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

Environmental Assessment for the Swiftwater Field Office

Shingle Lane Commercial Thinning and Regeneration Harvest

EA No. OR - 104 - 99 - 10

The Swiftwater Field Office proposes to do a regeneration harvest on approximately 25 acres of mature and old-growth forest and commercial thinning harvest on approximately 160 acres of second-growth forest located in the Elk Creek Watershed in Section 27; T23S R4W, W.M. This project is within the Matrix and Riparian Reserves Land Use Allocations and is designed to help meet the Roseburg District's annual harvest commitment and to enhance late-successional forest characteristics in the Riparian Reserve.

Acronyms Used:

ACS	-	Aquatic Conservation Strategy
BLM	-	Bureau of Land Management
BA	-	Basal Area
CWD	-	Coarse Woody Debris
EA	-	Environmental Assessment
GFMA	-	General Forest Management Area
ID Team (IDT)	-	Interdisciplinary Team
NEPA	-	National Environmental Protection Act
NFP or NWFP	-	Northwest Forest Plan
PDC	-	Project Design Criteria
RMP	-	Resources Management Plan
ROD	-	Record Of Decision
S&G	-	Standards & Guidelines
T&E	-	Threatened or Endangered
WA	-	Watershed Analysis

Definitions:

Co-dominant Tree: Trees with crowns forming the general level of the crown canopy and receiving full light from above but comparatively little from the sides.

Dominant Tree: Trees with crowns extending above the general level of the crown canopy and receiving full light from above and partly from the side.

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INTRODUCTION

This Environmental Assessment (EA) has been prepared for the Swiftwater Field Office's proposed **SHINGLE LANE REGENERATION AND COMMERCIAL THINNING HARVEST**. An EA is a site specific analysis of potential environmental impacts that could occur as the result of the implementation of a federal action. The EA assists the Agency in project planning, ensuring compliance with the National Environmental Policy Act (NEPA), and in making a determination as to whether any "significant" impacts could result from analyzed actions. "Significance" as defined by NEPA is found in regulation 40 CFR 1508.27. An EA provides evidence for determining whether to prepare an Environmental Impact Statement (EIS) or a "Finding of No Significant Impact" (FONSI). The FONSI is a document that briefly presents the reasons why implementation of the proposed action will not result in "significant" environmental impacts (effects) beyond those already addressed in the Roseburg District's *Proposed Resource Management Plan / Environmental Impact Statement* (PRMP/EIS, October 1994).

A Decision Document would be completed after the FONSI is signed to document the decision, however, Forest Management Regulation 43 CFR 5003.2 states that "[w]hen a decision is made to conduct an advertised timber sale, the notice of such sale shall constitute the decision document." This notice would be placed in *The News Review*, a daily newspaper of general circulation in Roseburg, Oregon and constitutes a decision document with authority to implement the proposed action.

I. PURPOSE OF AND NEED FOR ACTION

This section provides a general overview of the proposed action. Included are: the need for the action, purpose of the action, a general description and objectives of the proposal, and conformance with existing land use plans. The issues that were identified as pertinent to this project are analyzed in Appendix D.

A. <u>Need for Action</u>

The *Roseburg District Record of Decision and Resources Management Plan* (RMP, June 1995) guides and directs management on BLM lands. It "responds to dual needs: the need for forest habitat and the need for forest products" (pg. 15).

The **need for forest products** can be met by providing ". . . a sustainable supply of timber and other forest products that will help maintain the stability of local and regional economies . . . on a predictable and long-term basis" (RMP, pg. 15). The sale of timber on BLM lands on a scheduled and sustainable basis (i.e., management of the timber resource that results in a continuous level of harvest) necessitates harvest of late-successional forests within the Matrix land allocation. The BLM also needs to offer for sale commercial thinnings ". . . after developing stands reach a combination of stem diameter and surplus volume to permit an entry that is economical" (RMP, pg. 149). Silvicultural stand exams indicate that the stands are overly dense with decreasing growth rates and would benefit from a thinning at this time to improve growth potential.

The **need for a healthy forest ecosystem** "is . . . for a healthy forest ecosystem with habitat that will support populations of native species and includes protection for riparian areas and waters" (RMP, pg. 15). Much of the riparian areas consist of homogeneous second growth trees resulting from past harvest. Silvicultural practices are needed to reintroduce complexity and accelerate mature forest characteristics within the Riparian Reserve in order to ". . . acquire desired vegetation characteristics needed to attain Aquatic Conservation Strategy [ACS] objectives" (RMP, pg. 25) as well as actions to reduce road related hydrological impacts as a source of sedimentation to streams.

The *Elk Creek Watershed Analysis* (March 2004) identifies management opportunities for vegetative treatments for commercial and wildlife purposes. The need for the proposed action is based in part on the need as described in this document.

B. Purpose of Action

The purpose of the action described in this EA is to offer the **Shingle Lane Timber Sale** for auction in fiscal year 2005 or later. This proposal would help meet the Roseburg District's annual harvest commitment. It is also the purpose of this project to accelerate the development of mature forest characteristics (large trees, down woody debris and snags) within the Riparian Reserve areas through density management.

The following objectives would be accomplished by the proposed action:

1. **Timber Management and Production:**
   a. "Produce a sustainable supply of timber and other forest products" (RMP, pg. 60).
   b. Manage developing stands . . . to promote tree survival and growth and to achieve a balance between wood volume production, quality of wood, and timber value at harvest (pg. 60).
   c. Improve stand health by reducing the excess stocking in the forest stand to increase the growth and vigor of the remaining individual trees (RMP, pg. 149).

2. **Ecosystem Management:**
   a. "Restore and maintain the ecological health of watersheds and aquatic ecosystems contained within them . . ." (Aquatic Conservation Strategy) (RMP pg. 19).
   b. "Provide connectivity . . . between Late-Successional Reserves" and "Provide habitat for a variety of organisms associated with both late successional and younger forests." (RMP pg. 33).
   c. Maintain "ecologically valuable structural components such as down logs, snags and large trees" (RMP pg. 33).
   d. Improve and/or maintain soil productivity (RMP pg. 35).
   e. "Maintain or enhance the fisheries potential of the streams . . . " (RMP pg. 40).
   f. Protect, manage and conserve all Special Status Species and Supplemental EIS Special Attention Species and their habitat (RMP pg. 41).
   g. "Improve existing culverts, bridges, and other stream crossings determined to pose a substantial risk to riparian conditions." (RMP, pg. 73).

C. Description of the Proposal

The Swiftwater Field Office of the Bureau of Land Management (BLM) proposes to harvest timber in the Elk Creek Watershed located in Section 27; T23S R4W, W.M. (see maps, Appendix A through C). The proposed project area is approximately 14 road miles northeast of Oakland, Oregon and 24 air miles north-northeast of Roseburg, Oregon. Approximately 250 acres are analyzed for potential harvest and density management (within the Riparian Reserve) activities. New road construction and renovation or improvement of existing roads would also occur. Section II (pg. 4) of this EA provides a more detailed description of the Proposed Action Alternative.

D. Conformance with Existing Land Use Plans

The Proposed Action was developed to be in conformance with 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* (RMP) dated June 2, 1995. The RMP was written to be consistent with 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); dated Feb. 1994 and its associated *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* (ROD) and *Standards and Guidelines for Management of Habitat for Late-Successional and Old Growth Related Species Within the Range of the Northern Spotted Owl* (S&G's) dated April 13, 1994; generally referred to as the "Northwest Forest Plan" (NFP). All treatment of noxious weeds would be in compliance with the *Roseburg District Noxious Weed EA*.

The Northwest Forest Plan (ROD, pg. 6) divides the federal landbase into seven land use allocations or categories. This project is primarily within the "Matrix" land use allocations. "Stands in the matrix can be managed for timber and other commodity production, and to perform an important role in maintaining biodiversity" (S&G, pg. B-6) by providing for biological legacies (snags, large woody debris and retention trees) that bridge past and future forests. The RMP further classifies the Matrix into two categories: the "General Forest Management Area" (GFMA); which are lands available for timber harvest and "Connectivity / Diversity Blocks" which are lands that are available for timber harvest and also provide connectivity between Late-Successional Reserves (RMP, pg. 33). This project is within the GFMA category.

Portions of this project are within the "Riparian Reserves" land use allocation. The "Riparian Reserves are areas along all streams, wetlands, ponds, lakes, and unstable or potentially unstable areas where the conservation of aquatic and riparian-dependent terrestrial resources receives primary emphasis" (ROD, pg. 7).

II. ALTERNATIVES INCLUDING THE PROPOSED ALTERNATIVE

This section describes the No Action and Proposed Action alternatives, and any alternatives considered but eliminated from detailed analysis. These alternatives represent a range of reasonable potential actions that would meet the Purpose and Need. This section also discusses specific design criteria that would be implemented under the action alternative.

A. The No Action Alternative (Alternative A)

The No Action Alternative is required by NEPA and provides a baseline for the comparison of the alternatives. This alternative represents the existing condition. If this alternative were selected there would be no harvesting of timber within the bounds of the project area. Harvest would, however, occur at another location within Matrix lands in order to meet harvest commitments identified in the RMP (pg. 7 and 60). Selection of this alternative would not constitute a decision to reallocate these lands to non-commodity uses. Future harvesting in this area would not be precluded and could be analyzed under a subsequent EA. There would be no entry into the Riparian Reserve for the purpose of enhancing conditions of late-successional forest and aquatic ecosystems and applying silvicultural practices to contribute towards meeting ACS objectives in the watershed at this time. Road maintenance would be on a sporadic as needed basis for the primary purpose of keeping roads open to traffic. Decommissioning and improvement of roads to reduce road related impacts would be deferred indefinitely.

B. The Proposed Action Alternative

Implementation of the Proposed Action Alternative would result in the harvest of approximately 2.1 MMBF (million board feet) of the Roseburg District's annual harvest commitment of 45 MMBF. A small amount of additional timber could potentially be included as a modification to this project. These additions would be limited to 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 (ex. guyline and tailhold trees, cable yarding corridor trees, or trees within the road construction prism). Historically this addition has been less than 10% of the estimated sale quantity.

Roads - Approximately 0.8 miles (9 spurs) of **temporary road construction** (roads built, used and decommissioned) would occur on government land. Approximately 2.5 miles of government road would have **road renovation** (restoring the road back to its original design). This would consist of installing or maintaining drainage structures (culverts and ditches), reshaping the road surface and surfacing with crushed rock Approximately 2.4 miles of BLM and private road would have **road improvement** (improving the road beyond its original design). This would consist of installing additional drainage structures (culverts) and road surfacing (crushed rock).

Timber Harvest - Practices would consist of a combination of regeneration, commercial thinning and density management harvest. **Regeneration harvest** is designed to open the forest canopy to allow the re-establishment of a new forest stand with early seral stage vegetation (even-aged) (RMP, pg. 110). The silvicultural technique of modified even aged management and reserve seed tree harvest (RMP, pg. 150) would be used in the regeneration harvest areas This technique modifies the traditional seed tree system to include biological legacies. This legacy consists of retaining a remnant of older aged, large (>20") green trees and snags (reserve trees), and coarse woody debris (CWD). CWD consists of trees, or portions of trees, that have fallen or have been cut and left in the unit for present and future wildlife habitat components (RMP, pg. 146) and to maintain site productivity. **Commercial thinning** is designed to reduce the density of the forest stand in order to maintain stand vigor and increase wood quality, to promote increased growth on the remaining trees and recover wood fiber that would ordinarily be lost through natural mortality (RMP, pg. 149). **Density Management harvest** (in the Riparian Reserve) is designed to accelerate the attainment of old growth forest characteristics by encouraging the development of larger trees more quickly through reducing the stocking of the forest stand around selected trees in order accelerate the growth of the remaining trees. Other trees would be left quite dense to promote mortality for stand diversity (RMP, pg. 103). **Partial cut harvest** (removal of selected trees) would occur on one acre adjacent to Unit 6.

The Proposed Action would require skyline cable logging (approximately 97 percent of project) and ground based (tractor) logging of road right-of-ways (approximately three percent of the project). The Authorized Officer (Contract Administrator) may determine that isolated minor ground based logging would be necessary (ex. removal of guyline anchor trees, isolated portions of units, etc.). Up to ten acres were assumed in the analysis which includes one acre of partial cut (shovel logging). **Firewood cutting and salvaging** of logging debris (slash) could occur in landing cull decks and near roads.

TABLE 1. Proposed Action Summary (All figures are approximate)

Activity	Total
Timber Harvest	Regeneration harvest - 24 ac. (two units) Commercial thinning harvest - 126 acres (seven units) Density management harvest - 30 ac.
Logging	Cable - 170 to 175 ac. Ground based - 5 to 10 ac.
Road Construction	Temporary Roads - 0.8 mi.
Road Renovation and Improvement	Renovation - 2.5 mi. Improvement - 2.4 mi.
Fuel Treatment	Broadcast Burn - 16 ac. Hand Pile & Burn - 8 ac.
Habitat Restoration	RR Treatment - 30 ac. (Density Management) Buffer Treatment - 10 ac. (falling and girdling)

Other Actions - Fire trails would be constructed by hand, prior to ignition, around the perimeters of the Units 8 and 9. **Prescribed burning of slash** (burning under the direction of a written site specific prescription or "Burn Plan") would occur in these units to prepare the site for tree planting by providing plantable spots for seedlings (i.e. clearing away the slash), removing or temporarily retarding competing vegetation, as well as reducing the fuel loading hazard. Approximately 24 acres would be burned. Burning would be by a combination of broadcast burning (maximum of 16 ac.) and hand pile and burn (maximum of eight acres). Units 8 and 9 would be planted with young seedlings to regenerate the new stand. The **burning of landing cull decks** could occur on Units 1 through 7 as a means of reducing fire hazard (See Appendix C). **Subsoiling** would occur on selected old existing skid trails used under this action (see pg. 9).

