composition of the stands.

Live crown ratios of the overstory trees would continue to decrease from current levels (27 to 48 percent) with a corresponding decline in vigor and stagnation in growth (Table 2). Closely spaced trees with small crowns have reduced photosynthetic capacity which results in decreased diameter growth and lower 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 stands would not develop into multi-storied stands without altering the current growth and developmental trajectories. In the absence of treatment, shade-tolerant species (e.g. grand fir, western red cedar) remain suppressed in the understory and there would be insufficient sunlight to allow for shrub, conifer and hardwood regeneration.

3. Proposed Action Alternative

Stands in the General Forest Management Area would be commercially thinned to a relative density of 0.31 to 0.34 (Table 3) by removing approximately half (43-50 percent) of the existing basal area. Commercial thinning would maximize timber quality and yield which is consistent with ROD/RMP direction (pg. 60) to "[m]anage developing stands on available lands to promote tree survival and growth and to achieve a balance between wood volume production, quality of wood, and timber value at harvest."

Density management in the Late-Successional Reserve and Riparian Reserve allocations would reduce relative stand densities to 0.24 to 0.31 (Table 3) by removing approximately one-third to one-half (37-56 percent) of the existing basal area. Density management would also reduce canopy closure to approximately 50 percent (Table 3). Reducing the canopy closure would allow sunlight to reach the forest floor to encourage establishment of an understory and vertical stratification of canopy layers (Hayes, et. al. 1997).

Generally, trees selected for retention would have at least a 30 percent live crown ratio. Trees with at least a 30 percent live crown ratio would be more likely to develop deeper crowns (i.e. increase live crown ratio) and accelerate diameter growth (Daniel, et. al. 1979).

Table 3: Post-Treatment Stand Conditions. Stands proposed for treatment were modeled using ORGANON.

FOI Stand Number	Trees per Acre	Basal Area (sq. ft.)	Quadratic Mean Diameter (inches)	Relative Density Index	Canopy Closure	Average Crown Ratio
Within General Forest Management Area						
30949	77	100	14.1	0.31	68	0.44
30952	115	100	12.7	0.32	66	0.28
30953	74	120	16.0	0.34	74	0.49
30954	-	-	-	-	-	-
Within Riparian Reserves and Unmapped Late-Successional Reserves						
30949	57	80	14.0	0.24	52	0.44
30952	82	80	13.2	0.24	49	0.28
30953	-	-	-	-	-	-
30954	52	120	20.5	0.31	53	0.33

Stands were grown out to the culmination of mean annual increment (CMAI) after the proposed treatment in order to illustrate the future stand conditions (Table 4). Since there are differing prescriptions based on land-use allocation, the stand conditions in the Riparian Reserves and unmapped LSR were modeled separately from stand conditions in the GFMA using ORGANON. Stands #30949 and #30952 were modeled in both GFMA and reserve prescriptions. In general, the model estimates that quadratic mean diameter increases more dramatically while relative density and crown closure remains lower in the reserve treatments than in the GFMA treatment (Table 4).

Table 4: Post-Treatment Conditions at Culmination of Mean Annual Increment (CMAI) in the General Forest Management Area. Stands proposed for treatment were modeled using ORGANON until the age of CMAI.

FOI Stand Number	Age at CMAI (years)	Trees per Acre	Basal Area (sq. ft.)	Quadratic Mean Diameter (inches)	Relative Density Index	Canopy Closure	Average Crown Ratio
Within General Forest Management Area							
30949	100	75	220	23.9	0.58	91%	0.25

30952	148	75	270	25.9	0.65	93%	0.19
30953	91	60	230	26.7	0.55	80%	0.30
30954	-	-	-	-	-	-	-
Within Riparian Reserves and unmapped Late-Successional Reserves							
30949	105	61	210	25.0	0.50	77	0.26
30952	158	58	250	28.0	0.57	78	0.19
30953	-	-	-	-	-	-	-
30954	119	48	230	29.6	0.51	67	0.22

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.

In FY2007, the Swiftwater Field Office is planning to thin approximately 357 acres of mid-seral forests (i.e. 151 acres under Bell Mountain Commercial thinning and Density Management [Decision Document, Febraury 27, 2007] and 206 acres under this EA). In addition, the Swiftwater Field Office is in the planning phase for thinning another 7,000 to 8,000 acres in Elk Creek watershed over the next decade. One such planning effort is the Elkhead Commercial Thinning and Density Management which includes approximately 1,360 acres. 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. Suitable habitat is located immediately adjacent to the west and northeast boundaries of the proposed project area. Based on current surveys (2006) the nearest known bald eagle nest site is approximately 9.3 miles to the southwest. There have been bald eagle sightings during the breeding season approximately 1.5 miles south of the project area, indicating possible nesting along Big Tom Folley Creek. However, bald eagles have not been detected within one mile of the proposed project area. In addition, the proposed project does not occur within suitable nesting habitat for the bald eagle. Therefore there would be no disturbance or habitat concerns for the bald eagle.

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, approximately 206 acres of mid-seral habitat within the proposed harvest units would remain in its current condition for the foreseeable future, including high tree densities with little vertical or horizontal structure, closed canopy with small tree crowns, little vegetative or structural diversity, and lack of large trees for nesting and roosting.

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 late-successional 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 and density management would lead to an indirect beneficial effect by accelerating the development of late-successional elements used by bald eagles (e.g. large diameter trees with large limbs and multiple canopy layers). Thinning and density management would facilitate the development of late-successional characteristics and suitable habitat in approximately 50 years, roughly 100 years sooner than through natural stand development.

b) Marbled Murrelet

(1) Affected Environment

The proposed project area is located approximately 33 miles from the coast and proposed project occurs within the Marbled Murrelet Inland Management Zone 1 (0-35 miles from the coast). All suitable marbled murrelet habitat within 0.25 mile of the project area was

surveyed in 2003-2004 following the 2003 survey protocol (Pacific Seabird Group, Marbled Murrelet Technical Committee). An occupied marbled murrelet site was detected in the south half of Section 27, T. 21 S., R. 07 W., W.M. during the intensive ground survey effort in 2004. Based on the discovery of this occupied murrelet site, an un-mapped Late-Successional Reserve approximately 340 acres in size was established within Section 27, T. 21 S., R. 07 W., W.M.. (Appendix B) Implementation of seasonal restrictions (from April 1st through August 5th) and daily operating restrictions (activities may occur between two hours after sunrise and two hours before sunset from August 6th through September 15t) within 100 yards of occupied habitat would mitigate disturbance concerns for the occupied site during the critical breeding period.

Currently there are approximately 205 acres (60 percent) of suitable nesting habitat for the marbled murrelet and approximately 135 acres (40 percent) of mid seral habitat within the un-mapped Late-Successional Reserve. Approximately 65 acres (48 percent) of the mid seral habitat within the reserve are proposed for treatment. Treatment will not occur within suitable habitat, where marbled murrelets were detected. In addition, 100-foot no-harvest buffers will be maintained around the occupied stand to maintain the integrity of the suitable nesting habitat.

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, approximately 206 acres of mid-seral habitat within the proposed harvest units would remain in its current condition for the foreseeable future, including high tree densities with little vertical or horizontal structure, closed canopy with small tree crowns, lack of structural diversity, and lack of large trees with large limbs. Suitable murrelet nesting platform structures would not develop within these closed canopy conditions. The suitable habitat within the un-mapped Late-Successional Reserve would remain non-contiguous, thus opportunities for additional nesting pairs of murrelets to colonize the stand would continue at their current levels.

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 (e.g. large limbs > 4", large crown depths, and large diameter trees) needed by marbled 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. Thinning and density management would facilitate the development of late-successional characteristics and suitable habitat in approximately 50 years, roughly 100 years sooner than through natural stand development. Thus, the proposed action would increase the amount of contiguous suitable habitat, increasing the density of platform structures within an occupied stand, providing an opportunity for additional pairs of murrelets to occupy these stands earlier.

c) Northern Spotted Owl

(1) Affected Environment

There are three spotted owl sites, which includes nine activity centers, within 1.5 miles (provincial home range) of Unit 27A. One spotted owl site, (Saddle Butte Creek [IDNO 02650]) with two activity centers, has its closest activity center located 262 yards from the boundary of Unit 27A. The other seven activity centers are located 900 to 2,577 yards (0.5-1.5 miles) from the proposed unit boundaries.

Known Owl Activity Centers (KOAC) have been designated to minimize impacts and protect nest sites found before 1994 (USDI, 2005). In addition, an established 104.7 acre Known Owl Activity Center (KOAC) for the Saddle Butte Creek owl site, is immediately adjacent to the west boundary of Unit 27A.

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 Saddle Up To Paradise 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 Saddle Up To Paradise commercial thinning and density management was included in the Biological Analysis as part of the consultation package with the U. S. Fish and Wildlife Service regarding the *Reinitiation of consultation on Roseburg District Bureau of Land Management FY 2005-2008 Management Activities* (Ref. # 1-15-05-I-0511) (USDI, 2005). The effect on Northern spotted owls by modifying dispersal habitat in the Saddle Up To Paradise through commercial thinning and density management was determined to be “may affect: not likely to adversely affect” (USDI, 2005; pg. 19).

(2) No Action Alternative

Under the no action alternative, approximately 206 acres of dispersal habitat for the northern spotted owl would remain in its current condition for the foreseeable future, including high tree densities, closed canopy, lack of structural and vegetative diversity, lack of large trees, snags and down wood. 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 development of suitable habitat components for the spotted owl.

(3) Proposed Action Alternative

Local, project specific impacts to northern spotted owls due to commercial thinning and density management activities would include the modification of approximately 206 acres of dispersal habitat. Between seven to 14 percent of the existing dispersal habitat would be modified for each of the three spotted owl sites within 1.5 miles of the proposed unit (Appendix D). Based on the residual density of trees remaining following treatment, dispersal habitat would not be reduced below approximately 49 percent canopy cover. Though dispersal habitat would temporarily be degraded post-treatment, the capability of the habitat to function for dispersing spotted owls would be maintained. The function of the degraded dispersal habitat would improve as vertical and horizontal structure developed and canopy closure increased within approximately five years.

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. 12-13) 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). Development of late-successional characteristics and suitable habitat is expected in approximately 50 years, roughly 100 years sooner than through natural stand development. Thus, the proposed action would make suitable habitat available to spotted owls earlier than through natural stand development.

Based on current survey data, there are no spotted owl nest sites within 65 yards of Unit 27A. Therefore, seasonal restrictions would not be applied to Unit 27A. However, if future surveys locate an activity center or nest within 65 yards (60 meters) of the

proposed unit, 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 1st 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 northern spotted owl 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 spotted owl does not warrant a change in RMP decisions pertinent to the spotted owl, 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 northern spotted owl 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 that 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. 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 immediately adjacent to the proposed units. 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 unit does not contain suitable nesting or foraging habitat for the goshawk, therefore suitable habitat would not be removed or modified.

(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. The high tree densities that currently exist within the stands make it difficult for goshawks to maneuver through the canopy and understory while in pursuit of prey. Therefore, the high tree densities that are likely to persist until the stands develop late-successional characteristics in at least 150 years would reduce the use of these stands by foraging goshawks.

(3) Proposed Action Alternative

The treatment proposed in this project would modify 206 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 once the project is completed. Commercial thinning and density management would accelerate the development of late-successional characteristics used by northern goshawks (e.g. large diameter trees, multiple canopy layers, and hunting perches). Development of late-successional characteristics and suitable habitat is expected in approximately 50 years, roughly 100 years sooner than through natural stand development. Thus, the proposed action would make suitable habitat available to goshawks earlier than through natural stand development.

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 11.5 miles southeast of the proposed project area. However, 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 unit, barring a stand-replacing event. The harvest unit does 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 (EA, pgs. 12-13). Up to three snags per acre on north slopes and one snag per acre on south slopes 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 found in late-successional conifers. Surveys have not been conducted for either bat species since surveys are not practical. 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. There are approximately 33 remnant snags (> 20 inches diameter at breast height) within the proposed units that would be suitable for bat roosts. 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

Approximately 33 potential remnant snags and 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 (EA, pgs. 12-13). 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.

The BLM 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.

The litigation over the Annual Species Review process in Klamath-Siskiyou Wildlands Center et al. v. Boody et al will not 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."

Saddle Up To Paradise is a commercial thinning and density management of 206 acres of forest stands aged 33 to 64 years. For the foregoing reason, the Saddle Up To Paradise 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. 8-9). Spur road construction would either 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 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.

The BLM manages 41,700 acres of conifer forest lands in the Elk Creek 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 fifth-field watershed there are approximately 15,965 acres of mid-seral forest stands managed by the BLM (see Table 5) 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 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 fifth-field watershed include commercially thinning/density management of about 357 acres of mid-seral forests (i.e. Bell Mountain and Saddle Up To Paradise) and planning for commercially thinning/density management of another 7,000 to 8,000 acres over the next decade (previously stated, pg. 20).

