Slim Sherlock
Commercial Thinning
Environmental Assessment

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U.S. Department of Interior
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Roseburg District
Swiftwater Field Office
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Foreword

The BLM recognizes the uncertainty surrounding: the U.S. Fish & Wildlife Service's recently approved *Final Recovery Plan for the Northern Spotted Owl* (May 2008), the final rule re-designating critical habitat for the northern spotted owl (Federal Register, Vol. 73, No. 157; Aug. 13, 2008), the *Final Environmental Impact Statement for the Revision of the Resource Management Plans of the Western Oregon Bureau of Land Management* (2008 Final EIS), and the subsequent District Record of Decision and Resource Management Plans (2008 ROD/RMP), to which this EA is tiered. The spotted owl recovery plan, the final rule re-designating spotted owl critical habitat, and the 2008 ROD/RMP are the subject of legal challenge. However, the Roseburg District has considered this and concludes that the uncertainty surrounding these legal challenges does not invalidate the design and layout of the proposed action described in this environmental assessment.

Revision of a resource management plan necessarily involves the transition from the application of the old resource management plan to the application of the new resource management plan. A transition from the old resource management plan to the new resource management plan avoids disruption of the management of BLM-administered lands and allows the BLM to utilize work already begun on the planning and analysis of projects.

The 2008 ROD allowed for such projects to be implemented consistent with the management direction of either the 1995 RMP (as amended) or the 2008 RMP, at the discretion of the decision maker.

This project is in compliance with the 1995 RMP and meets the requirements designated in the 2008 ROD/RMP for such transition projects:

1. A decision was not signed prior to the effective date of the 2008 ROD.
2. Preparation of National Environmental Policy Act documentation began prior to the effective date of the 2008 ROD (i.e. December 30, 2008). The public was notified of initiation of the Slim Sherlock Commercial Thinning EA in the Winter 2008 Roseburg District Quarterly Planning Update (December 2, 2008), and a period for informal scoping was provided.
3. Decisions on the timbersales analyzed in the Slim Sherlock EA will be issued within two years of the effective date of the 2008 ROD.
4. None of the proposed timbersales analyzed in the Slim Sherlock EA include regeneration harvest; therefore regeneration harvest within a Late-Successional Management Area or in a Deferred Timber Management Area would not occur under this project.
5. None of the proposed timbersales analyzed in the Slim Sherlock EA occur within designated critical habitat; therefore this project would not result in the destruction or adverse modification of critical habitat designated for species listed as endangered or threatened under the Endangered Species Act.

The proposed action is commercial thinning of approximately 512 acre of mid-seral forest (45-51 years old) from the Timber Management Area and Riparian Management Area land use allocations. The thinning will occur exclusively within spotted owl dispersal habitat, outside currently and previously designated spotted owl critical habitat. These sales conform with the Roseburg 2008 Record of Decision and Resource Management Plan (2008 ROD/RMP); however, these sales would also comply with the requirements of the 1995 Roseburg District ROD/RMP, as units would be in land use allocations that were previously designated as Matrix (i.e. General Forest Management Area and Connectivity/Diversity Block), Adaptive Management Area (AMA), and Riparian Reserve under the 1995 ROD/RMP.

Since the planning and design for this project was initiated prior to the 2008 ROD, it contains certain project design features that comply with the 1995 ROD/RMP but are not consistent with the management direction contained in the 2008 RMP including: Riparian Management Area & Riparian Reserve, snag & coarse woody debris retention, and the Aquatic Conversation Strategy (discussed below).

Riparian Management Area & Riparian Reserve:
Under the 2008 ROD/RMP, fish-bearing streams and perennial non-fish bearing streams would have a Riparian Management Area one site-potential tree height (i.e. 180 feet) in width and silvicultural activities (e.g. thinning) would not be applied within 60 feet. Intermittent non-fish bearing streams would have a Riparian Management Area half of one site-potential tree height (i.e. 90 feet) in width and silvicultural activities (e.g. thinning) would not be applied within 35 feet of the stream (2008 ROD/RMP, pg. 35).

Under the 1995 ROD/RMP, as amended, the Riparian Reserve width on fish-bearing streams was the height of two site potential trees (i.e. 360 feet) and the Riparian Reserve width on perennial non-fish bearing or intermittent streams was the height of one potential tree height (i.e. 180 feet; 1995 ROD/RMP, pg. 24) but there was no specific management direction limiting silvicultural activities from the stream.

In Slim Sherlock, the Riparian Management Areas and associated management direction from the 2008 ROD/RMP would be used in the project design. Even though the total width of the 2008 ROD/RMP Riparian Management Area (i.e. 180 or 90 feet) would be narrower than the 1995 ROD/RMP Riparian Reserves (i.e. 360 or 180 feet), both plans allow for silvicultural activities such as thinning in the Riparian Management Area/Riparian Reserve away from the stream (i.e. more than 35 or 60 feet away from the stream). In Slim Sherlock, the restriction on silvicultural activities within 35 or 60 feet of the stream would comply with either the 2008 or 1995 plan.

Snag & Coarse Woody Debris Retention:
Under the 2008 ROD/RMP, all snags and coarse woody debris would be retained within the Riparian Management Area, except for safety or operational reasons (e.g., maintaining access to roads and facilities [2008 ROD/RMP, pg. 35]). Within the TMA, non-commercial snags and coarse woody debris would be retained, except for safety or operational reasons (2008 ROD/RMP, pg. 38).

Under the 1995 ROD/RMP, existing coarse woody debris already on the ground was retained within the Matrix (1995 ROD/RMP, pg. 34) but during partial harvest (such as commercial thinning), it was not necessary to fall the larger dominant or co-dominant trees to provide coarse woody debris (1996 Plan Maintenance in *Roseburg District Annual Program Summary and Monitoring Report Fiscal Year 2007*, pg. 62).

Snags would be retained at levels sufficient to support species of cavity nesting birds at 40 percent of potential population levels (1995 ROD/RMP, pg. 38). The number of snags that met the 40 percent potential population level of cavity nesting birds was approximately 1.2 snags per acre $\geq$ 11 inches diameter breast height (Nietro *et al*., 1985[1] as cited in the 1994 Roseburg District PRMP/EIS [Chapter 4-43]). Based on monitoring of commercial thinning units that were harvested 3-4 years ago under the 1995 ROD/RMP, there was an average of approximately 2.1 snags per acre greater than 11 inches (sample mean = 2.05, Std. Dev. = 3.53, n = 45; R. McGraw, unpub. data).

[1] Nietro, W.A. et al. 1985. Snags. In: *Management of Wildlife and Fish Habitats in Western Oregon and Washington*. Publication No. R6-F & WL-192-1985.

Coarse woody debris and snags within the AMA were managed in a manner that met the intent of management actions/directions for the Matrix (1995 ROD/RMP, pg. 35) but there were no explicit requirements within Riparian Reserves for snags or coarse woody debris under the 1995 ROD/RMP.

The Slim Sherlock project meets the requirements of the 1995 ROD/RMP for coarse woody debris and cavity nesting birds. It includes retention of conifer and hardwood snags 10 inches or larger in diameter breast height and at least 16 feet in height in the TMA (EA, pg. 4). Existing snags would be felled only if they pose a safety concern and snags felled for safety reasons would be retained on site as coarse woody debris (EA, pg. 4). Existing coarse woody debris in decay classes 3, 4, and 5 would be retained in the TMA (EA, pg. 4). All snags and coarse woody debris would be retained within the RMA, except for safety or operational reasons (EA, pg. 5).

Aquatic Conservation Strategy:

Hydrology and Fisheries staff within the Swiftwater Field Office assessed the effect of the proposed project on the Aquatic Conservation Strategy (ACS) objectives at both the site and watershed scale (assessment included in Appendix D of the Slim Sherlock Commercial Thinning EA). The proposed project would not retard or prevent attainment of ACS objectives at the site or watershed scales. Instead, the proposed action would speed attainment of these objectives through the commercial thinning prescription. Therefore, the proposed action alternative in the Slim Sherlock EA is consistent with the ACS, and its objectives at the site and watershed scales.

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Chapter 1. Purpose and Need for Action

A. Purpose & Need

The Bureau of Land Management (BLM), Swiftwater Field Office proposes commercial thinning of approximately 512 acres of mid-seral forest stands, 45-51 years old, in two separate proposed timber sales: Slim Big Jim (160 acres) and Sherlock Home (352 acres).

There is a need to treat mid-seral stands that are currently overstocked to maintain stand vigor in the Timber Management Area (TMA) and maintain/enhance stand diversity in the Riparian Management Area (RMA). The purpose of the proposed project would be to reduce the stand densities through commercial thinning prescriptions in a cost-efficient manner following 2008 ROD/RMP Management Objectives.

These proposed sales are located in the Little River & Lower-South Umpqua River Watersheds within the Timber Management Area and Riparian Management Area.

It is anticipated that the proposed timber sales would yield approximately 5.1 million board feet (5.1 MMBF) of timber in support of local and regional manufacturers and economies.

B. Conformance

This environmental assessment (EA) analyzes the environmental consequences of the Proposed Action Alternative and the No Action Alternative, to explain the environmental effects of each in the decision-making process. In addition to the *Roseburg District 2008 Record of Decision and Resource Management Plan* (2008 ROD/RMP), this analysis tiers to the *2008 Final Environmental Impact Statement for the Revision of the Resource Management Plan of the Western Oregon Bureau of Land Management* (2008 Final EIS).

