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

Environmental Assessment for the Swiftwater Field Office

O.M. Hubbard II
Density Management Study
EA #OR – 104 – 07 – 07

The O.M. Hubbard II Environmental Assessment (EA) analyzes the environmental impacts associated with the Swiftwater Field Office's proposal for the second phase of an ongoing density management study (DMS) that includes commercial thinning and density management treatments. The DMS was formally initiated in 1993 by the Bureau of Land Management (BLM), Pacific Northwest Research Station, US Geological Survey, and Oregon State University. O.M. Hubbard II utilizes the same treatment area boundaries that were used in the first phase of implementation of the density management study in 1996-1998.

The proposed commercial thinning and density management would occur on one unit (approximately 135 acres) of mid-seral, second-growth forest located in the Upper Umpqua 5th Field Watershed in Section 19 of T. 26 S., R. 7 W. and Section 24 of T. 26 S., R. 8 W., Willamette Meridian. There is an additional 97 acres of untreated, mid-seral stands and 14 acres of early-seral stands that are also part of the study but are not proposed for harvest. Of the 135 acres of treatment, no acres would be removed for the development of spur roads. This project is within the General Forest Management Area and Riparian Reserve Land Use Allocations. This project is in conformance with management direction from the ROD/RMP.

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Date of Preparation: January 14, 2008

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

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Chapter 1. Purpose and Need for Action

A. Background

O.M. Hubbard II is the second phase of the ongoing Density Management Study (DMS) that was formally initiated in 1993 by the Bureau of Land Management (BLM), Pacific Northwest Research Station, US Geological Survey, and Oregon State University (Cissel at al., 2006; pg. 3). O.M. Hubbard II utilizes the same treatment area boundaries that were used in the first phase of implementation of the density management study. Phase I treatments were analyzed under the *O.M. Hubbard Density Management Study Site and Commercial Thinning Environmental Assessment* (EA) (No. OR-106-95-10) and implemented as described in *the O.M. Hubbard Density Management Study Site and Commercial Thinning Decision Record* (September 26, 1995). Phase I treatments were implemented from 1996-1998 (Cissel et al., 2006; pg. 38).

As per the direction stated in Instruction Memorandum OR-2005-083 (August 12, 2005), on-the-ground treatment implementation for Phase II of O.M. Hubbard is scheduled for 2009 (Cissel et al., 2006; pg. 61). Phase II of the density management study on O.M. Hubbard is referred to as "O.M. Hubbard II".

B. Proposed Action

The Swiftwater Field Office proposes continuation of the DMS project on the O.M. Hubbard II site which includes approximately 246 acres in Section 19 of T. 26 S., R. 7 W. and Section 24 of T. 26 S., R. 8 W., Willamette Meridian. O.M. Hubbard II is located within the General Forest Management Area and Riparian Reserve land-use allocations. The summary of treatments proposed within O.M. Hubbard II is briefly outlined in Table 1 (below). The *Control Block (39 acres)*, *Leave Islands* (12 acres) and *Riparian Buffers* (46 acres) are "unthinned", i.e. vegetation not previously treated and not proposed for treatment under the proposed action. The *Patch Cuts* (14 acres) are small openings containing only tree seedlings, shrubs and herbaceous vegetation ranging from one-quarter to one acre in size that were previously harvested in Phase 1 of the DMS. Within the patch cuts, no treatment of vegetation is planned under the proposed action, although yarding would occur through the openings to designated log landings.

Table 1. O.M. Hubbard II Treatment Summary. The following information adapted from Cissel et al. 2006 (pg. 115) and unpublished monitoring data.

Treatment Type Description	Total Treatment Areas (acres)	Proposed Treatment Area (acres)	Current Tree Density[1] (trees/acre)		Proposed Post-treatment Density[1] (trees/acre)		Live Trees Retained for CWD[2] (trees/acre)
			≥ 4" dbh	≥ 9" dbh	≥ 4" dbh	≥ 9" dbh	
Control Block	39	0	259	224	259	224	n/a
Leave Islands	12	0	259	224	259	224	n/a
Riparian Buffers	46	0	259	224	259	224	n/a
High Residual Density	52	52	131	97	99	65	5
Moderate Residual Density	80	80	89	70	54	35	5
Low Residual Density	3	3	38	35	28	25	5

Patch Cuts	14	0	0	0	0	0	n/a

Approximately 135 acres of O.M. Hubbard II would be commercially harvested through thinning activities in accordance with the study design (i.e. "Proposed Treatment" from Table 1). The stand proposed for thinning is a mid-seral forest stand 50-55 years old that was previously thinned in 1996-1998. O.M. Hubbard II is within the Upper Umpqua Fifth-field Watershed and within the General Forest Management Area (GFMA) and Riparian Reserve Land Use Allocations. This project is located in Section 19; T26S, R07W and Section 24; T26S, R08W; Willamette Meridian, and is within Revested Oregon and California Railroad Lands (O&C Lands).

It is anticipated that the proposed action would yield approximately 763 thousand board feet (763 MBF) of timber in support of local and regional manufacturers and economies. Volume derived from treatments in the GFMA land use allocation would contribute toward the annual allowable sale quantity (ASQ) of 45 MMBF for the Roseburg District, supporting socio-economic benefits envisioned in the PRMP/EIS (Vol. 1, p. xii). Timber volume derived from density management in Riparian Reserves (approximately 300 MBF) would not be chargeable towards this objective.

The summary of the activities associated with the commercial harvest of 135 acres is described below in Table 2.

Table 2. O.M. Hubbard II Timber Harvest Summary.

Activity		Total
Timber Harvest	Commercial Thinning (GFMA)	83 acres
	Density Management (Riparian Reserves)	52 acres
	Temporary Spur Right-of-Way	0 acres
Yarding	Cable – GFMA	45 acres
	Cable – Riparian Reserve	36 acres
	Ground Based* – GFMA	38 acres
	Ground Based* – Riparian Reserve	16 acres
Hauling	Wet Season	4.96 miles
	Dry Season	1.26 miles
	Wet-or-Dry Season	0.00 miles
Road Activities	Roads to be Constructed	0.0 miles
	Renovation of Existing Roads	6.22 miles
	Maintenance of Existing Roads	4.96 miles
	Road Decommissioning (i.e. water barred, seeded/mulched, and blocked)	1.26 miles
Fuel Treatment	Machine Pile and Burn at Landings	12 acres

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

C. Relevant Policies, Assessments, and Plans

1. National Policy and Northwest Forest Plan Level Guidance

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

- The *Final Supplemental Environmental Impact Statement (FSEIS) on Management of Habitat for Late-Successional and Old-Growth Related Species Within the Range of the Northern Spotted Owl* (USDA, USDI; 1994a); and

- The *FSEIS for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines in Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* (USDA, USDI; 2001).

Implementation of the proposed action would conform to management direction from the ROD/RMP which incorporates as management direction the standards and guidelines of the *Record of Decision for Amendments (ROD) to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* (USDA, USDI 1994b).

a) *Survey & Manage*

On July 25, 2007, a new *Record of Decision to Remove the Survey and Manage Mitigation Measure Standards and Guidelines from Bureau of Land Management Resource Management Plans Within the Range of the Northern Spotted Owl* was signed by the Assistant Secretary, U.S. Department of the Interior. The effect of the decision eliminated the provisions of the Survey and Manage program set forth in the *Record of Decision for Amendments* (ROD) *to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl.* The 2007 *Record of Decision* addressed both the deficiencies in the 2004 Record of Decision set aside by the District Court in Northwest Ecosystem Alliance et al. v. Rey et al. and the decision of the United States Court of Appeals for the Ninth Circuit in Klamath Siskiyou Wildlands Center et al. v. Boody et al.

Consequently, the decision to eliminate Survey and Manage is effective on this project.

b) *O&C Act*

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

- Section 1 of the O&C Act stipulates that suitable commercial forest lands revested by the government from the Oregon and California Railroad are to be managed "…for permanent forest production, and the timber thereon shall be sold, cut, and removed in conformity with the principal of sustained yield for the purpose of providing a permanent source of timber supply, protecting watersheds, regulating stream flow, and contributing to the economic stability of local communities and industries, and providing recreational facilities…" (pg. 5).

- The Federal Land Policy and Management Act (FLPMA): Section 302 at 43 U.S.C. 1732(a), directs that "The Secretary shall manage the public lands . . .in accordance with the land use plans developed by him under section 202 of this Act when they are available . . ."

- Roseburg District Record of Decision/Resource Management Plan (ROD/RMP): The ROD/RMP (USDI, BLM 1995b), approved in accordance with the requirements of FLPMA, provides specific direction for timber management.

2. Roseburg District ROD/RMP Guidance

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

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

3. Watershed Level Guidance

The *Upper Umpqua Watershed Analysis version 3.0* (April 2002) identified that density management treatment is the highest priority in stands of the 40 to 59 year age classes (USDI, 2002; pg. 112). The stands in the O.M. Hubbard II were identified in the Upper Umpqua Watershed Analysis as being in the 40-49 and 50-59 year age classes (USDI, 2002; pg. 120, Figure 8-1). Managing young mid-seral stands would meet silvicultural objectives by maintaining conditions for growth, allowing for the development of large diameter trees in the shortest period of time possible. Expanding and improving interior habitat conditions; and

improving connectivity habitat between LSR units and late-successional habitat within the watershed would also meet wildlife and botany objectives (USDI, 2002; pg. 112).

The *South Fork Coos River Watershed Analysis* (July, 1999) recommended that density management in Riparian Reserves efforts focus on stands that were previously thinned and manage for landscape level diversity rather than attempting to maximize diversity within all stands (USDI, 1999; pg. 114). The South Fork Coos River Watershed Analysis gave no specific recommendations for density management treatments in upland portions of stands.

D. Objectives

The objectives of the proposed O.M. Hubbard II DMS include:

1) The primary objective is to evaluate if alternative thinning treatments accelerate development of late successional stand characteristics and vegetation communities (e.g., large trees, late-seral understory species) in young Douglas-fir forests of the Coast Range in western Oregon through implementation of the designed study (Cissel et al., 2006; pg. 16).

2) Comply with Section 1 of the O&C Act (43 USC § 1181a) which stipulates that O & C Lands be managed "… for permanent forest production, and the timber thereon shall be sold, cut, and removed in conformity with the principal of sustained yield for the purpose of providing a permanent source of timber supply, protecting watersheds, regulating stream flow, and contributing to the economic stability of local communities and industries, and providing recreational facilities…"

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

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

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

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

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

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

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

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

E. Decision Factors

Factors to be considered when selecting among alternatives will include:

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

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

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

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

- Partial recovery of the investment already made by the BLM contributing to the ongoing research and to the DMS program.

Chapter 2. Discussion of Alternatives

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

A. The No Action Alternative

The No Action Alternative provides a baseline for the comparison of the alternatives. This alternative describes the existing condition and continuing trends anticipated in the absence of the proposal but with the implementation of other reasonably foreseeable federal and private projects.

If the no action alternative were selected there would be no harvesting of timber or treatment of the mid-seral stands within the bounds of the project area at this time. Harvest at this location for purposes of analysis would be deferred for the foreseeable future. Selection of this alternative would not constitute a decision to re-allocate these lands to non-commodity uses.

Future harvesting in this area would not be precluded and could be considered again under a subsequent EA. Road maintenance would be on a sporadic "as needed" basis for the primary purpose of keeping roads open to traffic.

B. The Proposed Action Alternative

The Proposed Action would implement the treatments designed by the involved researchers, thus advancing the development of the project, as defined in the DMS study plan. The thinnings would be implemented through a timber sale that would yield approximately 763 MBF of timber. The proposed action consists of the following activities:

1. Timber Harvest

a) *Treatment Prescription*

The stand to be treated in O.M. Hubbard II is 50-55 years-old and was thinned previously in Phase I of the O.M. Hubbard project. Phase I commercial thinning treatments were implemented 1996-1998. The stand would be re-thinned with a proportional thinning design that would remove trees from all diameter classes. Many of the co-dominant and dominant trees would be removed since the majority of the intermediate and suppressed trees were thinned in the first thinning. Douglas-fir is the dominant tree species in the treatment area. Generally, minor species of conifer (e.g. grand fir, incense cedar, western red cedar, and western hemlock), trees less than nine inches DBH, and hardwoods would be reserved from harvest.

There would be three levels of treatment in O.M. Hubbard II targeting trees greater than or equal to nine inches dbh diameter: high residual density (65 trees/acre post-harvest), moderate residual density (35 trees/acre post-harvest), and low residual density (25 trees/acre post-harvest) (Table

1 and map in Appendix D). Riparian Reserves beyond the designated "no-harvest" buffers would be treated with the same treatment as the one used in the adjacent upland area.

Adjacent to, and interspersed between the proposed treatment areas are unthinned "leave islands", "riparian buffers", and "patch cuts" for which there are no planned treatments in this phase of the DMS.

Within each of the treatments, five trees per acre would be retained for future snag recruitment (already included in the retention levels in the preceding paragraph). Snag levels would be monitored for ten years following treatment. If mortality within the residual trees does not meet the target level for snags (i.e. five snags per acre) within ten years, then snags would be artificially created to meet the deficit (Cissel et al. 2006, pg. 12). Trees damaged from the harvest would be preferentially selected for girdling and recruited as snags.

In addition, within two years after completion of harvest activities, up to two trees per acre would be felled within each of the treatments as coarse woody debris. Existing, recently downed trees (class 1 or 2 logs) can be used to satisfy this requirement (Cissel et al., pg. 12). Trees damaged during harvest operations would be preferentially selected for falling and recruitment as coarse woody debris.

b) *Stream Buffers*

Within Riparian Reserves, variable-width "no-harvest" buffers were established in Phase I of the project (i.e. in 1996-1998) to protect stream bank integrity, maintain streamside shade and provide a filtering strip for overland run-off. Variable buffer width would be based on slope break and would have a minimum width of 50 feet measured from the edges of the stream channel. Actual widths would vary subject to an on-the-ground evaluation and consideration of factors such as unique habitat features, streamside topography and vegetation. These variable-width "no-harvest" buffers would be implemented again as configured in Phase I.

Heavy equipment operation would not be allowed within the "no-harvest" buffers. If necessary to fell trees within the "no-harvest" buffers for operational purposes, the felled trees would be left in place to provide in-stream wood and protection for stream banks.

c) *Timber Cruising*

Timber cruising has been done and used methods that included the felling of 67 sample trees in upland stands to formulate local volume tables. The environmental effects of sample tree felling were consistent with those described in the Roseburg District 3P Fall, Buck and Scale EA (EA# OR-100-00-06; USDI, BLM 2000). Felled sample trees would become part of the offered sale volume estimated to be 763 MBF.

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

d) *Firewood*

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

2. Timber Yarding

The Proposed Action would require a mix of skyline cable yarding (81 acres) and ground-based yarding (54 acres). Up to 10 acres of additional, incidental ground-based logging may be necessary (i.e. removal of guyline anchor trees, isolated portions of units, etc.) and would occur on gentle slopes (less than 35 percent), during the dry season.

3. Timber Hauling

Approximately 4.96 miles of rocked road and 1.26 miles of natural surfaced spurs would be used for the hauling of timber, for a total of 6.22 miles of haul route. Rocked roads would be either dry-season or wet-season haul while natural surfaced spurs would be limited to the dry-season.

4. Fuel Treatment

Prescribed burning of slash (burning under the direction of a written site specific prescription or "Burn Plan") would occur at machine-piled slash piles at logging landings (approximately 12 acres). Remaining fine fuels generated during thinning operations would be scattered throughout the treatment units.

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

The proposed project would include dry season and wet season logging activities and use existing roads to the greatest extent practical. Following the PDFs described on pg. 10, road construction, improvement, renovation, and decommissioning would be restricted to the dry season (normally May 15th to October 15th).

a) *Maintenance*

Approximately 4.96 miles of existing road would be maintained. Road maintenance would consist of maintaining drainage structures (culverts and drainage ditches), reshaping the road surface, surfacing with rock where needed, and brushing road shoulders where needed.

b) *Renovation*

Approximately 1.26 miles of existing spur roads (Spurs #1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, and 14 [*Note: there is no Spur #6.*]) would be renovated by blading the road surface and installing drainage structures.

Placement of rock on the surface of Spurs #1-5 and #7-14 was considered but would not be permitted since the spurs are designed with a 14 foot subgrade for natural surface, dry season haul. As analyzed, this subgrade would not meet BLM standards for surfacing with rock for winter haul without additional engineering and excavation.

c) *Decommissioning*

Natural surfaced spurs (Spurs #1-5 and #7-14) would be decommissioned by water-barring, and mulching with logging slash and some topsoil where available or with straw if logging slash is not available, and blocking with trench barriers (1.26 miles).

C. Project Design Features as part of the Action Alternative

1. To protect riparian habitat:

a. To protect aquatic resources within riparian areas a variable width streamside no-harvest buffer has been established along all streams. The buffer width is a minimum of 50 feet measured from the edges of the stream channel for all intermittent and perennial, non-fish bearing streams. There are no fish-bearing streams in the treatment units.