C. Project Design Criteria and Management Practices as part of the Action Alternative

This section describes measures designed to avoid, minimize or rectify impacts on resources and are included as part of the action alternative. Project Design Criteria (PDC's) are site specific measures, restrictions, requirements or physical structures included in the design of a project in order to reduce adverse environmental impacts. Additionally, the RMP (Appendix D, pg. 129) lists "Best Management Practices" (BMP's) and the ROD lists "Standards and Guidelines" (S&G's). BMP's are measures designed to protect water quality and soil productivity. S&G's are ". . . the rules and limits governing actions, and the principles specifying the environmental conditions or levels to be achieved and maintained" (S&G, pg. A-6).

1. **To meet the objectives of the "Aquatic Conservation Strategy (ACS)" (RMP, pg. 19):** The objectives of ACS are to be met at the fifth-field watershed scale and over the long-term (decades). The following describes how the project level PDC's assist in contributing toward attainment of these broader objectives:

a. **Riparian Reserves (ACS Component #1)** were established. Riparian Reserves consist of (1) lands incorporating permanently flowing (perennial) and seasonally flowing (intermittent) streams, (2) the extent of unstable and potentially unstable areas that may directly impact streams, and (3) wetlands, ponds, and reservoirs. The RMP (pg. 24) specifies Riparian Reserve widths equal to the height of two site potential trees on each side of fish bearing streams; site-potential tree on each side of perennial or intermittent non-fish bearing streams, wetlands greater than an acre, and constructed ponds and reservoirs. Data has been analyzed from District inventory plots and the height of a site-potential tree for the Elk Creek watershed has been determined to be the equivalent of 200 ft. slope distance. Therefore, Riparian Reserve boundaries would be approximately 200 ft. slope distance from the edge of nonfish-bearing streams and 400 ft. from fish-bearing streams in the project area (Elk WA). No wetlands were found within the project area.

1). Streambank stability and water quality would be maintained by establishing a variable width streamside buffer along all streams adjacent to thinning Units 1-7. This zone consists of a strip generally 40 ft wide along intermittent and perennial nonfish-bearing streams. Along the fish-bearing stream in Unit 1 the buffer would have a 200 ft. wide minimum width. The buffer width could be expanded to include areas of instability, wide areas of riparian vegetation, sensitive areas identified during site review, or

additional area needed to maintain stream temperature. Likewise, the buffer could decrease along some non-fish bearing streams when the previously mentioned features are lacking or absent. At the very minimum, one-tree crown width would be maintained on each stream bank for bank stability. Minimum buffers would be used primarily on first or second order, ephemeral, or intermittent streams, which lack riparian vegetation, and where riparian habitat components and potential impacts to downstream fisheries are also absent. No density management would occur within the no-harvest buffer except that up to five trees per acre would be felled or girdled if needed (see para. 3b and 3d, pg. 10). Approximately 10 acres are contained within the no-harvest buffer. The RMP prescribed Riparian Reserve width (200 ft) would be maintained along all streams adjacent to regeneration Units 8 and 9 (see Appendix C).

2). Riparian habitat would be protected by maintaining a no-harvest buffer. Harvest would not occur within this zone, however treatment to restore riparian habitat would occur. This would include the girdling of one to three trees per acre for interim snag creation and falling two trees per acre to provide a source of interim down woody debris). Habitat would be protected from logging damage by directionally felling trees that are within 100 ft of the no-harvest buffer away from or parallel to the buffer (BMP I B2; RMP, pg. 130) and yarding logs away from or parallel to the streams (i.e. logs would not be yarded across streams, streambanks, or the inner gorge unless fully suspended through the no-harvest buffer (BMP II B5; RMP, pg. 130). No road building would take place within the Riparian Reserves.

3). Density management would be applied within the Riparian Reserves of Units 1 through 7 "to control stocking . . . and acquire vegetation characteristics needed to attain Aquatic Conservation Strategy objectives" (RMP pg. 25). The objective is to develop late seral forest structure and enhance existing diversity by accelerating tree growth to promote larger trees and canopies, and provide a future source of large woody debris for stream structure. Approximately 30 acres of the Riparian Reserve outside the no-harvest buffer would be thinned for this purpose. This would result in a change from approximately 300 dominant and co-dominant trees per acre before thinning to 130 trees per acre (100 to 140 ft^2 BA/ac) after thinning. The same prescription would apply to commercial thinning areas outside the Riparian Reserves, except all hardwoods would be retained in the Riparian Reserve.

4). Two acres of unstable or potentially unstable ground (Unit 4) met the Timber Production Capability Classification criterion for removal from the timber base and were removed from the project (BMP I A2; RMP, pg. 129).

b. **Key Watersheds (ACS Component #2)** were established "as refugia . . . for maintaining and recovering habitat for at-risk stocks of anadromous salmonids and resident fish species [RMP, pg. 20]." This project is not in a Key Watershed.

c. **Watershed Analysis (ACS Component #3)** for the Elk Creek Watershed was used in this analysis and is available for public review at the Roseburg District office.

d. **Watershed Restoration (ACS Component #4)** in this watershed would be accomplished through a combination of specific, focused restoration projects and restoration associated with the timber sale. This particular project includes the improvement of approximately 4.8 miles of existing road to reduce sedimentation to streams and treatment of Riparian Reserves as described in para.1a(1) above.

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 be implemented: (1) Maintaining existing roads (Road No. 23-4-27.0, through 27.5, 27.8, and 28.1) [see Appendix B]) to fix drainage and erosion problems. This would consist of maintaining existing culverts, installing additional culverts, and replenishing road surface with crushed rock where deficient (BMP II H; RMP, pg. 137). Approximately four additional cross drains would be installed to reduce the effective stream extensions due to ditchline. (2) Accomplishing in-stream work (i.e. culvert replacement and fill removal) during periods of low or no flow (between July 1 and September 15). (3) Locating new spur roads outside of Riparian Reserves (BMP II B1; RMP, pg. 132) and locating spurs on ridge tops and stable (0 - 40 percent slope) locations (BMP II B2; RMP, pg. 132). (4) Restricting road renovation and log hauling on unsurfaced roads to the dry season (normally May 15 to Oct. 15). If unacceptable resource damage could occur, operations during the dry season could 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). (5) Prior to any winter haul on surfaced roads, the stream crossings along the haul route would be evaluated for the need for turbidity reducing measures (ex., placement of straw bales and/or silt fences). If needed, these structures would be put in place prior to haul. (6) Not over-wintering bare erodible spur roads. This would be done by building, using and winterizing (installing necessary drainage features, blocking and seeding and mulching bare cut and fill surfaces with native species, or a sterile hybrid mix if native seed is unavailable) all temporary roads at the end of the operating season. (7) Decommissioning all new construction the same dry season as logging, i.e. the roadbed would be water barred, cut slopes and fills seeded with native species, or a sterile hybrid mix if native seed is unavailable, and access blocked (BMP II I; RMP, pg. 138).

b. **Measures to limit soil erosion and sedimentation from logging** would consist of: (1) requiring skyline yarding where cable logging is specified. This method limits ground disturbance by requiring at least partial suspension (BMP I C1a; RMP, pg. 130) during yarding (i.e., the use of a logging system that "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. (2) Dry season logging (BMP I C1c; RMP, pg. 130) would be required in portions of Units 1, 2, 5, 6, and 8 where fragile slopes occur. (3) Hand piling and burning of slash will be done in Unit 8 to protect Category 1 soils (soils highly sensitive to prescribed burning). These soils are identified as category 1 because of the steepness of the slope and shallow depth.

c. **Measures to limit soil compaction** (RMP, pg. 37) would consist of: (1) limiting road right-of-way construction; operation; and subsoiling, waterbarring and mulching to the dry season (May 15 to Oct. 15), however, operations would be suspended during periods of heavy precipitation if resource damage would occur. This season could be adjusted if conditions are such that no resource damage would occur (i.e., the dry season extending beyond Oct. 15). (2) Subsoiling decommissioned roads and temporary spur roads with a winged subsoiler (or equivalent) provided that subsoiling would not contribute to additional sedimentation to streams. Subsoiling is a practice that ameliorates soil compaction and improves water infiltration by pulling a device known as a winged subsoiler with a crawler tractor or the use of a specially equipped excavator. Existing skidtrails from previous entries would also be tilled when a post-operation evaluation indicates excessive compaction and where practical (e.g., tilling saturated or very rocky soils or skid trails with advanced reproduction would not benefit soil productivity and therefore would not be practical). Subsoiling of skid trails would be done using a subsoiler attached to the arm of an excavator. This method minimizes damage to the boles and roots of conifers and pulls organic debris back over the tilled trails. The Authorized Officer (Contract Administrator) may decide that additional isolated minor ground based logging would be necessary. Such proposals may be subject to Interdisciplinary review.

d. **Measures to protect the duff and surface soil layer** (RMP, pg. 37) would consist of burning of slash during the late fall to mid-spring season when the soil and duff layer (soil surface layer of fine organic material) moisture levels are high and the large CWD has not dried. Unit 8 has major components of soils highly sensitive to broadcast burning (Category 1 soils). This unit would be protected by hand piling and burning the piles. The CWD reserved according to RMP guidelines as well as tree tops and limbs would also be a source of organic material that can become incorporated into the soil structure (See para. 3b, below).

e. **Measures to protect slope stability** would consist of: (1) Avoiding broadcast burning on category 1 soils. Hand piling and burning would be used instead. (2) Locating new roads in stable locations (BMP II B2; RMP, pg. 132) and with proper drainage structures (BMP II D; RMP, pg. 133). NOTE: Dry season yarding with one-end suspension as described previously would also reduce the risk of slope failure.

3. **To provide wildlife habitat components:**

a. Nesting and roosting habitat for cavity dwellers (Units 8 and 9) would be provided by reserving existing hard or soft snags at least 20" inches in diameter and 15 ft in height (PRMP/EIS, Appendices 226) in sufficient numbers to meet the population needs of 40 percent of potential population (RMP pg. 64). This has been determined to be 1.2 snags per acre. Where this quantity is lacking, additional green trees would be reserved for future snag recruitment. Remnant mature or old-growth trees (Units 1 through 7) remaining from the previous stand would be reserved where possible. Any snag deemed as hazardous to worker safety could be felled at the discretion of the operator and the Sales Administrator. Such trees would be reserved and left in place as CWD. Past experience has been that less than five percent of snags need to be felled for this reason.

b. An interim source of snags would be provided by reserving snags that do not meet the size described above as well as girdling approximately one to three trees per acre within the Riparian Reserve (Units 1 through 7).

c. In Units 8 and 9, biological diversity, and future snag and down wood recruitment for wildlife would be provided through the retention of six to eight large (greater than 20") green conifer trees per acre (RMP Appendix E, pg. 150). At least 120 linear feet of CWD per acre (at least 16 inches in diameter and 16 ft in length) would be reserved (RMP, pg. 38). Where CWD is lacking in the above quantities, extra green trees would be reserved for future CWD recruitment (RMP pg. 65).

d. In Units 1 through 7, most existing CWD (at least 16" in diameter and 16 ft. in length) would be reserved (RMP, pg. 38). This has been created by blowdown trees and logs remaining from previous logging. An interim source of down wood would be provided through felling approximately two trees per acre within the Riparian Reserves.

4. **To protect air quality:**
All slash burning including burning of landing 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.

5. **To protect and enhance stand diversity:**
a. Retention trees (Units 8 and 9) would be reserved to provide a legacy of mature trees in the early successional stands. Trees would be retained in a scattered arrangement of individual trees as well as occasional clumps of two or more trees (RMP, pg. 38 and 64). Some large "wolf" trees (large, full crowned, limby trees) would be retained for non-vascular plant legacy attributes. Occasional hardwoods would also be retained. Trees remaining would approximate the pre-harvest relative proportions of species composition. Mature and old growth (RMP, pg. 112) remnant trees in the thinning units would be retained to the greatest extent possible as well as occasional defective (diseased) and deformed trees (trees with broken or multiple tops, and trees with ramicorn branches (large branch clusters)) that could provide future snags and nesting habitat.

b. Snags and CWD would be reserved as described in paragraph three above. Snags would be protected from logging damage by clumping trees around them and directionally falling trees away from the snags.

c. All hardwoods would be reserved in the Riparian Reserve and large dominant hardwoods would be reserved in the uplands. The thinning units would be marked with a variable (i.e., nonuniform) spacing.

6. **To prevent and/or control the spread of noxious weeds:**
Stipulations would be incorporated into the logging contract to prevent and/or control the spread of noxious weeds. This would include the cleaning of logging equipment prior to entry on BLM lands (BLM Manual 9015 - Integrated Weed Management) as well as roadside brushing and/or herbicide application prior to the start of management activities in the proposed project.

7. **To prevent and report accidental spills of petroleum products or other hazardous material and provide for work site cleanup:**
During operations described in this proposal, the operator would comply with all applicable State and Federal laws and regulations concerning the storage, use and disposal of industrial chemicals and other hazardous materials. All equipment planned for instream work would be inspected beforehand for leaks. Accidental spills or discovery of the dumping of any hazardous materials would be reported to the Sale Administrator and the procedures outlined in the "Roseburg District Hazardous Materials (HAZMAT) Emergency Response Contingency Plan" would be followed. Hazardous materials (particularly petroleum products) would be stored in durable containers and located so that any accidental spill would be contained and would not drain into watercourses. All landing trash and logging and construction materials would be removed from the project area.

8. **To protect the residual stand and promote stand health (thinning units):**
a. As much as possible, trees that would most likely survive logging and overall improve the stand condition and health would be selected for retention. The stand would be thinned from below (i.e. removal of the smallest diameter trees first) which would remove mostly suppressed trees and smaller trees that would result in less stand damage during falling.

b. Felling and yarding would be done in a manner to protect the residual stand. No falling and yarding would be permitted from April 15 through July 15 when the sap is up in the trees and damage due to bark slippage could occur. This date could be adjusted based on local conditions (e.g. earlier or later than normal loose bark period).

c. Yarding systems would be designed to match yarder and cable size to the size of the timber in order to minimize damage from an overly large yarding system. Corridors for yarding would be pre-designated and approved by the Sale Administrator. Cable yarding of logs would be done under the canopy to avoid damage to tree crowns.