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 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 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)

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. Acreages 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 project area is outside the wildland urban interface boundary as identified in the Roseburg District Fire Management Plan. Current fuel conditions are best described by photo 1-MC-3 in *Photo Series for Quantifying Natural Forest Residues in Common Vegetation Types of the Pacific Northwest* (Maxwell and Ward, 1980). Based on this photo series, the estimate for downed woody debris in this area is 11 tons per acre. The current risk of wildlfire is low to moderate.

2. No Action Alternative

Downed fuels would continue to gradually accumulate adding to the existing fuel conditions of 11 tons per acre. The risk of wildfire would also gradually increase as fine fuels continue to accumulate.

3. Proposed Action Alternative

After commercial thinning and density management, the down woody debris 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). A total of approximately six acres of slash piles would be burned at logging landings.

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 three inches in diameter, and would be scattered over the harvest area. The additional amount down woody debris (i.e. four tons per acre) would not dramatically increase the fire risk to the area.

D. Hydrology

1. Stream Temperature, Water Quality, & Beneficial Uses

a) Affected Environment

There are 15 first and second-order headwater streams and one perennial fish-bearing stream (Saddle Butte Creek, which is between 100 to 400 feet away) adjacent to or within the proposed units or Riparian Reserves within the proposed units. Big Tom Folley Creek has been placed on the Oregon 303(d) list for excessive temperature year round (ODEQ 2006). The 303(d) listed portion of Big Tom Folley Creek is approximately 1.5 miles downstream of the nearest proposed treatment unit.

A perceptible old road exists within Unit 27A that crosses one second order ephemeral stream and goes through the upslope most portion of a "no harvest" buffer upslope of the headwaters for a first order ephemeral stream (most of proposed Spur #3 is on this road). This old road shows signs of past erosion (see soils section) and has contributed sediment to the one stream it crosses. It does appear to have reached a state of equilibrium wherein further downcutting is prohibited by bedrock.

The affected beneficial uses of water within the project area are: resident fish and aquatic life, and salmonid fish spawning and rearing. 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 project area does not lay within the drinking water protection area for any city.

b) No Action Alternative

The old road that crosses the second order and first order streams (as described above) would continue to contribute sediment to the one stream being crossed. However, because bedrock has prohibited further downcutting, the amount of sediment contributed to the stream is negligible when compared to the amount of sediment contributed along the entire length of the stream from all sources. Therefore, there would be no change to stream temperature, water quality, or Beneficial Uses of Water under the No Action Alternative.

c) Proposed Action Alternative

(1) Water Temperature

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.

Most of the streams in Units 27A and 27B are ephemeral (i.e., they transport water only in response to precipitation events), which makes them less susceptible to propagating temperature impacts downstream during the warm dry season. Furthermore, variable width (20 to 60 feet) "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.

Maximum buffer widths would be used predominantly for those streams with flow that extends into the summer or have poor slope stability. Minimum buffer widths would be used primarily on first or second order, ephemeral or intermittent streams, which lack riparian vegetation and where riparian habitat components are also absent. 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.

There will be some trees cut in the "no-harvest" buffer for two streams in the proposed units in order to build spur roads to access timber harvest. Based on stand inventories for this area and average spur construction clearance width, there will be approximately a total of 11 trees cut (eight at one site and three at the other which equals approximately 1% and 1.5% of the stream "no-harvest" buffer, respectively). Removal of these trees would not cause measurable changes in shading or stream temperature in these ephemeral streams.

(2) Water Quality

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 stream channels.

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. Under this alternative, there would be two entries into the no-harvest buffer: (1) one stream crossing by proposed Spur #3 (near the center of Unit 27A) and (2) one entry into the no-harvest buffer also by proposed Spur #3 (in the northern portion of the unit). The second entry will be on existing old road and therefore few trees will be cut to facilitate road construction. The first entry will not be on the existing old road as that road is in a poor location prone to erosion where it crosses the stream, but rather will be constructed approximately 150 feet upstream of the old existing road. These entries through the no-harvest buffers would be necessary in order to avoid road construction on potentially unstable ground and still be able to access areas of treatment.

Spur #3 would cross a second-order ephemeral stream midway between its headwaters and confluence with Saddle Butte Creek slightly upstream of the existing, non-functional road crossing is located. The other entry into the no-harvest buffer is on existing road and upslope of an ephemeral stream and does not cross the stream itself.

Aside from the single stream crossing on Spur #3, the proposed road construction would not be connected to the drainage network. Since road segments must be connected directly to channels in order to deliver sediment-laden water, most (approximately 10,000 feet) of the newly constructed road would not be connected to the streams through ditchline drainage and therefore have no effect on stream sediment. The remaining 400 feet of newly constructed road (a portion of Spur #3) could be connected to the drainage network from ditchline drainage assuming that drainage structures (i.e. cross drains) are placed 200 feet away from the stream crossing on both sides. However, road construction and haul on this spur is limited to the dry season and the spur would be over-wintered in a condition that is resistant to erosion and sedimentation (see Project Design Features, page 10). Therefore, the amount of sediment contributed from this crossing would be negligible when compared to the amount of sediment contributed along the entire length of the stream from all natural sources.

Timber hauling could occur in both the dry and wet seasons, although during the wet season haul would be limited to only the paved roads and rocked roads. Haul during dry season would not deliver road-derived sediment to live stream channels, because without precipitation there would be no mechanism for the transport of fine sediment into streams. However, during the first seasonal rains there could be a flush of sediment from the roads near stream crossings. The amount of sediment contributed from these crossings during the first seasonal rains would be negligible when compared to the amount of initial sediment flush from ephemeral channel beds and stream banks in response to the first seasonal rains. There would be no sediment contribution to streams from the paved portion of the haul route as the drivable surface lacks the ability to generate sediment.

Effects of sediment generated by timber hauling in wet weather, would be short-term and limited to the immediate vicinity of two stream crossings on the Big Tom Folley road (BLM Road 22-7-14). However, the amount of sediment contribution to Saddle Butte and Big Tom Folley Creeks from these crossings would be minimal since: (1) the road prism next to the stream at both crossings is heavily vegetated which would filter out sediment and (2) the road is on a very low gradient which would not allow for sediment transport.

2. Stream Flow (Water Yield & Peak Flow)

a) Affected Environment

Average annual precipitation in the Saddle Butte Drainage (7th Field HUC) ranges from 50 to 52 inches, occurring primarily between October and April. Precipitation occurs mostly as rainfall since the entire drainage is below 2,000 feet. Therefore, more of the annual streamflow is concentrated to this period (Harr, et. al., 1979).

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).

Roads can 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. The increase in surface runoff can decrease the volume of water that infiltrates into groundwater or soil water storage. The increase in surface runoff also can increase the rate at which runoff is routed through a basin, which can result in higher peak flows and less time between a precipitation event and peak runoff (Harr, et.al., 1975).

b) No Action Alternative

Existing roads and landings may modify storm peaks by reducing infiltration on compacted surfaces which would allow more rapid surface runoff (Ziemer, 1981, pg. 915). Existing roads may also intercept subsurface flow and surface runoff and channel it more directly into streams (Ziemer, 1981, pg. 915). However, peak flows have been shown to have a statistically significant increase due to effects from roads only when roads occupy at least 12 percent of the watershed (Harr et. al, 1975).

Within the Saddle Butte Creek Drainage, roads occupy less than 0.5 percent of the land. Therefore, no statistically significant increase in peak flows would be expected to occur due to road effects. Also, with no change in the vegetative cover there would be no change in the average water yield from the Saddle Butte Creek Drainage.

c) Proposed Action Alternative

The impact of thinning and density management would result in a decrease in evapotranspiration which may lead to an increase in water yield. Removal of trees can increase soil moisture and base stream flow in summer when rates of evapotranspiration are high. These summertime effects only last a few years until the canopy closes and the understory further develops (Ziemer and Lisle, 1998, pg. 61). Because evapotranspiration from riparian vegetation accounts for most of the daytime decreases in summertime low-streamflow conditions (Bond et al., 2002), riparian buffers may mitigate the potential for thinning treatments to increase summertime low-flows (Moore and Wondzell, 2005).

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 in a watershed. 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. These relationships are based on watersheds that were clearcut logged with minimal stream buffers. To date, no research has been published that describes the effect that thinning and density management treatments designed following Northwest Forest Plan guidelines have on stream flow.

However, no measurable effect to peak flow would be anticipated as a result of the proposed action because Saddle Up To Paradise would involve less than 15 percent of the watershed. In addition, the proposed project is located below the transient snow zone elevation and would have no potential to impact the amount or timing of snow-melt runoff.

3. Cumulative Effects

Reasonably foreseeable future actions within the Elk Creek Watershed (5th Field HUC) include continued private and Federal forest management. As stated previously (EA, pg. 20), the Swiftwater Field Office is planning to thin approximately 357 acres of mid-seral forests (i.e. 151 acres under Bell Mountain Commercial Thinning and Density Management [Decision Document, Febraury 27, 2007] and 206 acres under this EA) in FY2007. In addition, the Swiftwater Field Office is in the planning phase for thinning another 7,000 to 8,000 acres in Elk Creek watershed over the next decade.

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; Moore and Wondzell, 2005) 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 small (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 streamflow decreases (Garbrecht, 1991). As a result, peak flow increases following harvesting at the drainage level are likely to be undetectable further downstream.

Road densities and condition within the Elk Creek Watershed would remain the same into the reasonably foreseeable future. At present, the road densities are not sufficient to cause a measurable increase in peak flows (refer to pg. 33).

"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

Units 27A and 27B are in dormant slump-earth flow topography where gently sloping benches and moderately steep slopes (10 to 60 percent) occur between steep scarps and mountain slopes

(60 to 90 percent). There are three to six levels of benches within the unit from the lowest point (above Saddle Butte Creek) to the highest point (along the 21-7-35.1 road). The greatest elevation relief between benches is 400 feet in the northwest part of the unit. Bench widths range from less than 100 to 600 feet. The total elevation relief of the unit is 1,060 feet.

The soils of the benches and moderately steep slopes are mostly deep soils 20 inches to more than 60 inches deep in places over soft siltstone and sandstone bed rock. The soils 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 relatively high silt and clay content. Because of the low shrink-swell capacity of the clay in these soils, compaction is long lasting. These soils are moderately to highly erodible under disturbed bare-soil conditions on sloping ground.

A dense pattern of old, naturally surfaced roads, skid trails, and landings exist on most gentle to moderately sloping ground in the northwest portion of Unit 27A. These naturally surfaced roads and trails have a lot of soil displacement and heavy residual compaction which resulted in a substantial loss to soil productivity. In other parts of Unit 27A and in Unit 27B, there is appreciably less residual impact from previous ground-based harvest operations. Most of the residual compaction is light to moderate.

The recovery of lost soil productivity in the roads and trails in Units 27A and 27B is proceeding very slowly, especially where the top soil is gone and highly compacted subsoil is exposed and where little soil remains (less than ten inches to bedrock). Moss dominates these road and trail segments and where trees grow there, they are widely spaced or small in diameter. There are segments, however, with some organic matter incorporation and soil structure development where native understory vegetation is growing well.

b) No Action Alternative

Road Effects

The rate of recovery of lost soil productivity in existing natural-surfaced road beds would be highly variable. There are not any studies that give recovery rates for old, abandoned roads in the Pacific Northwest. Based on anecdotal evidence collected by the Swiftwater soil scientist at this and other mid-seral sites, most natural surfaced road beds in Units 27A and 27B would have perceptible increases in soil organic matter and soil structure/porosity recovery over a complete harvest rotation. These increases and recovery would support moderate levels of native vegetation. However, overall soil productivity would still remain lower than the pre-harvest condition (e.g. pre-1960). In road beds where there is little soil material over hard bedrock and heavy compaction persists (primarily Spur #3 in the northwest part of Unit 27A), low soil productivity would remain indefinitely (possibly hundreds of years).

In-Unit Effects

Soil productivity would continue to recover very slowly where there are old, ground-based impacts. For the indefinite future, soil productivity would remain substantially lower than that during pre-harvest conditions (e.g. pre-1960) in the northwestern portion of the unit. This assessment is based on the observation that little to top soil has developed after forty five years of recovery and the exposed subsoil remains highly compacted (pers. obs., Cressy, 2007). There is also little soil to serve as a growing medium for vegetation in some trail beds that had been previously cut into the slope (D. Cressy, 2007; pers. obs.). In the other old ground-based

portions of the units, recovery of lost soil productivity would be faster and more complete. Near complete recovery for most of these areas could occur by the time the stand reaches maturity.

c) Proposed Action Alternative

Road Effects

Approximately one acre of old, existing road bed would be used as spurs where there is some degree of soil recovery and revegetation by native shrubs. These road beds would be become heavily compacted again. Approximately 2.5 acres of new spur and road construction would be located where there is no perceptible imprint of old roads or trails and soil compaction is light to none (i.e. portions of Spurs #1, #3, #4, and #5, portions of the 21-7-35.1 road, and all of Spur #2).

Approximately 1.1 acres of the 2.5 acres of new spur construction would be an irretrievable loss to soil productivity. This irretrievable loss would be on road beds that would not be subsoiled and would also be subject to additional compaction from future harvest entries. An irretrievable loss to soil productivity would also occur on cut slopes that expose subsoil and/or bedrock. Subsoiling would not occur on Spurs #3, #4, #5, and a portion of Spur #1 because these roads would be needed for future management of Matrix lands.