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

c. The integrity of the riparian habitat would be protected from logging damage by directionally felling trees away from or parallel to the Riparian Reserve (BMP I B2; RMP, pg. 130).

d. Prior to attaching any logging equipment to a reserve tree, precautions to protect the tree from damage shall be taken. Examples of protective measures include cribbing (use of sound green limbs between the cable and the bole of the tree to prevent girdling), tree plates, straps, and plastic culvert. If, for safety reasons, it would be necessary to fall a reserve tree then it would be left as coarse woody debris.

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

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

(1) Maintaining existing roads to fix drainage and erosion problems. This would consist of maintaining existing culverts, installing additional culverts, constructing drainage-relief ditchouts, stabilizing unstable cut and fill slopes, and replenishing road surface with crushed rock where deficient (BMP II H; RMP, pg. 137).

(2) Restricting road work (including renovation and decommissioning) and log hauling on naturally surfaced roads to the dry season which is normally May 15th to October 15th. Operations during the dry season would be suspended during periods of heavy precipitation. This season could be adjusted if unseasonable conditions occur (e.g. an extended dry season beyond October 15th or wet season beyond May 15th).

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

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

(5) During the same dry season as logging, 1.26 miles of spurs (Spurs #1-5 and #7-14,) accessing Matrix land would be decommissioned by water-barring, mulching with logging slash where available or with straw if logging slash is not available, and blocking with trench barriers. Mulch should cover approximately 25 percent of the road bed.

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

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

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

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

(1) Limiting ground-based logging in all units and subsoiling to the dry season (usually May 15th to Oct. 15th) when soils are least compactable (BMP I C2d; ROD/RMP, pg. 131). However, this season could be adjusted (e.g. an extended dry season or wet season) if unseasonable soil moisture levels would cause detrimental compaction (both old and new) to exceed 10 percent or more of the ground-based area. The Contract Administrator would approve all ground-based operation start-up dates.

(2) Operations would be suspended during unseasonably wet weather during the dry season. The soil scientist and the contract administrator would monitor soil moisture and compaction during unseasonably wet weather and would determine when operations may need to be suspended. Detrimental compaction is defined as a 15 percent or more gain in bulk density and alteration of the soil surface structure to a depth greater than four inches.

(3) Machines used for ground-based logging would be limited to a track width no greater than 10.5 feet (BMP I C2j; ROD/RMP, pg. 131); skid and forwarder trails would be limited to slopes less than 35 percent (BMP I C2b; ROD/RMP, pg. 131); yarding would be confined to designated skid and forwarder trails (BMP I C2c; ROD/RMP, pg. 131); skid trails would be spaced at least 150 feet apart on average; and harvester/forwarder trails would be spaced at least 50 feet apart where topography allows. Old trails would be used to the greatest extent practical.

(4) If harvester/forwarder equipment is used, harvesters would cut trees no further than twelve inches from the ground so that there would be enough stump clearance for subsoiling excavators. Harvesters would delimb trees in the trails in front of their advance to cushion against soil compaction.

(5) All main ground-based trails that have more than 50 percent exposed mineral soil would be subsoiled after thinning operations are complete. Trails that have less than 50 percent exposed mineral soil would also be subsoiled when field evaluation shows that detrimental compaction (e.g. 15 percent or more gain in bulk density and alteration of the

soil surface structure to a depth greater than four inches) is extensive enough to need subsoiling.

(6) Subsoiling of trail segments within five feet of tree boles would be avoided to limit damage to roots of residual trees. After subsoiling, mulching with logging slash (or straw if logging slash is unavailable) and some topsoil would be used to help re-establish soil microbial fauna.

d. **Measures to protect the duff and surface soil layer (RMP, pg. 36) would consist of:**
(1) Slash piles would be burned during the late fall to mid-spring season when the soil and duff layer moisture levels are high (ROD/RMP, pg. 140) and the large down logs have not dried. This practice would confine burn impacts to the soil underneath the piles and would lessen the depths of the impacts (i.e., loss of organic matter, change of soil physical properties, and alteration of soil ecology and soil nutrients).

e. **Measures to protect slope stability would consist of:**
(1) Spurs #1-5 and #7-14, located on stable benches and ridge top positions, would be renovated to a running surface width of 14 feet to minimize soil disturbance (BMP II C6; RMP, pg. 132).

(2) On very steep slopes (70 percent and greater) accessed by the rocked 25-8-1.0 road, no cable yarding would be permitted when soils are saturated, soil pores and voids between soil particles are filled with water, surface flow can be seen, or when water can be squeezed from a hand full of soil.

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

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

Within the O.M. Hubbard II density management study treatment units, snags and coarse woody debris would be retained or created in the following manner:

(1) Snags that are greater than 10 inches DBH and greater than 16 feet tall would be retained. Tree marking was designed to protect existing snags to the extent possible. Those that pose a safety concern would be cut and left for coarse woody debris.

(2) Snag levels would be monitored for ten years following treatment. If mortality within the residual stand does not meet the target level for snags (i.e. five snags per acre) within ten years, then snags would be artificially created to meet the deficit (Cissel et al. 2006, pg. 12). Trees damaged from the harvest would be preferentially selected for girdling and recruited as snags.

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

(4) Within two years after completion of harvest activities, up to two trees per acre would

be felled within each of the treatments as coarse woody debris. Existing, recently downed trees (class 1 or 2 logs) can be used to satisfy this requirement (Cissel et al., pg. 12). Trees damaged during harvest operations would be preferentially selected for falling and recruitment as coarse woody debris.

4. To protect air quality:

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

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

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

6. To protect cultural resources:

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

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

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

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

c. There are currently no known northern spotted owl sites, activity centers, or unsurveyed suitable habitat within 65 yards of the unit boundaries. Therefore, harvest activities (e.g. falling, bucking, and/or yarding) are not seasonally restricted due to northern spotted owl concerns, unless future surveys locate a nest site within 65 yards of the proposed treatment units.

d. Prescribed burning (i.e. slash piles) would not occur within 440 yards (0.25 mile) of any unsurveyed, suitable northern spotted owl habitat, or a known northern spotted owl nest site or activity center from March 1st through June 30th, unless current calendar year surveys indicate: 1) spotted owls not detected, 2) spotted owls present, but not attempting to nest, or 3) spotted owls present, but nesting attempt has failed. Waiver of seasonal restriction is valid until March 1st of the following year. Prescribed burning of slash piles at logging landings is proposed within 440 yards (0.25 mile) of unsurveyed, suitable spotted owl habitat and is therefore seasonally restricted from March 1st through June 30th.

e. Prescribed burning would not occur within 440 yards (0.25 mile) of unsurveyed marbled murrelet habitat from April 1st through August 5th. Prescribed burning of slash piles at logging landings is proposed within 440 yards (0.25 mile) of unsurveyed, suitable murrelet habitat and is therefore seasonally restricted from April 1st through August 5th.

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

The operator would be required to comply with all applicable State and Federal laws and regulations concerning the storage, use and disposal of industrial chemicals and other hazardous materials. All equipment planned for in-stream work (e.g. culvert replacement) would be inspected beforehand for leaks. Accidental spills or discovery of the dumping of any hazardous materials would be reported to the Authorized Officer and the procedures outlined in the "Roseburg District Hazardous Materials (HAZMAT) Emergency Response Contingency Plan" would be followed. Hazardous materials (particularly petroleum products) would be stored in appropriate and compliant UL-Listed containers and located so that any accidental spill would be fully contained and would not escape to ground surfaces or drain into watercourses. Other hazardous materials such as corrosives and/or those incompatible with flammable storage shall be kept in appropriate separated containment. All construction materials and waste would be removed from the project area.

D. Monitoring

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

E. Resources that Would be Unaffected by Either Alternative

1. Resources Not in Project Area

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

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

2. Cultural Resources

The project area was inventoried for cultural resources and none were discovered (May 1995, June 2007). It was determined that there would be no effect to any cultural resources since none were identified in the O.M. Hubbard II project area (May 1995, June 2007). The Oregon State Historic

Preservation Office concurs with the Swiftwater Field Office's determination of "no effect" on cultural resources (June 1995). Cultural resources will not be discussed further.

3. Native American Religious Concerns

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

4. Indian Trust Resources

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

5. Environmental Justice

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

6. National Energy Policy

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

7. Healthy Lands Initiative

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

8. Recreation

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

9. Visual Resources

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

10. Critical Elements of the Human Environment

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

Chapter 3. Affected Environment & Consequences by Resource

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

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

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

A. Forest Vegetation

1. Affected Environment

The forest stand in the proposed project area was burned in the Hubbard Creek fire of 1951. The area was salvaged logged and was both naturally and artificially regenerated. The stand in O.M. Hubbard II is approximately 50-55 years old and was precommercially thinned in 1970 and fertilized in 1972. As stated previously (pg. 1), Phase I treatments of the DMS were implemented in 1996-1998.

Vegetation data collected in 2003 (USDI, 2007b) was used in the Organon growth and yield model for analysis of effects of the proposed action. Table 2 (below) provides a summary of the existing stand condition in 2007 as projected with the Organon growth and yield model (Hann 2005) using the 2003 measurement dataset.

Table 2: Existing Stand Condition.

Treatment Type Description	Acres	Tree Density[1] (trees/acre)	Basal Area[1] (ft^2/acre)	Quadratic Mean Diameter (inches)	Canopy Cover	Average Crown Ratio[1]
Control Block	36	224	233	14	100%	0.33
Leave Islands	12	224	233	14	100%	0.33
Riparian Buffers	46	224	233	14	100%	0.33
High Density	52	97	128	15	82%	0.38
Moderate Density	80	70	106	16	66%	0.45

Low Density	3	35	61	18	36%	0.45
Patch Cuts	14	0	0	None	0%	None

[1] Tree density, basal area, and average crown ratio is calculated based on trees greater than or equal to 9" in diameter at breast height.

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

The previous treatments have enhanced the development of the various stand components of the project area. In the overstory, tree diameters and crown ratios are greater in the treated areas when compared to the untreated control area of the study (see Table 2) and (USDI, 2007b). Diameter growth rates in the previously treated areas are two to three times the rates in the previously unthinned areas (i.e. riparian buffers, leave islands, and control block). The live crown of trees in the treated areas has largely stopped receding (USDI, 2007b). As a consequence, trees in the treated areas have developed deeper, fuller crowns than trees in the untreated, control areas.

In the understory, previous Phase I treatments stimulated the growth of various vegetation components like herbs, shrubs, and tree seedlings and saplings. There is one and one-half times the shrub cover and twice the amount of herb cover in the previously thinned areas than in the unthinned areas. Tree seedling stocking in the previously thinned areas is twice the amount of that found in the previously unthinned areas (USDI, 2007b).

1. No Action Alternative

In the absence of treatment, overstory canopy cover would increase and crown ratios would decrease (Oliver and Larson, 1996). As a result, overstory tree diameter growth rates would decrease, growth rates (height and volume) of understory vegetation would decrease and mortality would increase except in the low residual density areas and in areas adjacent to the patch openings from Phase I. Of the three current residual thinning densities, only the low residual density areas from Phase I would have a high probability of providing a long-term contribution to the development of late-successional stand structure without further thinning (Brandeis et al., 2001; Chan et al., 2006).

The primary objective (pg. 4) to evaluate if alternative thinning treatments accelerate development of late successional stand characteristics and vegetation communities (e.g., large trees, late-seral understory species) in young Douglas-fir forests of the Coast Range in western Oregon would not be realized. The research and monitoring opportunities for Phase II of the DMS would also not be realized.

2. Proposed Action Alternative

Thinning would result in an increase in site resources (primarily light) to the residual overstory and understory plants. This should result in the maintenance of or an increase in overstory diameter growth rates, maintenance of current height to live crown base and increasing crown

ratios until such time as the stand recloses. Response levels are expected to correspond to the level of overstory density reductions, i.e. effects would be more pronounced at the lowest residual density level and least at the highest density. Substantial wind and/or sun scald damage to overstory trees is not expected since the residual trees have had 10 years to adapt to the more open conditions produced by the initial thinning in 1998.

Tree seedling, shrub and herbaceous cover could be reduced temporarily due to harvest activities, but increased post-thinning light levels should stimulate new germinants leading to increased cover, as well as accelerated growth rates of residual plants.

a) ***High Residual Density***

Thinning would reduce the stand to approximately 20-25 trees per acre, which would approximate the moderate residual density immediately following the original 1998 thinning. This should result in an increase in overstory diameter growth rates similar to that exhibited in the moderate residual density over the last 10 years. The potential for temporary reduction in tree seedling, shrub and herbaceous cover is greatest in this treatment due to the higher amount of overstory trees to be removed and resultant site disturbance. Understory growth response should also approximate the rates seen in the moderate residual density treatment over the last decade.

b) ***Moderate Residual Density***

Thinning would reduce the stand to approximately 12-15 trees per acre, which would approximate the low residual density immediately following the original 1998 thinning. This should result in an increase in overstory diameter growth rates similar to that exhibited in the low residual density over the last 10 years. The potential for temporary reduction in tree seedling, shrub and herbaceous cover is intermediate for this treatment due to the moderate higher amount of overstory trees to be removed and resultant site disturbance compared to the other two treatment intensities. Understory growth response should also approximate the rates seen in the low residual density treatment over the last decade.

c) ***Low Residual Density***

The low density retention prescription would create a high level of structural diversity within the treated area by further stimulating growth of understory vegetation and tree regeneration. Thinning would reduce the stand relative density to levels approximating the low end of the range recommended by Chan et al. (2006) for development of vigorous understory (approximately 8-10 trees per acre). This should result in the maintenance of current diameter growth rates similar to that seen over the last 10 years. The potential for temporary reduction in tree seedling, shrub and herbaceous cover is lowest for this treatment due to the low number of overstory trees to be removed and minor level of site disturbance compared to the other two treatment intensities. Understory growth response should also approximate the rates seen in the low residual density treatment over the last decade.

d) ***Patch Openings and Leave Islands***

Patch openings and leave islands would not be treated with a density management prescription. However, cable yarding corridors would be allowed through the patch openings

to facilitate harvest operations. These areas are expected to contribute to stand diversity both short and long-term (Harrington et al., 2005).

Table 3: Predicted Post-Treatment Stand Condition.

Treatment Type Description	Acres	Tree Density[1] (trees/acre)	Basal Area[1] (ft^2/acre)	Quadratic Mean Diameter (inches)	Canopy Cover	Average Crown Ratio[1]
Control Block	36	224	233	14	100%	0.33
Leave Islands	12	224	233	14	100%	0.33
Riparian Buffers	46	224	233	14	100%	0.33
High Residual Density	52	65	74	15	54%	0.38
Moderate Residual Density	80	35	44	16	31%	0.46
Low Residual Density	3	25	35	18	21%	0.45
Patch Cuts	14	0	0	None	0%	None

[1] Tree density, basal area, and average crown ratio is calculated based on trees greater than or equal to 9" in diameter at breast height.

3. Cumulative Effects

While the proposed treatment in Phase II of O.M. Hubbard II would reduce tree densities, it would not generally affect stand ages or seral stages in the short-term. In the long-term, the treatment would accelerate the development of late-successional (seral) stand conditions (i.e. the stand characteristics would be more similar to an older age class stand than is indicated by the overstory age).

Through 2009, the Swiftwater Field Office is planning to offer approximately 1,100 acres of commercial thinning or density management projects in mid-seral forest stands analyzed under the Upper Umpqua Watershed Plan (EA# OR-104-02-09). No regeneration harvests are currently planned to be offered within the Upper Umpqua watershed.

On private lands, some of these mid seral types of forests might be thinned but the majority are expected to be clearcut at some point in time. 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 young plantations or early and mid-seral forest type characteristics.

B. Wildlife

1. Federally Threatened & Endangered Wildlife Species

a) *Marbled Murrelet*

(1) Affected Environment

The proposed project area is located approximately 40 miles from the coast and occurs within Marbled Murrelet Inland Management Zone 2 (35-50 miles from the coast). The

project does not occur in suitable marbled murrelet habitat and there are no large, remnant green trees in the stand to provide suitable nesting habitat. The nearest suitable habitat is more than 200 yards from the project area.

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

(2) No Action Alternative

Under the no action alternative, approximately 207 acres of mid-seral habitat within the project area (i.e. treatment areas, leave islands, riparian buffers, and patch openings) would be expected to continue development of older forest conditions initiated after the Phase I treatment. Existing trees, snags, and coarse woody debriswould remain within the stand.

The vegetative development would continue until the overstory canopy begins to close, resulting in the shading out of shrubs, some hardwood trees, and conifer saplings. The scattered distribution of patch openings and low residual density areas within the project area would continue to provide vegetative development as well as openings that would provide future flight paths into the stand as the stand re-establishes crown closure.

(3) Proposed Action Alternative

The proposed action would further reduce tree densities, thus facilitating the continued development of future murrelet nesting habitat by increasing tree and limb growth rates. The Phase II treatments would facilitate the development of late-successional characteristics such as trees with large platform structures and a multi-storied canopy, sooner than through natural stand development. The scattered distribution of patch openings and low residual density areas would continue to provide openings that would allow flight paths into the residual stand for murrelets.

b) *Northern Spotted Owl*

(1) Affected Environment

The proposed unit falls within the provincial home range (i.e. 1.5 miles in the Coast Range) of three spotted owl sites which include six activity centers. The closest spotted owl site, Western Camp (IDNO 2146), is located 0.75 miles from the unit and the other activity centers are between 1.25 to 1.5 miles away.