Implementation of the actions proposed in this analysis would conform to the requirements of the 2008 ROD/RMP, incorporating the standards and guidelines therein.

C. Management Objectives

The management objectives of the proposed action vary based on land-use allocation, in accordance with the 2008 ROD/RMP. Specific objectives of the proposed action are outlined below.

Within the Timber Management Area:

- Manage forests to achieve continuous timber production that could be sustained through a balance of growth and harvest (2008 ROD/RMP; pg. 37).

- Contribute timber for sale towards meeting the declared annual productive capacity (allowable sale quantity) of 69 million board feet (2008 ROD/RMP; pg. 37).

- Contribute timber for sale from commercial thinning towards meeting the declared decadal allowable sale quantity of 160 million board feet (2008 ROD/RMP; pg. 37).

Within the Riparian Management Area:

- Provide for conservation of special status fish and other special status aquatic species (2008

ROD/RMP; pg. 35).

- Provide for riparian and aquatic conditions that supply stream channels with shade, sediment filtering, leaf litter and large wood, and streambank stability (2008 ROD/RMP; pg. 35).

- Maintain and restore water quality (2008 ROD/RMP; pg. 35).

- Maintain and restore access to stream channels for all life stages of fish species (2008 ROD/RMP; pg. 35).

D. Decision Factors

Factors to be considered when selecting among alternatives would include:

- The degree to which the objectives previously described would be achieved, including: the manner in which commercial thinning would be conducted with respect to cost, the method(s) of yarding, and type of equipment; season(s) of operations; and the manner in which access would be provided, including road renovation, and the types and locations of road construction;

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

- Compliance with management direction from the 2008 ROD/RMP; and

- Compliance with applicable laws including, but not limited to, the Clean Water Act, the Endangered Species Act, O&C Act, and the National Historic Preservation Act.

Chapter 2. Discussion of the Alternatives

This chapter describes the basic features of the alternatives being analyzed.

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 commercial thinning of timber or treatment of the mid-seral stands within the bounds of the project area at this time.

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 conducted as-needed to provide resource protection, accommodate reciprocal users, and protect the federal investment.

B. The Proposed Action Alternative

The action alternative proposes the offering of two timbersales (i.e. Slim Big Jim and Sherlock Home) that would result in commercial thinning of approximately 512 acres of mid-seral stands and is expected to yield approximately 5.1 million board feet of timber (Appendix E, Figures 1-3). The proposed action consists of the following activities, summarized in Table 1.

Table 1. Slim Sherlock Proposed Activity Summary.

Activity		Total
Commercial Thinning	Timber Management Area* Riparian Management Area*	512 acres
Yarding	Cable Yarding Combination of Cable & Ground Based Yarding	294 acres 218 acres
Hauling	Dry Season Haul Only Wet or Dry Season Haul	24,250 feet 7,800 feet
Road Activities	New, Temporary Construction New, Permanent Construction Decommissioning (i.e. waterbar, block, and mulch) Renovation of Existing Roads Improvement of Existing Roads	4,950 feet 3,900 feet 24,550 feet 23,300 feet 200 feet
Fuels Treatment	Machine Pile and Burn at Landings	

* The distribution of project acreage between the TMA and RMA would be disclosed in the individual Slim Big Jim and Sherlock Home decisions.

Slim Sherlock includes lands within the TMA and RMA land use allocations and would total approximately 512 acres. The extent of the RMA within the proposed projects would be determined following completion of field work to define the spatial arrangement of intermittent, perennial, and fish-bearing streams. The distribution of project acreage between the TMA and RMA would be disclosed in the individual project decisions. Slim Sherlock is located on Revested Oregon and

California Railroad Lands (O&C Lands). The land use allocation and yarding method(s) for each of the proposed units is displayed in Table 2.

Table 2. Slim Sherlock Land Use Allocations & Yarding Methods.

Unit	Township-Range-Section	Unit Acres	Land Use Allocation	Yarding Method(s)
Slim Big Jim				
9A	T27S-R03W-Sec. 9	29	TMA, RMA	Cable
9B	T27S-R03W-Sec. 9	50	TMA, RMA	Cable
9C	T27S-R03W-Sec. 9	55	TMA, RMA	Cable
9E	T27S-R03W-Sec. 9	26	TMA, RMA	Cable; Ground-based
Sherlock Home				
19A	T27S-R03W-Sec. 19	28	TMA, RMA	Cable; Ground-based
19B	T27S-R03W-Sec. 19	39	TMA, RMA	Cable; Ground-based
19C	T27S-R03W-Sec. 19	73	TMA, RMA	Cable
25A	T27S-R04W-Sec. 25	49	TMA, RMA	Cable; Ground-based
25B	T27S-R04W-Sec. 25	39	TMA, RMA	Cable
25D	T27S-R04W-Sec. 25	76	TMA, RMA	Cable; Ground-based
31A	T27S-R03W-Sec. 31	48	TMA, RMA	Cable
Total		**512**		

1. Commercial Thinning

a) Timber Management Area Prescription

Apply commercial thinning to recover anticipated mortality; to adjust stand composition or dominance; to reduce stand susceptibility to disturbances such as a fire, windstorm, disease, or insect infestation; and to improve merchantability and value (2008 ROD/RMP; pg. 38). The proposed units are mid-seral forest, aged 45 to 51 years and were previously harvested and planted/seeded in the late 1950's and early 1960's.

The prescription in the TMA Maintain stand densities through commercial thinning at levels above that needed to occupy the site, but below densities that will result in loss of stand vigor and health (2008 ROD/RMP; pg. 38). The TMA would be thinned by leaving 120 square feet of basal area. Within the TMA, non-commercial snags and coarse woody debris would be retained, except for safety or operational reasons (2008 ROD/RMP, pg. 38).

In addition, conifer and hardwood snags 10 inches or larger in diameter breast height and at least 16 feet in height would be marked for retention in the TMA. Existing snags would be felled only if they pose a safety concern. Snags felled for safety reasons in the TMA would be retained on site as coarse woody debris. Existing coarse woody debris in decay classes 3, 4, and 5 would be retained in the TMA.

Older remnant trees may be present, but are not the numerically predominant stand components or the focus of the treatments. Since treatments would focus on removal of intermediate and suppressed canopy layers in the majority of each unit, it is possible that suppressed trees designated for cutting may include trees older than the prevailing stand age.

b) Riparian Management Area Prescription

The RMA would be one site-potential tree height (i.e. 180 feet) on each side of the stream channel as measured from the ordinary high water line for perennial streams and intermittent fish-bearing streams (2008 ROD/RMP, pg. 35). For intermittent non-fish bearing streams, the RMA would be half of one site-potential tree height (i.e. 90 feet) on each side of the stream channel as measured from the ordinary high water line (2008 ROD/RMP, pg. 35). The RMA would be commercially thinned by leaving 80 to 120 square feet of basal area. A variable spacing marking prescription would be used. The prescription near streams would be based on the following management direction from the 2008 ROD/RMP (pg. 35):

<u>For Perennial and Intermittent Fish-Bearing Streams and Perennial Non-Fish-Bearing Streams</u>**:**

- Apply thinning and other silvicultural treatments to speed development of large trees to provide an eventual source of large woody debris to stream channels. These treatments:
    - Would retain a minimum of 50 percent canopy closure; and
    - Would not be applied within 60 feet (slope distance) on either side of the edge of the stream channel, as measured from the ordinary high water line.
- Retain all snags and coarse woody debris in thinning operations, except for safety or operational reasons (e.g., maintaining access to roads and facilities).
- Make timber to be cut in thinning, tree-falling, and salvage operations available for sale.

<u>For Intermittent Non-Fish-Bearing Streams</u>**:**

- Apply thinning and other silvicultural treatments to speed the development of large trees to provide an eventual source of large woody debris to stream channels. Do not apply thinning and other silvicultural treatments within 35 feet (slope distance) on either side of the edge of the stream channel, as measured from the ordinary high water line.
- Retain all snags and coarse woody debris in thinning operations except for safety or operational reasons (e.g., maintaining access to roads and facilities).
- Make timber to be cut in thinning, tree-falling, and salvage operations available for sale.

c) Timber Cruising

Timber cruising would employ methods that could include the felling of sample trees to formulate local volume tables. Felled sample trees would become part of the offered sale volume.

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

d) Firewood

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

2. Timber Yarding

The Proposed Action would require a mix of skyline cable yarding and ground-based yarding (Table 2). Project Design Features for timber yarding were developed, in part, from the Best Management Practices provided in Appendix C of the 2008 ROD/RMP and are provided under "*Additional Project Design Features of the Action Alternative*".

A power line that provides power to the Lane Mountain Communication Site is adjacent to proposed Sherlock Home Unit 25A (Appendix E, Figure 3). Trees would be felled away from the transmission lines, and ground-based equipment would not be allowed to operate within the transmission line corridor, except on designated skid trails and roads.

Cable-yarding in Sherlock Home Unit 19A would be done from the existing 27-3-19.0 road. Short, temporary spurs from the 27-3-19.0 road would not be constructed to cable yard this unit.