9. **To protect Special Status and SEIS Special Attention Plants and Animals:**
a. Special Status and Special Attention plant and animal sites would be protected where needed to protect 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 (Threatened or Endangered, proposed Threatened or Endangered, Candidate, State listed, Bureau Sensitive, Bureau Assessment, or Special Provision) species are found that were not discovered during pre-disturbance surveys; operations would be suspended and appropriate protective measures would be determined before operations would be resumed.

c. Seasonal restrictions to prohibit logging during the nesting season (March 1 to September 30) would be applied to Units 1, 6, and 7 if surveys indicate that a northern spotted owl (NSO) is nesting in the adjacent NSO core area/activity center.

10. **To protect cultural resources:**
Stipulations would be placed in the contract to halt operations and evaluate the appropriate type of mitigation needed to provide adequate protection; if any objects of cultural value (e.g. historical or prehistorical ruins, graves, fossils or artifacts) are found during the implementation of the proposed action that were not found during project evaluation.

D. Alternatives Considered but Eliminated

There were no other alternatives considered during the formulation of this project.

III. AFFECTED ENVIRONMENT

This section describes the existing environment and forms a baseline for comparison of the effects created by the alternatives under consideration. This section does not attempt to describe in detail every resource within the proposed project area that could be impacted but only those resources which could be substantially impacted. Appendix F (Analysis File) contains data and additional supporting information used by the interdisciplinary team (IDT) to describe the affected environment.

This project lies within the Oregon Western Cascades Physiographic Province. The FSEIS describes the affected environment for this province on page 3&4-19. The Roseburg District Proposed Resource Management Plan/Environmental Impact Statement (PRMP/EIS, pp. 3-3 through 3-71) provides a detailed description of BLM administered lands on the Roseburg District. A further description can also be found in the Elk Creek Watershed Analysis.

A. General Setting

Stand Description - The area where the project is proposed is a transition between the interior valley and the grand fir zone. Douglas-fir is the predominant species within the analysis area because of fire. Hardwoods including chinkapin, Pacific madrone, and red alder were observed in the stand. All previously harvested areas have been successfully regenerated on BLM managed lands. Plantations are mostly uniform in structure and composition. Douglas-fir is the predominant species planted. The other conifer species in plantations naturally regenerated from seed. The **second growth stands** are dense with closed canopies. Very little vegetation is growing on the forest floor within much of the area examined. The stand at age 34 contains on average about 5000 cubic feet wood volume/acre. Old growth stands average about 6000 cubic feet wood volume/acre. Units proposed for commercial thinning /were logged in the 1960's, precommercially thinned in 1979 and fertilized in 1985. Transect sampling data for CWD was collected during the stand exam. This data was used to estimate the amount of CWD within the stand. The CWD material on plots was all Decay Class 4, meaning it has started to rot. Much of the material is residual since logging. There is a total of about 11 tons/acre and about 680 linear feet per acre.

The **mature stands** contain a diversity of species, age, size, and condition. Douglas-fir is the predominant large conifer, with incense-cedar and grand fir the most common associates. Large, old conifers remnant since the last fire are found intermixed with the most recent cohort. Large snags and down logs are common structural components in the oldest stands, their quantity and arrangement dependant on the intensity and time since the last major fire.

Site Description - The proposed project is located between the drainages of Lane Creek and Shingle Mill Creek in the Headwaters Elk Creek sixth-field watershed which covers 22,620 acres. The Elk Creek fifth-field watershed covers a total of 186, 620 acres. Current landscape patterns include natural stands that are the result of fire, managed stands established following timber harvest, and non-forested agricultural and pasture lands. This project is within 25 miles of the Roseburg Designated Area for attainment of federal Clean Air standards.

B. Affected Resources

The RMP (pg. 41) requires that all proposed actions be reviewed ". . . to determine whether or not special status species occupy or use the affected area or if the habitat for such species is affected." Special Status Species are those listed or proposed for listing as threatened or endangered (T&E), under the Endangered Species Act (ESA) of 1973, as amended; or species designated as Bureau Sensitive or Bureau Assessment. Bureau Sensitive species are species eligible for federal or state listing or candidate status and Bureau Assessment species are species not presently eligible for listing or candidate status under the ESA but are of State concern and may require protection or mitigation in the application of BLM management activities. The affected area was surveyed for the resources listed below according to established protocols:

Botany - No BLM Special Status plants species, former survey and manage species or State Listed species were observed in the project area. There are some localized infestations of scotch broom, a noxious weed, in the project area.

Cultural Resources - No cultural resources were found in the project area as the result of surveys.

Hydrology - Two small unnamed tributary systems to Elk Creek in Section 27 have stream reaches adjacent to Units 1, 2, 5, 6, and 7. Another small unnamed tributary system to Lane Creek is adjacent to Units 2 and 3. All streams within 100 feet of the units are either first or second order intermittent streams which usually stop flowing by late spring. Beneficial Uses of Water downstream of the project area consists primarily of domestic water supply, irrigation and livestock watering, resident fish and aquatic life, and salmonid spawning and rearing. There are no waterbodies in the project area on the Oregon Department of Environmental Quality's 2002 303(d) List of Water Quality Limited Waterbodies. Elk Creek (0.5 miles downstream at the closest extent) has been identified as water quality limited for summer temperature (Oregon DEQ, 2003).

The characteristics of climate (e.g. precipitation type and timing), elevation, and geomorphology all contribute to the way watersheds move and store water. Mean annual precipitation amounts of 50 to 55 inches occur within the project area primarily between October and March. Elevation within the project area ranges from 1100 to 1900 feet. Precipitation occurs primarily as rain at lower elevations (< 2,000 feet). The Transient Snow Zone (TSZ) is defined as areas between 2,000 to 5,000 foot elevation that may alternately receive snow or rain. Only under unusual weather conditions would snow occur below 2000 feet. None of the project is in the TSZ.

Soils and Geology - The **geology** consists of sandstones and siltstones of the Tyee Formation in the Coast Range physiographic province. **Topographic features** primarily include gently rounded ridge tops and ridge noses 50 to 100 feet wide, benches and old earth flow terrain with gentle to moderate slopes (10 to 60 percent) and moderate to very steep mountain slopes (30 to 90 percent). Also present are small areas of extremely steep slopes (up to 105 percent). **Soils** derived from Tyee sandstones and siltstones are primarily moderately deep to very deep (20 to greater than 60 inches to bedrock) and well drained. Moderately deep to deep soils are most common on the steep and very steep slopes. Small inclusions of shallow soils and rock outcrop occur on some of these steeper slopes. The rock fragment content of the soils is generally low (less than 15 percent of the soil volume), although there are pockets of gravelly soil on the steeper slopes. The bedrock of sandstone and siltstones varies from soft and brittle to hard and has varying degrees of fracture. Soil and bedrock characteristics in combination with slope affect soil productivity, slope stability and amount of rock fragment recruitment available to streams.

About 30 acres (five acres of the regeneration units and 25 acres of the thinning units) have **slopes** greater than 65 percent and are considered **potentially unstable** (i.e., can become unstable with changing site conditions). This area has the TPCC (Timber Production Capability Classification) of FGR (fragile due to slope gradient but suitable for forest management using appropriate mitigation). The FGR classification is based on landscape features including past landslides, various soil properties and the appearance of conifers growing on these sites. Major components of FGR occur in Units 1, 2, 5, 6, 8 and 9 (approximately 17 percent of the sale area) and include the inner gorges of three streams and four headwalls. Five small (0.03 to 0.1 acre) and two medium-sized (0.15 and 0.5 acres) debris avalanches occurred shortly after the stands were clearcut (1964 aerial photo interpretation and field observations). The largest was caused by the failure of road sidecast. The others were harvest related. Four of these landslides reached first and second order streams. Numerous very small landslides were also noted. No recent landslides that may have occurred under the mid seral and late seral canopies were evident during field investigations. Two unstable (actively failing) sites totaling two acres were identified. They have FGNW and FPNW (unsuitable for forest management even with mitigation) TPCC classifications. One is a headwall on the northern edge of Unit 4 where a debris flow occurred in the early 1960s. The other is a large slump in the southern part of Unit 4.

The gentle and moderate slopes have an extensive coverage of skid trails with varying degrees of soil displacement, **residual compaction** and vegetative recovery. Many of the mainline trails are still highly compacted. Dozer constructed fire trails surround all of the units. Current erosion levels on these trails are low.

Fisheries – The Elk Creek Watershed supports four species of anadromous salmonids. See Appendix F (Analysis File), Table 4 and Fish Presence Map for species presence and location. A complete listing of fish species present in the watershed can also be found in the Elk Creek WA (Table 15-1). There are four fish-bearing streams downstream of the proposed project area: Lane Creek (0.6 miles downstream), Elk Creek (0.5 miles downstream), a second order tributary to Elk Creek (900 feet from Unit 8), and a third order tributary to Elk Creek (200 feet from Unit 1).

The Oregon Department of Fish and Wildlife (ODFW, 1994) has conducted **aquatic habitat** surveys in the Elk Creek fifth-field watershed. These surveys generally show that fish-bearing streams within the watershed lack large wood, contain a high percentage of fine sediment within the stream channels, and have substrates dominated by bedrock (Elk Creek WA, Chart 7-2). Based on WA data, the Riparian Reserve, within 200 feet of non-fish bearing streams, generally consists of overstory and understory components as described previously in the stand description (pg. 12). Streams within the project area consist of high gradient, non-fish bearing, intermittent streams of the first and second order. Within the proposed project area there is a series of step falls ranging from three to five feet in height. These falls serve as a natural fish passage barrier to adult and juvenile salmonids on the third order stream, 0.6 miles above Elk Creek. The Magnuson-Stevens Fishery Conservation and Management Act of 1996 designated habitat that is currently or was historically available to Oregon Coast coho and chinook salmon (Federal Register 2002 Vol. 67, No. 12) as **Essential Fish Habitat** (EFH). The nearest EFH is located approximately 200 ft below Unit 1.

Wildlife - Federally **Threatened and Endangered** (T&E) **species** known to occur in the Roseburg District include the Northern spotted owl (*Strix occidentalis caurina*), marbled murrelet (*Brachyramphus marmoratus*), bald eagle (*Haliaeetus leucocephalus*), Canada lynx (*Lynx canadensis*) and Fender's blue butterfly (*Icaricia icarioides fenderi*). There are two known Northern spotted owl sites and their Residual Habitat Areas within 1.2 miles (provincial home range) of the project area; one of these sites has an alternate activity center located within 0.25 miles of Units 1, 6 and 7. This project contains 181 acres within Critical Habitat Unit CHU OR-24 for the Northern spotted owl. Critical Habitat is defined as a specific geographical area specified by the US Fish and Wildlife Service (FWS) in Recovery Plans as containing habitat essential for the conservation of a T&E species. This project occurs more than 50 miles from the Coast and is outside of the nesting range of the marbled murrelet habitat. There are no known bald eagle nests or winter roosts which could be affected by disturbance above ambient noise levels within 0.25 miles of any of the project areas. The remaining T&E species do not occur in the project area. There are no terrestrial species documented on the Roseburg District that are currently proposed for listing, or candidates for listing under the Endangered Species Act. **Bureau Sensitive and Bureau Assessment** species are addressed in Table 5, Appendix F.

IV. ENVIRONMENTAL CONSEQUENCES

This section provides the analytical basis for the comparisons of the alternatives. The reasonably foreseeable environmental consequences (impacts, effects) to the human environment that each alternative would have on selected resources are described. Impacts can be beneficial or detrimental. This section is organized by the alternatives and the effects on any key issue identified in Appendix D, as well as the selected resources. Analysis considers the direct impacts (effects caused by the action and occurring at the same place and time), indirect impacts (effects caused by the action but occurring later in time and farther removed in distance but are reasonably foreseeable) and cumulative impacts (effects of the action when added to other past, present and reasonably foreseeable future actions). The temporal scale assumed in this analysis may vary depending on the subject matter. Generally, short-term refers to the time of the action up to the first year after the action but may be as long as ten years. Long-term may be a year or more but generally more than ten years and up to 200 years.

The Roseburg RMP/EIS analyzes the environmental consequences in a broader context. This EA does not attempt to reanalyze impacts that have already been analyzed in these documents but rather to identify the particular site specific impacts that could reasonably occur. Environmental effects to the "Critical Elements of the Human Environment" are analyzed in Appendix D and E.

When encountering a gap in information, the question implicit in the Council on Environmental Quality regulations on incomplete and unavailable information was posed: Is this information "essential to a reasoned choice among the alternatives"? (40 CFR 1502.22(a)). While additional information would often add precision to estimates or better specify a relationship, the basic data and central relationships are sufficiently well established that any new information would not likely reverse or nullify understood relationships. Although new information would be welcome, no missing information was determined as essential for the decision maker to make a reasoned choice among the alternatives.

A. <u>No Action Alternative</u>

This alternative would not meet the Purpose and Need (objective) of the EA (pg. 1) of producing a sustainable supply of timber and other forest commodities that would contribute to the local economy. Restoration of past disturbance would not occur. Road densities and conditions would remain unchanged. Only normal programmed maintenance would be performed. There would be no entry into the Riparian Reserves for the purpose of enhancing conditions of late-successional forest ecosystems and applying silvicultural practices to meet ACS objectives.

Stands - Stand exams indicate an extremely dense stand with suppression mortality. Trees that have developed over long periods of competitive stress are more likely to be killed by insects and disease (Waring 1985; Smith, 1962), are slow to respond to improved growing conditions, and never attain potential growth rates (Oliver, 1990; Smith, 1962). Mortality would consist of predominantly smaller trees. Accumulations of dead wood consisting of small trees increases fire intensity, rate of spread, and the risk of stand damage from fire (Waring, 1985; Graham, 1999). The potential production of wood volume and wood quality would be reduced and the timber resource objectives for Matrix lands would not be met (see Silv. Prescript., Appendix F).