Known Owl Activity Centers (KOACs) have been designated to minimize impacts and protect spotted owl nest sites found before 1994 (USDI, 2005). The Western Camp owl site was located after 1994 and so does not have a KOAC. The other two sites, Camp Creek (IDNO 1917) and Melrose (IDNO 2150), have established KOACs of 96 and 98 acres respectively. These KOACs are located more than one mile from the proposed project unit.

This project does not occur within spotted owl designated critical habitat, a specific geographical area designated by the US Fish and Wildlife Service as containing habitat

essential for the conservation of a Threatened and Endangered species. Therefore, there is no concern for spotted owl critical habitat.

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

Northern spotted owls are known to prey upon red tree voles but their importance as a prey item varies among geographic regions and individual owl pairs (Forsman et al., 2004). In the South Coast Range, which includes O.M. Hubbard II, red tree voles comprised 18.2 percent of the spotted owl diet based on number of prey items consumed and 4.2 percent of the diet based on biomass of prey items consumed (Forsman et al., 2004).

By comparison, the predominant prey item in the South Coast Range is the Northern flying squirrel which comprised 36.0 percent of the spotted owl diet based on number of prey items consumed and 38.6 percent of the diet based on biomass of prey items consumed (Forsman et al., 2004). The woodrat also comprises 18.2 percent of the spotted owl diet based on number of prey items consumed, but was the secondary food source based on biomass of prey consumed which comprised 37.1 percent of the diet (Forsman et al., 2004).

In this portion of the Northern spotted owl range, red tree voles are not a primary source of prey in the Northern spotted owl prey base. Any effects this project may have on red tree voles would therefore not have a significant effect on the northern spotted owl.

(2) <u>No Action Alternative</u>

Under the no action alternative, approximately 207 acres of mid-seral habitat within the project area (i.e. treatment areas, leave islands, riparian buffers, and patch openings) would be expected to continue development of older forest conditions initiated after the Phase I treatment. Existing trees, snags, and coarse woody debris would remain within the stand.

The vegetative development would continue until the overstory canopy begins to close, resulting in the shading out of shrubs, some hardwood trees, and conifer saplings. The scattered distribution of patch openings and low residual density areas within the project area would continue to provide vegetative development as well as openings that would provide future flight paths into the stand as the stand re-establishes crown closure.

The high and moderate residual density areas of the stand would continue to develop towards closed canopy conditions from their current canopy closure of 82 percent and 66 percent, respectively (Table 2). The three acres of low density treatment would progress from current 36 percent canopy closure (Table 2) to above the threshold for dispersal habitat (i.e. 40 percent canopy closure) within approximately five years.

The scattered patch openings, totaling 14 acres, have provided vegetative diversity which would continue to develop as the surrounding stand re-establishes crown closure. These areas will not function as dispersal habitat for approximately another 20-25 years, until crown closure reaches 40 percent or more but will provide habitat for other species (e.g. including prey species for the spotted owl).

Spotted owls would continue to use the proposed unit for dispersal and foraging at their current levels but use is expected to increase over the next ten to fifteen years as crown closure occurs.

(3) Proposed Action Alternative

Impacts to spotted owls due to density management would include modification of approximately 135 acres of dispersal habitat. The stand has the different treatment types (i.e. low, moderate, and high residual density) intermingled with the untreated stream buffer areas, leave islands, and existing patch openings from Phase I.

The variation in treatment across the 207 acres (including the treatment areas, leave islands, riparian buffers, and patch openings) would allow the stand to continue to function as dispersal habitat with an average, weighted post harvest crown closure estimate of 54 percent (calculated based on information in Table 3).

The proposed treatment would accelerate the development of large diameter trees, deeper crowns, and multiple canopy layers which are late-successional characteristics used by spotted owls. Accelerated development of late-successional characteristics in this stand would promote the transition of dispersal habitat into suitable roosting and foraging, and eventually nesting, habitat sooner than the no action alternative. Thus, the proposed action would make additional suitable habitat available to spotted owls earlier than the no action alternative.

The quality of the existing dispersal habitat would improve within approximately five to fifteen years as vertical and horizontal structure develops and canopy closure increases. The seventeen acres of low density (three acres) and patch openings (14 acres) do not currently function as dispersal habitat. The thinning of the low density stand from 35 to 25 trees per acre would result in those areas remaining non-habitat for a longer period of time but would allow for further development of vertical, vegetative layers and diversity.

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

Based on this evaluation, the Roseburg District Manager found that effects on northern spotted owl populations identified in the four reports are within those anticipated in the PRMP/EIS, and that the ROD/RMP goals and objectives are still achievable in light of the information from the reports (USDI, 2005). As such, it was also found that the latest information on the spotted owl does not warrant a change in ROD/RMP decisions pertinent to the spotted owl, and therefore does not warrant amendment or revision of the Roseburg District ROD/RMP. It was also found that the underlying analysis in the EIS

remains adequate for purposes of tiering NEPA analyses of northern spotted owl effects from proposed actions implementing the RMP.

2. Bureau Sensitive Wildlife Species

Those Bureau Sensitive species that are suspected to occur within the project area and that may be affected by the proposed action are discussed below. The remaining Bureau Sensitive species are discussed briefly in Appendices F and G.

a) *Bald Eagle*

(1) Affected Environment

There are no known bald eagle nest sites within the proposed project area. Based on current surveys (2007), the nearest known bald eagle nest site is approximately six miles to the east. The nearest large body of water is the Umpqua River and it is more than five miles to the east of the project area. The proposed project does not occur within suitable nesting habitat for the bald eagle, therefore there would be no disturbance or habitat concerns for the bald eagle. The proposed project area is located outside of the Umpqua River Corridor Bald Eagle Management Area.

(2) No Action Alternative

Under the no action alternative, the mid-seral habitat within the proposed harvest unit would be expected to continue development of older forest conditions initiated after the Phase I treatment. Existing trees, snags and coarse woody debris would remain within the stand.

The vegetative development would continue until the overstory canopy begins to close, resulting in the shading out of shrubs, some hardwood trees, and conifer saplings. The scattered distribution of patch openings and low residual density areas within the project area would continue to provide vegetative development as the surrounding stand re-establishes crown closure.

(3) Proposed Action Alternative

Thinning and density management would accelerate the development of late-successional stand characteristics which would include large diameter trees with large limbs and multiple canopy layers used by bald eagles for nesting and roosting. The proposed action alternative would further reduce tree densities, thus facilitating the continued development of future nesting and roosting habitat by increasing tree and limb growth rates.

b) *Purple Martin*

(1) Affected Environment

Purple martins nest in colonies within snag cavities located in forest openings, meadows, and other open areas. Although the project area does contain some smaller snags they are not located in open areas

typical of purple martin colonies. There are currently no known purple martin sites within the project area.

(2) No Action Alternative

Purple martins may utilize the stand within the proposed harvest unit in the areas of low density retention. These areas have the open areas typical of purple martin colonies even though snags may or may not be present.

(3) Proposed Action Alternative

Snags are expected to be retained in the proposed unit due to the protection afforded them in the project design features (EA, pgs. 13-14). Five additional trees per acre would be retained following harvest which would be available for future snag recruitment through natural means or would be created as needed if monitoring results indicate that there are insufficient snags within ten years after harvest (EA, pg. 13-14). The project area would continue to be suitable for purple martins to colonize the low residual density areas and the moderate residual density areas may also be suitable for colonization.

c) *Townsend's Big-eared Bat & Fringed Myotis*

(1) Affected Environment

The fringed myotis and Townsend's big-eared bat can roost in snags or trees with deeply furrowed bark, loose bark, cavities, or with similar structures typically found in late-successional conifers. Potential bat roosts are typically located within the overstory canopy. Surveys have not been conducted for either bat species since surveys are not practical, thus it is unknown if the Townsend's big-eared bat or the fringed myotis is present within the proposed project area.

The stand replacing fire in 1951 left no remnant snags. The few snags present today are small and do not provide the deep, furrowed bark or cavities necessary for bats. No caves were found within the harvest units during field review.

(2) No Action Alternative

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

(3) Proposed Action Alternative

As discussed under effects for the purple martin, existing snags are expected to be retained and/or recruited within ten years after harvest (EA, pgs. 13-14). Therefore, habitat for bats would be retained and potentially enhanced by the proposed action.

3. Cumulative Effects

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

The BLM manages 51,859 acres of conifer forest lands in the Upper Umpqua fifth-field watershed (Table 4). Of this total, there are 32,041 acres of late-seral stands representing 62 percent of forest lands managed by the BLM. In the Upper Umpqua fifth-field watershed there are approximately 14,805 acres of mid-seral forest stands managed by the BLM that would develop into late-seral forest stands over the next 20 to 30 years (Upper Umpqua Watershed Analysis, pg. 39).

Based on the Upper Umpqua Watershed Analysis (pg. 39), of the 72,917 acres of forested land in private ownership within the watershed there are approximately 34,765 acres of late-seral forest (refer to Table 4 below). The PRMP/EIS assumed (Vol. I, pg. 4-4) that ". . . most private forest lands would be intensively managed with final harvest on commercial economic rotations averaging 50 years." If timber harvest on private forest lands continues at a comparable rate, then late-seral forest habitat would be unavailable on private lands within the next 40 years.

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

Reasonably foreseeable timber management actions (through 2009) that the Swiftwater Field Office is planning within the Upper Umpqua Watershed include approximately 1,100 acres of commercial thinning or density management projects in mid-seral forest stands. These stands were previously considered for harvest under the Upper Umpqua Watershed Plan (EA# OR-104-02-09).

While thinning and density management would reduce tree densities in the treated stands, it would not affect overall stand ages, the ability of the stands to grow and develop into late seral habitat, or the current availability of late-seral forest habitat in the Upper Umpqua fifth-field watershed. Thinning treatments may temporarily reduce the utility of the density treatment area for certain wildlife species by removing canopy cover and horizontal structure, but canopy closure would begin to be evident again within 10 to 20 years. Variable density thinning, which means an uneven treatment across a stand, would result in greater variation in canopy closure and vegetative cover in forest stands, leading to future diversity in tree size, crown depth and vegetation.

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

Table 4. Forest Habitat within the Upper Umpqua Fifth-Field Watershed.

Forest Habitat	Private Lands[1] (acres)	Federal Lands[2] (acres)	Federal Lands In Reserves[3] (acres)	Total[1,2] (acres)
Late-Seral Forest (20 + inches diameter)	34,765	29,333	26,871	64,098
Mid-Seral Forest (6-20 inches diameter)	36,176	14,805	11,784	50,981
Early-Seral Forest (0-6 inches diameter)	1,976	7,721	6,359	9,697
Non-Forest Lands	37,857	236	0	39,093
Total	**110,774**	**52,095**	**45,014**	**162,869**

1. Acreages estimated based on the 1997 Interagency Vegetation Management Project dataset and forest change detection since 1972 (Upper Umpqua WA, April 2002, pg. 39).
2. Data obtained (April 2005) from Biological Assessment for the Roseburg District BLM FY2005-2008, Appendix B- Table B (pp. 168-169). Analysis determined using Forest Operations Inventory data.
3. Land allocations with no programmed timber harvest.

C. Fire and Fuels Management

1. Affected Environment

The project area is outside of the Wildland Urban Interface (WUI) boundary as identified in the Roseburg District Fire Management Plan (USDI, 2006). Current fuel conditions are low (estimated to be five to twelve tons per acre) throughout the area so the current risk of wildfire is low to moderate. There are 20 to 30 slash piles remaining from the Phase I treatment which would be incorporated into new slash piles created from the Phase II treatment.

2. No Action Alternative

Downed fuels would continue to gradually accumulate adding to the existing fuel conditions and the risk of wildfire would also gradually increase as fine fuels continue to accumulate.

3. Proposed Action Alternative

After treatment, the down woody debris would increase marginally over the project area depending on the type of treatment. Slash piles, totaling approximately 12 acres, would be burned at logging landings.

4. Cumulative Effects

Machine generated piles at landings would be burned to reduce concentrated fuel loads. Remaining fuels generated would be predominately small, less than three inches in diameter, and would be scattered over the harvest area. The additional amount down woody debris would not dramatically increase the fire risk to the area.

D. Soils

1. Soil Displacement & Compaction

a) *Affected Environment*

(1) Roads

The fourteen natural surfaced spur roads used during Phase I of O.M. Hubbard covered approximately 2.5 acres. The spur roads were subsoiled after treatment in 1998. Approximately 1.8 acres of the spur roads has substantial soil recovery due to subsoiling amelioration. Off-highway vehicle (OHV) traffic has created trails with bare, compacted soil on Spur #5 and parts of Spurs #2 and #8 (approximately 0.7 acres).

(2) In-Unit

In the central and northeast portion of the unit are gently sloping benches (5 to 35 percent slopes) that are separated by moderately steep slopes (35 to 60 percent) 100 to 150 feet in length. These soils are very deep (> 60 inches), well-drained, and have clay and silty-clay loam subsoils. There are small, scattered inclusions of similar soils in depressions that are somewhat poorly drained (i.e. have seasonably high water tables for short periods during the growing season). These clay and silty-clay loam textures are highly susceptible to compaction under moist conditions.

Most of the old ground-based harvest impacts are concentrated in the central and northeast portion of the unit in a dense pattern of skid trails and landings. Within these areas, mechanical soil displacement that exposed subsoil and compaction were extensive. Phase I of O.M. Hubbard further compacted soils that were compacted during the late 1950's and early 1960's. Currently, there is detrimental compaction covering approximately 25 percent of this region of the unit. Detrimental compaction is defined as an increase in bulk density of 15 percent or more and an alteration of soil structure (i.e. change to platy or massive structure) to a depth of at least four inches. Detrimental compaction can retard the growth of immediately adjacent trees by approximately ten percent (Adams, 2003). The exposed subsoil is heavily compacted and shows little topsoil development.

In the western portion of the unit is gentle to moderately sloping ground (20 to 60 percent). The soils are shallow to deep to very deep (i.e. 10 inches to more than 60 inches), well-drained, and cover brittle bedrock. Old ground-based impacts are present, but less extensive than in the central and northeast areas of the unit.

In the southwestern portion of the unit are steep mountain slopes (65 to 90 percent) that rise 900 feet above the bench topography. The soils are shallow to deep (10 to 60 inches), well-drained, and have loamy textures, many of which are gravelly. Scattered throughout this area are old skid trails that contour or angle up-slope.

The recovery of lost soil productivity in the unit where there are ground-based impacts is proceeding very slowly, especially where highly compacted subsoil is exposed. However, there are skid trail segments with some organic matter incorporation and soil structure development where native understory vegetation is growing well.

b) *No Action Alternative*

(1) Road Effects

The subsoiling of the spur roads done as part of Phase I accelerated the soil recovery process. Approximately 0.7 acres of old, existing spur roads that are compacted would continue gradually recover soil productivity. However, OHV traffic would continue

which would probably maintain some portion of the spur roads in an unproductive condition.

(2) In-Unit Effects

Soil productivity would continue to recover very slowly where there are old, ground-based impacts.

c) Proposed Action Alternative

(1) Road Effects

All 2.5 acres of spur roads would again be heavily compacted. Subsoiling would not occur during Phase II since the project is located on GFMA lands and future forest management that requires road access is anticipated here. Consequently, there would be a 2.5 acre loss in soil productivity due to roads. Mulching approximately 25 percent of the spur roadbeds with logging slash (from the PDFs, pg. 12) would reduce the OHV use of these roads.

(2) In-Unit Effects

The amount of detrimental compaction created by ground-based yarding greatly depends on slash levels, soil moisture, slope steepness, up-slope or down-slope haul, the type of equipment, operator technique and the number of passes (D. Cressy, 2006; pers. obs.). When the measures to limit soil compaction (PDFs, pg. 12) are considered, yarding with a tractor or rubber-tired skidder would create detrimental compaction on approximately six to seven percent of the ground. For a harvester-forwarder operation, detrimental compaction would be created on approximately one to three percent of the ground-based area (D. Cressy, 2006; pers. obs.). If old skid trails are used to the greatest extent practical (PDFs, pgs. 12-13), then the area covered by new detrimental compaction from O.M. Hubbard II would be less than three percent of the total ground-based area for both skidding and harvester-forwarder operations.

Skid trail segments with substantial amounts of detrimental compaction would be subsoiled and mulched with logging slash and some topsoil to help re-establish the soil microbial fauna and to lessen the impact to tree growth. Overall, soil productivity in the O.M. Hubbard II study area would be maintained at no-action levels in the short-term if approximately four acres of detrimentally compacted trails and log deck areas were to be subsoiled (Appendix H, Table 3). This amount of subsoiling would offset losses to soil productivity from new spur and ground-based compaction.