Soil productivity would not be irretrievably lost on the newly constructed road beds that planned to be subsoiled (about 1.2 acres) or on fill slopes (about 0.2 acres). The spur roads that access only unmapped LSR (1.2 acres) would be subsoiled. In addition, 0.2 acres of old road bed that would be bypassed by new spur construction (a portion of Spur #3) would also be subsoiled. Subsoiling would shatter up to 80 percent of the compaction (Andrus, and Froehlich, 1983; pg. 8). Subsoiled roads would also be mulched with topsoil and logging slash in order to help re-establish the soil microbes. Re-establishment of the soil microbes would aid recovery of lost soil productivity. The logging slash and organic debris would provide a nutrient reservoir and growth medium for organisms beneficial to soil health, conserve soil moisture, and protect against soil erosion by absorbing rain-drop energy.

In-Unit Effects

Ground-based yarding is proposed on 91 acres where slopes are generally less than 35 percent. There are short slope pitches of 35 to 45 percent up to 120 feet in length where ground-based operations are designated. The soils on these steeper slope pitches, which have high clay content, can easily be compacted under moist soil conditions. Skidders and forwarders would not be allowed on these steeper pitches. Under dry conditions, harvesters swinging logs down these steeper pitches to slopes less than 35 per cent would create little compaction.

The amount of detrimental compaction created depends on site specific conditions, slash levels, and soil moisture (D. Cressy, 2006; pers. obs.). An example of site specific conditions considered includes the amount of existing detrimental compaction in old trails used by the current operation and slope steepness. Where there is no existing detrimental compaction, yarding with a tractor/skidder would create detrimental compaction on approximately seven percent of the ground while harvester/forwarder yarding would create approximately two to six percent detrimental compaction (D. Cressy, 2006; pers. obs.). Detrimental compaction is defined 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. Detrimental compaction could retard the growth of adjacent trees by approximately ten percent (Adams, 2003).

Landings and compacted log deck areas along landings would occupy about two percent of the ground-based area. When added to the detrimental compaction in old trail used and new trail, the total detrimental compaction associated with ground-based yarding would be four to nine percent, depending on the yarding method used. Consequently, with either tractor or harvester/forwarder ground-based yarding, the total area subjected to detrimental compaction would be below the ten percent standard under the ROD/RMP (Plan Maintenance for FY2001 [USDI, 2007; pg. 58-59]) when all PDFs are followed.

Skid 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 and to help re-establish the soil microbial fauna. The soil productivity in the ground-based harvest areas would be maintained or improved slightly by the proposed project because approximately 2.5 acres of old compacted surfaces (trails and roads) would be subsoiled and mulched (Appendix H, Table 3).

Skyline cable-yarding corridors would cover about three percent of the treatment area's surface (Adams, 2003). Compaction would typically be absent or light with little soil displacement in the cable-yarding corridors (D. Cressy, 2007; pers. obs.). There would be small pockets of heavier compaction along terrain breaks. Compaction that would occur within the cable yarding corridors would mostly be confined to the topsoil and would heal satisfactorily without further mitigation (D. Cressy, pers. obs.).

When road and in-unit effects are considered jointly, soil productivity would either be maintained or slightly decreased following implementation of the proposed action (Appendix H, Table 3). However, a net improvement to soil productivity would be expected in the long-term because:

- Old and new surfaces with detrimental compaction would continue to recover very slowly where not subsoiled but have accelerated recovery where subsoiled and mulched.
- The unmapped LSR and Riparian Reserve portions of the project area would not undergo future soil disturbance.

2. Landslides

a) Affected Environment

The soils on steep slopes (60 to 90 percent) are well drained and loamy and typically are shallow to moderately deep (10 to 40 inches) over brittle, somewhat hard sandstones. A ten acre portion immediately above the 22-7-2.0 road also has major components of very shallow soils and rock outcrops. About 18 acres of the steep slopes are considered potentially unstable for shallow-seated landslides and would be classified under the TPCC system as FGR (i.e. soils considered fragile due to slope gradient but suitable for forest management with mitigation for surface erosion and landslides) (Appendix I, Table A). Ninety percent of the FGR slopes occur below the 22-7-22.0 road. Of the 18 acres of FGR: fifteen acres are isolated from streams by benches, two acres slope down to a swale bottom without any sign of an annual scour and deposition stream channel, and one acre slopes down to a first order stream. No tension cracks were discovered from the field investigation, indicating that no slopes are actively failing.

Based on an aerial photo landslide inventory (nine aerial photo flights from 1959 to 2004) and

field observations, 13 post-harvest landslides between 0.03 to 0.2 acres in size were identified (D. Cressy, 2007; pers. obs.). Road construction was the biggest contributing factor for the occurrence of all 13 landslides. Removal of trees during harvest may have been a contributing factor for some of these events. The following is a brief description of the landslides documented in Appendix H, Table 2:

- Ten landslides were debris avalanches resulting from the failing of sidecast material from roads. These landslides ranged in size from 0.03 to 0.2 acres. Most came to rest on gently sloping benches. None of these landslides reached streams.
- One landslide was a failure of road sidecast material that developed into a 1,100 feet long, 0.75 acre debris flow that reached Saddle Butte Creek.
- Two post-harvest landslides were cut-slope failures of the 22-7-22.0 road up to 0.6 acres in size. There is a block of the slide material of one of these landslides that remained intact and came to rest above the road bed. Neither failure reached a stream.
- One small cut-slope failure of 0.02 acres occurred in 2006 in the northwestern portion of the unit.

b) No Action Alternative

Occasional, small cut-slope failures of the 22-7-2.0 road are likely to occur. Sediment from these small cut-slope failures would stay in the road prism or filter into the forest floor. The potentially unstable fill beneath the landing at the end of proposed Spur #3 could fail some time in the future. The size of this failure is predicted to be less than 0.1 up to 0.5 acre. If a slope failure occurred at this location, it would be captured by a bench before it could reach Saddle Butte Creek.

In-unit landslides on the potentially unstable FGR areas would have a low probability of occurring (less than ten percent chance in a given year). If in-unit landslides do occur they would likely be small in size (less than 0.1 acre). This assessment is based on the following reasons:

- No landslides that were solely harvest-related were identified in the aerial photo landslide inventory. Also, no landslides were discovered inside Unit 27A or Unit 27B during field investigations that occurred under mid-seral stand conditions except those that are road-related. (D. Cressy, 2007; pers. obs.).
- No actively failing slopes were discovered on the FGR ground as evidenced by the absence of tension cracks that indicate periodic, sudden soil movement or soil creep (D. Cressy, 2007; pers. obs.).
- The Oregon Department of Forestry finding that landslide numbers and volumes were overall the lowest in mid-seral stands (ages 31 to 100 years) following the intense 1996 storms (ODF Forest Practices Technical Report No. 4, p. 64).
- Landslides that were identified in the aerial photo inventory were commonly small in size (0.03 to 0.2 acres) (D. Cressy, 2007; pers. obs.)

Additionally, the probability of landslides that might occur that have the potential to reach a stream would also be low for the following reasons:

- There are only three acres of FGR slopes where initiating landslides could reach streams. One of those acres borders a second order stream. The two other acres border a swale bottom with no stream channel. A landslide would need to enter the swale bottom and initiate a debris flow that would travel 700 feet down the swale to impact Saddle Butte

Creek. This scenario did not occur under earlier clear cut conditions so it is reasonable to that it would be even more unlikely to occur under a mid-seral condition.
- In the remaining fifteen FGR acres, streams are isolated from FGR slopes by gently sloping benches and moderate slopes.
- Small landslides, the most likely size to occur, rarely exceed 180 feet in travel.

Landslide effects to 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. The volume of soil and rock moved in a small landslide (the most likely size) would be less than 150 cubic yards and would stay on site unless some of this volume reaches a stream and transported as sediment (which would have a low probability of occurring). Only the zone of depletion (i.e. where the landslide material originates from) would experience long-term soil productivity losses. However, the zone of depletion is usually less than 0.05 acre for a small landslide.

c) Proposed Action Alternative

All spur construction would occur on stable positions on gentle slopes except for 250 feet of Spur #1. This segment of Spur #1 would be built on FGR soils with a 75 percent slope. This segment follows an old skid trail just below a prominent bench for half of its length before merging into an existing road on the next lower bench. Spur #1 would bypass a steep 25 percent adverse grade on that existing road. The probability of slope failure below the road would be low for the following reasons:

- The FGR slope is a planar slope that does not concentrate runoff or soil moisture.
- The segment of Spur #1 would be full-bench construction with no sidecasting of material. (Sidecasted material adds to the weight of the soil on the slope below which could destabilize the slope and lead to failure).
- The cut-slope would intersect the bench above the road. Consequently, there would be little steep-sloped drainage into the road from the area above the road.
- The roadbed would be in-sloped to prevent drainage from expelling onto potentially unstable portions of the FGR slope below.
- There would be closely spaced water bars after use to disperse the drainage.

In the unlikely event of a slope failure below this segment of Spur #1, the landslide would be small to medium in size (e.g. likely less than 0.15 acres) and would be captured on a bench before it could intersect a stream. There would be a higher probability of small cut slope failures of less than 0.03 acres in size. Any cut slope landslide would come to rest on the roadbed.

After treatment, the removal of the potentially unstable fill material at the end Spur #3 would eliminate the risk of fill failure on the FGR slope below.

Thinning and density management would result in a slight short-term (e.g. 10 years) increase in the risk of harvest-related landslides on the steep FGR slopes. This short-term increase in landslide risk is due to a temporary decrease in canopy interception of precipitation. However, the risk of slope failure under the action alternative (which would be low) would be unchanged as compared to the no action alternative (which was also considered low [pgs. 39-40]). This conclusion is supported by the fact that no landslides solely caused by the clear cut harvest inside were identified from the aerial photo landslide inventory. Landslides are less likely in mid-seral stands than under clear cut conditions (ODF Forest Practices Technical Report No. 4, p. 64).

3. Erosion & Sedimentation

a) Affected Environment

Current levels of surface erosion in Units 27A and 27B are typically low to none because:

- Canopy cover, understory vegetation, duff, and woody debris dissipate rainfall energy and are barriers to water flow/sediment movement.
- Well developed soil structure and porosity covering most of the unit allow high water infiltration rates into the soil.
- Where detrimental compaction and soil displacement reduced soil structure and porosity, the predominantly gentle slopes and absence of vehicle traffic on roads and trails help keep erosion low.

There are a few localized exceptions to low erosion levels. In the northwestern part of Unit 27A, there are some trails and one existing road (Spur #3 under the action alternative) with grades steeper than ten percent where erosion created deep rills and two gullies. Sediment from these features is entering a second-order order stream. The rate of erosion here has slowed down in the gullies because down-cutting has reached bedrock over much of their length.

b) No Action Alternative

The deep ruts and gullies on the natural surface road (a segment of Spur #3 under the action alternative) and a few old ground-based trails would continue to deliver sediment to a second-order stream in the northwestern part of the unit. One of those ground-based trails would continue to capture the flow of a first-order stream. In-unit surface erosion would remain at very low levels with little of the soil leaving the site.

c) Proposed Action Alternative

The deep ruts and gullies on Spur #3 and old ground-based trails would be eliminated. The stream flow from the first-order stream that has been diverted by the ground-based trail would be directed back into the stream channel at the point of diversion. There would be a first wet season flush of sediment from newly constructed spurs in the first wet season following harvest and surface stabilization with water bars and mulch. All road-derived sediment would filter into the forest floor except for small amounts (up to approximately one half cubic yard) from Spur #3 that would enter a first- and second-order stream at the stream crossings.

There would be also be a first wet season flush of sediment from ground-based yarding trails and cable-yarding corridors. The amount of sediment from yarding trails/corridors would be too small to reliably measure. Little of this sediment would reach streams for the following reasons:

- High soil infiltration (ground-based yarding trails excluded) and understory vegetation, logging slash, and other woody debris within the unit and riparian no-cut buffers would intercept sediment (D. Cressy, 1998 & 2003; pers. obs).
- The source of sediment that could reach streams is in swale bottoms that do not have annual scour and deposition channels. These swales would only contribute a perceptible amount of harvest-derived sediment if they experience surface flow during the first wet season immediately following harvest. Unusually intense storms with return intervals of at least 10 years are necessary to make these swales flow. The probability of a ten year event intersecting the first wet season following harvest would be ten percent.

- Ground-based operations would be suspended during dry season periods of unseasonable wet soil moistures or in topographic positions where soils normally dry slower (e.g. swale bottoms and north facing slopes).
- Cable-yarding corridors where gouging occurs 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.

4. Cumulative Effects

a) Soil Productivity

As stated previously (EA, pg. 38), soil productivity would either be maintained or slightly decreased following implementation of the proposed action. In the long-term (i.e. one harvest rotation or more), soil productivity would be maintained or slightly improved at the watershed scale on BLM administered lands. The combination of slow, natural recovery and active amelioration by the BLM during future projects of old ground-based and road impacts would improve soil productivity. The effects of forest management on private timber lands in the watershed would be highly variable based on the history of site-specific practices.

b) 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. Landslides on BLM-administered lands are expected to continue to decline due to Best Management Practices for timber harvest and road building under the Northwest Forest Plan. Amelioration of past issues with slope stability and drainage of old roads would account for most of the improvement on BLM lands.