Although the proposed thinning units are not within the Deferred TMA, there is a 2 acre portion adjacent to Sherlock Home Unit 31A that is within the Deferred TMA. This 2 acre portion of the Deferred TMA is a stand comparable to those being proposed for commercial thinning (i.e. mid-seral forest, aged 45 to 51 years). Within this portion of the Deferred TMA, it may be necessary to fall and remove trees as needed for the creation of yarding corridors adjacent to nearby harvest units (2008 ROD/RMP; pg. 37).

3. Timber Hauling

Approximately 7,800 feet of rocked roads would be hauled across either in the dry- or wet-season while 24,250 feet of natural surface roads would be limited to dry-season hauling.

4. Fuels Treatment

Prescribed burning of slash (burning under the direction of a written site specific prescription or "Burn Plan") would occur at machine-piled landing piles. The fine fuels generated during the thinning process would remain scattered throughout the treatment units.

5. Road Activities (Construction, Reconstruction, Maintenance, & Decommissioning)

The proposed project would include dry season and wet season logging activities and use existing roads to the greatest extent practical. Road construction, reconstruction, maintenance, and decommissioning would be restricted to the dry season (normally May 15th to October 15th). The operating season could be adjusted if unseasonable conditions occur (e.g. an extended dry season beyond October 15th or wet season beyond May 15th).

Construction – There would be a total of approximately 8,850 feet of new construction in Slim Sherlock. Approximately 4,950 feet of new, temporary spur roads would be constructed and approximately 3,900 feet of new, permanent spur road would be constructed and rocked (Tables 3a, 3b). Temporary spurs would be decommissioned after harvest. Permanent spurs would not be decommissioned after harvest.

Roads or spurs that may be rocked at the purchaser's expense include: the 27-3-9.1B road, Spur SH4, Spur SH5, Spur SH6, and 27-4-25-RD1. Spurs or roads that are rocked at purchaser's expense would be decommissioned by blocking with trench barriers.

Renovation – There would be a total of approximately 23,500 feet of renovation in Slim Sherlock. Approximately 19,800 feet of existing, native surfaced roads in Slim Sherlock would be renovated by brushing, grading, replacing drainage structures (Tables 3a, 3b). Approximately

3,500 feet of existing, rock surfaced roads in Slim Sherlock would be renovated by brushing, grading, replacing drainage structures, and adding rock where needed (Tables 3a, 3b). Existing rocked roads that currently have insufficient rock may be renovated with additional rock, at the purchaser's expense, to allow winter haul. These rocked roads would then remain open following commercial thinning.

Improvement – Approximately 200 feet of existing, native surfaced road (i.e. Spur SBJ10) would be improved by brushing, grading, replacing drainage structures, and adding rock to the running surface (Table 3a). This road would then remain open following commercial thinning.

Decommissioning – Approximately 4,950 feet of newly constructed, native-surface spur roads and 19,600 feet of renovated, native-surface spur roads would be decommissioned following their use (Tables 3a, 3b). These roads and spurs 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.

Maintenance – In addition, about 69,960 feet of existing roads would be maintained. Road maintenance might consist of maintaining drainage structures (culverts and drainage ditches), reshaping the road surface, surfacing with rock where needed, and brushing road shoulders.

Over-wintering – Over-wintering natural surface spur roads (referred to as "stormproofing" in the 2008 ROD/RMP) would be done by building, using, and winterizing natural surface spur roads prior to the end of the dry season. Over-wintering would include: installation of waterbars (2008 ROD/RMP, Appendix C-33, Table C-5), 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.

Table 3a. Slim Big Jim Roads & Spurs[1]

Spur/Road #	New Construction (feet)	Renovation (feet)	Improvement (feet)	Surfacing		Decommissioning
				Existing	Proposed	
Spur SBJ1	200	0	0	none	Rock	none
Spur SBJ3	1,100	0	0	none	Native	Water-bar, mulch, block
Spur SBJ5	350	0	0	none	Native	Water-bar, mulch, block
Spur SBJ9	1,100	0	0	none	Rock	none
Spur 10	0	0	200	Native	Rock	none
27-3-9.1A	0	1,000	0	Rock	Rock	none
27-3-9.1B	0	2,200	0	Native	Native*	Water-bar, mulch, block
27-3-9.2	1,100	900	0	Rock	Rock	none
27-3-9.4	1,500	1,800	0	Rock	Rock	none
TOTAL	**5,350**	**6,100**	200			

[1]Approximately 22,440 feet of existing roads would be maintained for Slim Big Jim in addition to the roads and spurs described in the table.
* allow purchaser expense rock; block and mulch when harvest complete.

Table 3b. Sherlock Home Roads & Spurs[1]

Spur/Road #	New Construction (feet)	Renovation (feet)	Surfacing		Decommissioning
			Existing	Proposed	

Spur/Road #	New Construction (feet)	Renovation (feet)	Surfacing		Decommissioning
			Existing	Proposed	
Spur SH2	700	0	none	Native	Water-bar, mulch, block
Spur SH4	0	1,000	Native	Native*	Water-bar, mulch, block
Spur SH5	500	0	none	Native*	Water-bar, mulch, block
Spur SH6	800	0	none	Native*	Water-bar, mulch, block
27-4-15	0	11,300	Native	Native	Water-bar, mulch, block
27-4-19.1	0	1,100	Native	Native	Water-bar, mulch, block
27-4-25-RD1	1,500	0	None	Native*	Water-bar, mulch, block
27-4-25.1	0	2,700	Native	Native	Water-bar, mulch, block
27-4-25.2	0	1,300	Native	Native	Water-bar, mulch, block
TOTAL	**3,500**	**17,400**			

[1]Approximately 47,520 feet of existing roads would be maintained for Sherlock Home in addition to the roads and spurs described in the table.
* allow purchaser expense rock; block and mulch after harvest complete.

C. Additional Project Design Features of the Action Alternative

The Additional Project Design Features described below include those Best Management Practices (BMPs) for roads and timber harvest from Appendix C of the 2008 ROD/RMP and additional project deisgn features that are proposed for the Action Alternative. As anticipated in the 2008 ROD/RMP, not all BMPs listed in the 2008 ROD/RMP were selected for inclusion in Slim Sherlock's Additional Project Design Features.

There are also Additional Project Design Features for: air quality, cultural resources, noxious weeds, special status plants and animals, and petroleum products and other hazardous materials.

1. Roads:

General Construction

R1 Locate roads and landings on stable locations that minimize sediment delivery potential to streams (e.g., ridge tops, stable benches or flats, and gentle-to-moderate side-slopes). To the extent workable, avoid unstable headwalls, and steep channel-adjacent side slopes (2008 ROD/RMP; Appendix C-5).

R2 Where practical to do so plan routes to limit new road construction, including stream crossings, within RMAs (2008 ROD/RMP; Appendix C-5).

R5 To the extent workable, locate new landings outside of RMAs. Avoid expanding existing landings in RMAs where sediment delivery to stream channels could occur (2008 ROD/RMP; Appendix C-5).

R6 Locate landings in areas with low risk for landslides (2008 ROD/RMP; Appendix C-5).

R8 Design roads no wider than needed for the specific use (2008 ROD/RMP; Appendix C-6).

R9 Limit road and landing construction, reconstruction, or renovation activities to the dry season, generally from May into October. When conditions permit operations outside of the dry season, keep erosion control measures concurrent with ground disturbance to the extent that the affected area can be rapidly stormproofed of weather conditions deteriorate (2008 ROD/RMP; Appendix C-6). In the Swiftwater Field Office the dry season is normally considered May 15th to October 15th.

R14 Where deemed necessary, use temporary sediment containment structures to contain runoff from construction areas (e.g. silt fencing) (2008 ROD/RMP; Appendix C-6).

R15 Surface roads if they would be subject to traffic during prolonged wet weather (2008 ROD/RMP; Appendix C-6).

R17 Seed and mulch cut and fill slopes, ditchlines, and waste disposal upon construction completion. Where straw mulch or rice straw mulch is used; require certified weed free, if readily available. Mulch shall be applied at no less than 2,000 lbs/acre (2008 ROD/RMP; Appendix C-7). In addition, for new construction, new cut and fill slopes would be mulched with weed-free straw, or equivalent, and seeded with a native or sterile hybrid mix.

Cross Drains

R34 Space cross drains at intervals sufficient to prevent water volume concentration and accelerated ditch erosion. Increase cross drain frequency through erodible soils, steep grades, and unstable areas (2008 ROD/RMP; Appendix C-9).

Temporary Stream Crossings for Roads and Skid Trails

R62 Limit the number of new temporary crossings on a stream (2008 ROD/RMP; Appendix C-14).

Road Use and Dust Abatement

R73 Suspend timber hauling during wet weather when road run-off delivers sediment at higher concentrations than existing conditions in the receiving stream. Hauling could resume when ditch flow subsides, or when conditions allow turbidity standards to be met (2008 ROD/RMP; Appendix C-15).

R75 Wash equipment at sites with no potential for runoff into waterbodies, floodplains, or wetlands (2008 ROD/RMP; Appendix C-15). This BMP is would be used in conjunction with Additional Project Design Features for *Noxious Weeds* (below).

Road Closure and Decommissioning

R90 Close roads not needed, but not recommended to be fully decommissioned. When this measure is used by itself, it applies only to roads that do not significantly reroute hillslope drainage, involve stream channels, or present slope stability hazards. Close roads using methods such as gates, guard rails, earth/log barricades, etc. to reduce or eliminate erosion and sedimentation due to traffic on roads (2008 ROD/RMP; Appendix C-18).