Skyline cable-yarding corridors would cover about three percent of the area that is cable yarded (Adams, 2003). Soil compaction would typically be absent or light with little soil displacement in these cable-yarding corridors, because intermediate supports would be required where necessary to achieve one-end suspension (D. Cressy, 2007; pers. obs.). Light compaction would mostly be confined to the topsoil and would heal satisfactorily without further mitigation (D. Cressy, pers. obs.).

(3) Cumulative Effects

When both road and in-unit effects of the proposed action are considered, soil productivity would be maintained following implementation of the proposed action. However, a net improvement to soil productivity would be expected in the long-term because old and new surfaces with detrimental compaction would continue to recover. Very slow recovery would occur where not subsoiled and accelerated recovery would

occur where subsoiled and mulched.

2. Landslides

a) *Affected Environment*

Based on an aerial photo landslide inventory (1965 to 2004) and field observations, ten post-wildfire or post-timber salvage landslides were identified within the unit boundary between 0.03 to 0.5 acres in size (D. Cressy, 2007; pers. obs.). All ten landslides first appeared on the 1965 aerial photos and were likely the result of the December 1964 rain-on-snow event, considered a one-hundred year event.

Six of the landslides were road-related failures and four were harvest related. Two of the road-related landslides were medium-sized debris flows about 0.35 acres each in size that impacted a first-order stream in the South Coos River watershed. The four other road-related landslides and four harvest-related landslides did not reach streams.

About 14 acres of the steep mountain slopes (65-90 percent) in the western portion of the unit are considered potentially unstable for shallow-seated landslides. This area would be classified under the TPCC system as FGR (i.e. soils considered fragile due to slope gradient but suitable for forest management with mitigation for surface erosion and landslides). Approximately eighty-five percent (12 of the14 acres) of FGR are isolated from streams by benches and moderate slopes. No tension cracks or fresh scarps were discovered from the field investigation, indicating that no slopes are actively failing.

The O.M. Hubbard II spur roads are located on stable, gentle slopes (i.e. bench and ridge-top positions). During Phase I of O.M. Hubbard, no slope instability developed at these spur locations during construction, use, or subsoiling. In addition, the drainage from these spur roads did not create instability down-slope during Phase I.

b) *No Action Alternative*

(1) Road Effects

The spurs in their current condition would continue to be stable and would not create instability down-slope.

(2) In-Unit Effects

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

- No apparent in-unit landslides have occurred since the December 1964 storm events even though there have been several large, long-return-interval events, including the November 1966 storm-event.
- No actively failing slopes were discovered on the FGR ground as evidenced by the absence of tension cracks that indicate periodic, sudden soil movement or soil creep (D. Cressy, 2007; pers. obs.).

- A recurrence of the circumstances that triggered the in-unit landslides (i.e. a one-hundred year storm event shortly after a stand-replacing fire and salvage) is not reasonably foreseeable.

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

- Streams are isolated from 85 percent of FGR slopes by benches and moderate slopes.
- Small landslides, the most likely size to occur, rarely exceed 180 feet in travel.

Landslide effects to soil productivity would be inconsequential in the absence of either a stand-replacing fire or renewed landslide activity caused by intense-long return interval storms. Both of these events have a low probability of occurring over the span of the O.M. Hubbard II study.

c) *Proposed Action Alternative*

(1) Road Effects

The spurs would not cause instability because of their stable locations and because water bars would disperse road drainage. Dispersed road drainage would prevent concentration of runoff on potentially unstable slopes below.

(2) In-Unit Effects

The FGR slopes generally have low risks of slope failure (less than 10 percent) under unthinned mid-seral, mature and old growth stand conditions. The Oregon Department of Forestry found that landslide numbers and volumes were the lowest in mid-seral stands (ages 31 to 100 years) following the intense 1996 storms (ODF Forest Practices Technical Report No. 4, p. 64). The FGR slopes in O.M. Hubbard II are in the moderate residual density prescription area. With the proposed second treatment, canopy cover would be reduced from approximately 66 percent to 31 percent (Tables 2 & 3). With this degree of canopy reduction, the landslide risks would increase from low to low-to-moderate.

If landslides do occur, then they would likely be small to moderate in size (e.g. up to 0.2 acre), few in number, and cumulatively not expected to exceed 0.3 acres. Where landslides can initiate inside the unit and reach a stream (i.e. on two acres of FGR slopes), there would be a moderate risk of these landslides reaching a stream.

(3) Cumulative Effects

The landslide aerial photo inventories of the Upper Umpqua Watershed show an overall downward trend in landslide incidence over the past 50 years. The downward trend, in part, corresponds to improved management practices.

With continued road maintenance, landslides on BLM-administered lands would continue to be substantially lower than historically-observed highs. Because of improved management practices since the 1970's, and the presence of Riparian Reserves, the spatial and temporal distribution of landslides and their effects would more closely resemble those within relatively unmanaged forests (Skaugset and Reeves, 1998). This

distribution of landslides would be approaching the range of natural variability and would serve as a mechanism to deliver large woody debris to streams.

3. Erosion & Sedimentation

a) *Affected Environment*

(1) Road Effects

The existing spur roads are producing little to no erosion or sedimentation except where OHV traffic has created trails with bare, compacted soil on Spur #5 and parts of Spurs #2 and #8.

(2) In-Unit Effects

Current levels of surface erosion and sediment transport inside units are low to none because:

- Canopy cover, understory vegetation, duff slash, and woody debris dissipate rainfall energy and are barriers to water flow/sediment movement.
- Well developed natural soil structure and porosity outside of old ground-based impacts allow high water infiltration rates into the soil.
- Where detrimental compaction and soil displacement has reduced soil porosity, the predominance of gentle slopes help keeps soil erosion low.
- Riparian no-cut buffers provide filtering.

b) *No Action Alternative*

(1) Road Effects

The level of erosion would continue to be low to none except where there is ATV traffic. ATV use of Spurs #2, #5, and #8 would probably continue and could expand to other spurs until further tree and shrub growth prevents this possible expansion. Streams would likely not be affected.

(2) In-Unit Effects

The amount of soil erosion and sedimentation would be unchanged from the affected environment condition (i.e. low to none).

c) *Proposed Action Alternative*

(1) Road Effects

There would be a first season flush of sediment from the renovated spur roads during the first wet season following harvest. Road-derived sediment would filter into the forest floor. The proposed road renovation would not be connected to the drainage network. Since road segments must be connected directly to channels in order to deliver sediment-laden water to the stream (e.g. through ditch-line drainage, stream crossings, and road water runoff routed directly to the stream channel), the proposed road renovation would have no effect on stream sediment.

(2) In-Unit Effects

There would also be a first wet season flush of sediment from ground-based yarding trails and cable-yarding corridors. The amount of sediment generated from yarding trails and cable-yarding corridors would be too small to reliably measure. In addition, little of this sediment would reach streams because high soil infiltration, understory vegetation, logging slash, and other woody debris within the unit and riparian no-cut buffers would intercept sediment.

(3) Cumulative Effects

Sediment generated from the proposed action would filter into the forest floor and would not reach streams because high soil infiltration, understory vegetation, logging slash, and other woody debris within the unit and riparian no-cut buffers would intercept sediment.

E. Hydrology

1. Stream Temperature, Water Quality, & Beneficial Uses

a) *Affected Environment*

There are 10 first-order and 2 second-order headwater streams within the proposed unit. These streams drain into Hubbard Creek between approximately 0.5 and 1 mile upstream of Hubbard Creek's confluence with Camp Creek. Hubbard Creek is currently not listed on the Oregon 303(d) list for any water quality parameters (ODEQ, 2006).

The affected beneficial use of water within the project area is aquatic life. Beneficial uses of water downstream of the project area consist primarily of: livestock watering, domestic water supply, irrigation, and fish and aquatic life.

No surface water rights for domestic use exist within one mile downstream of the proposed treatment units. Although very distant from the water intake (approximately 50 stream miles), the project site is located within the city of Elkton's Drinking Water Protection Area. However, no effect to domestic water users is expected as a result of the proposed project and water rights will not be discussed further in this document.

b) *No Action Alternative*

There would be no expected change to stream temperature, water quality (e.g. sedimentation), or Beneficial Uses of Water under the No Action Alternative.

c) *Proposed Action Alternative*

(1) Water Temperature

There would be density management treatments in Riparian Reserves but there are no treatments proposed within the primary shade zone (i.e. the area providing shade during peak solar radiation between 1000 and 1400 hours) due to the variable width no-harvest buffers along the streams. Because of the relatively insignificant influence of trees outside the primary shade zone on stream temperature (Northwest Forest Plan Temperature TMDL Implementation Strategies, 2005), density management treatment in Riparian Reserves is expected to have no measurable impact to the stream temperature.

(2) Water Quality (e.g. Sedimentation)

No-harvest buffers would be established for all streams adjacent to proposed units. These no-harvest buffers would prevent disturbance to stream channels and stream banks and would intercept surface run-off allowing for deposition of any sediment transported by overland flow before it reached active stream channels.

Under this alternative, there would be one road renovated within the no-harvest buffer (Spur #2). This entry would be on an existing spur road that was used for timber harvest in 1996-1997 and was afterward subsoiled and therefore would not require the removal of trees within the no-harvest buffer. This entry through the no-harvest buffer would be the same as done in the 1996-1997 treatment and would be necessary in order to access an area of treatment. The no-harvest riparian buffer was delineated during the first treatment of the study, but subsequent field assessment has not identified any stream features within 300 ft of where the spur would cross the no-harvest buffer.

The proposed road renovation would not be connected to the drainage network. Since road segments must be connected directly to channels in order to deliver sediment-laden water to the stream (e.g. through ditch-line drainage, stream crossings, and road water runoff routed directly to the stream channel), the proposed road renovation would have no effect on stream sediment.

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

As identified in the discussion of effects to soils (EA, pg. 32), there are two areas where timber harvest could increase the probability of small landslides capable of reaching two streams from low to light-to-moderate. Both of the streams that could be impacted by the landslides are first-order, high-gradient headwater streams that have the potential to transport sediment downstream. In the event that a landslide does occur that reaches either stream, the sediment [which typically has high amounts of gravel in this area (Upper Umpqua Watershed Analysis, pg 67)] is likely to be deposited over time in 3rd order or greater streams where the gradient is less (Benda et al., 2005). Because many of the 3rd order and greater streams in this area are lacking smaller substrate, the impact of the debris flow downstream of the headwater streams would be positive over time as the fine materials are transported further downstream and the gravels are deposited.

2. Stream Flow (Water Yield & Peak Flow)

a) *Affected Environment*

Average annual precipitation in the Upper Hubbard Creek (7th Field HUC) and Cedar Creek (6th Field HUC) drainages ranges from 50 to 54 inches and 52 to 78 inches respectively, occurring primarily between October and April. Precipitation occurs as both rainfall and snow since approximately 50% of the Upper Hubbard Creek drainage and 40% of the Cedar Creek drainage is above or equal to 2,000 feet in elevation. Therefore, more of the annual streamflow is concentrated to between October and April (Harr, et. al., 1979).

The area above 2,000 feet elevation receives alternating rain and snow during the winter and is called the transient snow zone (TSZ) (Upper Umpqua Watershed Analysis, pg 1). If a large acreage of timber harvest or burned area is within the TSZ, there may be increased peak flows due to the TSZ effect (Chirstner and Harr, 1982, pg. 15; Moody and Martin, 2001, pg. 2,990). The TSZ effect is the effect of warm rain-on-melting snow in openings created within the TSZ where there is less vegetation to intercept precipitation.

b) *No Action Alternative*

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

Within the Upper Hubbard Creek and Cedar Creek drainages, roads occupy approximately four and five percent of the land, respectively. Therefore, no statistically significant increase in peak flows would be expected to occur due to road effects. Also, with no change in the vegetative cover there would be no change in the average water yield from the Upper Hubbard and Cedar Creek drainages.

c) *Proposed Action Alternative*

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

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

No measurable effect to peak flow would be anticipated as a result of the proposed action because O.M. Hubbard II would involve approximately two percent or less of the Upper Hubbard Creek and Cedar Creek drainages. Approximately 50 acres of the proposed unit is in the TSZ. Because the amount of area harvested in the TSZ represents such a small amount of the drainage (approximately 0.5 percent of Upper Hubbard Creek and 0.05 percent of Cedar Creek) the treatment would have no potential to impact the amount or timing of snow-melt runoff in the drainages.

3. Cumulative Effects

Reasonably foreseeable future actions within the Upper Umpqua and South Fork Coos River Watersheds (5th Field HUCs) include continued private and Federal forest management. As stated previously (EA, pg. 21), the Swiftwater Field Office is planning to offer approximately 1,100 acres of thinning and/or density management projects of mid-seral forests as considered under the Upper Umpqua Watershed Plan (EA# OR-104-02-09) through 2009. No regeneration harvests are currently planned to be offered within the Upper Umpqua watershed through 2010, but there is approximately 68 acres of regeneration harvest (Diamondback) that may be re-analyzed by 2010.

Several studies have shown that the first storms of fall have the most increase in peak flow from pre-logging conditions (Rothacher 1973; Harr et al. 1975; Harr et al. 1979; Ziemer 1981). These fall storms are generally small and geomorphically inconsequential (Harr 1976). Large peak flows occur mid-winter after soil moisture deficits are satisfied in both logged and unlogged watersheds (Ziemer and Lisle, 1998, pg.60). Increases in peak or storm flows in winter and spring can alter channel morphology by flushing smaller substrate, causing the channel to downcut and increase stream bank failures.

Studies on increased peak flows are varied in their findings on how much increase in flow would result from a given amount of timber harvest. Most studies agree that the effects of harvest treatment decreases as the flow event size increases (Rothacher, 1971, pg. 51; Rothacher 1973, pg. 10; Wright et al., 1990; Moore and Wondzell, 2005) and is not detectable for flows with a two year return interval or greater (Harr, et al., 1975, pg. 443; Ziemer, 1981, pg.915; Thomas and Megahan, 1998, pg. 3402; Thomas and Megahan, 2001, pg. 181). At the drainage scale (7th Field HUC), there may be short- and long-term increases in peak flows of small (less than two year return interval) storm events; this effect would decrease over time. As small streams form larger drainage networks, the ability of individual small watersheds to affect streamflow decreases (Garbrecht, 1991). As a result, peak flow increases following harvesting at the drainage level are likely to be undetectable further downstream.

Road densities and condition within the Upper Umpqua and South Fork Coos River Watersheds would remain the same into the reasonably foreseeable future. At present the road densities are approximately four percent for both watersheds, which is not sufficient to cause a measurable increase in peak flows.

"No-harvest" buffers would be established on all streams adjacent to the proposed unit. These "no-harvest" buffers would prevent disturbance to stream channels and stream banks. They would also intercept surface run-off and prevent sedimentation of streams, such that there would

be no cumulative degradation of water quality in the Upper Umpqua and South Fork Coos River Watersheds.

F. Fish Populations & Habitat

1. Affected Environment

On October 9, 2007 in Trout Unlimited v. Lohn (CV-06-1493-ST), U.S. District Court Judge King ordered the National Marine Fisheries Service (NMFS) to issue a new final listing rule for the Oregon Coast coho salmon (*Oncorhynchus kisutch*) consistent with the Endangered Species Act (ESA) within 60 days of the Court's decision. On October 26, 2007, Judge King granted NMFS' request to extend its deadline to issue a new final listing rule until February 4, 2008.

On November 27, 2007, the National Marine Fisheries Service (NMFS) notified the OR/WA BLM that the Oregon Coast coho salmon was proposed for listing as threatened under the ESA. The BLM is required to confer with NMFS on any action that the BLM determines is "likely to adversely affect" the Oregon Coast coho salmon. There is no requirement for the BLM to confer with NMFS on actions that are determined to be "not likely to adversely affect" proposed species. The Oregon Coast coho is also considered a Bureau Sensitive species.

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

There is one fish bearing stream (unnamed Hubbard Creek tributary) adjacent to the proposed unit. It is 300 feet away from the unit at the closest point. This stream contains coastal cutthroat trout (McEnroe, 2007; pers. obs.). The proposed haul route for O.M. Hubbard II has one perennial fish bearing, two perennial non-fish bearing, and 19 intermittent or ephemeral stream crossings. Ditch-lines along the haul route are well-vegetated or armored. Cross drains along the haul route are spaced appropriately. The shortest distance between the project downstream to the extent of coho salmon distribution is 1.6 miles.

The Oregon Department of Fish and Wildlife (ODFW, 1994) has conducted stream habitat surveys in the Upper Umpqua Watershed. These surveys generally show that fish-bearing streams within the watershed lack large wood, contain a high percentage of fine sediment within the stream channels, and have substrates dominated by bedrock (USDI, 2004; Chart 7-2). With the exception of Hubbard Creek, streams within the project area consist of high gradient, non-fish bearing, and ephemeral streams of the first- and second-order. Hubbard Creek is dominated by gravel and cobble substrates, and has a good riparian conifer density (McEnroe, 2007; pers. obs.).