F. Fish Populations & Habitat

1. Affected Environment

Oregon Coast coho salmon (*Oncorhynchus kisutch*), Oregon Coast steelhead (*Oncorhynchus mykiss ssp.*), coastal cutthroat trout (*Oncorhynchus clarki clarki*), Pacific lamprey (*Lampetra tridentata*), and Umpqua chub (*Oregonichthys kalawatseti*) are special status fish species present in the Elk Creek/Upper Umpqua Watershed (see Appendix J). Special status species and their

habitats are managed by the BLM so as not to contribute to the need to list, and to recover the species (ROD/RMP, pg. 41). Oregon Coast chinook salmon (*Oncorhynchus tshawytscha*) are also present in the Elk Creek/Upper Umpqua Watershed, but have not been assigned a special status by the BLM. 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 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. Bureau Sensitive species and their habitats are managed so that the BLM will not contribute to the need to list the species under the ESA.

There is one fish bearing stream (Saddle Butte Creek) adjacent (100 to 400 feet) to the proposed units. This stream contains Oregon Coast coho salmon, Oregon Coast steelhead, and coastal cutthroat trout (McEnroe, 2007; pers. obs.).

The proposed haul route for the project has two perennial fish-bearing, two perennial non-fish bearing, and 19 intermittent or ephemeral stream crossings. Ditch lines along the haul route are well vegetated or armored. Cross drains along the haul route are spaced appropriately. The portions of the haul route in close proximity (less than 50 feet) to fish habitat are located in the valley bottom. These areas lie on flat topography and the well vegetated ditch lines would filter and capture any road-derived sediment (EA, pg. 33).

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 (USDI, 2004; Chart 7-2).

With the exception of Saddle Butte Creek, streams within the project area consist of high gradient, non-fish bearing, and ephemeral streams of the first- and second-order. Saddle Butte Creek is dominated by gravel and cobble substrates, has sufficient amounts of large woody debris, and has a good riparian conifer density (McEnroe, 2007; pers. obs.).

2. No Action Alternative

Fish species and populations would remain unaffected. 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 watershed. 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. No-harvest buffers of 100 feet along fish bearing streams will maintain stream shade and protect large woody debris sources. The variable width buffers of at least 20 feet would maintain stream shade on the intermittent and ephemeral streams within the project area. Fish habitat within the drainages would be unaffected with respect to large wood and stream temperatures.

b) Channel Geometry

Without a measurable increase in peak flows (EA, pg. 35) there would be no mechanism to change channel geometry. Fish habitat within the project area would be unaffected with respect to channel geometry.

c) Fine Sediment and Substrate

The proposed road construction is located in stable locations outside of Riparian Reserves for perennial streams. The only direct connection to the drainage network is Spur #3. Spur #3 crosses an ephemeral stream 0.3 miles upslope from Saddle Butte Creek. The amount of sediment contributed from this crossing would be negligible when compared to the amount of sediment contributed along the entire length of the stream from all sources (EA, pg. 33)

Timber hauling could occur in both the dry and wet seasons of operation. Haul during dry season would generate negligible amounts of road-derived sediment to stream channels, because there would be little or no mechanism for the transport of fine sediment into adjacent or nearby streams. However, as stated earlier (pg. 33), during the first seasonal rains there could be a flush of sediment from the roads near stream crossings. The amount of sediment contributed from these crossings during the first seasonal rains would be negligible when compared to the amount of initial sediment flush from ephemeral channel beds and stream banks in response to the first seasonal rains.

Road derived sediment resulting from haul during the wet season would be limited to paved and rock roads. The effects of this sediment would be short-term and limited to the immediate vicinity of the two fish-bearing stream crossings (EA, pg. 33). In addition the project design features would require that prior to any wet season haul on surfaced roads, sediment reducing measures (e.g. placement of straw bale or silt fences) would be placed near stream crossings to prevent sediment from reaching streams (EA, pg. 10). Short term pulses of sediment are normal during the wet season and any road derived sediment from this project would be indistinguishable above background levels. There would be no effect to fish or fish habitat from sediment as a result of this project.

d) Fish Passage

There are two stream crossings over fish-bearing streams in the haul route. Both of these stream crossings are passable by juvenile and adult fish in summer and winter flows. The rest of the stream crossings on the haul route are over intermittent or ephemeral streams. Fish passage would not be affected by this project.

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 (EA, pgs. 31-32); and changes in sediment would be negligible (EA, pg. 33), 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 (EA, pg. 33) 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. 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 0.1 miles downslope of the project.

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 or water quantity (pgs. 31-33) as a result of the proposed action.

Substrate characteristics – There would be no measurable effect to substrate as a result of sediment (pgs. 32).

Large woody debris (LWD) within the channel and LWD source areas – There would be no effect to LWD or source areas (pg. 42).

Channel geometry – There would be no measurable impact to fisheries or aquatic organisms from peak flows capable of altering the channel geometry (pg. 43).

Fish passage – There would be no effect to fish passage. There are no new crossings along fish bearing streams and the stream crossings that are over fish-bearing streams allow passage of adult and juvenile salmonids under all flow conditions (pg. 43).

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 or substrate (pgs. 32).

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.

6. Aquatic Conservation Strategy

The Aquatic Conservation Strategy (ACS) was developed to restore and maintain the ecological health of watersheds and aquatic ecosystems contained within them on public lands. The ACS must strive to maintain and restore ecosystem health at watershed and landscape scales to protect habitat for fish and other riparian-dependent species and resources and restore currently degraded habitats. This approach seeks to prevent further degradation and restore habitat over broad landscapes as opposed to individual projects or small watersheds. (Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl, page B-9).

a) ACS Components:

(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). Approximately 20 acres of this treatment are within Riparian Reserves and approximately 82 acres are within Late Successional Reserves (LSR) of which approximately 47 acres are within riparian areas (there is no additional designation of Riparian Reserve within the LSR). One of the objectives of this project is to accelerate the development of late seral characteristics in the Late Successional Reserves and Riparian Reserves.

(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 [ROD/RMP, pg. 20]." There are no key watersheds within the Elk Creek/Umpqua 5th field Watershed.

(3) Watershed Analysis (ACS Component #3) and other pertinent information:

In developing the project, the Elk Creek/Umpqua River Watershed Analysis was used to evaluate existing conditions, establish desired future conditions, and assist in the formulation of appropriate alternatives. The Elk Creek/Umpqua River Watershed Analysis 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.

Existing watershed conditions are described in the Hydrology (pg. 30-35) and Fisheries (pg. 42-45) sections of the EA and in the Elk Creek/Umpqua River Watershed Analysis. The short and long term effects to aquatic resources are also described in these sections of the EA.

(4) Watershed Restoration (ACS Component #4)

One of the purposes of this project is to accelerate tree growth in Riparian Reserves and the attainment of late seral stand conditions. Therefore, the Riparian Reserve and LSR portions of the proposed action are considered to be a watershed restoration project.

Additionally, since 1994, numerous stream enhancement projects have been implemented in the Elk Creek Watershed. This includes placing instream structures (e.g. logs, boulders, root wads, etc…) to improve aquatic habitat on over 4 miles of stream, replacing over 13 culverts identified as barriers to fish passage to open up access to additional habitat, or improving or decommissioning over 10 miles of road to reduce road sediment impacts to aquatic systems. This work has been done in collaboration with private timber companies, the Partnership for Umpqua Rivers watershed council, Oregon Department of Fish and Wildlife, and the BLM. Future opportunities for restoration are discussed in the Elk Creek/Umpqua River Watershed Analysis. Approximately 52 miles of road were identified for improvement or decommissioning, 55 miles of stream for instream restoration and 31 culverts for replacement. This work would be implemented as budgets allow.

b) Range of Natural Variability within the Watershed:

Based on the dynamic, disturbance-based nature of aquatic systems in the Pacific Northwest, the range of natural variability at the site scale would range from 0-100% of potential for any given aquatic habitat parameter over time. Therefore, a more meaningful measure of natural variability is assessed at scales equal to or greater than the 5th field watershed scale. At this scale, spatial and temporal trends in aquatic habitat condition can be observed and evaluated over larger areas, and important cause/effect relationships can be more accurately determined.

Natural disturbance events to aquatic systems in the Pacific Northwest include wildfires, floods, and landslides. Average fire return intervals at the drainage scale were calculated between 50 and 75 years (prior to the advent of fire suppression). The more destructive stand replacement fires occurred irregularly at intervals from 150 to 350 years (Elk Creek/Umpqua River Watershed Analysis pg 9). Most of the Elk Creek watershed is dominated by Tyee and Umpqua Formations of sandstones and siltstones which have a relatively high frequency of debris avalanches on slopes steeper than 65 percent and debris flows on slopes steeper than 35 percent.

Timber harvesting and road construction over the past 50 years have substantially increased the frequency and distribution of landslides above natural levels in the Elk Creek Watershed. However, there is a downward trend in landslide incidence over the last 50 years that is associated with improved management practices. (Elk Creek/Umpqua River Watershed Analysis, pgs 35-36) On BLM land, future landslides, mostly during large storm events, are expected to deliver large wood and rock fragments to lower-gradient streams because of BLM Riparian Reserves. These events would more closely resemble landslides within relatively unmanaged forests. These disturbance events are the major natural sources of sediment and wood to a stream system and are very episodic in nature.

Due to the dynamic nature of these disturbance events, stream channel conditions vary based on the time since the last disturbance event. This results in a wide range of aquatic habitat conditions at the site level. Site level habitat conditions can be summarized by Oregon Department of Fish and Wildlife (ODFW) habitat surveys. Surveys have been conducted throughout Elk Creek mostly in the third through sixth-order streams. Approximately 20 stream

reference reaches in the Coast Range of the Umpqua Basin were used to compare against all surveyed streams. These relatively unmanaged reaches represent the variability of conditions within natural stream systems as well as characteristics desirable for a variety of fish species (including salmonid habitat). When compared to these "reference streams", aquatic habitat survey data from the Elk Creek watershed indicates that most of the tributaries are lacking large woody debris. While this condition is considered typical at any given site scale, it is considered atypical for most streams to be devoid of wood at the larger 5th field scale. Therefore, at this larger scale, aquatic habitat conditions are considered to be outside the range of natural variability.

Because of its dynamic nature, sediment effects to streams can only be described in general terms. It is important to remember that ODFW instream habitat data is a snapshot in time. When compared to reference reaches, sediment conditions in most of the tributaries of Elk Creek Watershed appear to be similar to the reference reaches (Elk Creek/Umpqua River Watershed Analysis).

Stream temperatures vary naturally in this watershed as a result of variation in geographic location, elevation, climate, precipitation, and distance from the source water (Elk Creek/Umpqua River Watershed Analysis, pgs 43-44). Stream temperatures also naturally vary as a response to the natural disturbance events mentioned in the previous paragraphs, as well as current practices on private forest, agricultural, and residential properties. Due to the large amount of riparian clearing that has occurred over the last 150 years (converting forest into farmland), coupled with management-induced channel widening, irrigation withdrawals, and loss of gravels, it is likely that stream temperature increases have been greater over larger spatial and temporal scales than observed naturally. One of BLM's objectives for managing Riparian Reserves is to maintain and enhance shade providing vegetation along streams.

Changes in stream flow can result from consumptive withdrawals and effects of land use activities on storm water runoff, infiltration, storage and delivery. Commercial and domestic withdrawals are common along Elk Creek. There is evidence that previous management has heavily influenced stream channels throughout the Elk Creek Watershed (Elk Creek/Umpqua River Watershed Analysis, pg 44). Over the last 150 years, much of the lower elevation forest land has been converted to farmland. Many tributaries within Elk Creek have also been cleaned (had large wood removed) or salvage logged. BLM Forest management in Elk Creek would be designed to reduce or prevent watershed impacts.

Table 6. Individual Aquatic Conservation Strategy Objective Assessment.

ACS Objective	Site/Project Scale Assessment	5th Field Watershed Scale Assessment
	Scale Description: This project is located in the Saddle Butte Creek 7th field drainage. This drainage is roughly 1,500 acres in size. The BLM manages approximately 950 acres in this drainage (63%). Units proposed for treatment represent 14% of the total drainage area, and 22% of the BLM-managed lands in the drainage.	Scale Description: This project is located in the Elk Creek/Umpqua River 5th field watershed. This watershed is roughly 187,000 acres in size. The BLM manages approximately 45,000 acres in this watershed (24%). Units proposed for treatment represent 0.1% of the total watershed area, and 0.5% of the BLM-managed lands in the watershed.
1. Maintain and restore the distribution, diversity, and	Within the drainage, the proposed action would result in 67 acres of thinned riparian	This treatment would also speed attainment of this objective at the watershed scale.