Wildlife Habitat - Direct impacts would not occur under this alternative. Wildlife populations and diversity would be expected to remain static. There would be no loss of suitable spotted owl habitat. The existing old-growth habitat would remain suitable for old-growth dependent species. The mid- seral stands would progress naturally as Douglas-fir dominated stands and continue to function as dispersal habitat for the spotted owl.

For mid-seral stands, the indirect impacts would include increased canopy closure which could cause a reduction in habitat for some species. The canopy closure would result in competitive mortality, thereby creating snags and CWD as habitat for some species. Existing structural features (i.e., snow breaks, forked tops, decay, etc.) would be maintained, fostering the creation of nesting habitat. Dispersal capabilities of the stand would continue to increase as late-successional characteristics develop.

Soil Productivity - "Long-term soil productivity is the capability of soil to sustain inherent, natural growth potential of plants and plant communities over time" (RMP/EIS, pg. 4-12). Soil productivity losses from the extensive ground-based harvesting of the past would continue to very slowly heal due to natural processes. The probability of landslides would be low (less than 10 percent) on the potentially unstable FGR slopes (Units 1, 2, 5, 6, 8 and 9). This assessment is based on the low level of landslide activity under mid-seral and late-seral tree canopies within the project area (aerial photo history and field observations). The Oregon Department of Forestry storm impacts and landslide study of 1996 (Oregon Department of Forestry, 1999) indicated that failures were least likely in stands in the 31 to 100 year age class. It also indicated that failures were more likely in the 100+ class than in the mid-seral class with the 0 to 9 year class being the most likely to fail. The assessment is also based on indicators of potential instability ("pistol-butted" trees, hummocky ground, steep slopes, etc.) seen in the field. The likely size of any landslide occurring under the no action alternative would be small (less than 0.1 acre) based on the near absence of larger harvest-related landslides that occurred in the commercial thin units under clearcut conditions and under subsequent mid seral canopies of the thin units.

Water Quality and Hydrologic Processes - There would be no direct impacts to hydrology or water quality. Stream temperature, sediment transport and storage, and peak flows would continue at baseline rates. Vegetation within the Riparian Reserve would continue to slowly develop over time to provide increased shade, bank stability, and large woody debris recruitment. Without density management, old-growth characteristics within the Riparian Reserves would take much longer to develop. An overly dense stand increases the risk of a higher severity wildfire, or an insect or disease epidemic which could result in a stand replacing event. These types of events would affect a much larger area and would cause far greater impacts to the watershed than the proposed action. Road-related erosion and sedimentation would likely be greater in the long-term under this alternative than the action alternative due to the absence or delay of needed renovation.

The likelihood of landslides reaching streams over the next decade (indirect effect) would be low for those initiating within the thinning units and unlikely for those initiating in the regeneration units. The reasons are as follows: 1) The FGR slopes in both regeneration Units 8 and 9 are

isolated from streams. 2) The geotechnical engineer determined that there was no potential for a debris flow in Unit 8 because the swale bottom at the base of the FGR slope does not have a stream channel, has a gradient of less than 35 percent, and has a broad valley bottom. 3) The most likely size of a landslide would be small. Because of small landslides' limited reach (less than 200 feet) only about 8 of the 31 acres of potentially unstable FGR slopes could produce small landslides that would reach streams (all non fish-bearing). Most small landslides that would originate inside the Riparian Reserve would be slowed down and possibly stopped by the high density of trees (150 to 300 trees/acre in the mid-seral stands). The likely amount of material entering the stream floodplain and channel from a small landslide would range from negligible to 150 cubic yards (soil scientist estimate) depending on the point of origin, size, reach and the amount of scour of the landslide. These small landslides would result in a short-term increase in fine sediment until the material is dispersed downstream. The effect of fine sediment from the landslides has a very low probability of being detectable in the stream beds more than a few hundred feet outside the project area and would not be detectable in the identified fish-bearing streams downstream. The amount of rock fragments that are delivered to streams would be variable depending on location (negligible to 20 cubic yards/landslide for the most typical locations). Delivered rock fragments and woody debris could eventually move down to fish-bearing streams, a long-term, indirect effect benefiting stream structure.

Fisheries and Fisheries Habitat- There would be no direct impacts. Fish species and populations would remain relatively unchanged from current trends. The riparian habitat adjacent to the aquatic environment on both fish-bearing and non-fish bearing streams consists primarily of dense mid-seral stands of Douglas-fir (see Silvicultural Prescription, Appendix F). These stands would continue to mature and develop late-successional characteristics over time. However, due to high tree density late-seral forest characteristics would develop slowly (indirect impact), resulting in the continued development of future large wood and coarse woody components which are small in size and structure. Road maintenance activities would occur over time based on requests by permittee or on an "as-needed" basis. Fish barrier culverts would be replaced according to District-wide priority as funds are available.

Current stream temperature, sediment inputs, woody debris and hydrologic processes would be expected to recover gradually as culvert replacements, road treatments, road decommissioning, and **fisheries habitat** improvement projects occur across the fifth-field. Occasional pulses of increased sediment and woody material would enter the aquatic systems as a result of blowdown, landslides, and road failures. These events would tend to coincide with large wind and/or rain storms.

B. Proposed Action Alternative

Stands - Regeneration and commercial thinning harvest would meet the land use objectives as described in the RMP for GFMA by providing raw materials to mills and present and future employment. Stand health and growth would be maintained within the mid-seral stands. The Riparian Reserve objective to produce large diameter trees in a shorter period of time would be realized.

Wildlife Habitat - Direct impacts to **T&E species** due to harvest activities would include the removal or modification of 181 acres of Northern spotted owl habitat and its designated Critical Habitat. Regeneration harvest activities would remove 24 acres of suitable spotted owl nesting, roosting, and foraging habitat, including 24 acres (ten percent of suitable habitat) to be removed within the provincial home range (1.2 miles) of the Harness Mountain owl site and 16 acres (six percent) within the provincial home range of the Lane Creek owl site. Twenty-four acres of Critical Habitat would be removed. Thinning would modify an additional 157 acres of dispersal habitat and Critical Habitat within the project area. Twenty-four acres (ten percent) of dispersal habitat would be removed and an additional 157 acres (nine percent of mid-seral dispersal habitat) would be modified within the home range (1.2 miles) of the Harness Mountain owl site. Sixteen acres (six percent) of dispersal habitat would be removed and an additional 84 acres (11 percent of mid-seral dispersal habitat) would be modified within the home range of the Lane Creek owl site. Thinned stands would continue to function as dispersal habitat, but in a slightly degraded condition. As canopy cover recovers and understory vegetation layers develop, functionality of the modified dispersal habitat would improve for the spotted owl. Functionality should be restored in 10 to 15 years.

Indirect impacts due to thinning activities within 0.25 miles of a known Northern spotted owl site could potentially affect nesting behavior through disturbance. An alternate activity center for the Harness Mountain spotted owl site occurs within 0.25 miles of thinning Units 1, 6, and 7. To mitigate disturbance effects to the spotted owl, harvest activities would not occur within 0.25 miles of a known nest site or activity center from March 1-June 30, unless protocol surveys have determined the activity center to be not occupied, non-nesting, or failed in their nesting attempt. There would be no indirect impacts to dispersal habitat.

The regeneration harvest would remove 24 acres of suitable nesting habitat direct impact for the Northern goshawk (**Bureau Sensitive Species**). Thinning the stands in the project area would increase the amount of foraging and roosting habitat available to the Northern goshawk. The proposed action may cause disturbance to nesting northern goshawks (indirect impacts) if they occur in the project area or within 0.25 miles. Therefore, surveys for the northern goshawk are planned for the 2004 nesting season. If a northern goshawk is discovered, seasonal restrictions would be applied within 0.25 mile of the nest site from March 1 - July 30 (or until the young have dispersed) and a 30-acre core area would be established around the active nest site and alternate nest sites. Direct and indirect impacts to other Special Status Species are referenced in the Appendix F (Table 3).

Soil Productivity - The most common actions that could potentially impact soil productivity include: 1) losses due to displacement/compaction, 2) erosion, either surface erosion or mass wasting and 3) alteration of soil nutrients (PRMP/EIS, pg. 4-14). According to the SEIS, Volume I on page 3&4-112, implementation of appropriate management prescriptions and best management practices should prevent unacceptable degradation of the soil resource and related long-term productivity.

Direct impacts would result from **soil displacement/compaction** due to road building and logging activities. Vegetation would be removed from the travel surfaces and heavy compaction would be reestablished. Vegetative recovery and healing from past compaction would be reversed on about 3200 feet of old natural surfaced road and trail reopened as spurs for this

action. About 800 feet of new road would be constructed over natural ground. New spur construction, including widening of trails, would cover about 0.8 acres. All new construction would be decommissioned the same dry season that logging is completed. All cable yarding impacts to the surface should be within acceptable limits. The yarding effects would be small Skyline yarding with at least one-end suspension in the thinning units would add small amounts of light, superficial compaction on less than one percent of the skyline yarded ground (< 1.6 acres) (based on Sampson Butte and Coon Creek monitoring). Compaction due to skyline yarding in the Regeneration units would be greater with moderate soil compaction covering up to three percent of the surface (0.7 acres). This compaction would be confined largely to the topsoil and would eventually heal satisfactorily without mitigation. Any incidental ground-based yarding would likely be accomplished using the swing shovel method or tractor yarding. Swing yarding using good technique adds very little compaction to the soil (Off Little River monitoring). Incidental tractor yarding would use designated skid trails and cover about six percent of the tractor-yarded ground (less than an acre). Some of this trail coverage would overlap old existing trails with residual compaction. New tractor yarding compaction would be substantial enough (moderate to heavy over most of the trail lengths) to reduce the growth of adjacent trees (about 10 percent growth loss of adjacent trees, an <u>indirect effect</u> – Adams, 2003 presentation). Based on post-operation evaluation by the soil scientist, tilling compaction, in accordance with RMP requirements, may be prescribed or necessary amelioration could be deferred to final harvest with a documented plan. Subsoiling with an excavator would minimize damage to the boles and roots of conifers and allow organic debris to be placed back over the tilled trails. Subsoiling of old skid trails and roads not needed for current operations in Units 1 and 5 would ameliorate some of the compaction on these units. Down woody debris would be left on site in accordance with RMP guidelines. This would benefit long-term soil productivity by leaving a nutrient reservoir and a medium for growth of organisms beneficial to the soil.

No landslides (<u>indirect impact</u>) due to new spur construction would occur since spurs would be located on stable locations (i.e., at or near ridge tops on gentle to moderate slopes) with good drainage features. The action alternative would result in a slight short-term (ten years) increase in the probability of harvest-related **debris avalanches** on the 25 acres of FGR slopes in the thinning units and five acres in the regeneration units (four in Unit 8 and one in Unit 9). The risk of failure would still be in the low range in the thinning units. This would be due to a temporary decrease in root strength and canopy interception of precipitation. The increase in risk would be hard to quantify. Although the probability of debris avalanches would increase, it would still be in the low range (<10 percent) as under the no action alternative and would be expected to be within the range of natural variation for a mid-seral stand. The high post-thin density of trees (100 to 150) and the design feature of dry season yarding with at least one-end suspension would help keep the risk low. The risk of debris avalanches would increase from low to the moderate range for the FGR slopes in the regeneration units. Dry season yarding with one-end suspension, hand waterbarring any skyline yarding trail that can channel water to locations susceptible to failure, and no broadcast burning in Unit 8 would reduce the risk of landslides in the regeneration portions to the lower ends of moderate. Based on the relatively low level of landslides on the FGR slopes after clearcut as seen on the 1964 and 1970 aerial photos, the extent of harvest-related landslides inside the units would be small and of low consequence to soil productivity. **In-unit surface erosion** due to soil disturbance would be negligible due to high soil infiltration, the cover provided by duff, woody debris and residual vegetation, and the waterbarring of any yarding trail (skyline or tractor) that can channel water.

The intent of the RMP to avoid **broadcast burning** on sensitive Category 1 soils (pg. 9) would be met. Broadcast burn**s** on slopes steeper than 70 percent often are intense resulting in unacceptable loss of organic matter and nutrients and in degrading the soil structure at the surface. This impact would be avoided on Category 1 soils in Unit 8 by handpiling and burning rather than broadcast burning. Broadcast burning would be allowed in regeneration Unit 9 since there is only one acre of soil that is marginally Category 1. Broadcast burning would occur under moist, spring-like conditions and likely be light in intensity and minimally impact soil productivity.

Water Quality and Hydrologic Processes - Actions that could potentially impact the water quality and hydrologic processes include: 1) increase in stream sedimentation, transport, and storage from timber felling, yarding, and haul; 2) increase in water temperature from stream canopy reduction; 3) increase in water yield and increase in peak flows and change in timing of peak flows from timber harvest and road construction; and 4) change in water chemistry from slash burning.

Some level of erosion from new construction would occur during the first season flush and would then decrease thereafter. Any sediment would filter onto the forest floor and not reach streams. In the absence of harvest-related landslides (indirect impact), virtually no sediment would reach streams from thinned stands due to the "no-harvest" buffer acting as a filter strip (Sampson Butte, Hello Folley, and Coon Creek monitoring observations). Some direct pathways for short-term soil displacement and potential sediment delivery may occur as a result of localized soil disturbance from cable yarding, and ground-based equipment operations. The few yarding trails that could pose **sedimentation** risks would be waterbarred and covered with slash. A variable stream-side buffer on minor, non-fish bearing streams (generally 40 feet along all streams in this project) would be sufficient to maintain bank stability on streams since half a tree crown diameter is an estimate of the extent to which root systems affect soil stability (FEMAT, 1993, pg. V-26). Two streams in Unit 1 have a smaller buffer since they have minimal concerns for sedimentation risks given the project design criteria, are highly interrupted (have segments of subsurface flow), and have no capacity for **transporting sediment** to fish bearing streams. In the long-term, large wood contributed to the Riparian Reserve as a result of density management has the potential to create additional capacity for **sediment storage** due to sediment capture by larger wood in streams.