R91 Place woody material or other appropriate barriers to discourage off-highway vehicle use on decommissioned roads, unless specifically designated for this use (2008 ROD/RMP; Appendix C-18).

2. Timber Harvest:

Cable Yarding

Cable yarding would not be permitted on very steep slopes (i.e. ≥ 70 percent) when soil moisture levels are too high. Soil moisture would be considered too high if cable yarding creates glazed imprints on soil that channels water down slope or if water can be squeezed from soil samples by hand. This generally occurs when the soil moisture is greater than 30 percent. This design feature would also apply to the moderate and greater slopes (i.e. ≥ 35 percent) of the northern part of Sherlock Home Unit 19C.

TH2 Design yarding corridors so as to limit canopy loss in RMAs and to meet shade targets. Techniques include limiting the number of such corridors, using narrow widths, and using perpendicular orientation to the stream (2008 ROD/RMP; Appendix C-22). In addition, cable logging systems that limit ground disturbance (i.e. partial or full suspension) would be used and intermediate supports would be used as necessary to obtain partial suspension at slope breaks.

TH3 Where workable, require full suspension over flowing streams, non-flowing streams with erodible bed and bank, and jurisdictional wetlands (2008 ROD/RMP; Appendix C-22).

TH6 Implement erosion control measures such as waterbars, slash placement and seeding in cable corridors where the potential for erosion and delivery to waterbodies, floodplains and wetlands exists (2008 ROD/RMP; Appendix C-22). In addition, erosion control measures would be applied where the potential to destabilize slopes exists.

Ground-Based Harvesting

Ground-based yarding equipment would be limited to slopes generally less than 35 percent and would be confined to designated skid and forwarder trails. Skid trails would have an average spacing of at least 150 feet apart and harvester/forwarder trails would be spaced at least 50 feet apart where topography allows.

TH7 Exclude equipment from the RMA retention areas (60 feet from the edge of the active stream channel for fishbearing and perennial streams, lakes, and ponds, and 35 feet for intermittent streams), except for road crossings, restoration, wildfire, or similar operational reasons (2008 ROD/RMP; Appendix C-23).

TH9 Plan use on existing and new skid trails, to be less than 12 percent of the harvest area (2008 ROD/RMP; Appendix C-23).

TH10 Limit width of skid roads to what is operationally necessary for the equipment (2008 ROD/RMP; Appendix C-23).

TH11 Ensure one-end suspension of logs; (e.g. integral arch on all conventional ground-base yarding equipment) (2008 ROD/RMP; Appendix C-23).

TH12 Restrict ground-based harvest and skidding operations to periods of low soil moisture when soils have resistance to compaction and displacement (2008 ROD/RMP; Appendix C-23). In the Swiftwater Field Office the period of low soil moisture (also referred to as the dry season) is normally considered May 15th to October 15th.

TH13 As a first priority, use ground-based equipment on existing compacted surfaces (2008 ROD/RMP; Appendix C-23).

TH16 Designate skid trails where water from trail surface would not be channeled into unstable areas adjacent to waterbodies, floodplains, and wetlands (2008 ROD/RMP; Appendix C-24).

TH17 When hand falling, directionally fall trees towards skid trails. When mechanically harvesting, directionally fall and bunch trees to facilitate skidding (2008 ROD/RMP; Appendix C-24).

TH21 Block skid roads that intersect haul roads at the end of seasonal use (2008 ROD/RMP; Appendix C-25).

3. Air Quality:

Implement prescribed burns (i.e. slash piles) in accordance with the Oregon Smoke Management Plan to reduce emissions, to avoid smoke intrusions into designated areas, and to avoid degrading the visibility in Class I areas (2008 ROD/RMP; pg. 39).

4. 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, operations would be suspended until the site has been evaluated to determine the appropriate mitigation action.

5. Noxious Weeds:

Manual, mechanical, or chemical treatments would be used to manage invasive plant infestations (2008 ROD/RMP; pg. 41). Existing infestations of, Scotch broom and Himalayan blackberry would be treated prior to commercial thinning operations.

Logging and road construction equipment would be required to be cleaned, with a pressure washer, and free of weed seed prior to entering BLM lands (BLM Manual 9015-Integrated Weed Management).

6. Special Status Plants and Animals:

Manage plant and animal species that are listed under the Endangered Species Act consistent with recovery plans and designated critical habitat (2008 ROD/RMP; pgs. 40, 58). Wildlife species with currently approved recovery plans include the marbled murrelet and northern spotted owl (2008 ROD/RMP; pg. 58).

Manage BLM special status plant, fungi, and animal species to maintain or restore populations and habitat consistent with species conservation needs. Protection measures may include altering the type, timing, extent, and intensity of actions; and other strategies designed to maintain populations of species (2008 ROD/RMP; pgs. 40, 58).

Prior to attaching any logging equipment to a reserve tree, precautions to protect the tree from damage would 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, or plastic culverts.

Northern Spotted Owls

Restrict activities that would disrupt nesting during nesting season where northern spotted owls have been found to be currently nesting (2008 ROD/RMP; pg. 58).

Harvest activities (e.g. falling, bucking, and yarding of timber) within 65 yards of suitable habitat or spotted owl activity centers (i.e. nest sites) would be seasonally restricted from March 1st through July 15th 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.

Suitable spotted owl habitat is within 65 yards of Slim Big Jim Units 9C and 9E (Appendix E, Figure 4) and within 65 yards of Sherlock Home Units 19B, 19C, 25B, 25D, and 31A (Appendix E, Figure 5). Based on 2008 protocol survey data, there are currently no known northern spotted owl activity centers within 65 yards of the proposed unit boundaries. Spotted owl surveys had not been conducted in the proposed project area for more than 10 years prior to the 2008 surveys; therefore, there is currently one year of protocol surveys completed in the project area. However, spotted owl surveys are currently in progress for the 2009 nesting season.

Prescribed burning (i.e. slash piles) within 440 yards of suitable habitat or spotted owl activity centers would be seasonally restricted from March 1st through July 15th 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.

7. Petroleum Products or other Hazardous Material:

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. 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: Areas of Critical Environmental Concern (ACECs), Research Natural Areas (RNAs), prime or unique farm lands, floodplains/wetlands, solid or hazardous waste, Wild and Scenic Rivers, and Wilderness.

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

2. Cultural Resources

Inventories for cultural resources in the proposed Slim Sherlock units were completed in September 2008. No cultural resources were discovered. It was determined that there would be no effect to any cultural resources since none would be included within the Slim Sherlock harvest units.

3. Visual Resource Management

The Visual Resource Management (VRM) classification for this area is Class IV. The VRM Class IV areas in Slim Sherlock would be managed for high levels of change to the characteristic landscape in accordance with 2008 ROD/RMP direction (pg. 58).

4. Energy Transmission or Transport Facilities

A power line that provides power to the Lane Mountain Communication Site is adjacent to proposed Sherlock Home Unit 25A (Appendix E, Figure 3). Trees would be felled away from the transmission lines, and ground-based equipment would not be allowed to operate within the transmission line corridor because there is insufficient vertical clearance for equipment. No adverse effect on energy resources would be anticipated because no other commercially usable energy sources are known to exist in the proposed units.

E. Alternatives Considered but Not Analyzed in Detail

1. Slim Big Jim Unit 9D

An alternative was considered that included an additional unit (Slim Big Jim Unit 9D) of mid-seral forest approximately 48 years old and approximately 30 acres in size. In order to access Unit 9D for conventional ground-based or cable-based yarding, either new construction of a stream crossing over Jim Creek would have been required from the north or construction of a new road through young (currently sub-merchantable) plantations on BLM and private lands from the south.

Given the volume of timber that was available for thinning in Unit 9D, the interdisciplinary team considered that it would not be cost effective to build the stream crossing over Jim Creek at this time. The interdisciplinary team also considered that it would be advantageous to defer harvest on Unit 9D until the young plantations to the south developed into trees of merchantable size. In addition, accessing Unit 9D from the north (over Jim Creek) would have led to downhill cable-yarding the unit whereas accessing the unit from the south would lend itself to uphill cable-yarding. Consequently, Unit 9D was deferred from further analysis in the Slim Sherlock EA.

2. Sherlock Home Units 25C & 25D

An alternative was considered that included an additional unit (Sherlock Home Unit 25C) of mid-seral forest approximately 46 years old and approximately 30 acres in size. Commercial thinning in Unit 25C would be uneconomical given the low standing volume of the small, densely stocked trees in the stand (i.e. quadratic mean diameter of 7.6 inches; 600 trees per acre). In addition, an alternative was considered that would have included an additional 48 acres of 34 to 46 year old mid-seral stands in Sherlock Home Unit 25D. However, these additional stands are predominantly (60-70 percent) comprised of off-site pine and have a low volume of timber

available for commercial thinning. Thinning would not benefit these off-site pine stands at this time and it would also not be economical to commercially thin them at this time. Consequently, both Unit 25C and the additional acreage for Unit 25D are not analyzed further in the Slim Sherlock EA.