2. No Action Alternative

Fish species and populations would remain unaffected. The riparian habitat adjacent to the aquatic environment on both fish-bearing and non-fish bearing streams consists primarily of dense mid-seral stands of Douglas-fir. These stands would continue to mature and develop late-

successional characteristics over time. However, due to the high tree density late-seral forest characteristics would develop slowly, resulting in the continued development of coarse woody debris components that are small in size and structure.

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

3. Proposed Action Alternative

a) *Large Woody Debris and Stream Temperature*

The proposed action would maintain existing levels of large woody debris and protect the mechanisms for future recruitment to benefit aquatic organisms due to establishment of Riparian Reserves and variable stream buffers along streams. No-harvest buffers of 100 feet along fish-bearing streams would maintain stream shade and protect large woody debris sources. The variable width no-harvest buffers of at least 20 feet would maintain stream shade on the intermittent and ephemeral streams within the project area. As stated previously (EA, pg. 35), density management treatment in Riparian Reserves is expected to have no measurable impact to stream temperatures. Fish habitat within the drainages would be unaffected with respect to large wood and stream temperatures.

b) *Channel Geometry*

Without a measurable increase in peak flows (EA, pgs. 36-37) and/or sediment (EA, pg. 35-36) there would be no mechanism to change channel geometry. Fish habitat within the project area would be unaffected with respect to channel geometry.

c) *Fine Sediment and Substrate*

As stated previously (EA, pgs. 35), the amount of sediment contributed from stream crossings during the first seasonal rains would be negligible when compared to the amount of initial sediment flush from ephemeral channel beds and stream banks in response to the first seasonal rains. Therefore, there would be no effect to fish or fish habitat from sediment as a result of this project.

d) *Fish Passage*

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

4. Cumulative Effects

Sediment regime, stream temperature, water chemistry, peak flows, and water yield together influence fish habitat or aquatic species. Since stream temperature and water chemistry would not be influenced by the proposed action and changes in sediment would be negligible (EA, pgs. 35-36), fish habitat and aquatic species would not be affected. Therefore, the Swiftwater Field Office has determined that the proposed O.M. Hubbard II project is a "*may effect, not likely to adversely affect*" for the proposed threatened Oregon Coast coho salmon.

Changes in peak flows and water yield from the project do not have the capacity to alter channel morphology (EA, pgs. 36-37) and effects would be indistinguishable from background levels at the fish-bearing streams downstream of the project. Therefore, fish habitat and aquatic species populations would not be incrementally affected by the proposed action at the project level nor would they add to the cumulative effects at the fifth-field watershed.

5. Essential Fish Habitat

Essential Fish Habitat (EFH) is designated by the Magnuson-Stevens Fishery Conservation and Management Act of 1996 as habitat that is currently or was historically available to Oregon Coast coho and chinook salmon (Federal Register 2002 Vol. 67, No. 12). The nearest EFH is located more than two miles downslope of the project. Oregon Coast coho and steelhead were surveyed for up to two miles downstream of the project and were not detected. Presumably, there is a barrier to anadromous fish migration downstream of the project on Hubbard Creek but the exact location of the barrier is unknown.

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

Water quality/Water quantity – There would be no measurable effect to water quality or water quantity (EA, pgs. 36-37) as a result of the proposed action.

Substrate characteristics – There would be no measurable effect to substrate as a result of sediment (EA, pgs. 35-36, 39).

Large woody debris (LWD) within the channel and LWD source areas – There would be no effect to LWD or source areas (pg. 39).

Channel geometry – There would be no measurable impact to fisheries or aquatic organisms from peak flows capable of altering the channel geometry (EA, pg. 36-37, 39).

Fish passage – There would be no effect to fish passage. There are no new crossings along fish bearing streams and the stream crossings that are over fish-bearing streams allow passage of adult and juvenile salmonids under all flow conditions (EA, pg. 38, 39-40).

Forage species (aquatic and terrestrial invertebrates) – Forage for coho and Chinook salmon would remain unaffected. Riparian vegetation would continue to provide sources of terrestrial invertebrates. Aquatic invertebrate populations would be unaffected since there is no measurable effect to water quality or substrate (EA, pgs. 35-38).

Federal agency conclusions regarding the effects of the action on EFH:
The proposed action "*Will Not Adversely Effect"* (WNAE) EFH for coho or Chinook salmon in Hubbard Creek or its tributaries.

Proposed mitigation (if applicable):
Without any mechanisms for an adverse affect on EFH, there are no mitigation measures proposed.

6. Aquatic Conservation Strategy

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

a) *ACS Components:*

(1) Riparian Reserves (ACS Component #1)

Riparian Reserves were established. The ROD/RMP (pg. 24) specifies Riparian Reserve widths equal to the height of two site potential trees on each side of fish-bearing streams and one site-potential tree on each side of perennial or intermittent non-fish bearing streams, wetlands greater than an acre, and constructed ponds and reservoirs. The height of a site-potential tree for the Upper Umpqua Watershed has been determined to be the equivalent of 180 feet (Upper Umpqua Watershed Analysis, pg. 3). Approximately 36 acres of the treated unit are within Riparian Reserves. One of the objectives within the DMS is to assess the combined effects of density management and alternative buffer widths on aquatic and riparian ecosystems (Cissel et al., 2006, pg. 4).

(2) Key Watersheds (ACS Component #2)

Key Watersheds were established "as refugia . . . for maintaining and recovering habitat for at-risk stocks of anadromous salmonids and resident fish species [ROD/RMP, pg. 20]." There are no key watersheds within the Upper Umpqua 5th field Watershed.

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

In developing the project, the Upper Umpqua Watershed Analysis was used to evaluate existing conditions, establish desired future conditions, and assist in the formulation of appropriate alternatives. The Upper Umpqua Watershed Analysis is available for public review at the Roseburg District office or can be viewed under "Plans & Projects" on the Roseburg District website at www.blm.gov/or/districts/roseburg/index.htm.

Existing watershed conditions are described in the hydrology (EA, pgs. 34-38) and fisheries (EA, pgs. 38-41) sections of the EA and in the Upper Umpqua Watershed Analysis. The short- and long-term effects to aquatic resources are also described in these sections of the EA.

(4) Watershed Restoration (ACS Component #4)

One of the objectives within the DMS is to assess the combined effects of density management and alternative buffer widths on aquatic and riparian ecosystems (Cissel et al., 2006, pg. 4).

Additionally, since 1994, some stream enhancement projects have been implemented in the Upper Umpqua Watershed. This includes placing instream structures (e.g. logs, boulders, root wads, etc…) to improve aquatic habitat along at least four miles of stream and replacing at least eight culverts identified as barriers to fish passage to provide access to additional habitat.

While not previously identified as "stream enhancement projects", other road improvement and decommissioning activities have been done that provided functional enhancements to the riparian system through reduction in fine sediment input and improving fish passage and habitat. This work has been done in collaboration with private timber companies, Oregon Department of Fish and Wildlife (ODFW), and the BLM.

Future opportunities for restoration are discussed in the Upper Umpqua Watershed Analysis (USDI, 2002). In the watershed analysis, approximately 82 miles of road were identified for improvement or decommissioning, 30 miles of stream for instream restoration and 32 culverts for replacement. This work would be implemented as budgets allow. In 2008 through 2009, instream structures are planned to be placed in 11 miles of stream in the Rader-Wolf 6th field drainage.

b) *Range of Natural Variability within the Watershed:*

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

Natural disturbance events to aquatic systems in the Pacific Northwest include wildfires, floods, and landslides. Average fire return intervals at the drainage scale were calculated between 50 and 75 years, prior to the advent of fire suppression. The more destructive stand replacement fires occurred irregularly at intervals up to 350 years (USDI, 2002; pg. 23).

Timber harvesting and road construction over the past 50 years have substantially increased the frequency and distribution of landslides above natural levels in the Upper Umpqua Watershed. However, there is a downward trend in landslide incidence over the last 50 years that is associated with improved management practices (USDI, 2002; pg. 116). On BLM land, future landslides, during large storm events, are expected to deliver large wood and rock fragments to lower-gradient streams. These events would more closely resemble landslides within relatively unmanaged forests. These disturbance events are the major natural sources of sediment and wood to a stream system and are very episodic in nature.

Due to the dynamic nature of these disturbance events, stream channel conditions vary based on the time since the last disturbance event. This results in a wide range of aquatic habitat conditions at the site level. Site level habitat conditions can be summarized by ODFW habitat surveys. Surveys have been conducted throughout the Upper Umpqua Watershed mostly in the third through sixth-order streams. Approximately 20 stream reference reaches in the Coast Range of the Umpqua Basin were used to compare against all surveyed streams. These relatively unmanaged reaches represent the variability of conditions within natural stream systems as well as characteristics desirable for a variety of fish species (including salmonid habitat). When compared to these "reference streams", aquatic habitat survey data from the Upper Umpqua Watershed indicates that most of the tributaries are lacking large woody debris. It is considered atypical for most streams within the watershed to be devoid of wood at the larger 5th field scale. Therefore, at this larger scale, aquatic habitat conditions are considered to be outside the range of natural variability.

Because of its dynamic nature, sediment effects to streams can only be described in general terms. It is important to remember that ODFW instream habitat data is a snapshot in time. When compared to reference reaches, sediment conditions in many of the tributaries of the Upper Umpqua Watershed appear to be lacking gravel substrate when compared to the reference reaches.

Stream temperatures vary naturally in this watershed as a result of variation in geographic location, elevation, climate, precipitation, and distance from the source water (USDI, 2002; pg. 88). Stream temperatures also naturally vary as a response to the natural disturbance events mentioned in the previous paragraphs, as well as current practices on private forest, agricultural, and residential properties. Due to the large amount of conversion of forest into farmland that has occurred over the last 150 years, coupled with management-induced channel widening, irrigation withdrawals, and loss of gravels, it is likely that stream temperature increases have been greater over larger spatial and temporal scales than observed naturally. One of BLM's objectives for managing Riparian Reserves is to attain and maintain water quality standards (ROD/RMP, pg. 16) which typically includes water temperature as one of the water quality parameters. Riparian Reserves would help attain and maintain water quality standards relating to temperature by providing adequate stream shading.

Changes in stream flow can result from consumptive water withdrawals and effects of land use activities on storm runoff, infiltration, storage and delivery. Commercial and domestic withdrawals are common along the Upper Umpqua River and its' tributaries. There is evidence that previous management has heavily influenced stream channels throughout the Upper Umpqua Watershed (USDI, 2002; pg 90). Over the last 150 years, much of the lower elevation forest land has been converted to farmland. Many tributaries within the Upper Umpqua Watershed have also been cleaned (had large wood removed) or salvage logged. BLM Forest management in the Upper Umpqua Watershed would be designed to reduce or prevent watershed impacts in order to meet ACS objectives (ROD/RMP, pg 25).

Table 5. Individual Aquatic Conservation Strategy Objective Assessment: O.M. Hubbard II.

ACS Objective	Site/Project Scale Assessment	5th Field Watershed Scale Assessment
	Scale Description: Approximately 83% of this project is located in the Upper Hubbard	Scale Description: This project is located in the Upper Umpqua 5th field watershed and

ACS Objective	Site/Project Scale Assessment	5th Field Watershed Scale Assessment
	Creek 7th field drainage of the Upper Umpqua Watershed and 17% is located in the Cedar Creek 6th field drainage of the South Fork Coos River watershed. The Upper Hubbard Creek 7th field and Cedar Creek 6th field drainages are roughly 5,600 and 34,800 acres in size, respectively. The BLM manages approximately 2,540 acres in Upper Hubbard Creek (45%) and 3,460 acres in Cedar Creek (10%). The unit proposed for treatment represents approximately 2% and 0.1% of the total drainage area for Upper Hubbard Creek and Cedar Creek drainages, respectively, and 4% and 1%of the BLM-managed lands in the said respective drainages.	South Fork Coos River 5th field watershed. The Upper Umpqua and South Fork Coos River watersheds are roughly 169,800 and 134,900 acres in size, respectively. The BLM manages approximately 58,700 acres in the Upper Umpqua watershed (35%) and 28,800 acres in the South Fork Coos River watershed (21%). The unit proposed for treatment represents approximately 0.1% and 0.02% of the total drainage area for Upper Hubbard Creek and Cedar Creek drainages, respectively, and 0.2% and 0.1%of the BLM-managed lands in the said respective drainages.
1. Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations, and communities are uniquely adapted.	Within the drainages, the proposed action would result in 36 acres of thinned riparian stands. Trees within these treated stands would attain larger heights and diameters in a shorter amount of time than if left untreated. PDF's such as variable width "no-harvest" buffers established along streams would retain shading and hence maintain water temperature. "No-harvest" buffers established on streams in or adjacent to proposed units would prevent disturbance to stream channels and stream banks and intercept surface run-off allowing sediment transported by overland flow to be filtered out before reaching active waterways (EA, pg. 35) and would prevent impacts to aquatic resources. This treatment would speed attainment of this objective.	This treatment would also speed attainment of this objective at the watershed scale.
2. Maintain and restore spatial and temporal connectivity within and between watersheds	Within the drainage, the proposed project would have no influence on aquatic connectivity. Therefore this treatment would maintain the existing connectivity condition at the site scale.	Within the watershed, the proposed project would have no influence on aquatic connectivity. Therefore this treatment would maintain the existing connectivity condition at the watershed scale.
3. Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations	As discussed on pages 37-38, the treatment would not reduce canopy closure to an extent that could potentially influence in-stream flows. In addition, "no-harvest" buffers established on all Northwest Forest Plan streams in or adjacent to the proposed unit would prevent disturbance to stream channels and stream banks (EA, pg. 35). Therefore, this treatment would maintain the physical integrity of the aquatic system at the site scale.	This treatment would also maintain the physical integrity of the aquatic system at the watershed scale.
4. Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the	PDFs would ensure that water quality would not be adversely impacted by the proposed action. PDF's such as variable width "no-harvest" buffers established along streams would retain shading and hence maintain water temperature. "No-harvest" buffers established on streams in or adjacent to proposed units would prevent disturbance to stream channels and stream banks and	Based on the information discussed at the site scale, this project would also maintain water quality at the watershed scale.

ACS Objective	Site/Project Scale Assessment	5th Field Watershed Scale Assessment
system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.	intercept surface run-off allowing sediment transported by overland flow to be filtered out before reaching active waterways (EA, pg. 35). Therefore, this treatment would maintain the existing water quality at the site scale.	
5. Maintain and restore the sediment regime under which aquatic ecosystems evolved.	As mentioned above, "No-harvest" buffers established on streams in or adjacent to proposed units would prevent disturbance to stream channels and stream banks and intercept surface run-off allowing any management related sediment transported by overland flow to settle out before reaching active waterways. Therefore, this project would maintain the existing sediment regime.	This project would maintain the existing sediment regime at the watershed scale as well.
6. Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing.	As discussed on pages 37-38, thinning treatments would not reduce canopy closure to an extent that could potentially influence in-stream flows. The project would involve partial removal of vegetation on areas constituting two percent or less of each affected drainage. In addition, road renovation would not extend the drainage network or contribute to a potential increase in peak flow because the new roads would be located on ridge tops or stable side slopes with adequate cross drain structures. Additionally, some of the roads would be temporary and would be closed after harvest. Therefore, this treatment would maintain stream flows within the range of natural variability at the site scale.	As discussed at the site scale, thinning treatments would not reduce canopy closure to an extent that could potentially influence in-stream flows. Therefore, at the larger watershed scale, this treatment would also maintain stream flows within the range of natural variability.
7. Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and woodlands.	As discussed in #6 above, this project would maintain stream flows within the range of natural variability at the site scale. Therefore, it would also maintain stream interactions with the floodplain and respective water tables at the site scale.	At the watershed scale, this project would also maintain stream interactions with the floodplain and respective water tables within the range of natural variability.
8. Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.	The proposed treatment is designed to return riparian stands to a more natural density and growth trajectory. Therefore this treatment would serve to restore plant species composition and structural diversity at the site scale.	The proposed treatment is designed to return riparian stands to a more natural density and growth trajectory. Therefore this treatment would serve to restore plant species composition and structural diversity at the larger watershed scale as well.

ACS Objective	Site/Project Scale Assessment	5th Field Watershed Scale Assessment
9. Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.	As mentioned previously, the intent of this project is to restore riparian stand conditions in the proposed treatment areas. Implementation of riparian restoration projects will help restore adequate habitat to support riparian-dependent species at the site and watershed scales.	As mentioned previously, the intent of this project is to restore riparian stand conditions in the proposed treatment areas. Implementation of riparian restoration projects will help restore adequate habitat to support riparian-dependent species at the site and watershed scales.

c) ***ACS Summary:***

Based upon the information presented in Table 5 (above), the proposed action would meet ACS objectives at the site and watershed scale. In addition, based upon the restorative nature of the action, this project would not retard or prevent attainment of ACS objectives but would actually speed attainment of these objectives. Therefore, this action is consistent with the ACS and its objectives at the site and watershed scales.

G. Botany

1. Botanical Special Status Species

a) *Affected Environment*

The following analysis considers Special Status Plants whose known range is within the project area, are documented to occur in the project area, and whose habitat is documented or suspected to occur within the project area. The project area is within the known range of Kincaid's Lupine (*Lupinus sulphureus* ssp. *kincaidii*), a federally Threatened plant. There is habitat present for this species in the project area but there are no known sites of this species in the project area.