ACS Objective	Site/Project Scale Assessment	5th Field Watershed Scale Assessment
complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations, and communities are uniquely adapted.	stands. Trees within these treated stands would attain larger heights and diameters in a shorter amount of time than if left untreated. PDF's such as variable width "no-harvest" buffers established along streams would retain shading and hence maintain water temperature. "No-harvest" buffers established on streams in or adjacent to proposed units would prevent disturbance to stream channels and stream banks and intercept surface run-off allowing sediment transported by overland flow to be filtered out before reaching active waterways (pg. 32 of EA) and would prevent impacts to aquatic resources. This treatment would speed attainment of this objective.	
2. Maintain and restore spatial and temporal connectivity within and between watersheds	Within the drainage, the proposed project would have no influence on aquatic connectivity. Therefore this treatment would maintain the existing connectivity condition at the site scale.	Within the watershed, the proposed project would have no influence on aquatic connectivity. Therefore this treatment would maintain the existing connectivity condition at the watershed scale.
3. Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations	As discussed on pages 33-34 of the EA, thinning treatments would not reduce canopy closure to an extent that could potentially influence in-stream flows. In addition, "no-harvest" buffers established on all Northwest Forest Plan (NFP) streams in or adjacent to proposed units would prevent disturbance to stream channels and stream banks (pg 7 of EA). Therefore, this treatment would maintain the physical integrity of the aquatic system at the site scale.	This treatment would also maintain the physical integrity of the aquatic system at the watershed scale.
4. Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.	Project design features (PDF) would ensure that water quality would not be adversely impacted by the proposed action. PDF's such as variable width "no-harvest" buffers established along streams would retain shading and hence maintain water temperature. "No-harvest" buffers established on streams in or adjacent to proposed units would prevent disturbance to stream channels and stream banks and intercept surface run-off allowing sediment transported by overland flow to be filtered out before reaching active waterways (pg. 32 of EA). Therefore, this treatment would maintain the existing water quality at the site scale.	Based on the information discussed at the site scale, this project would also maintain water quality at the watershed scale.
5. Maintain and restore the sediment regime under which aquatic ecosystems evolved.	As mentioned above, "No-harvest" buffers established on streams in or adjacent to proposed units would prevent disturbance to stream channels and stream banks and intercept surface run-off allowing any management related sediment transported by overland flow to settle out before reaching active waterways. Therefore, this project	This project would maintain the existing sediment regime at the watershed scale as well.

ACS Objective	Site/Project Scale Assessment	5th Field Watershed Scale Assessment
	would maintain the existing sediment regime.	
6. Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing.	As discussed on pages 33-34 of the EA, thinning treatments would not reduce canopy closure to an extent that could potentially influence in-stream flows. The project would involve partial removal of vegetation on areas constituting three percent or less of each affected sub-watershed. In addition, new road construction would not extend the drainage network or contribute to a potential increase in peak flow because the new roads would be located on ridge tops or stable side slopes with adequate cross drain structures. Therefore, this treatment would maintain stream flows within the range of natural variability at the site scale.	As discussed at the site scale, thinning treatments would not reduce canopy closure to an extent that could potentially influence in-stream flows. Therefore, at the larger watershed scale, this treatment would also maintain stream flows within the range of natural variability.
7. Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and woodlands.	As discussed in #6 above, this project would maintain stream flows within the range of natural variability at the site scale. Therefore, it would also maintain stream interactions with the floodplain and respective water tables at the site scale.	At the watershed scale, this project would also maintain stream interactions with the floodplain and respective water tables within the range of natural variability.
8. Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.	The proposed treatment is designed to return riparian stands to a more natural density and growth trajectory. Therefore this treatment would serve to restore plant species composition and structural diversity at the site scale.	The proposed treatment is designed to return riparian stands to a more natural density and growth trajectory. Therefore this treatment would serve to restore plant species composition and structural diversity at the larger watershed scale as well.
9. Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.	As mentioned previously, the intent of this project is to restore riparian stand conditions in the proposed treatment areas. Implementation of riparian restoration projects will help restore adequate habitat to support riparian-dependent species at the site and watershed scales.	As mentioned previously, the intent of this project is to restore riparian stand conditions in the proposed treatment areas. Implementation of riparian restoration projects will help restore adequate habitat to support riparian-dependent species at the site and watershed scales.

c) ACS Summary:

Based upon the information listed above, the proposed action would meet Aquatic Conservation Strategy objectives at the site and watershed scale. In addition, based upon the restorative nature of the action, this project would not retard or prevent attainment of ACS objectives – it would actually speed attainment of these objectives. Therefore, this action is consistent with the Aquatic Conservation Strategy, and its objectives at the site and watershed scales.

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. There is habitat present for this species in the project area.

The project area is also within the known range of the popcorn flower (*Plagiobothrys hirtus)*, a federally Endangered plant. However, there is no habitat present for this species in the project area.

Field surveys were conducted in the spring, summer, and fall of 2006 to comply with Departmental Manual 6840 directives and the Special Status Plant program (ROD/RMP, pg. 40). There were no Special Status Plants detected, including Kincaid's lupine and the popcorn flower, within the 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. 27-28), Saddle Up To Paradise 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 cyanescens* (a lichen) and *Eucephalis vialis* (a vascular plant) were completed the spring, summer and fall of 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 these two Survey and Manage botanical species were found in the proposed project area. These two Survey and Manage botanical species are the only species requiring surveys. The remaining Survey and Manage botanical species were either outside of the range of the project area, or there was no suitable habitat in the project area (see Appendix J).

Therefore, the decision for the Saddle Up To Paradise 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. The severity of infestation ranges from low to high, and is mostly located within the road prism or previously used logging landings surrounding the project area (Table 7).

Table 7. Noxious Weed Infestations.

	Infestation	Severity
Road Segment	**Scotch Broom**	**Himalayan blackberry**
22-7-2.0	Moderate - High	Moderate
22-7-35.1	Low-Moderate	Low
22-7-35.2	High	Low
22-7-14.0	Low	High

* Infestation level is based on canopy cover class per acre: Low = 1-5%; Moderate = 6-25%; High => 25%.

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 would continue to be performed by manual removal and/or application of an approved herbicide.

b) No Action Alternative

Noxious weeds currently located in the project area would be 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 with the Roseburg District Integrated 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, logging and construction equipment would 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 following the project design features (EA, pg. 13). 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 occupied site within Zone 1 (pgs.8-11, Ref. # 1-15-05-I-0511).

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 (EA, pg. 46). 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 March 8, 2007. A "No Effect" determination was made. It has been determined that there would be no effect to scientific, cultural, or historical resources.

B. Public Notification

1. A letter was sent (March 19, 2007) to three **adjacent landowner**s. No comments were received.

2. Notification was provided (May 11, 2007) 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.

3. The **general public** was notified via the *Roseburg District Planning Update* (Spring 2007) 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 July 3, 2007 and end close of business August 2, 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

Jay Bernards	Project Lead / Layout
Al James	Management Representative
Jeff McEnroe	Fisheries
Dan Cressy	Soils
Brooke Shakespeare	Hydrology
Krisann Kosel	Fuels Management
Elizabeth Gayner	Wildlife
Rex McGraw	Planning & Environmental Coordinator / EA Preparer
Trixy Moser	Silviculture
Terrie King	Engineering
Dave Harman	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

Culmination of mean annual increment, or CMAI, is defined as the age in the growth cycle of a tree or stand at which the mean annual increment for height, diameter, basal area, or volume is at a maximum. (The Dictionary of Forestry, The Society of American Foresters 1998)

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 annual scour and deposition. Normally streams with seasonal flow.

Ephemeral Stream: Streams that contain running water only sporadically such as in direct response to a precipitation event.

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).

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.

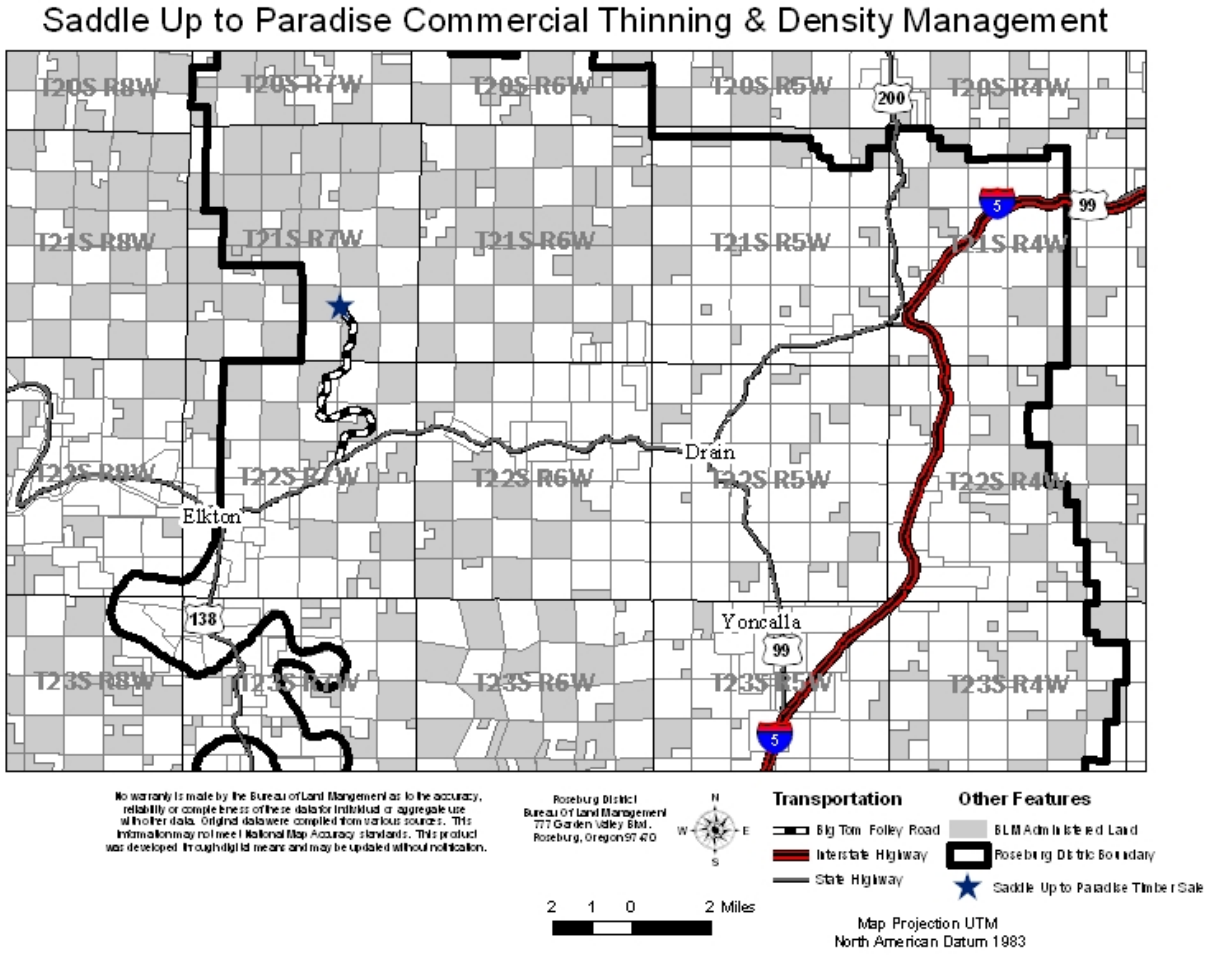
Peak Flow: The highest of stream or river flow occurring in a year or from a single storm event (FEMAT, pg IX-25).