If **harvest-related landslides** do occur in the thinning units (low probability events), their size would tend to be small (less than 0.1 acre) and the risk of them reaching streams would be low. This assessment is based on the following: 1) Only one harvest-related landslide has occurred under clearcut conditions slightly exceeding 0.1 acre (interpretation of 1964 and 1970 aerial photos of the project area and field investigations); 2) Project Design Criteria (pg. 9) designed to lessen the risk, size and reach of landslides would be incorporated. Because of the limited reach of small landslides (less than 200 feet) only about 8 of the 31 acres of potentially unstable FGR slopes could produce small landslides that would reach streams (all non fish-bearing). Any small harvest-related landslides that would originate inside the Riparian Reserve would be slowed down and possibly stopped by the high residual density of trees. The likely amount of material entering the stream floodplain and channel from a small landslide would range from negligible to

150 cubic yards (soil scientist estimate) depending on the point of origin, size, reach and the amount of scour of the landslide. These small landslides would result in a short-term increase in sedimentation until the material is dispersed downstream. If harvest-related landslides would occur in the five acres of potentially unstable FGR slopes in the regeneration units (moderate probability events), their size would tend to be small to medium (less than 0.2 acre) with no risk of them reaching streams. This assessment is based on the following: 1) Landslide size estimate is based on the Swiftwater soil scientist's field observations in clearcuts with similar site characteristics as the proposed project area, aerial photo landslide inventories, and landslide literature; 2) The FGR slopes in both Units 8 and 9 are isolated from streams; and 3) The geotechnical engineer determined that there was not any potential for a debris flow in Unit 8 because the swale bottom at the base of the FGR slope does not have a stream channel, has a gradient of less than 35 percent and has a broad valley bottom. In Unit 9 any landslide would catch on gentle ground before reaching any stream.

In summary there would be a slight short-term increase in the potential for sediment input and transport. This increase would be within the range of existing background levels. In the long-term there would be a possible decrease due to road improvements. Sediment storage in the long-term would have a slight increase due to recruitment of large down wood.

There would be no increase in **stream temperature** as a result of the proposed project. All streams within the project area are seasonal intermittent streams (i.e., stop flowing by late spring). These streams do not contribute to elevated water temperature in Elk Creek. A reduction in canopy from thinning near these streams would have no effect on downstream stream temperature. Over time, shade levels near these streams would increase as the canopies of the residual trees expand and close in the openings created by thinning. Additional shade may be provided by new undergrowth stimulated by increased light levels after thinning. These responses would accelerate the development of late-successional characteristics near these streams and would provide greater riparian habitat in the long-term. The stream system between Units 2 and 3 (tributary to Lane Creek) has potential to flow later into the summer. A wider buffer (40-100 feet) has been placed along this stream to protect the primary shade zone ([zone providing shade from 10 a.m. to 2 p.m.] USDA and DOI, 2003, pg. 18-19). Up to two trees per acre would be felled and three trees per acre would be girdled as needed within the no-harvest buffer in a manner that would not reduce effective stream shade.

Given the filtering capacity of the forest floor and the distance to the streams, there would be no change in **water chemistry** from slash burning. No change in any chemical or physical parameter is likely to occur due to the buffering effect of the no harvest buffer along all streambanks (see pg. 7).

<u>Indirect impacts</u> of vegetation removal during density management and regeneration harvest could result in short-term increases in **water yield and peak flows** due to a decrease in evapotranspiration and interception. Removal of trees tends to increase soil moisture and base streamflow in summer when rates of evapotranspiration are high; these summertime effects only last a few years (Ziemer and Lisle, 1998). Slight increases in summer flow would benefit riparian areas, which are often moisture limited during the summer. With the onset of the rainy season in the fall, the soil becomes recharged with moisture. Several studies have shown that the first storms of the fall have the most increase in peak flow from pre-logging conditions

(Rothacher, 1973, pg. 7; Harr, et al. 1975, pg. 441; Harr, et al. 1979, pg. 11; Ziemer, 1981, pg. 916). These fall storms are typically small and geomorphically inconsequential. Large peak flows occur mid-winter after soil moisture deficits are satisfied in both logged and unlogged watersheds (Ziemer and Lisle, 1998, pg. 60). Increases in peak or storm flows in winter and spring can alter channel morphology by flushing smaller substrate, causing the channel to downcut and increase stream bank failures. Studies on increased peak flows are varied in their findings on how much increase in flow would result from a given amount of timber harvest. Most studies agree that the effects of harvest treatment decreases as the flow event size increases (Rothacher, 1971, pg. 51; Rothacher 1973, pg. 10; Wright et al., 1990) and is not detectable for flows with a two year return interval or greater (Harr, et al., 1975, pg. 443; Ziemer, 1981, pg. 915; Thomas and Megahan, 1998, pg. 3402; Thomas and Megahan 2001, pg. 181). After examining 94 watershed experiments conducted worldwide, Bosch and Hewlett (1982) concluded that water yield increases are usually only detectable when at least 20 percent of the forest cover has been removed. At the project level, the only possible increases in peak flows as a result of BLM forest management would occur during small storm events (less than 2 year return interval) in the smallest non-fish bearing streams (those streams with >20 percent of their catchment's area cleared by timber harvest). These streams would have a two year flow of approximately 0.05-0.2 cfs. If increases in peak flow develop in these stream channels, they would likely be small (<5 percent), geomorphically inconsequential, and would not be discernible farther downstream. Any possible increase in peak flow, as a result of timber harvest, would also likely be reduced by the influence of the Riparian Reserve. The above relationships are described in the Elk Creek WA. Roads and landings may modify storm flow peaks by reducing infiltration on compacted surfaces, allowing rapid surface runoff, or by intercepting subsurface flow and surface runoff, and channeling it more directly into streams (Ziemer, 1981, pg. 915). However, effects from peak flows have been shown to increase significantly only when roads occupy at least 12 percent of the watershed (Harr, et al. 1975, pg. 443), which is not the case in this watershed (Headwaters Elk Creek road area is 3 percent). This phenomenon is due to the increased speed of delivery of water from road surfaces, ditches, and culverts (Harr, et al., 1975, pg. 441). Road maintenance and improvements would decrease the effects of roads on changing the timing of the storm hydrograph. Since none of the project is in the Transient Snow Zone, no measurable increase in peak flows as a result of rain-on-snow events is expected.

Fisheries – The risk of adverse impacts to fish populations and aquatic habitat were assessed to be inconsequential. This low risk evaluation is based on: 1) Project Design Criteria in place to reduce sediment from roads, 2) establishment of Riparian Reserve and streamside no-harvest buffers along all streams that would effectively filter any sediment potentially generated from ground disturbance, and 3) the majority of the proposed actions are located well upstream of fish-bearing habitat.

Density management is specifically prescribed to enhance the development of late-successional conditions adjacent to the aquatic environment. No <u>direct</u> or <u>indirect impacts</u> are anticipated from management activities (see previous water quality discussion, pg. 21) that would affect the stream channel due to sedimentation or a reduction in shade from trees being felled adjacent to streams. Impacts within the variable width streamside no-harvest buffer (site level) would be inconsequential since at most five trees per acre would be treated (girdled or felled and left in place) leaving stand densities relatively unchanged. No trees would be felled into the streams.

The long-term impacts would enhance the riparian resources by providing future large woody debris and improved shade conditions.

The impact of **sedimentation** from the haul road activity to the aquatic environment was considered, however is difficult to quantify or measure (Brown, 1985). Research has shown that road networks "are the most important source of . . . delivery of sediment to anadromous fish habitats" (FEMAT, 1993; pg. V-16); however, in-stream sedimentation from road construction, maintenance of existing roads, and timber haul is not expected to be measurable in streams and would not be above existing background levels for the following reasons: 1) Research has shown that the greatest amount of fine sediment from timber haul comes from roads within 200 feet of streams (WDNR, 1995). Approximately 1.2 miles out of the 5.8 miles of haul road (21 percent) would be within 200 feet of streams. Beyond this distance there is very little sediment impact to streams from hauling. Any increased level of sediment production would be a temporary condition that would return to pre-hauling levels after completion of hauling. 2) Spur construction would be on stable locations at and just below ridge tops on gentle to moderate slopes (10 to 40 percent) with locations outside of Riparian Reserves at least 250 feet upslope of streams. 3) All segments of naturally surfaced roads (both existing and newly constructed) would have dry season haul followed by decommissioning (pg. 8, para. 2a) the same dry season as logging. Any sediment from these segments would filter onto the forest floor and not reach streams. No new permanent roads would be constructed. 4) The proposed haul route currently includes nine non-fish bearing stream crossings and approximately 27 cross drains. Proposed road renovation would include replacing six stream crossings culverts, 19 cross drains, and installing four new cross drains. Overall, rock quality is good and ditch lines adequately vegetated to filter sediment and prevent ditch erosion on the haul roads. Drainage would be improved and some segments deficient in the amount or quality of rock would receive an additional lift of rock to handle winter haul; 5) For the wet season haul portion, all culvert crossings would be inspected prior to haul for implementation of PDC's (pg.8) that would lessen sedimentation concerns (i.e., use of hay bales, sediment curtains, etc.); 6) The wet season haul would only cross five streams (four first order and one second order stream which have good sediment filtering capacity) before reaching paved road. 7) Dry season haul generates considerably less sediment than wet season haul. Operations during the dry season could be suspended during periods of heavy precipitation (pg.8); 8). There is potential for a small amount of sediment delivery to the streams when the culverts on haul roads are replaced; however, the effects are minimal, short-term, and would not extend to the downstream fish-bearing streams due to the distance (approximately 300 ft at the closest site) of the culvert actions from fisheries habitat and the capacity of these stream systems to store sediment. Therefore sedimentation would not have an affect on habitat for coho salmon, as well as habitat for cutthroat and steelhead trout and would not adversely affect EFH for coho and chinook salmon.

<u>Indirect impacts</u> from harvest related landslides are not reasonably certain to occur, due to: 1) low probability of occurrence (less than 10 percent), 2) size of potential landslide would likely be less than 0.1 acre (see p. 20) and; 3) harvest units with potential harvest related landslide areas as identified by the soil scientist are located approximately 1000 ft from fish-bearing waters and 2600 ft from coho bearing waters. If any landslide should occur, the effect of sediment would have a very low probability of being detectable in the stream beds more than a few hundred feet outside the project area and would not be detectable in the identified fish-bearing streams downstream.

Irreversible and Irretrievable Commitment of Resources - An irreversible commitment is a commitment that cannot be reversed whereas an irretrievable commitment is a commitment that is lost for a period of time. An irreversible commitment of petroleum fuels for road building, logging and timber hauling as well as the loss of rock from quarries for crushed rock used in the renovation of the road system would result from the proposed action. The irretrievable loss of mature or old-growth forest would occur since portions of the project area would be subject to regeneration harvest and be managed on an 80 to 150 year rotation. That part of the new construction in road bed and landings (0.6 acres) would be considered an irretrievable loss to soil productivity since they would not be subsoiled and would be used in future entries.

C. Cumulative Impacts Analysis

The following paragraphs discuss the cumulative impacts of the action. These impacts are described for federal lands in the FSEIS beginning on page 3&4-4 and throughout the chapter based on the resource affected. The Elk Creek Watershed Analysis (WA) provides baseline information with which to assess potential future cumulative impacts. Unless otherwise noted, these effects are described in the context of the fifth-field watershed scale.

Harvest Activity Impacts on Wildlife Habitat - Private landowners control a little over three quarters of the Elk Creek watershed. Of this about 40 percent are industrial forestlands with the remainder managed by private landowners with varying agricultural and forestry objectives. Private forestlands managed for timber production are normally harvested in accordance with state forest practice standards between 40 and 60 years of age. As these areas are replanted they will maintain a mosaic pattern of forest stand ages across the landscape. The majority of private lands will maintain early and mid-seral forest type characteristics on a 40 to 60 year rotation. The following describes expected impacts to key wildlife and their habitat resulting from these activities.

1. **Wildlife Habitat – Late-Successional Forests -** The Elk Creek WA (Chart 2-3) shows that about 20,000 acres of the forested lands in 2002 were in a late-successional condition. BLM manages close to 18,000 acres of these forests (Table 2-3) leaving an estimated 2,000 acres on private forestlands. Approximately 14,500 acres (8% of watershed) of BLM is in some type of reserve (Table 2-4). Based on current projections, the late-successional forests on private lands are expected to be harvested within the next 20 years. These forest lands most likely will be replanted and managed for timber production on a 40 and 60 year rotation (see Table 2). BLM has about 170 acres of sold-unawarded regeneration timber sales (Broken Buck, Bell Mountain, and Yoncalla West) that could be harvested within the next 5 to 10 years. The Elk Creek WA also identified approximately 700 potential acres of regeneration harvest in Connectivity/Diversity Blocks and 1,800 potential acres of regeneration harvest in General Forest Management Areas. This represents approximately 13 percent of existing late-successional forests in the watershed. Of these potential harvest acres, approximately 455 acres of regeneration harvest are planned to be sold in the next five years which includes 24 acres identified in this EA.

Table 2. Elk Creek/Umpqua River Watershed Late-Successional Forest Habitat

	Acres of Late-Successional Forest	Percent of Existing Late-Successional Forest	Percent of Watershed
Existing Forest on BLM/Private Lands	20,000	----	11%
Expected Harvest on Private Lands Next 20 Years	2,000	10%	1%
Expected Regeneration Harvest on BLM Lands Next 20 Years	2,500	13%	1%
Remaining Late-Successional Habitat After All BLM/Private Harvesting in Next 20 Years	15,500*	78%	8%

*This would be about 34% of federal lands in the watershed.