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

Field surveys were conducted through a BLM administered contract in the summer of 2007 to comply with Departmental Manual 6840 directives and the Special Status Plant program (ROD/RMP, pgs. 41-42). No Special Status Plants were detected within the project area, including Kincaid's lupine or the popcorn flower. Therefore, Special Status Plants will not be discussed further.

2. Noxious Weeds

a) *Affected Environment*

Numerous noxious weed species are present in the project area. Most of these species are growing along the main access roads, or in openings and meadows created by past timber harvest. Weed species present in the project area include: bull thistle, Canada thistle, Himalayan blackberry, meadow knapweed, oxeye daisy, Scotch broom, St. Johnswort, and tansy ragwort.

The project area has been treated in the past (2002) and will receive future treatment (2006-2007) under the Roseburg District Integrated Weed Control Plan (USDI, 1995a). Treatments

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

b) *No Action Alternative*

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

c) *Proposed Action Alternative*

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

Logging and construction equipment would be cleaned prior to entry on to BLM lands to help control or prevent the spread of noxious weeds in the project area, following the project design features (EA, pg. 14). The project area would be monitored after implementation of the Proposed Action, and weed infestations would be treated in accordance with the Roseburg District Integrated Weed Control Plan.

Chapter 4. Contacts, Consultations, and Preparers

A. Agencies, Organizations, and Persons Consulted

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

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

a. A Letter of Concurrence was received from the US Fish and Wildlife Service (USFWS) (*Reinitiation of consultation on Roseburg District Bureau of Land Management FY 2005-2008 Management Activities* [Ref. # 1-15-05-I-0511]) dated June 24, 2005 which concurred with the Roseburg District's conclusion that the proposed commercial thinning and density management activities are not likely to adversely affect Northern spotted owls and are not likely to adversely affect the Northern spotted owl as a result of disturbance (pgs. 19-20). The USFWS also concurred with the Roseburg District's conclusion that the proposed commercial thinning and density management activities are not likely to adversely affect the marbled murrelets within Zone 2 (pgs. 6, 10; Ref. # 1-15-05-I-0596).

b. On November 27, 2007, NMFS notified the OR/WA BLM that the Oregon Coast coho salmon was proposed for listing as threatened under the ESA (EA, pg. 38). The Swiftwater Field Office determined that the proposed O.M. Hubbard II project is a "*may effect, not likely to adversely affect*" for the Oregon Coast coho salmon (EA, pg. 40). This project is included in the Upper Umpqua Watershed Density Management Plan Biological Assessment which is currently in the process of conferencing with the National Marine Fisheries Service (NMFS). Findings of this conferencing will be included in the O.M. Hubbard II decision document. The Swiftwater Field Office also determined that the proposed action "*Will Not Adversely Effect"* EFH for coho or Chinook salmon in Hubbard Creek or its tributaries (EA, pg. 41).

2. **Cultural Resources Section 106 Compliance –** Compliance with Section 106 of the National Historic Preservation Act under the guidance of the 1997 National Programmatic Agreement and the 1998 Oregon State Historic Preservation Office Protocol has been documented with a Project Tracking Form dated June 5, 2007. A "No Effect" determination was made.

B. Public Notification

1. A letter was sent (November 6, 2007) to four **adjacent landowners**, **downstream water rights users**, and/or ; **landowner adjacent to the haul route**. No comments were received.

2. Notification was provided (November 6, 2007) to affected **Tribal Governments** (Confederated Tribes of Grand Ronde, Confederated Tribes of Siletz, Cow Creek Band of Umpqua Tribe of Indians, and the Komemma Cultural Protection Association). No comments were received.

3. The **general public** was notified via the *Roseburg District Planning Update* (Fall 2007) which

was sent to approximately 150 addressees. These addressees consist of members of the public that have expressed interest in Roseburg District BLM projects. Comments were received from one local organization requesting additional information about the project.

4. A **public field trip** sponsored by the Swiftwater Field Office was held May 31, 2007 to the O.M. Hubbard II project area. Eighteen members of the public attended representing various local businesses, organizations, Oregon State University, the Title II Roseburg Resource Advisory Committee, and *The News-Review*. In addition, an article was published in The News-Review on June 5, 2007 that featured the O.M. Hubbard project.

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

6. A 30-day **public comment period** would be established for review of this EA. A Notice of Availability would be published in *The News-Review*. The public comment period will begin with publication of the notice published in *The News-Review* on January 22, 2008 and end close-of-business February 21, 2008. Comments must be received during this period to be considered for the subsequent decision. This EA and its associated documents will be sent to all parties who request them. If the decision is made to implement this project, a notice will be published in *The News-Review* and notification sent to all parties who request them.

C. List of Preparers

Core Team

Craig Kintop	DMS Coordinator / Silviculture
Trixy Moser	Project Lead / Silviculture
Al James	Management Representative
Jeff McEnroe	Fisheries
Dan Cressy	Soils
Brooke Shakespeare	Hydrology
Krisann Kosel	Fuels Management
Melanie Roan	Wildlife
Rex McGraw	Planning & Environmental Coordinator / EA Preparer
Bruce Baumann	Layout
Bill May	Engineering
Evan Olson	Botany

Expanded Team (Consulted)

Isaac Barner	Cultural Resources
Ron Murphy	Recreation / Visual Resource Management

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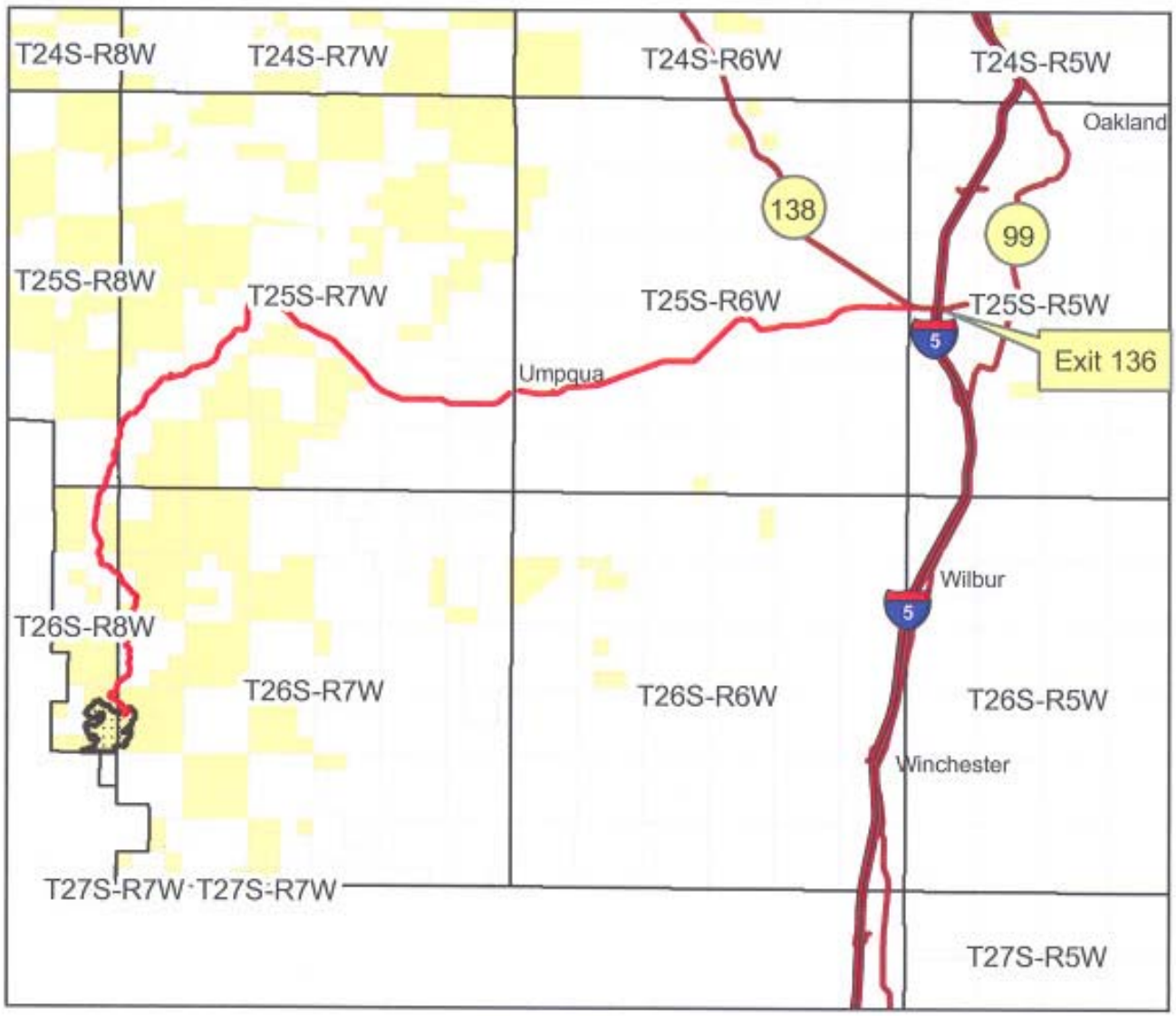
Appendix A. Project Vicinity Map



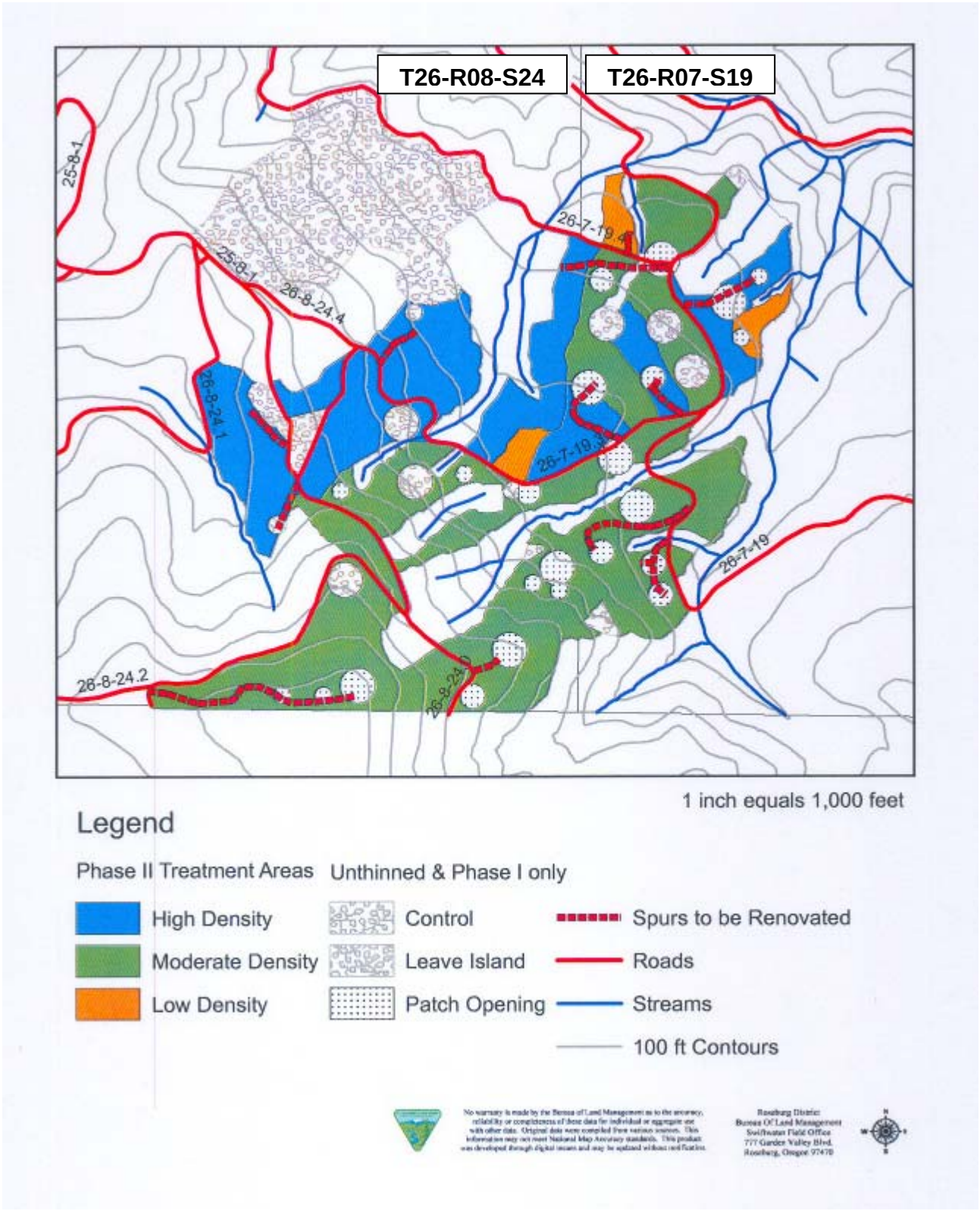
Legend

1 inch equals 3 miles

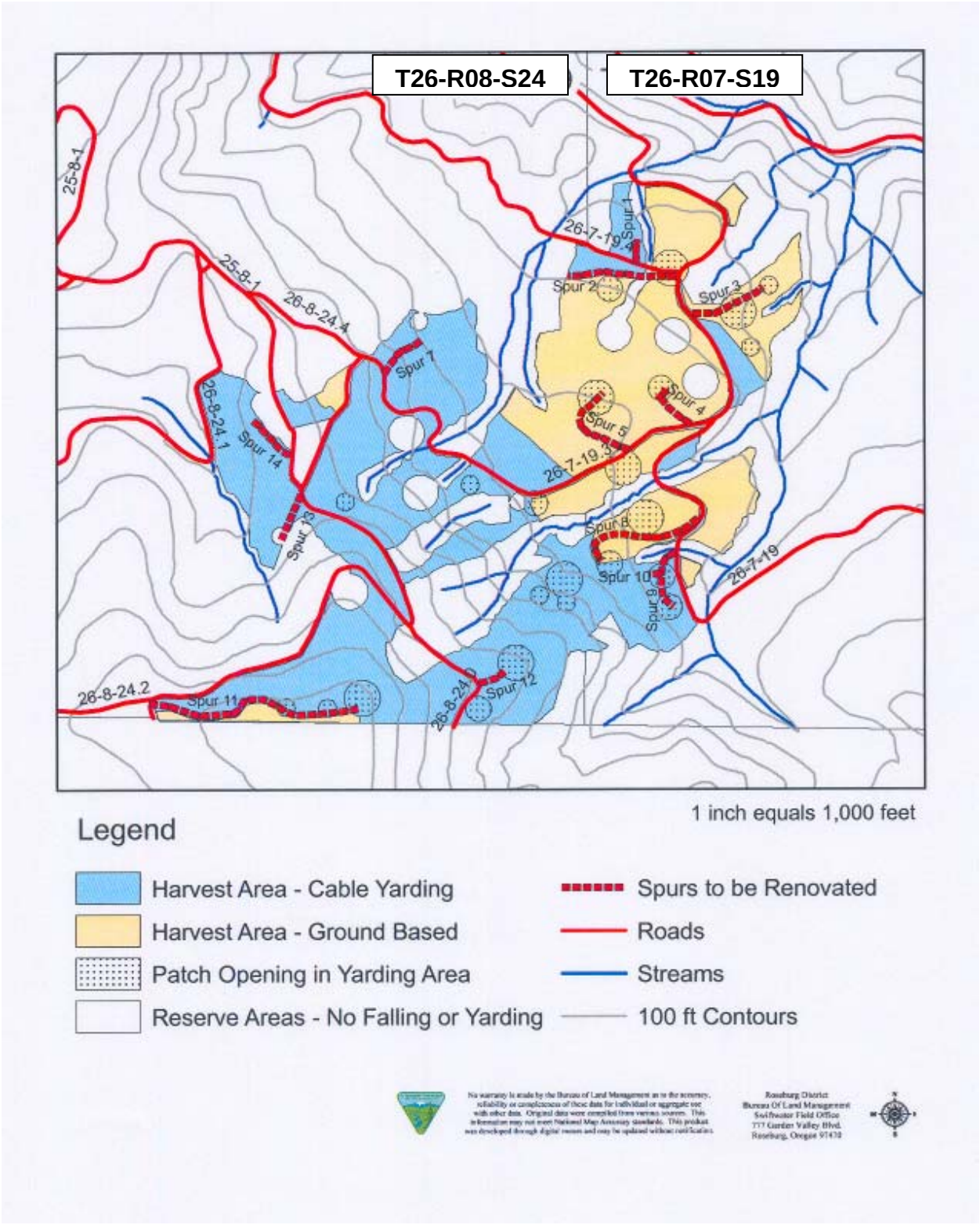
- O.M. Hubbard II
- BLM Administered Land
- Route to O.M. Hubbard II
- State Highways
- Interstate Highway

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

Appendix B. Map of Residual Density Prescription



Appendix C. Map of Yarding Methods



Appendix D. Critical Elements of the Human Environment

Element	Relevant Authority	Environmental Effect
Air Quality	The Clean Air Act (as amended)	Impacts to areas designated for attainment of federal Clean Air standards is not considered likely since the units would be burned under parameters of the Oregon Smoke Management Plan which prescribes smoke emission reduction measures (e.g., rapid ignition and aggressive mop-up) and directs burning under conditions when smoke would rise high in the atmosphere and be transported away from designated areas.
Areas of Critical Environmental Concern	Federal Land Policy and Management Act of 1976 (FLPMA)	**None** - Project area is not within or near a designated or candidate ACEC.
Cultural Resources	National Historic Preservation Act of 1966 (as amended)	**"No Effect"** – A determination of no effect to cultural resources was made since no cultural resources were identified (EA, pgs. 15-16, 48).
Environmental Justice	E.O. 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (Feb. 02, 1994). ***This EO requires that agencies insure that adverse health or environmental effects do not disproportionately affect minority or low-income populations.***	**None** - The proposed project areas are not known to be used by, or disproportionately used by, Native Americans, minorities or low-income populations for specific cultural activities, or at greater rates than the general population. According to 2004 U.S. Census Bureau data approximately six percent of the population of Douglas County was classified as minority status. It is estimated that approximately 14% of the county is below the poverty level (2003 U.S. Census Bureau data).
Farm Lands (prime or unique)	Surface Mining Control and Reclamation Act of 1977. ***This act seeks to identify and restore prime farmlands and other unique federal land characteristics.***	**None** - No prime or unique farm land would be affected. "No discernable effects are anticipated" (PRMP, pgs. 1-7).
Floodplains	E.O. 11988, as amended, Floodplain Management (May 24, 1977). ***This EO requires agencies to determine if a proposed action will occur in a floodplain and that the action will avoid adverse impacts associated with occupancy and modification of floodplains and avoids floodplain development.***	**None** - Project is not within 100 yr. floodplain.