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

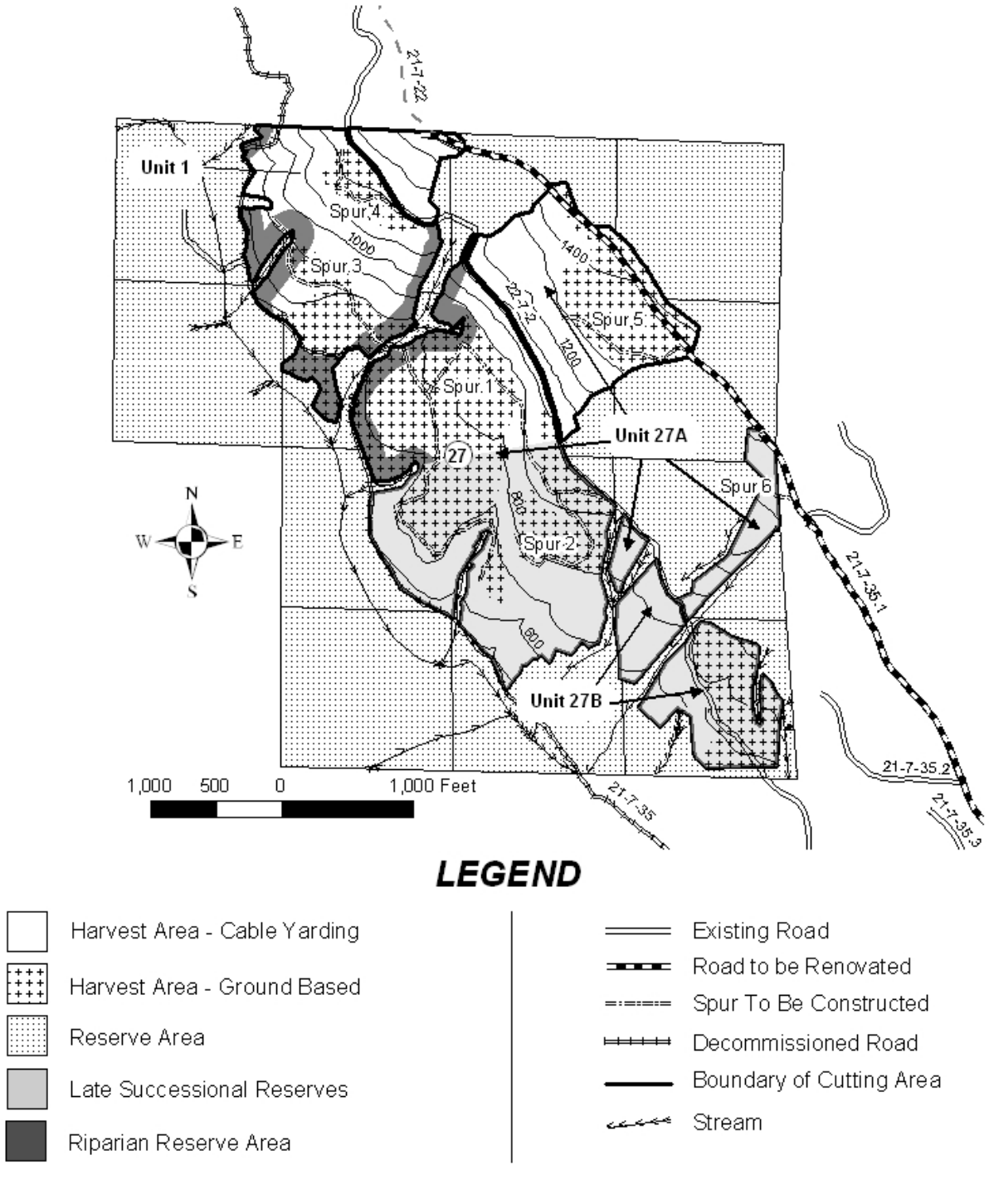
Snag: Standing dead or partially dead trees at least 10 inches in diameter at breast height, and at least six feet tall (FEMAT, pg IX-33).

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



Appendix B. Project Location Map



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"** – A determination of no effect to cultural resources was made since no cultural resources were identified (EA, pgs. 15, 53).
Environmental Justice	E.O. 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (Feb. 02, 1994). ***This EO requires that agencies insure that adverse health or environmental effects do not disproportionately affect minority or low-income populations.***	**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. ***This act seeks to identify and restore prime farmlands and other unique federal land characteristics.***	**None** - No prime or unique farm land would be affected. "No discernable effects are anticipated" (PRMP, pgs. 1-7).
Floodplains	E.O. 11988, as amended, Floodplain Management (May 24, 1977). ***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.***	**None** - Project is not within 100 yr. floodplain.

Element	Relevant Authority	Environmental Effect
Invasive and Nonnative Species	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. ***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.***	Infestations of noxious weeds are being treated under the Roseburg District Integrated Weed Control Plan (1995). Project design features are included in the proposed action to prevent or control the spread of noxious weeds (EA, pgs. 13, 52).
Native American Religious Concerns	American Indian Religious Freedom Act of 1978. ***This act seeks to protect and preserve for American Indians the right of exercise of traditional religion including access to religious sites.***	No concerns were noted as the result of public and tribal contact including impacts to Indian Trust Resources.
Threatened or Endangered Species	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).	**Botany** – Surveys were performed in March – August 2005 and Kincaid's Lupine (federally threatened) and the rough popcorn flower (federally endangered) were not detected (EA, pgs. 51-52). **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, pgs. 21-25, 53). The proposed action has no effect on the bald eagle. (EA, pg. 21). **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, pgs. 45, 53)
Wastes, Hazardous or Solid	Resource Conservation and Recovery Act of 1976; Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (as amended). ***These laws regulate hazardous waste that endangers public health or the environment.***	**None** - Applicable HazMat policies would be in effect.
Water Quality, Drinking / Ground	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).	**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.
Wetlands/Riparian Zones	E.O. 11990, Protection of Wetlands (May 24, 1977). ***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.***	**None** - "The selected alternative [of the FEIS] complies with [E.O. 11990]..."(ROD p. 51, para.7).

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. The 22-7-14.0 and 21-7-35.1 roads are encumbered under Right-of-Way Agreements #R-645A (Seneca Jones Timber Co.) and #R-659 (Roseburg Resources), respectively.
Minerals	**None** - Project has no mining claims or leases of record.
Recreation	**Minimal short-term impacts** – Temporary road closures that could occur due to active haul/logging would reduce the dispersed recreational activities but would not have long term impacts on the recreational use of the project area once the treatment has been completed. (EA, pg. 16).
Visual Resources	**None** - The VRM classification for this area is IV. The basic elements of form, line, color and texture as required by the ROD/RMP (pg. 52) would be maintained under the proposed action (EA, pg. 16).
Other (Adjacent Landowners)	**None -** Adjacent landowners are in the vicinity of this sale were notified (March 19, 2007) and no comments were received.

Appendix D. Northern Spotted Owl Habitat

Roseburg District BLM – Swiftwater Field Office
Project Name: Saddle Up To Paradise
Project Type: Commercial Thinning & Density Management
Location: T21S-R07W-Section 27

Prepared By: Elizabeth Gayner
Date: April 5, 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.

Project Area						5th-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				
Commercial Thinning						17,700	24,800	38,400
27A	0	0	104	0	0			
27B	0	0	0	0	0			
Density Management								
27A	0	0	79	0	0			
27B	0	0	23	0	0			
Total	***0***	***0***	***206***	***0***	***0***			

1. **NRF- N**esting, **R**oosting, and **F**oraging Habitat on federal lands. For analysis purposes is considered stands ≥ 80 years of age based on FOI (0 < DK ≤ 1925).

2. Suitable Dispersal Habitat on federal lands, for analysis purposes, is considered stands aged 40 to 79 years based on FOI (1925 < DK ≤ 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 (Density Management) 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.

Northern Spotted Owl		**Saddle Butte Creek**		**Big Tom**	
Site Identification Number (id #s) [1]		**2650**	**2650A**	**2048B**	**2048C**
Known Owl Activity Center (KOAC) (acres)		104.7	None	None	Private
Total Acres of Federal Lands within Home Range		2,379 (53%)	2,556 (56%)	2,295 (51%)	2,248 (50%)
Critical Habitat (acres)		421 (18%)	409 (16%)	817 (36%)	1,243 (55%)
Critical Habitat degraded (acres)		0	0	0	0
Suitable NRF (acres) (0 < stand birth date ≤ 1925)(acres)	**pre-harvest**	1,117 (47%)	1,188 (46%)	880 (38%)	1,038 (46%)
	post-harvest	1,117 (47%)	1,188 (46%)	880 (38%)	1,038 (46%)
Dispersal Habitat (acres) (0< stand birth date ≤ 1966)(acres)	**pre-harvest**	1,564 (66%)	1,551 (61%)	1,514 (66%)	1,597 (71%)
	post-harvest	1,564 (66%)	1,551 (61%)	1,514 (66%)	1,597 (71%)
Dispersal Habitat degraded (acres) (percent dispersal degraded)[2]		207 (13%)	207 (13%)	207 (14%)	207 (13%)

Northern Spotted Owl		**Big Tom**	**Halfway Creek**	
Site Identification Number (id #s) [1]		2048, **2048A**	0264, **0264A**-C	
Known Owl Activity Center (KOAC) (acres)		None	None	
Total Acres of Federal Lands within Home Range		2,275 (50%)	3,327 (74%)	
Critical Habitat (acres)		1,295 (57%)	1,472 (68%)	
Critical Habitat degraded (acres)		0	0	
Suitable NRF (acres) (0 < stand birth date ≤ 1925)(acres)	**pre-harvest**	1,062 (47%)	1,463 (45%)	
	post-harvest	1,062 (47%)	1,463 (45%)	
Dispersal Habitat (acres) (0< stand birth date ≤ 1966)(acres)	**pre-harvest**	1,472 (65%)	2,234 (67%)	
	post-harvest	1,472 (65%)	2,234 (67%)	
Dispersal Habitat degraded (acres) (percent dispersal degraded)[2]		96 (7%)	176 (8%)	

1. If activity centers occurred within the same contiguous stand, the activity centers were analyzed together as one site using the activity center that best represented the stand (indicated in bold) for this analysis.

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

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 threats[1] 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.

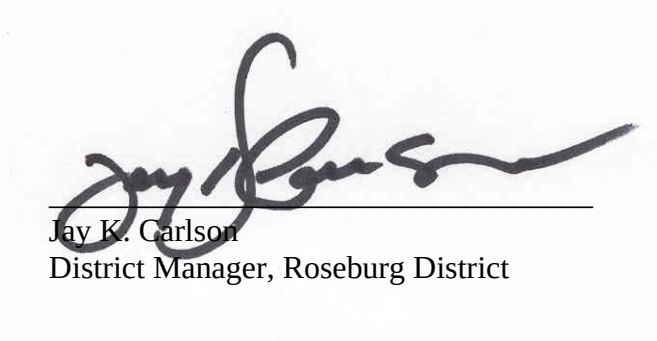
The continuing decline in NSO populations was anticipated and is consistent with the analysis in the Roseburg PRMP/EIS and Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl (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: Saddle Up To Paradise
Project Type: Commercial Thinning & Density Management
Location: T21S-R07W-Sections 27

Prepared By: Elizabeth Gayner
Date: March 21, 2007
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 **Appendix G: Wildlife Summary** and may be further discussed in the body of the EA as appropriate.

Table 1. 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	Status[1]	Present in Project Area?[2]	General Habitat Requirements
BUREAU SENSITIVE			
American Peregrine Falcon *Falco peregrinus anatum*	BS, SE	No Habitat	Cliffs, rock outcrops; open habitats for hunting birds
Chace Sideband *Monadenia chaceana*	BS	Out of Range	Rocky, talus habitats in the Klamath Province and southwards
Columbian White Tailed Deer *Odocoileus virginianus leucurus*	BSO, CR	No Habitat	Bottomlands, oak/hardwood forests; cover for fawning
Crater Lake Tightcoil *Pristiloma arcticum crateris*	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 *Monadenia fidelis beryllica*	BSO	No Habitat	Coast Range, riparian forests at low elevations; deciduous trees & shrubs in wet, undisturbed forest
Klamath Tail-Dropper *Prophysaon sp. nov.*	BS	Out of Range	Moist, open areas along streams or springs in Ponderosa Pine forests; as far North as Crater Lake
Lewis' Woodpecker *Melanerpes lewis*	BSO, CR	No Habitat	Open woodland habitat near water; open woodland canopy and large diameter dead/dying trees, snag cavities
Northern Goshawk *Accipiter gentilis*	BSO, XC, CR	Suspected	Mature and older conifer forests; multi-storied canopies and great structural diversity
Northwestern Pond Turtle *Clemmys marmorata marmorata*	BSO, XC, CR	No Habitat	Ponds, low gradient rivers; upland over-wintering habitat, CWD

Species	Status[1]	Present in Project Area?[2]	General Habitat Requirements
Oregon Shoulderband *Helminthoglypta hertleini*	BSO	No Habitat	Talus and rocky substrates, grasslands or other open areas with low-lying vegetation
Oregon Vesper Sparrow *Pooecetes gramineus affinis*	BSO, CR	No Habitat	Open habitats such as grasslands, meadows, farmlands
Purple Martin *Progne subis*	BSO, CR	Suspected	Snags cavities in open habitats (e.g. grasslands, brushlands, open woodlands)
Rotund Lanx *Lanx subrotundata*	BSO	No Habitat	Major rivers and large tributaries with cold, well-aerated water and rocky substrate
Scott's Apatanian Caddisfly *Allomyia scotti*	BSO	Out of Range	High-elevation (>4,000ft), cold streams in the mountainous regions of Oregon
Spotted Tail-dropper *Prophysaon vannattae pardalis*	BS	No Habitat	Mature conifer forests in the Coast Range; associated with significant deciduous tree/shrub component
Townsend's Big-eared Bat *Corynorhinus townsendii*	BSO, XC, CR	Suspected	Late successional forests; Caves, mines, buildings, bridges, tunnels
BUREAU ASSESSMENT			
Foothill Yellow-legged Frog *Rana boylii*	BAO, XC, V	No Habitat	Low gradient streams/ponds; gravel/cobble, bedrock pools
Fringed Myotis *Myotis thysanodes*	BAO, XC, V	Suspected	Late-successional conifer forests, associated with water; caves, mines, bridges, rock crevices
Harlequin Duck *Histrionicus histrionicus*	BAO, XC, U	Out of Range	Mountain Streams in forested areas on west slope of the Cascade Mountains
Pacific Pallid Bat *Antrozous pallidus pacificus*	BA	No Habitat	Usually rocky outcroppings near open, dry open areas; occasionally near evergreen forests
Pallid Bat *Antrozous pallidus*	BA	No Habitat	Usually rocky outcroppings near open, dry open areas; occasionally near evergreen forests
White-Tailed Kite *Elanus leucurus*	BAO	No Habitat	Open grasslands, meadows, emergent wetlands, farmlands, lightly, wooded areas; wooded riparian habitats close to open hunting; tall trees and shrubs