2. **Wildlife Habitat – Mid and Early-Seral Forests -** The Elk Creek WA (Chart 2-3) shows an estimated 74,000 acres of mid-seral type forest stands in the Elk Creek Watershed. The majority of these forestlands is managed forest plantations and can function as foraging and dispersal habitat for northern spotted owls, as well as provide habitat for early-seral-dependent species. BLM manages approximately 16,000 acres of these forest types. In this watershed, Roseburg BLM has about 500 acres of sold-unawarded commercial thinning timber sales (Ward Creek and Buck Creek) that could be harvested within the next 5 to 10 years. The Elk Creek WA identified approximately 10,700 acres of potential commercial thinning over the next 10 years. Of this about 3,700 acres would be harvested toward the objective of a sustainable supply of commercial timber and the other 7,000 acres would be thinned in Late-successional and Riparian Reserves for the purpose of creating future late-successional habitat. Of these potential harvest acres, approximately 820 acres are planned to be sold in the next five years of which 157 acres are identified in this EA. On private lands, some of these types of forests may commercially be thinned but the majority is expected to be clearcut within the next 30 years.

Across the Elk Creek Watershed the 40,000 acres of early-seral forest stands will grow into mid-seral forests in the next 30 years. Because the objectives are different for each private landowner, the timing of harvest will vary throughout the watershed. Forestlands will maintain a mosaic pattern of age classes in the watershed as different forest stands are harvested and replanted. The majority of private lands will maintain early and mid-seral forest type characteristics. Mid-seral forest stands on private lands will add to foraging and dispersal spotted owl habitat, as well as provide habitat for early seral-dependent wildlife species within the watershed.

3. **Wildlife Habitat Long-term Changes -** Within the next 10 years, BLM's regeneration harvest would convert at the most one percent of the total watershed into early-seral forests. Thinning mid-seral forests in BLM reserves would accelerate and enhance the development of late-successional characteristics on approximately four percent of the watershed within the next 150 years. Harvesting of late-successional forests on private lands would reduce this forest type by about one percent within the next 20 years. Consultation with USFWS under the 2003-2008 Biological Opinion Programmatic Assessments for these types of activities

concluded that actions on BLM lands were "not likely to jeopardize" spotted owl, marbled murrelet, or bald eagle. There are no known occupied marbled murrelet sites on private land within the watershed. Some known spotted owl sites within Elk Creek are located on state or private land. Under state regulation, spotted owl nest sites are protected for at least three years following the last year of occupation. Known spotted owl sites would be protected with 70-acre core areas on private lands. Except for these core areas, private forestlands are not expected to provide spotted owl nesting, roosting and foraging habitat or murrelet nesting habitat (FWS Programmatic Biological Opinion, February 21, 2003).

Impacts to Soil Productivity - Past forest management on BLM and private lands has reduced soil productivity by taking lands out of production for roads, landslides/mass wasting, compaction/topsoil displacement during ground-based operations, and hot broadcast burning. On balance, soil productivity on BLM lands are expected to be maintained or improved as the natural healing process slowly progresses and best management practices are applied to project areas.

Impacts to Aquatics/Water Quality - The following describes the expected cumulative impacts due to harvest and management activities.

1. **Sediment from Landslides Related to Harvesting and Roads -** Landslides have naturally occurred on the landscape, however past human caused activities had substantially increased their frequency. Landslide activities above natural levels generally have been decreasing as best management practices for road construction and forest practices have been implemented (Elk Creek WA, Geology and Soils, Landslide Summary Trends With Land Management). Because mid-seral forest canopies would be maintained and because best management practices would be applied to help maintain stable slopes, occurrence of management related landslides on BLM lands would be low relative to historical levels, possibly within natural variation. Private forest practices are regulated under the Oregon Forest Practices Act, which provide protection to riparian and aquatic habitat. Landslide frequencies and effects from private clearcutting would be lower than the average levels experienced on similar ground over the past 50 years. Based on the projected trends, landslide rates from new and existing roads would decline due to management practices regulated under the Oregon Forest Practices Act and BLM best management practices. If BLM improves or decommissions the approximate 52 miles of existing road over the next 10 years, landslide risks and sedimentation would be reduced (Elk Creek WA, Charts 8-3 and 8-4). For the entire Elk Creek watershed, combined harvest and road-related landslides and their sedimentation rates in the short-term would be maintained at least at current levels. Sedimentation from landslides on both private and public lands would decrease in the long-term compared to the past 50 years because of best management practices and road improvements on private and public lands. This trend includes periods of increased landslide activities during high intensity storm events. Thus, the overall sedimentation rates from harvest and road-related landslides would be expected to decrease compared to levels from the last 50 years.

2. **Sediment Related to Agriculture and Hauling Activities -** Agricultural practices in the watershed are expected to remain the same in the short-term. As a result, fine sediment inputs into streams are expected to remain the same as the past. Some of these practices could change as the result of watershed council studies. It is estimated that over 2.3 billion board feet of timber could be hauled across the road system from private and public lands in this watershed within the next 10 to 20 years. The Oregon Forest Practices Act will regulate any winter hauling and resulting elevated fine sediment inputs. Analysis has shown that these regulations are sufficient to maintain water quality within legally acceptable levels (Oregon Department of Forestry and Department of Environmental Quality Sufficiency Analysis, 2002). In the short-term, as shown in this EA, fine sediment input to streams due to BLM harvesting and roads could increase slightly. The duration of this input would likely be very short, occurring during the season of wet weather haul or briefly following larger rain events. Upon cessation of haul or a return to drier weather, sediment inputs would likely return to background levels. At the watershed scale it would be indistinguishable from background levels and would be within the range of natural variation. Over the long-term (next 100 years), fine sediment delivery due to BLM and private roads would decrease because of road improvements and renovations throughout the watershed. Any sediment added to the streams as a result of the proposed action cumulatively would be indistinguishable from background levels. Therefore sedimentation would have very little cumulative impacts at the Elk Creek watershed scale and would be within the range of natural variation. As a result, associated embedment from fine sediment within the stream substrate would likely decrease resulting in improved spawning habitat and substrate quality.

3. **Other Hydrologic Processes -** Seven percent of riparian areas within the watershed, are on an improving trajectory due to Riparian Reserve management. Density management activities are designed to improve forest health and encourage the development of late-successional characteristics. As these characteristics develop, improvements in riparian health, riparian vegetation, instream wood amounts, small channel capacity to store water and sediment, summer low flows, stream temperatures, and the delivery of upland nutrients to stream and hyporheic zones may occur. The long-term cumulative effects of these types of current and future federal activities would promote aquatic habitat complexity and stability in these areas. Peak flows may be influenced by reduced timber stand acreages on private and BLM-administered lands throughout the watershed. However, the limited size, spatial scattering, and lower harvest intensity of treatment areas on BLM lands along with road drainage improvements would help to mitigate these effects. No additional impacts are expected from the combined effects of the expected harvest and the proposed actions described in this EA.

4. **Aquatic Habitat** - Since 1994, approximately 10 miles of BLM roads have been either decommissioned or improved to reduce the risk of landslides and erosion (Elk Creek WA, Table 5-1). An additional 52 miles are expected to be improved or decommissioned in the coming years. There will be very few changes in road densities from BLM road building (Elk Creek WA, Table 5-3). The Elk Creek WA identified 23 culverts for replacement and stream reaches for restoration needs. Seven culverts have either been replaced or removed to provide fish passage since the 1990's. Approximately 52 miles of streams on BLM have been identified for potential restoration. Additional fish barrier culverts are likely to be identified on private lands by the Umpqua Basin Watershed Council. These additional fish

barrier culvert replacements and instream restoration work are expected to occur over the next 20 years through partnership arrangements with Umpqua Basin and/or the Elk Creek Watershed Councils and private landowners. The replacement or removal of fish barrier culverts would reduce risk of failure and open up more stream habitat to aquatic species. Over the long-term the quality and quantity of aquatic habitat would improve compared to current conditions. The reasons for this conclusion are: a) Sedimentation rates will be reduced on public and private lands through road improvements and decommissioning, b) Best management would continue to be applied to BLM and private harvest practices, c) aquatic habitat and access would be improved through fish barrier culvert replacements and instream restoration targeted in the highest priority areas in the watershed, and d) forests on previously harvested Riparian Reserves on federally managed land will continue to grow, providing increased stream shading and large wood over time.

Sustainable Commercial Forest Products – Using the projected harvest acreages, the BLM lands that are designated for the purpose of providing a sustained supply of commercial forest products within the Elk Creek watershed have the potential to provide about 125 million board feet. This includes commercial thinning and regeneration harvest. It is equivalent to about five and a half years of the Swiftwater Resource Area's harvest commitment (at 23 MMBF per year) for the Roseburg District. It is estimated that over 2.3 billion board feet of timber could be harvested from private and public lands in this watershed over the next 10 to 20 years.

V. 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. The Roseburg District's consultation for T&E wildlife species is covered under the **US Fish and Wildlife Service** (FWS) *Formal Consultation and Written Concurrence on FY 2003-2008 Management Activities (Ref. # 1-15-03-F-160)* (Feb. 21, 2003). The Biological Opinion (pg. 29) concluded that the project would ". . . not likely to jeopardize the continued existence of the spotted owl, murrelet and bald eagle, and are not likely to adversely modify spotted owl or murrelet critical habitat . . ." and an "Incidental Take Statement" was issued. Incidental Take is any take of listed animal species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency. The FWS has stipulated terms and conditions for the Incidental Take having to do with seasonal restrictions for the northern spotted owl and the marbled murrelet.

b. At this time the Oregon Coast coho is no longer afforded the protections of the Endangered Species Act. The status of the Evolutionary Significant Unit (ESU) is currently under review by the **National Oceanic and Atmospheric administration – fisheries** (NOAA – fisheries), and the Oregon Coast coho ESU is by definition a "candidate" species. Federal agencies are required under the Magnuson-Stevens Fishery Conservation and Management Act (MSA) to consult with NOAA Fisheries regarding actions that are authorized, funded, or undertaken by that agency that may adversely affect Essential Fish Habitat (EFH). The MSA defines EFH as "...those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (Federal Register, Vol. 67, No. 12). For the purposes of this assessment, EFH within the action area is the extent of coho and chinook salmon distribution. Activities associated with the proposed project would not adversely affect EFH for coho and chinook salmon.

2. **Cultural Resources Section 106 Consultation -** Consultation as required under Section 106 of the National Historic Preservation Act with the **State Historical Preservation Office** (SHPO) was completed on November 26, 1999 with a "No Effect" determination.

B. Public Notification

1. Notification was provided to affected **Tribal Governments** (Confederated Tribes of the Coos, Lower Umpqua and Siuslaw; Grande Ronde; Siletz; and the Cow Creek Band of Umpqua Indians). No comments were received.

2. A letter was sent to an **adjacent landowner**. No comments were received (see Appendix G - Public Contact).

3. The **general public** was notified via the Roseburg District Planning Update (Winter 1997-1998) going to approximately 150 addressees. These addressees consist of members of the public that have expressed an interest in Roseburg District BLM projects. Comments were received from Francis Eatherington representing Umpqua Watersheds, Inc. (see Appendix D - Issue Identification Summary).

4. Notification will also be provided to certain **State, County and local government** offices (see Appendix G - Public Contact).

5. A 30-day **public comment period** will be established for review of this EA. A Notice Of Availability will be published in *The News-Review*. 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*.

C. List of Preparers

Core Team

Mike Crawford	Fisheries
Dan Cressy	Soils
Dan Dammann	Hydrology
Elizabeth Gayner	Wildlife
Bob Gilster	Engineer
Craig Holt	Layout Forester
Al James	Silviculture
Jim Luse	EA Coordinator / EA Preparer
Ron Wickline	Botany

Expanded Team - Consulted

Isaac Barner	Cultural Resources
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Dan Couch	Watershed Analysis
Fred Larew	Lands
Ron Murphy	Recreation / VRM

References Cited

Adams, Paul W. June 2003. Forest soil compaction effects & management (presentation to Oregon BLM soil scientist meeting).

Bosch, J.M.; Hewlet, J.D. 1982. A Review of Catchment Experiments to Determine the Effects of Vegetation Changes on Water Yield and Evapotraspiration. J. of Hydrology 55: 3-23.

Brown, G.W. 1985. Forestry and water quality. OSU Book Stores, Inc., Oregon State Univ. Corvallis

Forest Ecosystem Management Assessment Team. July 1993. Report of the forest ecosystem management assessment team (FEMAT).

Graham, Russel T., Alan E. Harvey, Therasa B. Jain, and Jonalea R. Tonn. 1999. The effects of Thinning and similar stand treatments on fire behavior in western forests. General Technical Report PNW-GTR-463, September 1999.

Harr, R.D., W.C. Harper, J.T. Krygier, and F.S. Hsieh. 1975. Changes in Storm Hydrographs after Road Building and Clear-Cutting in the Oregon Coast Range. Water Resources Research, 11(3):536-444

Harr, R.D., R.L. Fredriksen, J. Rothacher. 1979. Changes in Streamflow following Timber Harvest in Southwestern Oregon. USDA Forest Service Research Paper PNW-249. 22p.

Oliver, Chadwick D. and Bruce C. Larson. 1990. Forest stand dynamics. McGraw-Hill, Inc.

Oregon Department of Environmental Quality, 2003. Consolidated assessment and listing methodology for Oregon's 2002 303(d) list of water quality limited waterbodies and integrated 305(b) report, Portland Oregon [http:///www.deq.state.or.us/wq/303dlist/Final2002AssessmentAndListingMethodolgy.pdf].

Oregon Department of Environmental Quality, 2003. Oregon's final 2002 303(d) list, Portland Oregon [http://www.deq.state.or.us/wq/303dlist/303dpage.htm].

Oregon Department of Environmental Quality and Department of Forestry. Nov. 1992. Oregon state smoke management plan, Salem, Oregon.

Oregon Department of Forestry. June 1999. Storm impacts and landslides of 1996: final report.