Element	Relevant Authority	Environmental Effect
Invasive and Nonnative Species	Lacey Act, as amended; Federal Noxious Weed Act of 1974 as amended; Endangered Species Act of 1973, as amended; and EO 13112 on Invasive Species dated Feb. 03, 1999. ***This EO requires the prevention of introduction of invasive species and to provide for their control to minimize their economic, ecological, and human health impacts.***	Infestations of noxious weeds are being treated under the Roseburg District Integrated Weed Control Plan (1995). Project design features are included in the proposed action to prevent or control the spread of noxious weeds (EA, pg. 14).
Native American Religious Concerns	American Indian Religious Freedom Act of 1978. ***This act seeks to protect and preserve for American Indians the right of exercise of traditional religion including access to religious sites.***	No concerns were noted as the result of public and tribal contact including impacts to Indian Trust Resources.
Threatened or Endangered Species	Endangered Species Act of 1973 (as amended); The Pacific Coast Recovery Plan for the American Peregrine Falcon (1982); Columbian White-tailed Deer Recovery Plan (1983); and Recovery Plan for the Marbled Murrelet (1997).	**Botany** – Surveys were performed in summer 2007 and Kincaid's Lupine (federally threatened) and the rough popcorn flower (federally endangered) were not detected (EA, pgs. 46). **Wildlife** – The USFWS concurred with the Roseburg District's determination that the proposed action is *not likely to adversely affect* the marbled murrelet or northern spotted owl (EA, pg. 48). **Fisheries** – The proposed action "*Will Not Adversely Effect"* EFH for coho or Chinook salmon in Hubbard Creek or its tributaries. The Swiftwater Field Office determined that the proposed O.M. Hubbard II project is a "*may effect, not likely to adversely affect*" for the proposed Oregon Coast coho salmon (EA, pgs. 40, 48).
Wastes, Hazardous or Solid	Resource Conservation and Recovery Act of 1976; Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (as amended). ***These laws regulate hazardous waste that endangers public health or the environment.***	**None** - Applicable HazMat policies would be in effect.
Water Quality, Drinking / Ground	Clean Water Act of 1987; Safe Drinking Water Act Amendments of 1996; EO 12088, Federal compliance with pollution control standards (Oct. 13, 1978); EO 12589 on Superfund implementation (Feb. 23, 1987); and EO 12372 Intergovernmental review of federal programs (July 14, 1982).	**None** - Although very distant from the water intake (approximately 50 stream miles), the project site is located within the city of Elkton's Drinking Water Protection Area. However, no effect to domestic water users is expected (EA, pg. 34). The project is not in a municipal watershed covered under a Memorandum of Understanding. No domestic water users have been identified within one mile downstream from the project area.
Wetlands/Riparian Zones	E.O. 11990, Protection of Wetlands (May 24, 1977). ***This EO requires federal agencies to avoid destruction or modifications of wetlands and to avoid undertaking or providing assistance for new construction located in wetlands.***	**None** - "The selected alternative [of the FEIS] complies with [E.O. 11990]..."(ROD p. 51, para.7).

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

OTHER RESOURCES CONSIDERED

Resource	Environmental Effect / Concerns
Land Use (Leases, Grazing etc.)	**None** – The proposed project has no conflicting land uses. Portions of the 26-8-24.0 road are encumbered under Right-of-Way Agreement #R-863 (Weyerhauser Company).
Minerals	**None** - Project has no mining claims or leases of record.
Recreation	**Minimal short-term impacts** – Temporary road closures that could occur due to active haul/logging would reduce the dispersed recreational activities but would not have long term impacts on the recreational use of the project area once the treatment has been completed. (EA, pg. 16).
Visual Resources	**None** - The VRM classification for this area is IV. The basic elements of form, line, color and texture as required by the ROD/RMP (pg. 52) would be maintained under the proposed action (EA, pg. 16-17).
Other (Adjacent Landowners)	**None -** Adjacent landowners are in the vicinity of this sale were notified (November 6, 2007) and no comments were received.

Appendix E. Northern Spotted Owl Habitat

Roseburg District BLM – Swiftwater Field Office
Project Name: O.M. Hubbard II DMS
Project Type: Density Management Study
Location: T25S R07W Section 19 and T26S R8W Section 24

Prepared By: Melanie Roan
Date: August 8, 2007

Table 2a. Northern Spotted Owl Habitat Modified or Removed within the Project Unit and Currently Present in the Upper Umpqua Fifth-Field Watershed.

Project Area						5th-Field Watershed[4]		
Project Unit	Suitable NRF Habitat[1] (acres)		Dispersal Habitat[2] (acres)		Critical Habitat[3] (acres)	Suitable Habitat[4] (acres)	Dispersal Only Habitat[2] (acres)	Critical Habitat[3] (acres)
	Modified	Removed	Modified	Removed			Total Dispersal Habitat[5] (acres)	
Low Density	0	0	3	0	0	29,333	14,804	37,072
Moderate Density	0	0	80	0	0			
High Density	0	0	52	0	0		44,138	
Total	***0***	***0***	***135***	***0***	***0***			

1. **NRF**- **N**esting, **R**oosting, and **F**oraging Habitat on federal lands. For analysis purposes is considered stands ≥ 80 years of age based on FOI (0 < DK ≤ 1928).

2. Suitable Dispersal Habitat on federal lands, for analysis purposes, is considered stands aged 40 to 79 years based on FOI (1928 < DK ≤ 1967).

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

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

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

Table 2b. Direct impacts to Northern Spotted Owl habitats within the Coast Range Provincial Home Range (1.5 miles = 4,524 acres) of Known Northern Spotted Owl Sites under the Action Alternative. The acres (federal land only) of available habitat types within each home range are provided in the table.

Northern Spotted Owl		**Western Camp**	**Camp Creek**	**Melrose**
Site Identification Number (id #s) [1]		2146	1917**, 1917A**	2150, **2150A**
Known Owl Activity Center (KOAC) (acres)		0	96	98
Total Acres of Federal Lands within Home Range		2219 (49%)	2467 (55%)	1691 (37%)
Critical Habitat (acres)		0	0	0
Critical Habitat degraded (acres)		0	0	0
Suitable NRF (acres) (0 < stand birth date ≤ 1928)(acres)	**pre-harvest**	436 (10%)	536 (12%)	343 (8%)
	post-harvest	436 (10%)	536 (12%)	343 (8%)
Dispersal Habitat (acres) (0< stand birth date ≤ 1967)(acres)	**pre-harvest**	1908 (42%)	1960 (43%)	1674 (37%)
	post-harvest	1908 (42%)	1960 (43%)	1626 (36%)
Dispersal Habitat degraded (acres) (percent dispersal degraded)[2]		135 (8%)	21 (0.5%)	48 (3%)

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

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

Appendix F. Wildlife Summary

Roseburg District BLM – Swiftwater Field Office

Project Name: O.M. Hubbard II DMS
Project Type: Density Management Study
Location: T25S R07W Section 19 and T26S R8W Section 24

Prepared By: Melanie Roan
Date: August 8, 2007
SSSP List Date: August 1, 2007

Critical Habitat				Management Concerns	
Species	**Present (Y / N)**	**Concern (Y / N)**	**Critical Habitat Unit(s) (CHU #)**	**Habitat Removal or Modification or Both?**	**Critical Habitat Affected by Project (acres)**
Marbled Murrelet	No	No	-	-	-
Spotted Owl	No	No	-	Yes – Dispersal Habitat	No

Species	**Within Species Range?**	**Habitat Present?**	**Species Present?[1]**	**Wildlife Concern?**	**Reason for concern or no concern**	**Mitigation Measures**		
						Seasonal Restriction Required?	**Daily Operating Restriction Required?**	**Buffers Required?**
Threatened & Endangered Species								
Canada Lynx	No	No	No	No	Out of species range	No	No	No
Fender's Blue Butterfly	Yes	No	No	No	No suitable habitat	No	No	No
Marbled Murrelet	Yes	No	No	No	No suitable habitat	April 1st- August 5th - Burning	No	No
Northern Spotted Owl	Yes	Yes	Yes	Yes	Degradation of Dispersal Habitat	Refer to PDFs	No	No
Bureau Sensitive Species								
Bald Eagle	Yes	No	No	No	No roost or nest sites	No	No	No
Fringed Myotis	Yes	Yes	Suspected	No	No removal of roosting habitat	No	No	Snag PDFs
Purple Martin	Yes	Yes	Suspected[2]	No	No measurable impact to foraging habitat	No	No	No
Townsend's Big-eared Bat	Yes	Yes	Suspected	No	No removal of roosting habitat	No	No	Snag PDFs
Bureau Strategic Species								
Merlin	Yes	No	No	No	No suitable nesting habitat	No	No	No
Oregon Giant Earthworm	Yes	No	No	No	No habitat disturbance	No	No	No

[1] *Suspected: species has not been documented, however based on literature review, species is expected to occur.*
[2] *Species would be expected to forage in the area if suitable habitat is present within one mile of the project area.*

Appendix G. Bureau Sensitive & Strategic Wildlife Species.

Roseburg District BLM – Swiftwater Field Office

Project Name: O. M. Hubbard II DMS
Project Type: Density Management Study
Location: T25S R07W Section 19 and T26S R8W Section 24

Prepared By: Melanie Roan
Date: August 8, 2007
SSSP List Date: August 1, 2007

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

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

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

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

Strategic Species.

- **a**. If sites are located, collect occurrence data and record in corporate database.
- **b.** Sensitive species policy as described in BLM 6840 does not apply.

Table 1. Sensitive & Strategic Wildlife Species.

Species	Status[1]	Present in Project Area?[2]	General Habitat Requirements
BUREAU SENSITIVE			
American Peregrine Falcon *Falco peregrinus anatum*	BS, SE	No Habitat	Cliffs, rock outcrops; open habitats for hunting birds
Chace Sideband *Monadenia chaceana*	BSO	Out of Range	Rocky, talus habitats in the Klamath Province and southwards
Columbian White Tailed Deer *Odocoileus virginianus leucurus*	BSO, CR	No Habitat	Bottomlands, oak/hardwood forests; cover for fawning
Crater Lake Tightcoil *Pristiloma arcticum crateris*	BSO	Out of Range	Perennially wet areas in late seral forests above 2000ft elevation and east of Interstate-5; seeps, springs, riparian areas
Fisher *Martes pennanti*	BS	No Habitat	Structurally complex forests; mature open forests with large live trees, snags and down wood.
Foothill Yellow-legged Frog *Rana boylii*	BSO, V	No Habitat	Low gradient streams/ponds; gravel/cobble, bedrock pools

Species	Status[1]	Present in Project Area?[2]	General Habitat Requirements
Fringed Myotis *Myotis thysanodes*	BSO, V	Suspected	Late-successional conifer forests, associated with water; caves, mines, bridges, rock crevices
Green Sideband *Monadenia fidelis beryllica*	BSO	No Habitat	Coast Range, riparian forests at low elevations; deciduous trees & shrubs in wet, undisturbed forest
Harlequin Duck *Histrionicus histrionicus*	BS, U	Out of Range	Mountain Streams in forested areas on west slope of the Cascade Mountains
Lewis' Woodpecker *Melanerpes lewis*	BSO, CR	No Habitat	Open woodland habitat near water; open woodland canopy and large diameter dead/dying trees, snag cavities
Northwestern Pond Turtle *Clemmys marmorata marmorata*	BS, CR	No Habitat	Ponds, low gradient rivers; upland over-wintering habitat, CWD
Oregon Shoulderband *Helminthoglypta hertleini*	BSO	No Habitat	Talus and rocky substrates, grasslands or other open areas with low-lying vegetation
Oregon Vesper Sparrow *Pooecetes gramineus affinis*	BS, CR	No Habitat	Open habitats such as grasslands, meadows, farmlands
Pallid Bat *Antrozous pallidus*	BS, V	No Habitat	Usually rocky outcroppings near open, dry open areas; occasionally near evergreen forests
Purple Martin *Progne subis*	BSO, CR	No Habitat	Snags cavities in open habitats (e.g. grasslands, brushlands, open woodlands)
Rotund Lanx *Lanx subrotundata*	BSO	No Habitat	Major rivers and large tributaries with cold, well-aerated water and rocky substrate
Scott's Apatanian Caddisfly *Allomyia scotti*	BSO	Out of Range	High-elevation (>4,000ft), cold streams in the mountainous regions of Oregon
Spotted Tail-dropper *Prophysaon vannattae pardalis*	BSO	No Habitat	Mature conifer forests in the Coast Range; associated with significant deciduous tree/shrub component
Townsend's Big-eared Bat *Corynorhinus townsendii*	BS, CR	Suspected	Late successional forests; Caves, mines, buildings, bridges, tunnels
Western Ridgemussel *Gonidea angulata*	BS	No Habitat	Creeks, rivers, coarse substrates; Umpqua R. and possibly major tribs.
White-Tailed Kite *Elanus leucurus*	BS	No Habitat	Open grasslands, meadows, emergent wetlands, farmlands, lightly, wooded areas; wooded riparian habitats close to open hunting; tall trees and shrubs
BUREAU STRATEGIC			
Broadwhorl Tightcoil *Pristiloma johnsoni*	Strategic	Out of Range	Moist forest sites, typically with deciduous component; Coast/Cascades in WA, Coast Range in OR, as far south as Lane County
Klamath Tail-Dropper *Prophysaon sp. nov.*	Strategic	Out of Range	Moist, open areas along streams or springs in Ponderosa Pine forests; as far North as Crater Lake
Merlin *Falco columbarius*	Strategic	No Habitat	Coniferous forests adjacent to open habitats, along forest edges.
Pristine Springsnail *Pristinicola hemphilli*	Strategic	No Habitat	Shallow, cold, clear springs/seeps; strongly spring-influenced streams, slow-moderate flow; Umpqua R. drainage
Oregon Giant Earthworm *Driloleirus macelfreshi*	Strategic	No Habitat	Deep, moist, undisturbed soils of riparian forests.

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

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

Appendix H. Soils

Roseburg District BLM – Swiftwater Field Office

Project Name: O.M. Hubbard II DMS
Project Type: Density Management Study
Location: T26S-R07W-Sec. 19 & T26S-R08W-Sec. 24

Prepared By: Dan Cressy
Date: August 10, 2007

Table 1. Timber Production Capability Classification (TPCC).

Unit	FGR[1] (acres)	FPR[2] (acres)	FSR[3] (acres)	FGNW[4] (acres)	FPNW[5] (acres)	Category 1[6] (acres)
1	14	0	NA	0	0	NA
Total	14	0	NA	0	0	NA

[1] **FGR** = soils considered fragile due to slope gradient but suitable for forest management with mitigation for surface erosion and landslides.
[2] **FPR** = soils on moderate slopes that have mildly active slump-earth flow topography and are suitable for forest management with mitigation for slump-earth flow movements.
[3] **FSR** = fragile soils due to moisture deficiencies caused by shallow, rocky soils on but are suitable for timber production with mitigation.
[4] **FGNW** = soils considered fragile due to slope gradient and unsuitable for forest management even with mitigation for surface erosion and landslides; withdrawn from units.
[5] **FPNW** = soils on moderate slopes that have active slump-earth flow topography and are not suitable for forest management because of active movement; withdrawn from units.
[6] **Category 1** = soils that are highly sensitive to broadcast burning due to shallow soil depths, that have A horizons less than 4 inches in depth and/or that are on slopes over 70 percent.