[1] *Status abbreviations: FE--Federal Endangered, FT--Federal Threatened, SE--State Endangered, ST--State Threatened, XC--Former Federal Candidate, CR--ODFW Critical, V--ODFW Vulnerable, P--ODFW Peripheral/Naturally Rare, U--ODFW Undetermined, BS--Bureau Sensitive in Oregon and Washington, BSO-- Bureau Sensitive in Oregon, BA-- Bureau Assessment Species in Oregon and Washington, BAO--Bureau Assessment Species in Oregon, BT--Bureau Tracking in Oregon and Washington, BTO--Bureau Tracking in Oregon*

[2] *A "Suspected" species has not been documented, however based on literature review, species is expected to occur.*

Table 2. 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?[2]	General Habitat Requirements	Source of Detection
BUREAU TRACKING				
Acorn Woodpecker *Melanerpes formicivorus*	BT	No Habitat	Mixed oak woodlands; snags	-
American Marten *Martes americana*	BTO, V	Suspected	Late-successional forest; large CWD, snags, uneven age stands with adequate cover	-
Brazilian Free-tailed Bat *Tadarida brasiliensis*	BTO	No Habitat	At low elevations where climatic conditions are warm; roosts in caves, mines, buildings	-
Broadwhorl Tightcoil *Pristiloma johnsoni*	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 *Lampropeltis zonata*	BT, V	No Habitat	Pine forests, oak woodlands, chaparral; rotting logs, loose soil	-
California Myotis *Myotis californicus*	BT	Suspected	Forested areas, shrub-steppe areas, arid grasslands; forage over water and tree canopies where insects congregate	-
Cascades Frog *Rana cascadae*	BT	No Habitat	Lakes, ponds, streams in meadows above elevations of 2600 feet; muddy or silty substrate of shallow waters	-
Clouded Salamander *Aneides Ferreus*	BTO, U	Suspected	Forested Habitats; CWD, talus	-
Common Kingsnake *Lampropeltis getula*	BT	No Habitat	Grassland, mixed oak woodlands; riparian	-
Common Nighthawk *Chordeiles minor*	BT	Suspected	Forest mountain clearings, open woodlands & meadows, urban areas; (nests on ground)	-
Del Norte Salamander *Plethodon elongates*	BT	Out of Range	Late-successional conifer forests; rock rubble or talus slopes	-
Great Gray Owl *Strix nebulosa*	BT, V	Documented	Coniferous forests; meadows and natural openings (>10ac) near late-seral nesting habitat	Incidental siting of a single bird documented in Sections 23 and 34; BLM 2003
Hoary Bat *Lasiurus cinereus*	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 *Polymerus castilleja*	BTO	No Habitat	Old-growth and late-successional conifer forests, mature riparian woodlands; Indian Paintbrush (*Castilleja spp*.)	-
Long-eared Myotis *Myotis evotis*	BT, XC, U	Suspected	Late-successional conifer forests, associated with water; roosts in caves, mines, bridges, snags	-
Long-legged Myotis *Myotis volans*	BT, XC, U	Suspected	Late-successional conifer forests, associated with water; roosts in caves, mines, bridges, loose bark, rock crevices	-
Northern Red-legged Frog *Rana aurora aurora*	BT	Suspected	Low gradient streams/ponds with aquatic vegetation	-
Olive-sided Flycatcher *Contopus cooperi*	BTO, XC, V	Suspected	Coniferous forests; uneven canopy with snags and tall trees	-

Species	Status[1]	Present in Project Area?[2]	General Habitat Requirements	Source of Detection
Oregon Floater *Anondonta oregonensis*	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 major tribs.	-
Oregon Megomphix *Megomphix hemphilli*	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 *Arborimus longicaudus longicaudus*	BTO, U	Suspected	Late-successional and mid seral Douglas-fir forests; arboreal platform structures	-
Pileated Woodpecker *Dryocopus pileatus*	BT, V	Documneted	Forests 40 years and older; Large diameter snags, CWD	BLM 2003
Pristine Springsnail *Pristinicola hemphilli*	BT	No Habitat	Shallow, cold, clear springs/seeps; strongly spring-influenced streams, slow-moderate flow; Umpqua R. drainage	-
Ringtail *Bassariscus astutus*	BTO, U	Suspected	Coniferous forests, mixed woodlands; vertical structure to habitat. Streams and rivers	-
Sharp-tailed Snake *Contia tenuis*	BT, V	Suspected	Forested Habitats; CWD, talus, riparian	-
Silver-haired Bat *Lasionycteris noctivagans*	BTO, U	Suspected	Late-successional conifer forests, associated with water; caves/mines, bridges, loose bark, rock crevices, snags	-
Slender-billed Nuthatch *Sitta carolinensis aculeate*	BT	No Habitat	Open woodlands, preferring oak woodlands in Western OR; nests in cavities	-
Southern Torrent (Seep) Salamander *Rhyacotriton variegatus*	BTO, XC, V	Suspected	Springs and streams; riparian/wetland, CWD	-
Tailed Frog *Ascaphus truei*	BT	No Habitat	High gradient, perennial streams; cobbles/boulders	-
Western Bluebird *Sialia mexicana*	BT, V	Suspected	Open habitats (incl. clearcuts), tree cavities	-
Western Gray Squirrel *Sciurus griseus*	BTO, U	Suspected	Oak/hardwood forests, conifer forests, riparian; broad-leafed component in habitat	-
Western Pearlshell *Margaritifera falcata*	BT	No Habitat	Fast, clear, very cold streams with coarse substrate; hosts include salmon, trout, speckled dace; Umpqua R. and major tribs.	-
Western Ridgemussel *Gonidea angulata*	BT	No Habitat	Creeks, rivers, coarse substrates; Umpqua R. and possibly major tribs.	-
White-footed Vole *Arborimus albipes*	BTO, XC	Suspected	Riparian habitats within conifer forests in the Coast Range; small clearings supporting forb growth	-
Willow Flycatcher *Empidonax traillii brewsteri*	BT, XC, V	Suspected	Riparian, edges of forest clearings; willows brushy vegetation	-
Yellow-breasted Chat *Icteria virens*	BT	No Habitat	Dense streamside/riparian vegetation, marshes	-
Yuma Myotis *Myotis yumanensis*	BTO, XC	Suspected	Late-successional conifer forests, associated with water; roosts in caves, mines, bridges, buildings, snags	-

[1] Status abbreviations: FE--Federal Endangered, FT--Federal Threatened, SE--State Endangered, ST--State Threatened, XC--Former Federal Candidate, CR--ODFW Critical, V--ODFW Vulnerable, P--ODFW Peripheral/Naturally Rare, U--ODFW Undetermined, BS-- Bureau Sensitive in Oregon and Washington, BSO-- Bureau Sensitive in Oregon, BA-- Bureau Assessment Species in Oregon and Washington, BAO--Bureau Assessment Species in Oregon, BT--Bureau Tracking in Oregon and Washington, BTO--Bureau Tracking in Oregon

[2] 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: Saddle Up To Paradise
Project Type: Commercial Thinning & Density Management
Location: T21S-R07W-Sections 27

Prepared By: Elizabeth Gayner
Date: March 21, 2007
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	No	No	-	-	-
Spotted Owl	No	No	-	-	-

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	No	No	No	No roost or nest sites	No	No	No
Canada Lynx	No	No	No	No	Out of species range	No	No	No
Fender's Blue Butterfly	Yes	No	No	No	No suitable habitat	No	No	No
Marbled Murrelet	Yes	Yes	Yes	Yes	Occupied Site	April 1st- August 5th	August 6th – Sept. 15th	Yes
Northern Spotted Owl	Yes	Yes	Yes	Yes	Degradation of Dispersal Habitat	Refer to PDFs	No	No
Bureau Sensitive Species								
American Peregrine Falcon	Yes	No	No	No	No cliffs/ rock outcrops within units	No	No	No
Northern Goshawk	Yes	Adjacent	Suspected	No	No impact to adjacent suitable habitat	No	No	No
Northwestern Pond Turtle	Yes	No	No	No	No Suitable Habitat	No	No	No
Oregon Vesper Sparrow	Yes	No	No	No	No Suitable Habitat	No	No	No
Purple Martin	Yes	No	Suspected[3]	No	No Suitable Habitat	No	No	No
Rotund Lanx	Yes	No	No	No	No Suitable Habitat	No	No	No
Spotted Tail-dropper	Yes	No	No	No	No measurable impact of treatment to habitat	No	No	No
Townsend's Big-eared Bat	Yes	Yes	Suspected	N	No impact to adjacent suitable habitat	No	No	Snag PDFs
Bureau Assessment Species								
Foothill Yellow-legged Frog	Yes	No	No	No	No aquatic effects due to PDFs	No	No	No
Fringed Myotis	Yes	Yes	Suspected	No	No impact to adjacent suitable habitat	No	No	Snag PDFs
Survey and Manage Species								
Great Gray Owl	Yes	No	Incidental Sighting Documented only in 2003	No	No removal or modification of suitable habitat	No	No	No

[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. Soils

Roseburg District BLM – Swiftwater Field Office

Project Name: Saddle Up to Paradise
Project Type: Commercial Thinning & Density Management
Location: T21S-R07W-Sec. 27

Prepared By: Dan Cressy
Date: April 10, 2007

Table 1. Timber Production Capability Classification (TPCC).

Unit	FGR[1] (acres)	FPR[2] (acres)	FSR[3] (acres)	FGNW[4] (acres)	FPNW[5] (acres)	Category 1[6] (acres)
27A & 27B	18	0	NA	0	0	NA
Total	18	0	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.
[2] **FPR** = soils on moderate slopes that have mildly active 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 active 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 2. Mass Wasting & Landslides in the Action Area. The action area considered is within the Elk Creek/Upper Umpqua 5th Field Watershed and covers approximately 430 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 1955 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 (1955-2004)	2	7	5	3	15 (3.7 acres)
Project Level Perspective[1]	1	7	4	2	13 (2.3 acres)
Probability of occurrence expected within units:					
No Action Alternative	none	low	low	low	low
Action Alternative (Harvest)	low	low-mod	low	low	low
Cumulative Effects	Unchanged[2]	Unchanged[2]	Unchanged[2]	Unchanged[2]	Unchanged[2]

[1] All identified landslides inside the Saddle Up To Paradise Unit were road-related.
[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 3. 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 subsoiling. A negative figure represents acres with a net loss in soil productivity. A positive figure represents acres with a gain. The figures in this table are estimates based on assumptions made from monitoring observations and data. They are meant to indicate the likelihood of Saddle Up To Paradise maintaining or improving soil productivity.

Road Effects (Unit)	**Losses to Soil Productivity due to the Action (prior to subsoiling)**				**Improvements to Soil Productivity due to subsoiling**		**Effective Net Change** (acres)
	New Construction		**Use of Existing Natural Surfaced Roads & Trails**		**Actual Subsoiled Area[1]** (acres)	**Effective Subsoiled Area[2]** (acres)	
	Rocked Roads (acres)	Natural Surfaced Roads (acres)	Permanent Roads (acres)	Temporary Roads (acres)			
27A & 27B	0	-2.44	0	-0.86	+1.40	+0.97	-2.33
Road Total	0	-2.44	0	-0.86	+1.40	+0.97	-2.33
Unit Effects (Unit)	**Harvest Operations**				**Actual Subsoiled Area[1]** (acres)	**Effective Subsoiled Area[2]** (acres)	**Effective Net Change** (acres)
	Helicopter Yarding (acres)	Skyline Cable Yarding (acres)	Ground-based Yarding (acres)	Other Method?			
27A & 27B	0	-0.35	-1.57*	0	+3.98	+3.66	+1.74
Unit Total	0	-0.35	-1.57*	0	+3.98	+3.66	+1.74
Grand Total	**-5.22***				**+5.38**	**+4.63**	**-0.59**

[1] 0.7 miles of natural surfaced spurs that only access reserves and an estimated 3.8 miles of trails with detrimental compaction and log deck areas along landings would be subsoiled.

[2] "Effective Sub-soiled Area" takes into account the effectiveness of sub-soiling in restoring soil productivity where compaction occurs on previously undisturbed surface. 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.