Oregon Department of Fish and Wildlife. 1994 Umpqua Basin Aquatic Habitat Surveys.

Programmatic Agreement Among the Bureau of Land Management, the Advisory Council on Historical Preservation and the National Conference of State Historic Preservation Officers regarding the manner in which BLM will meet its responsibilities under the National Historic Preservation Act. March 26, 1997.

Rothacher, J. 1971. Regimes of streamflows and their modification by logging. Pages 55-63 in Proceedings of the symposium of forest land use and stream environment. Oregon State University, Corvallis, Oregon.

Rothacher, J. 1973. Does harvest in west slope Douglas-fir increase peak flow in small streams, USDA Forest Service Research Paper PNW-163, 13 pp. Portland, Oregon.

Smith, David Martyr. 1962. The practice of silviculture. Seventh Edition. John Wiley & Sons, Inc.

U.S. Department of Agriculture, Forest Service. June 1985. Management of wildlife and fish habitats in forests of western oregon and washington.

Thomas, R.B. and W.F. Megahan. 1998. Peak flow responses to clear-cutting and roads in small and large basins, western Cascades, Oregon: A second opinion, Water Resources Research, Vol. 34(12): 3393-3403.

Thomas, R.B. and W.F. Megahan. 2001. Reply, Water Resource Research, Vol 37(1): 181-183.

U.S. Department of Agriculture, Forest Service, and U.S. Department of the Interior, Bureau of Land Management. Feb. 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 (FSEIS).

U.S. Department of Agriculture, Forest Service, and U.S. Department of the Interior, Bureau of Land Management. April 13, 1994. Record of decision for amendments to Forest Service and Bureau of Land Management planning documents within the range of the northern spotted owl (ROD) and standards and guidelines for management of habitat for late-successional and old growth related species within the range of the northern spotted owl (S&G).

U.S. Department of Agriculture, Forest Service, and U.S. Department of the Interior, Bureau of Land Management. January 2001. Record of decision and standards and guidelines for amendments to the survey and manage, protection buffer, and other mitigating measures standards and guidelines.

U.S. Department of Agriculture, Forest Service, and U.S. Department of the Interior, Bureau of Land Management. May 2003. Sufficiency Analysis for Stream Temperature: Evaluation of the adequacy of the Northwest Forest Plan Riparian Reserves to achieve and maintain stream temperature water quality standards.

U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA – fisheries). October 18, 2002. Programmatic biological and conference opinion.

U.S. Department of the Interior, Bureau of Land Management. National environmental policy handbook (BLM Handbook H-1790-1).

U.S. Department of the Interior, Bureau of Land Management. 1985. Northwest area noxious weed control program environmental impact statement; and Supplement.

U.S. Department of the Interior, Bureau of Land Management. Dec. 2, 1992. Integrated weed management (BLM Manual 9015).

U.S. Department of the Interior, Bureau of Land Management. October 1994. Roseburg District: Final - Roseburg District Proposed Resources Management Plan / Environmental Impact Statement (PRMP/EIS).

U.S. Department of the Interior, Bureau of Land Management. June 2, 1995. Roseburg District: Roseburg District: record of decision and resources management plan (RMP).

U.S. Department of the Interior, Bureau of Land Management. June 1996. Oregon State Office: Western Oregon transportation management plan.

U.S. Department of the Interior, Bureau of Land Management. August 5, 1998. Oregon State Office: Protocol for managing cultural resources on lands administered by the Bureau of Land Management in Oregon.

U.S. Department of the Interior, Bureau of Land Management. March 1999. Oregon State Office: Environmental justice screening in NEPA analysis for Oregon, Washington, and northern California.

U.S. Department of the Interior, Bureau of Land Management. Roseburg District: Roseburg District hazardous materials (HAZMAT) emergency response contingency plan (2003).

U.S. Department of the Interior, Fish and Wildlife Service. February 21, 2003. Formal consultation and written concurrence on FY 2003-2008 management activities (Ref: 1-15-03-F-160).

U.S. Department of the Interior, Fish and Wildlife Service. 1992. Endangered and threatened wildlife and plants; determination of critical habitat for the northern spotted owl. Washington, D.C.: *Federal Register* 57:1796-1838.

Waring, Richard H. and William H. Schlesinger. 1985. Forest ecosystems, concepts and management. Academic Press, Inc.

Washington Department of Natural Resources, 1995. Standard Methodology for Conducting Watershed Analysis, Version 3.0. Washington Forest Practices Board.

Wright, K.A., K.H. Sendek, R.M. Rice, and R.B. Thomas. 1990. Logging effects on streamflow: Storm runoff at Caspar Creek in Northwestern California, Water Resources Research, Vol. 26: 1657-1667.

Ziemer, R.R. 1981. Storm flow response of road building and partial cutting in small streams of Northern California, Water Resources Research, Vol. 17 (4): 907-917.

Ziemer, R.R. and T.E. Lisle. 1998. Hydrology. in River Ecology and Management: Lessons from the Pacific Coastal Ecoregion. eds. R.J. Naiman and R.E. Bilby. Springer-Verlag, New York, pp. 43-68.

Other references as cited in the individual Specialist's Reports (Appendix F - Analysis File).

Appendix A
Vicinity Map

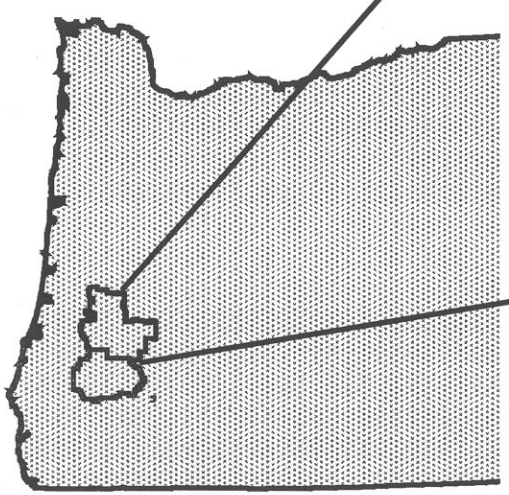
Shingle Lane Regeneration and Commercial Thinning

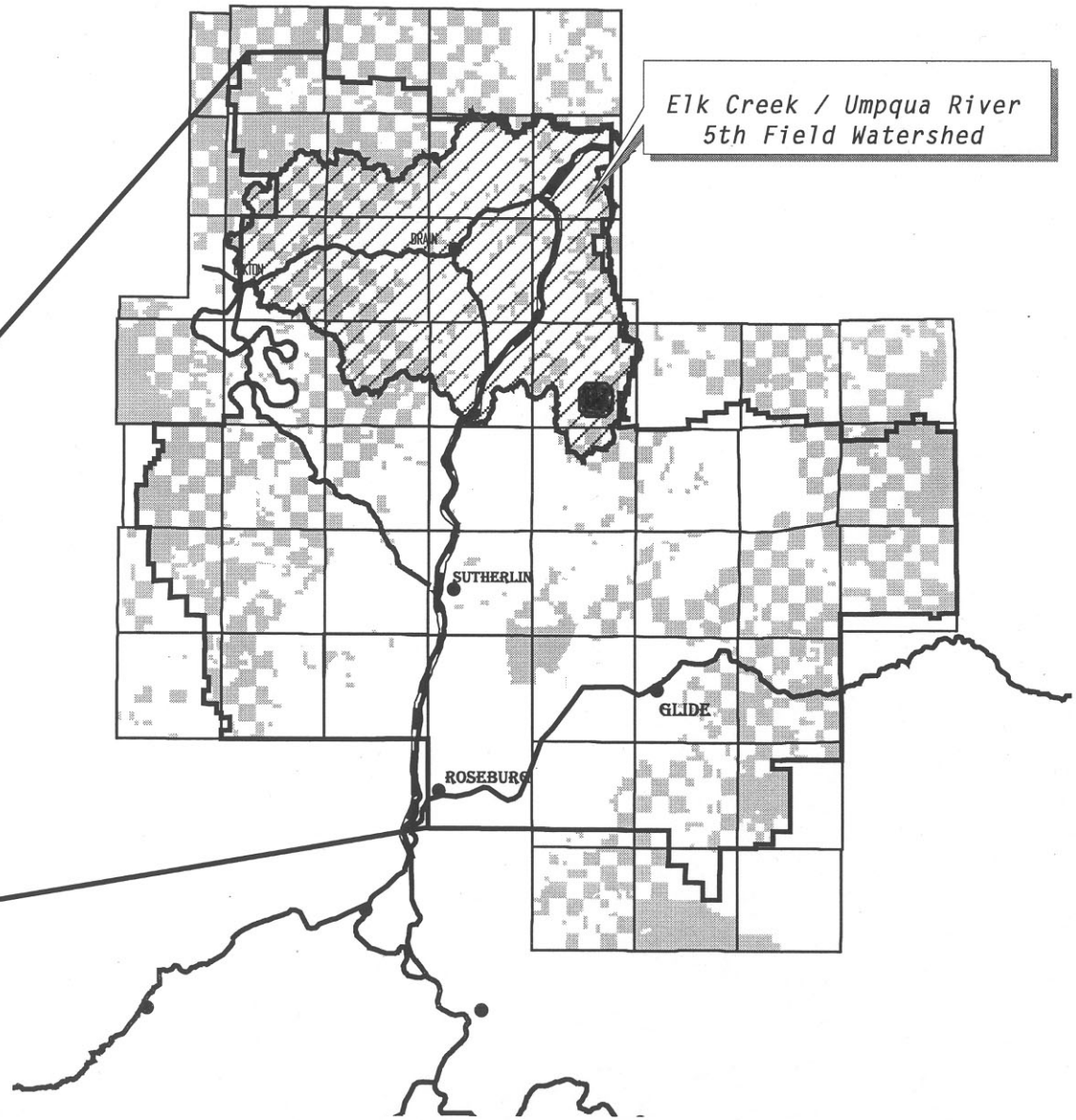
Legend

- Swiftwater Resource Area Boundary
- Major Oregon Highways
- Interstate 5
- Towns

Shingle Lane Sale Area

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

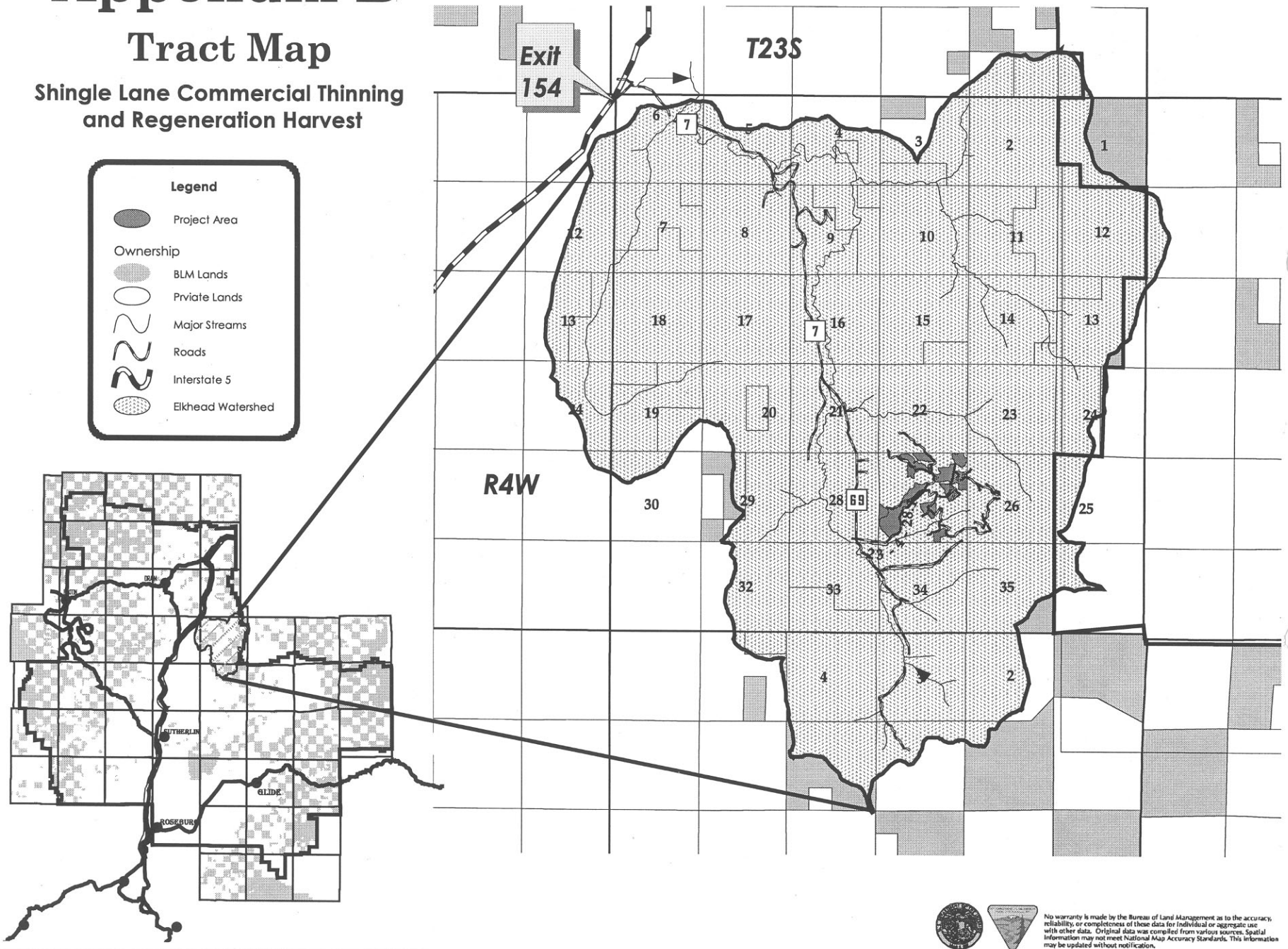




Appendix B

Tract Map

Shingle Lane Commercial Thinning and Regeneration Harvest



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APPENDIX C

INDIVIDUAL UNIT DESCRIPTION

Project Summary Table

EA Unit #	Unit #	Acres	Yarding System (ac.)			Fuel Treat.	Remarks
			Aerial	Cable	Ground		
27A	1	61		OES (60)	ROW (1)	P&BL	Commercial Thinning
27B	2	22		OES (22)	ROW (<1)	"	"
27C	3	10		OES (10)		"	"
27D	4	10		OES (10)	ROW (<1)	"	"
27E	5	31		OES (30)	ROW (1)	"	"
27F	6	13		OES (12)	ROW (1)	"	"
27G	7	9		OES (8)	ROW (1)	"	"
27H	8	8		OES (8)		HP&B	Regeneration
27I	9	16		OES (16)		BB	"
PC		1			SVL (1)	P&BL	Partial Cut
Total		181		175	6		