Chapter 3. Affected Environment & Consequences by Resource

This chapter discusses the specific resources potentially affected by the alternatives and the direct, indirect and cumulative environmental effects of the alternatives over time. Cumulative effects are the impacts of an action when considered with past, present, and reasonably foreseeable future actions (40 CFR 1508.7). This discussion is organized by individual resource, and provides the basis for comparison of the effects between alternatives.

The cumulative effects of the BLM timber management program in western Oregon have been described and analyzed in the 2008 Final EIS, incorporated herein by reference.

A. Forest Vegetation

1. Affected Environment

The proposed units are predominantly Douglas-fir forested stands 45-51 years old. Other conifer species in the stands include incense-cedar, western hemlock, western red cedar, and grand fir. Hardwoods and ground vegetation are common where there is sufficient light available (e.g. Pacific madrone, golden chinquapin, big leaf maple, red alder, salal, Oregon grape, and sword fern). All of the stands within the proposed Slim Sherlock project had been actively managed with precommercial thinning and fertilization treatments from 1972 to 1985. The stands are exhibiting signs of being overstocked (e.g. decreased crown ratios).

Stand ages were established by one of two methods. In stands previously harvested and reforested, operational inventory data was used. If this data was not available, stand exams (performed 1998-2007) determined the average age of the dominant and co-dominant trees that would benefit from commercial thinning.

Current stand exam data was input to the ORGANON growth and yield model version 8.2. Model output was used to describe current stand conditions and to predict post treatment conditions after the prescribed management is implemented. Harvest units may contain one or more stands, and may contain a mix of tree species, form, and distribution. The current stand conditions for the Slim Sherlock sales are summarized in Table 4.

Table 4. Current Stand Conditions.

Sale Name	Stand Age (years)	Total Trees Per Acre	Trees Per Acre (over 7" DBH)	Basal Area (sq. ft.)	Quadratic Mean Diameter (inches)	Relative Density Index	Canopy Closure* (%)
Slim Big Jim	48-49	249-302	185-218	177-222	11.1-11.6	0.58-0.72	100
Sherlock Home	45-51	251-384	143-223	191-218	10.1-12.6	0.63-0.74	100

*Canopy Closure is the proportion of the forest floor covered by the vertical projection of tree crowns, which is adjusted for crown overlap in closed canopy stands.

2. No Action Alternative

Current stand relative densities exceed or are near suppression related mortality thresholds. In the absence of treatment, canopies would remain closed and the crowns of individual trees would continue to recede, resulting in increased suppression mortality and decreasing diameter growth as trees compete for water, nutrients, and sunlight.

Suppression mortality would occur primarily in the smaller size classes of trees and would be the main source for snag and coarse woody debris recruitment. Continued suppression would also lead to a reduction in the hardwood and shrub components, which would further simplify the vegetative composition of the stands.

Live crown ratios of the overstory trees would continue to decrease from current levels as lower limbs are shaded out and die. Closely spaced trees with small crown ratios have reduced photosynthetic capacity, which results in decreased diameter growth and lower resistance to disease and insects. As trees increase in height, with little increase in diameter, they become unstable and more susceptible to wind damage (Oliver and Larson, 1996).

3. Proposed Action Alternative

Thinning results in increased diameter growth, improved stem and root strength, cessation of crown recession, release of understory vegetation and increased potential for new tree and shrub understory regeneration (Bailey 1996; Bailey and Tappeiner 1998; Bailey, et al. 1998; Oliver and Larson 1996).

Thinning in the TMA would produce relative stand densities ranging from 0.35 to 0.40 (Table 5). Within that range of relative densities, commercial thinning would produce high rates of volume growth (Curtis and Marshall, 1986).

Thinning in the RMA would result in relative stand densities ranging from 0.25 to 0.40 (Table 5). Stands thinned to a relative density of 0.15 to 0.3 would increase stand diversity and produce a high level of volume productivity (Chan, et al. 2006).

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

Table 5. Post-Treatment Stand Conditions.

Sale Name	Total Trees Per Acre	Trees Per Acre (over 7" DBH)	Basal Area (sq. ft.)	Quadratic Mean Diameter (inches)	Relative Density Index	Canopy Closure* (%)
Slim Big Jim (RMA)	117-176	76-144	80-120	12.6-14.2	0.25-0.39	50-82
Slim Big Jim (TMA)	163-176	122-144	120	12.6-13.7	0.37-0.39	78-82
Sherlock Home (RMA & TMA)	142-231	95-144	120	12.5-15.3	0.35-0.40	73-90

*Canopy Closure is the proportion of the forest floor covered by the vertical projection of tree crowns, which is adjusted for crown overlap in closed canopy stands.

The proposed treatments in Slim Sherlock would reduce tree densities, allowing selected trees more room to grow, while at the same time allowing for the capturing of anticipated mortality through harvest. In the long-term, the treatment would maintain or increase growth rates of desired species and promote stem quality and tree vigor. This would reduce stand susceptibility to disturbances such as wildfire, windstorm, disease or insect infestation. Additionally, in the RMA snags and down logs are retained, and live trees would provide a future source of these structures.

The 2008 Final EIS (pg. 518) concluded that in the harvest land base forest structure and spatial patterns will vary by land use allocation. Under the 2008 PRMP, which was adopted under the 2008 ROD/RMP, stand establishment forest would increase, and structurally complex forests would decrease in the harvest land base as a whole. The different land use allocations within the harvest land base would result in different patterns of forest structure across the landscape. In the Timber Management Area, an increase in the stand establishment forests and a decrease in the structurally complex forests would occur.

B. Wildlife

1. Federally Threatened & Endangered Wildlife Species

a) Northern Spotted Owl

(1) Affected Environment

Home Range – The home range for northern spotted owls in the Cascades Province is a 1.2 mile radius circle surrounding an activity center (i.e. nest site) and is used by spotted owls to obtain cover, food, mates, and to care for their young. The home ranges of several owl pairs may overlap and the habitat within them is commonly shared between adjacent owl pairs and by other dispersing owls. These areas are important for the survival and productivity of spotted owls because owls are non-migratory birds that remain in their home ranges year-round. For the analysis of effects to owls and their habitat in Slim Sherlock, only the most recently occupied activity centers and their corresponding home range circles were considered.

There are four known spotted owl activity centers within 1.2 miles of the proposed Slim Sherlock units. The closest spotted owl activity center (Falling Deer [IDNO 0243O]) is currently located approximately 480 yards from Sherlock Home Unit 19C. The other three activity centers are currently located approximately 1,000 to 2,000 yards (0.6 to 1.1 miles) away from proposed unit boundaries.

There is one historical spotted owl activity center (Jim Creek [IDNO 0290O]) that was not analyzed in detail because the area, including the activity center, was previously harvested and does not currently contain suitable habitat for northern spotted owls. The Jim Creek activity center was located in T27S-R03W-S16, and the majority of that section was harvested between 17-21 years ago (pers. comm., S. Weber) and neither spotted owl dispersal habitat nor suitable habitat has re-developed there. Current surveys (2008) of the adjacent suitable habitats have not indicated the presence of northern spotted owls in T27S-R03W-S16.

Core Area – Within the home range, the core area for spotted owls is a 0.5 mile radius circle around the spotted owl activity center used to describe the area most heavily utilized by spotted owls during the nesting season (USDI *et al*, 2008c). Core areas represent areas defended by territorial spotted owls and generally do not overlap the core areas of other spotted owl pairs. The proposed units would fall within the core area of one spotted owl activity center (Falling Deer [IDNO 0243O]; Appendix E, Figure 5).

Nest Patch – Within the core area, the nest patch is defined as the 300 meter radius circle around a known spotted owl activity center (USDI *et al*., 2008c). Activities within this

area are considered likely to affect the reproductive success of nesting spotted owls and are used in determination of incidental take. No proposed units would fall within the nest patch of any known spotted owl activity center (Appendix E, Figures 4 & 5).

Dispersal Habitat – Forest types described as dispersal habitat are essential to the dispersal of juvenile and non-territorial northern spotted owls. Dispersal habitat can occur in intervening areas between or within blocks of nesting, foraging, and roosting habitat. Dispersal habitat is essential to maintaining stable populations by filling territorial vacancies when resident owls die or leave their territories, and to providing adequate gene flow across the range of the species (USDI, 2008b).

Managed Owl Conservation Area (MOCA) –The 2008 Final Recovery Plan for the Northern Spotted Owl designated MOCAs with appropriate sizes and distances between them to allow for a reasonable level of owl dispersal and movement (USDI, 2008a; Appendix C, pg. 81). Based on the observed dispersal distances of juveniles, the maximum allowable distance between the nearest points of contact of neighboring large habitat blocks is 12 miles (Thomas et al. 1990, pg. 308). The proposed Slim Sherlock units are all within 12 miles of the nearest large MOCA. The MOCAs are co-incident with the Critical Habitat designation for the northern spotted owl.

Designated Critical Habitat – Critical Habitat is a specific geographical area designated by the USFWS as containing habitat essential for the conservation of a Threatened or Endangered species. All proposed Slim Sherlock units are located outside of designated Critical Habitat for the northern spotted owl.

(2) *No Action Alternative*

The quality and availability of northern spotted owl habitat would be unaffected under the No Action alternative. The 512 acres of mid-seral stands serving as dispersal habitat included in Slim Sherlock and the northern spotted owl activity centers described above would continue to function similar to current levels. Suitable habitat characteristics would continue to develop more slowly within the RMA when compared to the proposed action (refer to *Forest Vegetation*, pgs. 14-15).