Appendix I. Fisheries

Roseburg District BLM – Swiftwater Field Office

Project Name: Saddle Up To Paradise
Project Type: Commercial Thinning & Density Management
Location: T21S-R7W-Sec. 27

Prepared By: Jeff McEnroe
Date: April 6, 2007

Table 1. 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 (Winter Run) *Oncorhynchus mykiss ssp.*	FCO[1]	Documented	Streamnet 2005 Personal Obs. (McEnroe)
BUREAU SENSITIVE			
Chum Salmon *Oncorhynchus keta*	BSO	Out of Range[2]	-
Coho Salmon (North of Cape Blanco) *Oncorhynchus kisutch*	BSO[4]	Documented	Streamnet 2005 Personal Obs. (McEnroe)
Umpqua Oregon Chub *Oregonichthys kalawatseti*	BSO	Suspected[3]	-
BUREAU ASSESSMENT			
None	-	-	-
BUREAU TRACKING			
Coastal Cutthroat (Or. Coast) *Oncorhynchus clarki clarki*	BTO	Documented	Streamnet 2005
Pacific Lamprey *Lampetra tridentata*	BT	Suspected[3]	-

[1] Oregon Coast ESU Steelhead is no longer considered a federally listed species. NOAA Fisheries has placed OC Steelhead on the newly created "Species of Concern" list. OC Steelhead are included in the table as a placeholder, and until the BLM formally decides what status, if any, to give to species on the "Species of Concern" list.
[2] Chum Salmon are occasionally documented crossing over Winchester Dam in small numbers. These fish are thought to be strays and not part of an independent population.
[3] Umpqua 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.

FCO = Federal Candidate in Oregon
BSO = Bureau Sensitive Oregon
BTO = Bureau Tracking Oregon
BT = Bureau Tracking

Table 2. 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
27A & 27B	Perennial	Saddle Butte Creek	21S-7W-27	0.1	0.1	0.1	Unknown	Unknown

Table 3. Proposed Haul Route (to paved roadway).

Haul Route		Stream Crossings		
Road Number	Haul Distance (miles)	Fish-Bearing	Perennial	Intermittent
22-7-14.0	4.7	2	2	13
22-7-2.0	2.4	0	0	3
21-7-35.1	1.8	0	0	0
21-7-35.2	0.4	0	0	0
Temporary Spurs	2.3	0	0	3

Table 4. Essential Fish Habitat (EFH).

Unit	Nearest Location of EFH (miles)
27A & 27B	0.1

Appendix J. Botany Summary

Roseburg District BLM – Swiftwater Resource Area

Project Name: Saddle Up To Paradise Timber Sale
Project Type: Commercial Thinning and Density Management
Location: T21S-R07W-Sec. 27

Prepared By: Evan Olson
Date: March 16, 2007

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** and may be further discussed in the body of the decision as appropriate.

Table 1. 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	Surveys Completed	Mitigation Measures
Threatened & Endangered Species						
Lupinus sulphureus ssp. *kincaidii* Kincaid's lupine (T)	**Yes**	**Yes**	No	Surveys performed, not detected.	Mar.-Aug. 2005,	N/A
Plagiobothrys hirtus Rough popcorn flower (E)	**Yes**	No	No	No habitat present.	N/A	N/A
Bureau Sensitive						
Chiloscyphus gemmiparus Liverwort	**Yes**	No	No	No habitat present.	N/A	N/A
Trematodon boasii Moss	**Yes**	No	No	No habitat present.	N/A	N/A
Arcangeliella camphorata Fungus	**Yes**	No	N/A	Surveys Not Practical.[1]	N/A	N/A
Bridgeoporus nobilissimus Giant polypore fungus	No	No	N/A	No habitat present.	N/A	N/A
Dermocybe humboldtensis Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical.[1]	N/A	N/A
Phaeocollybia californica Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical.[1]	N/A	N/A
Phaeocollybia gregaria Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical.[1]	N/A	N/A
Phaeocollybia olivacea Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical.[1]	N/A	N/A
Phaeocollybia oregonensis Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical.[1]	N/A	N/A

Species	Within species range?	Habitat Present?	Species Present?	Reason for concern or no concern	Surveys Completed	Mitigation Measures
Ramaria spinulosa var. *diminutiva* Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical.[1]	N/A	N/A
Rhizopogon chamalelotinus Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical.[1]	N/A	N/A
Rhizopogon exiguus Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical.[1]	N/A	N/A
Eucephalus vialis Wayside aster	**Yes**	**Yes**	No	Surveys performed, not detected.	Mar.-Aug. 2005	N/A
Calochortus coxii Crinite mariposa-lily	**Yes**	No	N/A	No habitat present.	N/A	N/A
Calochortus umpquaensis Umpqua mariposa-lily	**Yes**	No	N/A	No habitat present.	N/A	N/A
Arabis koehleri var. *koehleri* Koehler's rockcress	**Yes**	No	N/A	No habitat present.	N/A	N/A
Bensoniella oregana Bensonia	**Yes**	No	N/A	No habitat present.	N/A	N/A
Cimicifuga elata Tall bugbane	**Yes**	**Yes**	No	Surveys performed, not detected.	Mar.-Aug. 2005	N/A
Frasera umpquaensis Umpqua swertia	**Yes**	No	N/A	No habitat present.	N/A	N/A
Horkelia congesta ssp. *congesta* Shaggy horkelia	**Yes**	No	N/A	No habitat present.	N/A	N/A
Kalmiopsis fragrans Fragrant kalmiopsis	**Yes**	No	N/A	No habitat present.	N/A	N/A
Lathyrus holochlorus Thin-leaved peavine	**Yes**	No	N/A	No habitat present.	N/A	N/A
Limnanthes gracilis var. *gracilis* Slender meadow-foam	**Yes**	No	N/A	No habitat present.	N/A	N/A
Perideridia erythrorhiza Red-rooted yampah	**Yes**	No	N/A	No habitat present.	N/A	N/A
Romanzoffia thompsonii Thompson's mistmaiden	**Yes**	No	N/A	No habitat present.	N/A	N/A
Sisyrinchium hitchcockii Hitchcock's blue-eyed grass	**Yes**	**Yes**	No	Surveys performed, not detected.	Mar.-Aug. 2005	N/A
BUREAU ASSESSMENT						
Crumia latifolia Moss	**Yes**	No	N/A	No habitat present.	N/A	N/A
Diplophyllum plicatum Liverwort	**Yes**	No	N/A	No habitat present.	N/A	N/A
Funaria muhlenbergii Moss	**Yes**	No	N/A	No habitat present.	N/A	N/A
Pseudoleskeella serpentinensis Moss	**Yes**	No	N/A	No habitat present.	N/A	N/A
Schistostega pennata Moss	**Yes**	No	N/A	Outside of elevational range.	N/A	N/A
Tayloria serrata Moss	**Yes**	**Yes**	No	Surveys performed, not detected.	Mar.-Aug. 2005	N/A
Tetraphis geniculata Moss	**Yes**	No	N/A	No Habitat present.	N/A	N/A
Tetraplodon mnioides Moss	**Yes**	**Yes**	No	Surveys performed, not detected.	Mar.-Aug. 2005	N/A
Tripterocladium leucocladulum Moss	**Yes**	No	N/A	No habitat present.	N/A	N/A
Bryoria subcana	No	N/A	N/A	No habitat present, outside of	N/A	N/A

Species	Within species range?	Habitat Present?	Species Present?	Reason for concern or no concern	Surveys Completed	Mitigation Measures
Lichen				current known range.		
Calicium adspersum Lichen	**Yes**	No	N/A	Surveys Not Practical.[1]	N/A	N/A
Lobaria linita Lichen	**Yes**	No	N/A	No habitat present.	N/A	N/A
Pannaria rubiginosa Lichen	**Yes**	No	N/A	No habitat present.	N/A	N/A
Pilophorus nigricaulis Lichen	**Yes**	No	N/A	No habitat present.	N/A	N/A
Stereocaulon spathuliferum Lichen	**Yes**	No	N/A	No habitat present.	N/A	N/A
Sulcaria badia Lichen	**Yes**	No	N/A	No habitat present	N/A	N/A
Adiantum jordanii California maiden-hair	**Yes**	No	N/A	No habitat present.	N/A	N/A
Asplenium septentrionale Grass-fern	**Yes**	No	N/A	No habitat present.	N/A	N/A
Carex brevicaulis Short stemmed sedge	**Yes**	No	N/A	No habitat present.	N/A	N/A
Carex comosa Bristly sedge	**Yes**	No	N/A	No habitat present.	N/A	N/A
Carex gynodynama Hairy sedge	**Yes**	**Yes**	No	Surveys performed, not detected.	Mar.-Aug. 2005	N/A
Carex serratodens Saw-tooth sedge	**Yes**	No	No	No habitat present.	N/A	N/A
Cicendia quadrangularis Timwort	**Yes**	No	N/A	No habitat present.	N/A	N/A
Eschscholzia caespitosa Gold poppy	**Yes**	No	No	No habitat present.	N/A	N/A
Festuca elmeri Elmer's fescue	**Yes**	**Yes**	No	Surveys performed, not detected.	Mar.-Aug. 2005	N/A
Horkelia tridentata ssp. *tridentate* Three-toothed horkelia	**Yes**	No	N/A	No habitat present.	N/A	N/A
Iliamna latibracteata California globe-mallow	**Yes**	No	No	No habitat present	N/A	N/A
Pellaea andromedifolia Coffee fern	**Yes**	No	N/A	No habitat present.	N/A	N/A
Polystichum californicum California sword-fern	**Yes**	No	N/A	No habitat present.	N/A	N/A
Scirpus subterminalis Water clubrush	**Yes**	No	N/A	No habitat present.	N/A	N/A
Utricularia gibba Humped bladderwort	**Yes**	No	N/A	No habitat present.	N/A	N/A
Utricularia minor Lesser bladderwort	**Yes**	No	N/A	No habitat present.	N/A	N/A
Wolffia borealis Dotted water-meal	**Yes**	No	N/A	No habitat present.	N/A	N/A
Wolffia columbiana Columbia water-meal	**Yes**	No	N/A	No habitat present.	N/A	N/A

[1] *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 2. 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			
Cephaloziella spinigera	3	Suspected	None Observed
Fissidens grandifrons	3	Suspected	None Observed
Grimmia anomala	3	Suspected	None Observed
Scouleria marginata	3	Suspected	None Observed
Tortula mucronifolia	3	Suspected	None Observed
Fungi			
Albatrellus ellisii	4	Documented	None Observed
Cazia flexiascus	3	Suspected	None Observed
Choiromyces alveolatus	3	Suspected	None Observed
Clavariadelphus sachalinensis	3	Suspected	None Observed
Clavariadelphus subfastigiatus	3	Documented	None Observed
Cudonia monticola	3	Documented	None Observed
Endogone oregonensis	3	Documented	None Observed
Glomus pubescens	3	Suspected	None Observed
Gomphus bonarii	3	Documented	None Observed
Gomphus kauffmanii	3	Documented	None Observed
Gymnomyces monosporus	3	Documented	None Observed
Gyromitra californica	2	Suspected	None Observed
Helvella crassitunicata	2	Suspected	None Observed
Helvella elastica	3	Documented	None Observed
Helvella maculata	3	Suspected	None Observed
Hygrophorus albicarneus	3	Suspected	None Observed
Leucogaster citrinus	3	Documented	None Observed
Mycena quinaultensis	3	Suspected	None Observed
Nolanea verna var. *isodiametrica*	3	Suspected	None Observed
Otidea smithii	3	Documented	None Observed
Phaeocollybia attenuata	4	Documented	None Observed
Phaeocollybia dissiliens	3	Suspected	None Observed
Phaeocollybia piceae	4	Suspected	None Observed
Phaeocollybia pseudofestiva	3	Suspected	None Observed
Phaeocollybia scatesiae	3	Suspected	None Observed
Phaeocollybia sipei	3	Suspected	None Observed
Phaeocollybia spadicea	3	Documented	None Observed
Plectania milleri	3	Suspected	None Observed
Psathyrella quercicola	3	Suspected	None Observed
Ramaria abietina	3	Documented	None Observed
Ramaria amyloidea	2	Suspected	None Observed
Ramaria aurantiisiccescens	4	Suspected	None Observed
Ramaria botrytis var. *aurantiramosa*	3	Suspected	None Observed
Ramaria concolor f. *tsugina*	3	Suspected	None Observed
Ramaria conjunctipes var. *sparsiramosa*	3	Suspected	None Observed
Ramaria coulterae	3	Suspected	None Observed

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

Scientific Name	ONHP Rank[1]	Roseburg Occurrence?	Occurrence in the Project Area?
Enemion stipitatum	4	Documented	None Observed
Epilobium luteum	3	Suspected	None Observed
Epilobium palustre	3	Suspected	None Observed
Erigeron cascadensis	4	Suspected	None Observed
Euonymus occidentalis	4	Documented	None Observed
Hazardia whitneyi var. *discoidea*	4	Suspected	None Observed
Helianthella californica var. *nevadensis*	3	Suspected	None Observed
Lewisia cotyledon var. *howellii*	4	Documented	None Observed
Linanthus bakeri	3	Suspected	None Observed
Lycopodium annotinum	4	Suspected	None Observed
Mimulus douglasii	4	Documented	None Observed
Mimulus kelloggii	4	Documented	None Observed
Minuartia californica	4	Suspected	None Observed
Montia howellii [2]	4	Documented	None Observed
Navarretia tagetina	3	Suspected	None Observed
Phacelia verna	4	Documented	None Observed
Sedum laxum ssp. *heckneri*	4	Suspected	None Observed
Sedum spathulifolium ssp. *purdyi*	4	Documented	None Observed
Sidalcea cusickii	4	Documented	None Observed
Vaccinium oxycoccos	4	Suspected	None Observed
Verbena hastata	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 howelli* is a candidate species for listing under the Oregon state threatened and endangered program.