Yarding System
OES = Cable Yard, One End Suspension Required
ROW = Ground Based, Yarding of Road Right of Way Timber
SVL = Shovel Logging

Fuel Treatment
P&BL = Pile and Burn Landings
BB = Broadcast Burn
HP&B = Hand Pile and Burn

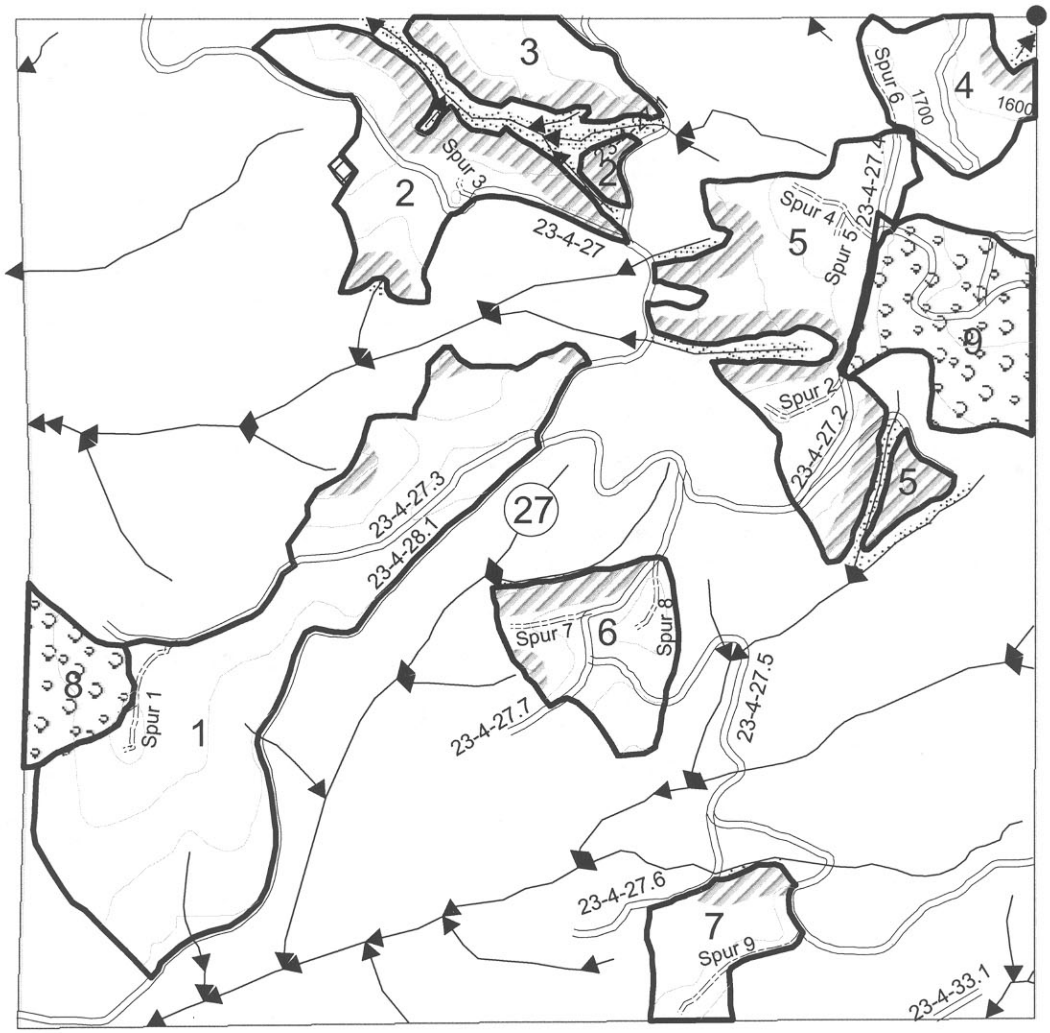
Directions to the Project Area

Follow Interstate 5 north from Roseburg to Exit 154 (Scotts Valley). Proceed east on County Road 7 five and three tenths (5.3) miles to County Road 69. Turn left on County Road 69 and travel one and two tenths (1.2) miles to BLM Road No. 23-4-28.1. See following map for directions to individual units.

Units are marked with boundary posters and blazed and painted trees.

Shingle Lane

T 23 S R 4 W Sec 27



Proposed Unit Boundary

Density Management

Regeneration Harvest

Commercial Thin

Partial Cut

Existing Roads

Temporary Spurs

Streams

Scale: 1" = 1000 ft

APPENDIX D

ISSUE IDENTIFICATION SUMMARY

This appendix summarizes the concerns that were identified by the ID Team during the identification of issues pertinent to this project. No further analysis was deemed necessary in that the mitigations called for were considered adequate to remove the concern as a major issue needing to be analyzed in the main body of the EA.

Concern #1 (Soils): Steep areas in Unit 1 and Unit 2

Discussion: The Soil Scientist expressed concern for potential instability over a steep slope on the edge of Unit #1 and three steep areas in Unit #2 (ID Meeting 6/9/99). This area was referred to the District geotechnical specialist for review and determined not to fall into the category of slope instability that would require reservation in order to met Aquatic Conservation Strategy (ACS) objectives (NWFP S&G's, pg. B-24). Meeting the objectives of ACS requires that unstable and potentially unstable areas be reserved when: (1) there is a significant probability of failure, and (2) resulting landslides are likely to directly affect the rate of achieving ACS objectives. FGR portions in the west half of Unit #1 and portions of Unit #2 have low probability of landslides occurring under a thinning regime even though there would be potential for a resulting landslides reaching intermittent and permanent streams. These locations meet one of the conditions for ACS reservation but not the other condition; therefore reservation would not be required. Both TPCC and ACS requirements for slope stability mitigation would be met.

Mitigation: None required.

Rationale: The RMP (pg. 24) and the S&G's (pg.C-31) specify that unstable and potentially unstable areas be included in the Riparian Reserves.

Public Issues:

Comments were received from one organization (Oregon Natural Resources Council). The issues identified in their comments were reviewed and those pertinent to this project are addressed as follows:

1. "*. . . thinning should be done in a way that creates ¼ to ½ acre gaps, dense patches, lightly thinned, moderately thinned, and heavily thinned patches in every stand.*"

   Response: The suggested marking prescription is proper and logical for the Late-successional Reserve where the objective is to introduce diversity and complexity into homogeneous mid-seral stands. This project is in the Matrix where the objective is for management of the timber resource (i.e., removal of weaker, smaller trees to encourage increased timber quality and volume for future harvest). The marking

guide would, however, require retention of existing snags, dominant and co-dominant hardwoods and old large remnant trees for diversity in the uplands. The Riparian Reserve would be marked similarly to the uplands; however, defective trees and hardwoods would be retained for diversity. Thinning in the Riparian Reserve is designed to accelerate mature stand characteristics.

2. "*A full range of action alternatives should be considered for this sale. These alternatives should include wildlife enhancement, restoration, old growth protection . . .*"

Response: These alternatives were not considered because such alternatives would not fully meet the purpose and need of this EA. Project Design Criteria were included as part of the action alternative to protect certain wildlife habitat features (see pg. 10). Additionally, restoration activities would occur within the Riparian Reserve in order to develop late-seral forest structure and enhance existing diversity by accelerating tree growth to promote larger trees and canopies, and provide a future source of large woody debris for stream structure. Also approximately 4.9 mi. of existing road would be renovated or improved to fix sources of stream sedimentation.

B. <u>Issues Specified by Regulation</u>

"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. These elements are as follows:

1. Air Quality
2. Areas of Critical Environmental Concern (ACEC)
3. Cultural Resources
4. Environmental Justice
5. Farm Lands (prime or unique)
6. Floodplains
7. Invasive, Nonnative Species
8. Native American Religious Concerns
9. Threatened or Endangered Species
10. Wastes, Hazardous or Solid
11. Water Quality, Drinking / Ground
12. Wetlands / Riparian Zones
13. Wild and Scenic Rivers
14. Wilderness

These resources or values (except item #9) were not identified as issues to be analyzed in detail because: (1) the resource or value does not exist in the analysis area, or (2) no site specific impacts were identified, or (3) the impacts were considered sufficiently mitigated through adherence to the NFP S&G's and RMP Management Actions/Direction therefore eliminating the element as an issue of concern. These issues are also briefly discussed in Appendix E ("Critical Elements of the Human Environment"). Item #9 is previously addressed in this EA and the Biological Assessment was prepared for consultation required by the Endangered Species Act (Appendix F).

The following items are not considered a Critical Element but have been cited by regulation or executive order as an item warranting consideration in NEPA documents:

Healthy Lands Initiative - This project would not violate the Healthy Lands Initiative. This project would be in compliance with the 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.

National Energy Policy - Executive Order 13212 provides that all decisions made by the Bureau of Land Management 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.

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 these resources.

C. Issues to be Analyzed

The Interdisciplinary Team did not identify any issues as having sufficient potential affect that would warrant detailed analysis as a key issue to be addressed in Section IV, "Environmental Consequences".

D. Watershed Analysis and Retention of Late-Successional Forests

The RMP (pg. 34) requires that late-successional forests be retained in those watersheds that contain 15% or less late-successional forests on federal lands in fifth-field watersheds, i.e., watersheds between 20 and 200 square miles (S&G, pg. C-44). Any timber stands greater than approximately 80 years of age are considered late-successional habitat (S&G, pg. B-2). For the Elk Creek Watershed, analysis of current forest inventories shows that of the 44,935 acres of federal ownership (24% of the watershed), approximately 18,800 acres (42%) are late-successional forests (Elk Creek 5th Field Watershed 2nd Iteration; pg. 2, Table 2) and 6,200 acres (13%) are greater than 200 years (Old Growth). It was estimated that approximately 3,850 acres of these stands are outside any type of reserve or withdrawn area and thus available for regeneration harvests (Elk Creek 5th Field Watershed 2nd Iteration; pg. 3). The project as proposed would remove 24 acres of these stands from within the watershed. Approximately 15,000 acres of late-successional forest are included within various reserves and are unavailable for harvest (Elk Creek 5th Field Watershed 2nd Iteration; pg. 2, Table 1). This is amounts to 33% of the total watershed.

APPENDIX E

CRITICAL ELEMENTS OF THE HUMAN ENVIRONMENT

Element	Relevant Authority	Environmental Effect
Air Quality	The Clean Air Act (as amended)	**Minimal** - Project is within 25 miles of the Roseburg Designated Area for attainment of federal Clean Air standards. Temporary smoke intrusion into populated areas is possible but not likely. Dust particles may be released into local airshed as a result of road construction /renovation and timber hauling.
Areas of Critical Environmental Concern	Federal Land Policy and Management Act of 1976 (FLPMA)	**None** - Project area is not within or near a designated or candidate ACEC.
Cultural Resources	National Historic Preservation Act of 1966 (as amended)	**"No Effect"** - See SHPO Report 11/26/99
Environmental Justice	E.O. 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, 2/11/94. ***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 2000 Census data approximately six percent of the population of Douglas County was classified as minority status (*Oregonian*, Pg. A-12; March 15, 2001). It is estimated that approximately 15% of the county is below the poverty level (Frewing-Runyon, 1999).
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 discernable effects are anticipated" (PRMP pg. 1-7)
Floodplains	E.O. 11988, as amended, Floodplain Management, 5/24/77 ***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 February 3, 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.***	Project Design Criteria would be included in the proposed action to prevent or control the spread of noxious weeds (EA, pg. 11).
Native American Religious Concerns	American Indian Religious Freedom Act of 1978 ***This act seeks to protect and preserve for American Indians right of exercise of traditional religion including access to religious sites.***	**None** - No concerns were noted as the result of public 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 Recovery Plan for the Marbled Murrelet, 1997	**Botanical** - No T&E species noted (Specialist Report – 7/15/99). **Animals** - See Specialist Report 3/10/04 (wildlife) and (fisheries). T&E species not specifically mentioned do not exist in the analysis area.
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 (October 13, 1978) EO 12589 on Superfund implementation (February 23, 1987); and EO 12372 Intergovernmental review of federal programs (July 14, 1982)	**None** - Project is not in a municipal watershed or near a domestic water source.

Element	Relevant Authority	Environmental Effect
Wetlands/Riparian Zones	E.O. 11990, Protection of Wetlands, 5/24/77 ***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).
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." (RMP pg. 54).

OTHER RESOURCES CONSIDERED

Resource	Environmental Effect / Concerns
Land Use (Leases, Grazing etc.)	**None** - Project has Coop fenceline that needs to be maintained (Specialist's Report 5/20/99). Roads are encumbered under Right-of-Way Agreement # R-763P (Juniper Properties) and #R-846A (Carol Whipple).
Minerals	**None** - Project has no mining claims (Specialist's Report 5/20/99).
Recreation	**Minimal short-term impacts** - ". . . some short-term inconvenience to persons wanting to recreate . . ." (Specialist's Report 6/1/99).
Visual	**None** - All units are within VRM Class IV (least restrictive category). No restrictions.
Other (Adjacent Landowners)	**None -** Three small adjacent landowners are in the vicinity of this sale. No registered domestic water use.