(3) *Proposed Action Alternative*

Based on 2008 survey data, there are no known spotted owl activity centers within 65 yards of the proposed unit boundaries. Therefore, disturbance or disruption to nesting spotted owls would not occur because no nesting owls are known to be present. In addition, the project design features include seasonal restrictions for nesting spotted owls if they are found based on future surveys (refer to *Additional Project Design Features: Special Status Plants and Animals*, pgs. 11-12).

Home Range –Approximately 325 acres of dispersal-only habitat would be modified within the home ranges of four known spotted owl activity centers (Buck Peak [IDNO 2086O], Falling Deer [IDNO 0243O], Lower Jim Creek [IDNO 2154O], and Cavitt Creek [IDNO 1549O]; Tables 6 & 7). No suitable habitat within the home range of any known owl activity center would be treated under the proposed action.

Core Area – A total of 38 acres of dispersal-only habitat are proposed for commercial thinning within the core area associated with one spotted owl activity center (Falling

Deer [IDNO 0243O]; Tables 6 & 7). No suitable habitat would be commercially thinned within the core area of any known spotted owl activity center under the proposed action.

Nest Patch – Neither dispersal-only habitat nor suitable habitat would be commercially thinned within the nest patch of any known spotted owl activity center under the proposed action (Tables 6 & 7).

Dispersal Habitat – Approximately 512 acres of dispersal-only habitat for spotted owls would be modified due to commercial thinning activities (Table 6).

Within the RMA, the proposed commercial thinning would accelerate the development of late-successional characteristics used by spotted owls such as large diameter trees, multiple canopy layers, understory development, and hunting perches. Development of late-successional characteristics and suitable habitat from dispersal-only habitat would be expected in approximately 50 years; roughly 100 years sooner than through natural stand development.

Though the quality of dispersal-only habitat within the RMA and TMA would be temporarily reduced by commercial thinning, the capability of the habitat to function for dispersing spotted owls would be maintained. Vertical and horizontal cover would be reduced within the proposed units through the reduction in canopy cover with varying levels of residual tree density. These stands are expected to continue functioning as dispersal habitat because post-treatment canopy closure would be maintained between 50-90 percent and the quadratic mean diameter would be at least 12.5 inches (Table 5). Canopy closure exceeding 40 percent and an average tree diameter exceeding 11 inches are figures widely used as minimum criteria describing functioning dispersal habitat (Thomas *et al.*, 1990).

Current research has shown that spotted owls are likely to increase the size of their home ranges to use untreated stands over newly treated stands both during and after harvest. Factors that reduce the quality of habitat within a home range or cause increased movement by owls in order to meet prey requirements may decrease the survival and reproductive fitness of owls at that site (Meiman *et al.*, 2003). However, there are an additional 13,315 acres of dispersal habitat (suitable plus dispersal-only habitat) available in the project area and surrounding areas within the Lower South Umpqua River and Little River Fifth-Field watersheds that are not being treated under this proposed action. Of the 13,315 acres of additional dispersal habitat available, approximately 1,500 acres are currently planned for commercial thinning in FY2010-2011 within the Lower South Umpqua River and Little River Fifth-Field watersheds.

There are also 4,285 acres of Deferred TMA within the Lower South Umpqua River and Little River Fifth-field watersheds (USDI, 2009). The Deferred TMA land use allocation was established to maintain substantially all of the existing levels of older and more structurally complex multi-layered conifer forests through the year 2023 on the District (2008 ROD/RMP, page 36). In addition, as previously discussed, MOCAs have been established to facilitate the movement of owls on the landscape.

Thus, although the proposed action would temporarily degrade the quality of dispersal habitat within the project area, it would still continue to function as dispersal habitat.

Therefore, this project would not preclude or appreciably reduce spotted owl movement between MOCAs or within the physiographic province.

Table 6. Northern Spotted Owl Habitat within Slim Sherlock Proposed Units.

Sale	Unit	Unit Acres	Unit Acres within…						Unit Total	
			Nest Patch		Core Area		Home Range			
			Suitable Habitat	Dispersal -only Habitat	Suitable Habitat	Dispersal -only Habitat	Suitable Habitat	Dispersal -only Habitat	Suitable Habitat	Dispersal -only Habitat
Slim Big Jim	9A	29	0	0	0	0	0	27	0	29
	9B	50	0	0	0	0	0	0	0	50
	9C	55	0	0	0	0	0	0	0	55
	9D	26	0	0	0	0	0	22	0	26
Sherlock Home	19A	28	0	0	0	0	0	28	0	28
	19B	39	0	0	0	0	0	39	0	39
	19C	73	0	0	0	38	0	74	0	73
	25A	49	0	0	0	0	0	25	0	49
	25B	39	0	0	0	0	0	0	0	39
	25D	76	0	0	0	0	0	62	0	76
	31A	48	0	0	0	0	0	48	0	48
TOTAL		**512**	0	0	0	38	0	325	**0**	**512**

Table 7. Northern Spotted Owl Habitat within Known Home Ranges.

Northern Spotted Owl Site (IDNO)		Federal Land (acres)	Habitat on Federal Lands Only (acres)			
			Suitable Habitat		Dispersal-Only Habitat	
			Current Condition	Habitat Modified through Proposed Action	Current Condition	Habitat Modified* through Proposed Action
Buck Peak (2086O)	Home Range (2,895 acres)	1,372	962	0	141	111
	Core Area (502 acres)	284	230	0	0	0
	Nest Patch (70 acres)	63	59	0	0	0
Falling Deer (0243O)	Home Range (2,895 acres)	883	248	0	181	166
	Core Area (502 acres)	202	131	0	42	38
	Nest Patch (70 acres)	47	47	0	0	0
Lower Jim Creek (2154O)	Home Range (2,895 acres)	836	167	0	311	48
	Core Area (502 acres)	252	72	0	86	0
	Nest Patch (70 acres)	51	12	0	11	0

Northern Spotted Owl Site (IDNO)		Federal Land (acres)	Habitat on Federal Lands Only (acres)			
			Suitable Habitat		Dispersal-Only Habitat	
			Current Condition	Habitat Modified through Proposed Action	Current Condition	Habitat Modified* through Proposed Action
Cavitt Creek (1549O)	Home Range (2,895 acres)	752	255	0	183	1
	Core Area (502 acres)	246	40	0	69	0
	Nest Patch (70 acres)	59	0	0	33	0

* Under the Proposed Action dispersal-only habitat would have a reduction in quality but would maintain its function.

2. Bureau Sensitive Species

Bureau Sensitive species suspected to occur within the project area and that may be affected by the proposed action, as well as other Bureau Sensitive and Bureau Strategic species suspected to occur on the Roseburg District BLM but not in the project area, are discussed briefly in *Appendix A: Bureau Sensitive & Bureau Strategic Species*.

a) No Action Alternative

Under the No Action Alternative, no suitable habitat or habitat features for BLM Special Status Species would be affected. Species within, or adjacent to the project area, would be expected to persist at their current levels. It is expected that the mid-seral wildlife habitat that is currently present would continue to function in its current capacity. Within both the TMA and RMA, the development of suitable and/or late-successional habitat characteristics for these species such as large trees, snags, coarse woody debris, and a well-developed understory would occur more slowly than compared to the proposed action (refer to *Forest Vegetation*, pgs. 14-15). The diversity of wildlife species and the wildlife populations currently utilizing the stands in the project area would be expected to continue using those stands.

As the stands mature, structural features (i.e., snow breaks, forked tops, decay, etc.) would be maintained, fostering the creation of snags and downed wood. In addition, as the stands in the project area mature, the structural diversity on the forest floor (e.g. shrub layer development, multi-layer canopy) will continue to develop which would benefit Special Status Species. The effects of the No Action Alternative on Bureau Sensitive and Strategic Species are summarized in *Appendix A: Bureau Sensitive & Bureau Strategic Species*.

b) Proposed Action Alternative

Under the Proposed Action Alternative, post-treatment canopy closure would be reduced to 50-90 percent within the proposed units. The proposed action may temporarily reduce the utility of the project area for some wildlife species by removing canopy cover and horizontal structure.

Within the TMA, snags and coarse woody debris would not necessarily be retained and therefore some species may be affected by a decrease in availability of snags and downed wood. However, snags and downed wood may be created incidentally through harvest operations or weather damage, thus providing additional snag and downed wood recruitment

as future habitat features. The 2008 Final EIS (pgs. 736-742) assumed that only non-commercial snags and non-commercial woody debris would be retained within the TMA, so the effects of the proposed project on these habitat features would be within the range of effects anticipated.

While the proposed action would reduce tree densities, it would not affect overall stand ages or affect the ability of the project area to grow into late seral habitat within the RMA. Canopy closure within the RMA would be reduced to 50-90 percent, where harvest would be permitted, and would be maintained at current levels within the 35-60 foot no-harvest stream buffers. Snags and coarse woody debris would be retained within the RMA. The development of late-successional characteristics such as larger trees, snags, and coarse woody debris would be accelerated by reducing tree densities.