Table 2. Mass Wasting & Landslides in the Action Area. The action area considered is within the Upper Umpqua and South Coos River 5th Field Watersheds and covers approximately 440 acres. An analysis of mass wasting events for both the BLM and private lands in the vicinity of the proposed activities was done using aerial photo interpretation covering 1960 to 2004 and field reconnaissance.

Timeframe	# Debris Torrents	# Landslides			
	Large (>0.5 acre)	Small (< 0.1 acre)	Medium (0.1-0.5 acre)	Large (> 0.5 acre)	All
Action Area (1960-2004)	1	14	10	2	26 (4.9 acres)
In-Unit (1960-2004)	0	7	3	0	10 (1.7 acres)
Probability of occurrence expected within units:					
No Action Alternative	none	low	low	low	low
Action Alternative (Harvest)	low	low-mod	low-mod	low	low
Cumulative Effects	Unchanged[1]	Unchanged[1]	Unchanged[1]	Unchanged[1]	Unchanged[1]

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

Table 3. Soil Productivity. The Spatial Extent of the short-term (less than 10 years) losses and subsequent short-term gains of soil productivity under the proposed action. The gains would be through amelioration that includes subsoiling. A negative figure represents acres with a net loss in soil productivity. A positive figure represents acres with a gain. The figures in this table are estimates based on assumptions made from monitoring observations and data. The difference in soil productivity losses and gains are given in the last column. The Effective-Net-Change grand total is meant to indicate the likelihood of O.M. Hubbard II DMS maintaining or improving soil productivity in the short-term.

Road Effects (Unit)	**Losses to Soil Productivity due to the Action (prior to subsoiling)**				**Improvements to Soil Productivity due to subsoiling**		**Effective Net Change** (acres)
	New Construction		**Use of Existing Natural Surfaced Roads & Trails**		**Actual Subsoiled Area** (acres)	**Effective Subsoiled Area[1]** (acres)	
	Rocked Roads (acres)	Natural Surfaced Roads (acres)	Permanent Roads (acres)	Temporary Roads (acres)			
1	0	0	0	-1.8	0	0	-1.8
Road Total	0	0	0	-1.8	0	0	-1.8
Unit Effects (Unit)	**Harvest Operations**				**Actual Subsoiled Area** (acres)	**Effective Subsoiled Area[1]** (acres)	**Effective Net Change** (acres)
	Helicopter Yarding (acres)	Skyline Cable Yarding (acres)	Ground-based Yarding (acres)	Other Method?			
1	0	-0.3	-1.0*	0	+4.0	+3.8	+2.5
Unit Total	0	-0.3	-1.0*	0	+4.0	+3.8	+2.5
Grand Total	**-3.1***				**+4.00**	**+3.8**	**+0.7**

[1] "Effective Sub-soiled Area" takes into account the effectiveness of sub-soiling in restoring soil productivity. For the purposes of this analysis, 80 percent short-term recovery is assigned to the subsoiling of trails and 60 percent to roads (based on the degree of shattering of the compaction given in subsoiling studies) (Andrus, C.W. & Froehlich, H.A. 1983. Research Bulletin 45 - An evaluation of four implements used to till compacted forest soils in the Pacific Northwest. Forest Research Laboratory, Oregon State University, Corvallis, Or.).

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

Appendix I. Fisheries

Roseburg District BLM – Swiftwater Field Office

Project Name: O.M. Hubbard II DMS
Project Type: Density Management Study
Location: T26S-R8W-Sec. 24 and T26S-R7W-Sec.19

Prepared By: Jeff McEnroe
Date: July 12, 2007

Table 1. Special Status Fish Species within the Project Area. The project area for fisheries analysis includes the harvest units and associated haul routes where an effect to fisheries may occur.

Species	Status	Present in Project Area?	Source of Detection
BUREAU SENSITIVE			
Coho Salmon (North of Cape Blanco) *Oncorhynchus kisutch*	PT BSO	Documented	Streamnet 2005
Umpqua Oregon Chub *Oregonichthys kalawatseti*	BSO[1]	Suspected[3]	-
BUREAU STRATEGIC			
Chum Salmon *Oncorhynchus keta*	BST[2]	Documented	Streamnet 2005
Oregon Coast Steelhead *Oncorhynchus mykiss*	BST	Documented	Streamnet 2005

[1] Umpqua Chub and Pacific Lamprey are documented in the watershed but have not been documented in the Project Area
[2] Chum Salmon are occasionally documented crossing over Winchester Dam in small numbers. These fish are thought to be strays and not part of an independent population..

PT = Proposed Threatened
BSE = Bureau Sensitive Oregon
BST = Bureau Strategic Oregon

Table 2. Nearest Location of Special Status Fish Species and Essential Fish Habitat to the Study Area.

Unit	Stream Type At Unit	Stream Name	Location (T-R-S)	Distance to Proposed Units (miles)					
				OC Coho Salmon	OC Steelhead	Coastal Cutthroat Trout	Pacific Lamprey	Umpqua Chub	Essential Fish Habitat
Study Area	Perennial	Unnamed Hubbard Creek Tributary	26S-7W-19	> 2.0[1]	> 2.0[1]	0.1	Unknown	Unknown	> 2.0

[1] Oregon Coast coho and steelhead are not present in Hubbard Creek two miles downstream of the Study Area, the exact barrier to migration has not yet been identified.

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

Haul Route		Stream Crossings		
Road Number	Haul Distance (miles)	Fish-Bearing	Perennial	Intermittent
26-7-7.0	2.0	1	1	4
26-7-19.0	1.3	0	1	7
26-7-19.3	0.8	0	0	3
26-7-19.4	0.6	0	0	5
26-8-24.1	0.3	0	0	0
26-8-24.4	0.2	0	0	0
25-8-1.0	1.0	0	0	0
Unnamed Spurs	1.0	0	0	0

Appendix J. Botany Summary

Roseburg District BLM – Swiftwater Resource Area

Project Name: O.M. Hubbard II DMS
Project Type: Density Management Study
Location: T26S-R08W-Sec. 24, T26S-R07W-Sec. 19

Prepared By: Evan Olson
Date: Nov. 8, 2007

The following two tables include species which are documented or suspected to occur within the Roseburg District BLM. These species lists are derived from the USDI Bureau of Land Management Oregon State Office (IM-OR-2007-072). Sensitive Species (i.e. Federally Threatened and Endangered, State Threatened and Endangered, and Bureau Sensitive botanic species) suspected or documented to occur within the project area are detailed in **Table 1** and may be further discussed if necessary. Strategic Species are identified in **Table 2**.

A species list is available in the Unit Descriptions and Survey Summary that was completed under contract with Wildwood Environmental Consultants, dated July 2007.

Sensitive Species
BLM districts are responsible to assess and review the effects of a proposed action on federally listed Threatened or Endangered species, State listed Threatened or Endangered species, or Bureau Sensitive species. To comply with Bureau policy, Districts may use one or more of the following techniques:

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

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

Strategic Species
- **a**. If sites are located, collect occurrence data and record in corporate database.
- **b.** Sensitive species policy as described in BLM 6840 does not apply.

Table 1 : Sensitive Botanical Species.

Species	Within species range?	Habitat Present?	Species Present?	Reason for concern or no concern	Surveys Completed	Mitigation Measures
Threatened & Endangered Species						
Lupinus sulphureus ssp. *kincaidii* Kincaid's lupine (T)	**Yes**	**Yes**	No	Surveys performed, not detected.	June/July 2007	N/A
Plagiobothrys hirtus Rough popcorn flower (E)	**Yes**	No	No	No habitat present.	N/A	N/A
Sensitive Species						
Chiloscyphus gemmiparus Liverwort	**Yes**	No	No	No habitat present.	N/A	N/A
Diplophyllum plicatum Liverwort	**Yes**	No	No	No habitat present	N/A	N/A
Entosthodon fascicularis Moss	**Yes**	No	No	No habitat present	N/A	N/A
Gymnomitrion concinnatum	**Yes**	No	No	No habitat present.	N/A	N/A

Species	Within species range?	Habitat Present?	Species Present?	Reason for concern or no concern	Surveys Completed	Mitigation Measures
Liverwort						
Helodium blandowii Moss	**Yes**	No	No	No habitat present	N/A	N/A
Meesia uliginosa Moss	**Yes**	No	No	No habitat present	N/A	N/A
Schistostega pennata Moss	**Yes**	No	No	No habitat present	N/A	N/A
Tayloria serrata Moss	**Yes**	No	No	No habitat present	N/A	N/A
Tetraphis geniculata Moss	**Yes**	No	No	No habitat present	N/A	N/A
Tetraplodon mnioides Moss	**Yes**	No	No	No habitat present	N/A	N/A
Tomentypnum nitens Moss	**Yes**	No	No	No habitat present	N/A	N/A
Tortula mucronifolia Moss	**Yes**	No	No	No habitat present	N/A	N/A
Trematodon boasii Moss	**Yes**	No	No	No habitat present.	N/A	N/A
Bridgeoporus nobilissimus Giant polypore fungus	No	No	N/A	No habitat present.	N/A	N/A
Cudonia monticola *Fungi*	Yes	No	N/A	Surveys Not Practical. [1]	N/A	N/A
Dermocybe humboldtensis Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	N/A	N/A
Gomphus kauffmanii Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	N/A	N/A
Helvella crassitunicata Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	N/A	N/A
Leucogaster citrinus Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	N/A	N/A
Otidea smithii Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	N/A	N/A
Phaeocollybia californica Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	N/A	N/A
Phaeocollybia dissiliens Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	N/A	N/A
Phaeocollybia gregaria Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	N/A	N/A
Phaeocollybia olivacea Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	N/A	N/A
Phaeocollybia oregonensis Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	N/A	N/A
Phaeocollybia pseudofestiva Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	N/A	N/A
Phaeocollybia scatesiae Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	N/A	N/A
Phaeocollybia sipei Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	N/A	N/A
Phaeocollybia spacidea Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	N/A	N/A
Pseudorhizina californica Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	N/A	N/A
Ramaria amyloidea Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	N/A	N/A
Ramaria gelatiniaurantia Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	N/A	N/A

Species	Within species range?	Habitat Present?	Species Present?	Reason for concern or no concern	Surveys Completed	Mitigation Measures
Ramaria largentii Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	N/A	N/A
Ramaria spinulosa var. *diminutiva* Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	N/A	N/A
Rhizopogon chamalelotinus Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	N/A	N/A
Rhizopogon exiguus Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	N/A	N/A
Sowerbyella rhenana Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	N/A	N/A
Adiantum jordanii California maiden-hair	**Yes**	No	N/A	No habitat present.	N/A	N/A
Arabis koehleri var. *koehleri* Koehler's rockcress	**Yes**	No	N/A	No habitat present.	N/A	N/A
Arctostaphylos hispidula *Hairy manzanita*	**Yes**	No	N/A	No habitat present.	N/A	N/A
Asplenium septentrionale Grass-fern	**Yes**	No	N/A	No habitat present.	N/A	N/A
Bensoniella oregana Bensonia	**Yes**	No	N/A	No habitat present.	N/A	N/A
Botrychium minganense Gray moonwort	**Yes**	No	N/A	No habitat present.	N/A	N/A
Calochortus coxii Crinite mariposa-lily	**Yes**	No	N/A	No habitat present.	N/A	N/A
Calochortus umpquaensis Umpqua mariposa-lily	**Yes**	No	N/A	No habitat present.	N/A	N/A
Camassia howellii Howell’s camas	**Yes**	No	N/A	No habitat present.	N/A	N/A
Carex brevicaulis Short stemmed sedge	**Yes**	No	N/A	No habitat present.	N/A	N/A
Carex comosa Bristly sedge	**Yes**	No	N/A	No habitat present.	N/A	N/A
Carex gynodynama Hairy sedge	**Yes**	**Yes**	No	Surveys performed, not detected.	June/July 2007	N/A
Carex serratodens Saw-tooth sedge	**Yes**	No	No	No habitat present.	N/A	N/A
Cimicifuga elata Tall bugbane	**Yes**	**Yes**	No	Surveys performed, not detected.	June/July 2007	N/A
Cypripedium fasciculatum Clustered lady slipper	**Yes**	**Yes**	No	Surveys performed, not detected.	June/July 2007	N/A
Delphinium nudicaule Red larkspur	**Yes**	**Yes**	**No**	Surveys performed, not detected.	June/July 2007	**N/A**
Epilobium oreganum Oregon willow-herb	**Yes**	**Yes**	**No**	Surveys performed, not detected.	June/July 2007	**N/A**
Eschscholzia caespitosa Gold poppy	**Yes**	**No**	**No**	No habitat present.	N/A	**N/A**
Eucephalus vialis Wayside aster	**Yes**	**Yes**	**No**	Surveys performed, not detected.	June/July 2007	**N/A**
Horkelia congesta ssp. *congesta* Shaggy horkelia	**Yes**	**Yes**	**No**	Surveys performed, not detected.	June/July 2007	**N/A**
Horkelia tridentata ssp. *tridentate* Three-toothed horkelia	**Yes**	**Yes**	No	Surveys performed, not detected.	June/July 2007	N/A
Iliamna latibracteata California globe-mallow	**Yes**	No	N/A	No habitat present.	N/A	N/A

Species	Within species range?	Habitat Present?	Species Present?	Reason for concern or no concern	Surveys Completed	Mitigation Measures
Kalmiopsis fragrans Fragrant kalmiopsis	**Yes**	No	N/A	No habitat present.	N/A	N/A
Lathyrus holochlorus Thin-leaved peavine	**Yes**	No	N/A	No habitat present.	N/A	N/A
Lewisia leana Lee's lewisia	**Yes**	No	N/A	No habitat present.	N/A	N/A
Limnanthes gracilis var. *gracilis* Slender meadow-foam	**Yes**	No	N/A	No habitat present.	N/A	N/A
Lotus stipularis *Stipuled trefoil*	**Yes**	No	N/A	No habitat present.	N/A	N/A
Meconella oregana *White fairypoppy*	**Yes**	No	N/A	No habitat present.	N/A	N/A
Pellaea andromedifolia Coffee fern	**Yes**	No	No	No habitat present	N/A	N/A
Perideridia erythrorhiza Red-rooted yampah	**Yes**	No	N/A	No habitat present.	N/A	N/A
Polystichum californicum California sword-fern	**Yes**	No	N/A	No habitat present.	N/A	N/A
Romanzoffia thompsonii *Thompson's mistmaiden*	**Yes**	No	N/A	No habitat present.	N/A	N/A
Schoenoplectus subterminalis Water clubrush	**Yes**	No	N/A	No habitat present.	N/A	N/A
Scirpus pendulus *Drooping rush*	**Yes**	No	N/A	No habitat present.	N/A	N/A
Sisyrinchium hitchcockii Hitchcock's blue-eyed grass	**Yes**	No	N/A	No habitat present.	N/A	N/A
Utricularia gibba Humped bladderwort	**Yes**	No	N/A	No habitat present	N/A	N/A
Utricularia minor Lesser bladderwort	**Yes**	No	N/A	No habitat present.	N/A	N/A
Wolffia borealis Dotted water-meal	**Yes**	No	N/A	No habitat present.	N/A	N/A
Wolffia columbiana Columbia water-meal	**Yes**	No	N/A	No habitat present.	N/A	N/A

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

Table 2. Strategic Botanical Species.

Scientific Name	Roseburg Occurrence?	Occurrence in the Project Area?
Bryophytes		
Cephaloziella spinigera	Suspected	None Observed
Grimmia anomala	Suspected	None Observed
Scouleria marginata	Suspected	None Observed
Fungi		
Cazia flexiascus	Suspected	None Observed
Choiromyces alveolatus	Suspected	None Observed
Clavariadelphus subfastigiatus	Documented	None Observed
Gymnomyces monosporus	Documented	None Observed
Helvella elastica	Documented	None Observed
Hygrophorus albicarneus	Suspected	None Observed
Mycena quinaultensis	Suspected	None Observed
Nolanea verna var. *isodiametrica*	Suspected	None Observed
Plectania milleri	Suspected	None Observed
Psathyrella quercicola	Suspected	None Observed
Ramaria abietina	Documented	None Observed
Ramaria rubribrunnescens	Suspected	None Observed
Ramaria suecica	Documented	None Observed
Ramaria thiersii	Suspected	None Observed
Rhizopogon brunneiniger	Suspected	None Observed
Rhizopogon clavitisporus	Suspected	None Observed
Rhizopogon flavofibrillosus	Documented	None Observed
Rhizopogon variabilisporus	Suspected	None Observed
Sarcodon fuscoindicus	Documented	None Observed
Lichens		
Buellia oidalea	Suspected	None Observed
Lecanora pringlei	Suspected	None Observed
Lecidea dolodes	Suspected	None Observed
Leptogium rivale	Documented	None Observed
Leptogium teretiusculum	Documented	None Observed
Peltula euploca	Suspected	None Observed
Vezdaea stipitata	Documented	None Observed
Vascular Plants		
Camissonia ovata	Suspected	None Observed
Frasera umpquaensis	Suspected	None Observed