C. Fire and Fuels Management

1. Affected Environment

Portions of Slim Big Jim and Sherlock Home are within the Wildland Urban Interface (WUI) boundary as identified in the Roseburg District Fire Management Plan. Current fuel conditions are best described by photo 1-MC-3 in *Photo Series for Quantifying Natural Forest Residues in Common Vegetation Types of the Pacific Northwest* (Maxwell and Ward, 1980). Based on this photo series, the estimate for downed woody debris in Slim Sherlock is 11 tons per acre, although there are some areas that have a lighter fuel load. Sherlock Home has limited access to the public because of locked gates which would decrease the risk of human-caused wildfires. Slim Big Jim is in an area used by the public but the units are uphill from the homes so residual slash in this area should not increase the fire risk to the homes. Considering these factors, the current risk of wildfire in the Slim Sherlock project is low to moderate.

2. No Action Alternative

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

3. Proposed Action Alternative

After commercial thinning, the down woody debris would increase from 11 tons per acre to 15 tons per acre as depicted in the photo 2-DF-3-PC from *Photo Series for Quantifying Forest Residues in the Coastal Douglas-Fir – Hemlock Type* (Maxwell and Ward, 1976). The down woody debris created at landings by the proposed action would be machine piled and burned to reduce concentrated fuel loads. The remaining fuels created by the proposed action would be predominately small (i.e. less than three inches in diameter) and scattered over the harvest area.

The additional amount of down woody debris (i.e. four tons per acre) would not dramatically increase the fire risk to the area. The primary carrier of fires is the fine fuels of less than three inches in diameter. These fine fuels generated in the harvest process would mostly degrade within two years after harvest. Therefore, there would be an increase in fire risk in the area for approximately two years before these additional fine fuels degrade. However, the homes in the area are not adjacent to the harvest units and therefore would not have increased fire risk.

D. Soils

1. Affected Environment

The soils formed primarily over granitic and schist-like volcanic rock. Topography varies from near level and gently sloping (0 to 35 percent) to very steep (greater than 70 percent) within the proposed units (Table 8). The greatest concentration of very steep slopes that include headwalls is in Slim Big Jim 19A and Sherlock Home 19C and 25D.

Table 8. Slope Distribution, Amount, and Percent of Area by Sale

Sale Name	Percent Slope	Sale Area (acres)	Percent of Sale Area
Slim Big Jim	0 to 70	148	92
	Greater than 70	12	8
Sherlock Home	0 to 70	300	86
	Greater than 70	52	15
Combined Sales	0 to 70	448	87
	Greater than 70	64	13

The soils on the gentle to steep slopes are mostly moderately deep to very deep (20 inches to more than 60 inches); are over hard to soft, decomposing bedrock; and generally have clay loam or clay subsoils with varying amounts of rock fragments. The soils with high clay content are highly susceptible to compaction under moist conditions and recover very slowly when compacted. Soils on the gentle slopes are generally well drained but there are small pockets of soils with poorer drainage (those with seasonably high water tables and hydrophitic vegetation). The soils on the very steep slopes are generally shallow to moderately deep (10 to 40 inches) to mostly hard bedrock.

a) Soil Disturbance & Productivity

Previous ground-based yarding occurred on about 40 percent of both sale areas, primarily on the gentle to moderate slopes based on 1965 and 1970 aerial photo interpretation. Substantial soil displacement and compaction resulted. The skid trail density is generally high on gentle slopes where soil displacement and compaction often exceeded 25 percent of the ground-based harvest area. Heavy compaction is still present in many existing skid trails, decking areas, and landings 45 to 50 years later. Soil productivity is recovering very slowly where the topsoil had been displaced and the highly compacted subsoil is exposed or where there is less than ten inches of soil depth. Some organic matter incorporation and recovery of soil compaction is occurring on skid trails where native understory vegetation is growing well.

Currently, little in-unit erosion is occurring because: (1) vegetation and woody debris dissipate rainfall energy, (2) natural soil structure and porosity outside of roads and old ground-based yarding features (i.e. trails; log decking areas) allow high water infiltration rates into the soil, and (3) the near absence of new disturbance, such as off-highway vehicle traffic in the trails helps keep erosion low.

However, there are some road segments that have noticeable ditch and travel surface erosion. There are segments of roads with either worn rock that are easily deformed and rutted with traffic, disrupting their designed drainage or with highly erodible granitic subgrades. Such roads include the 27-3-9.0 road near Slim Big Jim Units 9A and 9E, the 27-4-14.0 road along Sherlock Home 19C, and part of the 27-4-25.0 road through Sherlock Home 25D. There is

also an old, natural-surfaced road in Sherlock Home 19B that has occasional off-highway vehicle traffic and associated erosion.

b) Landslides & Slope Stability

An important contributing factor for landslides in this area is the granitic rock weakened by decomposition and the flakey, schist-like nature of other rock. Where these rocks were present under the moderate to steep slopes (35 to 70 percent), deep-seated slump-earth flows initiated, particularly in the concave topographic positions where water concentrates.

Nearly all of the 80 landslides indentified from field observations and aerial photo interpretation first appeared on the 1965 aerial photos taken during the summer following the December 1964 rain-on-snow storm event. At that time, the proposed units were in a clear-cut or early-seral condition. These landslides covered a spatial extent of approximately 8.3 acres or 1.6 percent of the proposed units. The primary management factor in most of these landslides initiating was timber harvest and roads in the remaining landslides. Sherlock Home Unit 19C was the most landslide prone area in the project since slightly over half of the landslides occurred there and the majority of the spatial extent of the landslides occurred there as well (Appendix B; Table B-2).

Approximately 63 acres of the proposed units are considered to be fragile due to slope gradient but suitable for forest management with mitigation for surface erosion and shallow-seated landslides (classified as FGR under the Timber Production Capability Classification [TPCC] system; Appendix B, Table B-1). Approximately 13 acres of the moderate to steep slopes are suitable for forest management with mitigation for slump-earth flow movements (classified as FPR under the TPCC system; Appendix B, Table B-1). No tension cracks or fresh scarps (those that have occurred after tree establishment) were discovered from field investigation, indicating no recent slope movements other than localized soil creep had occurred in the FGR and FPR areas.

2. No Action Alternative

a) Soil Disturbance & Productivity

Without timber harvesting or road construction, no additional soil compaction or displacement would occur beyond the current level. Erosion would remain low except for segments of road with worn rock and soft, granitic subgrades and the natural-surfaced road in Sherlock Home 19B that get occasional OHV traffic. Compacted soils within the skid trails would continue to recover very slowly over time, as plant roots penetrate through the soil, organic matter becomes incorporated into the soil, and small animals burrow through the soil layers. The duff layer would increase with the accumulation of needles, twigs, and small branches, along with decomposing larger woody material, absent a fire of sufficient intensity to consume the material.

b) Landslides & Slope Stability

Landslides on the potentially unstable areas (FGR and FPR) would have a low probability of occurring (less than ten percent chance in a given year). If landslides do occur they would likely be less than 0.10 acre in size and few in number. This assessment is based on:

- No in-unit landslides occurring under mid-seral forest conditions were identified by aerial photo interpretation landslide inventory or field observations; (pers. obs.; Cressy, 2008).

- No actively failing slopes were discovered in the FGR areas except for a few pockets of less than 0.05 acres each (pers. obs.; Cressy, 2008).
- Approximately 75 percent of historic, post-timber harvest landslides within the project area were 0.05 to 0.10 acres in size (aerial photo landslide inventory; field observations; Cressy, 2008; Appendix B, Table B-2).
- The Oregon Department of Forestry found that landslide numbers were lowest in mid-seral stands (31 to 100 years old) following the intense 1996 storms (ODF Forest Practices Technical Report No. 4, 1999, pg. 64).
- Many of the sites that were most vulnerable to failure probably failed after the units were clearcut in the early 1960s and then subjected to an intense rain-on-snow event. This left the FGR and FPR slopes in an overall more stable state.

3. Proposed Action Alternative

a) Soil Disturbance & Productivity

The proposed road construction would create approximately three acres of new soil disturbance and compaction where soil impacts due to past management are currently light or nonexistent (Table 9). Of the three acres of new soil disturbance, approximately 2.4 acres would be effectively removed from timber or forest production. The other 0.6 acres of new soil disturbance would be fill-slopes associated with road construction and would still provide timber or forest production. Re-disturbance of existing roads or trails would occur on 1.6 acres where there is currently moderate to heavy residual soil impact and varying degrees of revegetation (Table 9).

Table 9. Soil Disturbance from Road Construction in Slim Sherlock.

Sale	New Disturbance (acres)	Re-disturbance of Existing Roads/Trails (acres)	Total Disturbance (acres)
Slim Big Jim	2.2	1.2	3.4
Sherlock Home	0.8	0.4	1.2
Total	3.0	1.6	4.6

Generally, slopes greater than 35 percent would not be ground-based yarded. Detrimental compaction is defined, for this analysis, as an increase in soil bulk density of 15 percent or more and an alteration of soil structure to platy or massive to a depth of four inches or more that limits tree growth. Restricting ground-based operations to the dry season, as included in the *Additional Project Design Features: Ground-Based Harvesting* (TH12; pg. 10), would reduce soil productivity loss.

Where there is no existing compaction, ground-based yarding with a tractor or rubber-tired skidder would detrimentally compact approximately six to seven percent of the ground-based area. A harvester-forwarder operation, where slash is plentiful, would detrimentally compact approximately one to three percent of the ground-based area (D. Cressy, 2006; pers. obs.). The amount of new compaction that limits tree growth would be reduced by using existing compacted trails to the extent practical. Landings and log deck ground would account for approximately an additional two percent of the ground-based harvest area. Therefore, up to nine percent of the ground-based harvest area would be detrimentally compacted if tractors or rubber-tired skidders were used. Approximately five percent of the ground-based harvest area would be detrimentally compacted if harvesters and forwarders were used.

Cable-yarding corridors would cover about three percent of the cable-yarding area's surface (Adams, 2003). Soil disturbance from cable-yarding would vary by topography (e.g. convex vs. concave slope, slope steepness, and the presence or absence of pronounced slope breaks) and by the amount of logs yarded. Compaction would typically be absent or light with little soil displacement in the cable-yarding corridors, partly because intermediate supports would be required where necessary for one-end suspension. Light compaction would be confined to the topsoil and would recover without mitigation. There would be areas with heavier compaction, especially along terrain breaks. Excessive furrowing created by cable yarding would be hand waterbarred and filled with limbs or other organic debris to prevent erosion, sedimentation and the channeling of water onto potentially unstable slopes (*Additional Project Design Features, Cable Yarding, TH6;* pg. 10).

Both ground-based yarding and cable yarding would be within assumptions of the 2008 FEIS that residual soil disturbance following timber harvest activities would affect 15 percent of the ground-based harvest area and three percent of the cable yarding harvest area (2008 FEIS, Chap. 4, pg. 838).

Surface soil erosion in disturbed areas would be controlled by applying erosion control measures (*Additional Project Design Features*, pgs. 8-11). With the project design features described in Chapter 2, resulting soil erosion would be limited to localized areas, and any reduction of soil productivity due to erosion would be minor.

There would be a flush of sediment from newly constructed spurs, ground-based yarding trails, and cable-yarding corridors during the first wet-season event following harvest. The amount of sediment generated from yarding trails and corridors would be too small to reliably measure. Little sediment would reach streams because overland flow is rare on soils with high infiltration and covered with slash such as the soils in the project area. The 35 or 60 foot stream buffers as described in the *Riparian Management Area Prescription* (pgs. 4-5) would also intercept run-off from roads allowing for deposition of sediment transported by overland flow before it reached active stream channels and would prevent soil disturbance to stream channels and stream banks.

b) Landslides & Slope Stability

Most new spur construction and road renovation would be located in stable positions that have: (1) gently sloping benches or ridge top positions and side slopes up to 45 percent and (2) have no apparent signs of potential instability, such as highly curved or pistol-butted conifer boles or instability such as, tension cracks, scarps, or jack-strawed trees that indicate active slope movement. The proposed road construction and renovation would not create instability (based on the monitoring of spurs constructed on similar stable terrain [D. Cressy, 2007, 2008 and 2009, pers. obs]).

Where soils are classified as FGR or FPR (76 acres; Appendix B, Table B-1), the risk of in-unit landslide occurrence would fall between the low risk of the No Action Alternative and the moderate risk under clear-cut conditions (moderate risk determined from interpretation of 1964 and 1970 aerial photos and on-site field investigations). The period of maximum vulnerability would be the ten year period immediately following harvest as root systems and canopies expand. If in-unit landslides do occur during this period of vulnerability, then they would likely be few in number and would be less than 0.15 acre in size, for similar reasons as stated previously under the *No Action Alternative* (pg. 23-24).

Landslide aerial photo inventories within the Swiftwater Resource Area show a declining number of landslides during the past 25 years. The declining number of landslides corresponds with improved management practices. The rate of road-related landslides has declined the most. Fluctuations occur because of variations in weather and levels of management activity. Because of improvements in land management practices, the distribution of landslides in time and space, and their effects, more closely resemble those within relatively unmanaged forests (Skaugset and Reeves, 1998).

E. Hydrology

1. Water Quality

a) Affected Environment

The Slim Sherlock project area lies within the Jim Creek and Fall Creek drainages of the Little River fifth-field watershed and within the North Fork Deer Creek and Upper South Fork Deer Creek drainages of the Lower South Umpqua River fifth-field watershed.

There are approximately 38 first-order or second-order headwater streams and two higher order streams (Jim Creek and South Fork Deer Creek) adjacent to or within the proposed units totaling 9 miles of stream length. Approximately 38 percent of this stream length is classified as perennial (i.e. flows year-round) and 62 percent is classified as intermittent (i.e. stops flowing in the dry season). North Fork Deer Creek (1 mile downstream of the project area) had been placed on the Oregon 303(d) list for excessive *E.Coli* bacteria and Deer Creek (8 miles downstream of the project area) was listed for excessive summer temperature (ODEQ, 2006). These streams are now covered under ODEQ's 2006 Umpqua Basin Total Maximum Daily Load (TMDL) and Water Quality Management Plan (WQMP). Because forest managed lands do not contribute to bacteria water quality violations (ODEQ, 2006), *E. coli* bacteria levels in the North Fork Deer Creek will not be analyzed.

The beneficial uses of water within the project area potentially affected are: resident fish and aquatic life, and salmonid fish spawning and rearing. Beneficial uses of water downstream of the project area consist primarily of: livestock watering, domestic water supply, irrigation, and fish and aquatic life. Two surface water rights for domestic use and three points of diversion for irrigation are less than one mile downstream from the proposed thinning units. The project area lies within two municipal drinking water source areas. The city of Roseburg-Winchester has its water intake approximately 30 miles downstream from the project area and the City of Elkton has its water intake approximately 85 miles downstream.

Existing roads in the Slim Sherlock project area are generally in good condition and most have rock surfacing. However, some segments are in poorer condition and deteriorating due to lack of maintenance and are experiencing increased surface erosion (refer to *Soils: Affected Environment*, pg. 22).

b) No Action Alternative

There would be no impact to water quality, Beneficial Uses of Water, or hydrologic processes under the No Action Alternative. Trees within the RMA would continue to compete for space and stands would persist in an overly dense condition and not attain potential growth rates (refer to *Forest Vegetation: No Action Alternative*, pgs. 14-15 for more details). This

slow development would result in a smaller size of potential wood for long-term recruitment to streams and slower canopy development to provide shade.

Road renovation, beyond routine maintenance, would not repair existing sediment sources (e.g. some road segments that are in poorer condition and are experiencing surface erosion). Some road stream crossings and drainage features are in poor condition and have an increasing likelihood of failure over time, which could introduce sediment into streams. The amount of sediment would vary depending on the condition of the road and the size of the storm event.

There is the potential for in-unit landslides to directly impact segments of first, second, and third order streams that total approximately 1.5 miles (0.1 miles in Slim Big Jim and 1.4 miles in Sherlock Home). The likelihood of a landslide reaching a stream segment in a given year would be low because:

- The risk of landslide initiation on the potentially unstable slopes would be low.
- The reach (length of area affected) of small landslides that are less than 0.10 acre in size (the most likely size to occur) would be limited. The reach of small landslides is usually from 40 to 200 feet in length.

If a landslide occurs, it would produce a short-term increase in sedimentation until the material is dispersed downstream. Effects of sediment in the stream bed from small landslides would have a low probability of being detected more than a few hundred feet downstream from the landslide (during normal flow conditions) since small streams have low capacity for carrying sediment because of their small size and low flows.

Landslides are a natural disturbance mechanism which can provide important ecological functions when they occur at natural rates. As discussed previously (refer to *Soils: Landslides & Slope Stability*, pg. 25-26), landslide rates have been declining over the last 50 years to where they now occur at near natural rates on BLM managed lands.

c) Proposed Action Alternative

Flow on intermittent streams ceases for some portion of the year, which makes them less susceptible to propagating temperature impacts downstream during the warm dry season. Many of these intermittent streams are also interrupted (the defined stream channel disappears in some locations as it extends downstream due to water going subsurface) which further minimizes the mechanism for delivering impacts further downstream. Water going subsurface tends to be cooled by the subsurface environment such that it has a lower temperature when it reappears downstream (Story *et al*., 2003). In contrast, perennial streams flow year-round, which makes them more susceptible to temperature impacts.

Vegetation that provides primary shading for stream channels that have the potential for summer flow (i.e. perennial streams) would be protected by the 60 foot buffer and maintaining 50 percent canopy closure outside of this buffer within the RMA as described in the *Riparian Management Area Prescription* (pgs. 4-5). Consequently, effective shade for these streams would not be affected by thinning and therefore stream temperatures would not be affected (2008 Final EIS, pgs. 759-760).

Thinning within the RMA can cause localized soil disturbance and the short-term potential for erosion, primarily associated with yarding operations. However, “no-harvest” buffers would be established for all streams adjacent to proposed units and full suspension would be

required when yarding across streams (*Additional Project Design Features*, TH3; pg. 10). These "no-harvest" buffers would prevent disturbance to stream channels and stream banks and would intercept surface run-off allowing for deposition of any sediment transported by overland flow before it reached active stream channels.

According to Reid (1981) and Reid and Dunne (1984), forest roads can be a major contributor of fine sediment to streams, through down cutting of ditch lines and erosion of unprotected road surfaces by overland flow. Under the Action Alternative, there would be no stream crossings by new road construction. All stream crossings used by the haul route would be on existing roads.

Road renovation and improvement would occur on existing roads during the dry season (refer to *Road Activities*, pg. 6). Timber hauling could occur in both the dry and wet seasons, although during the wet season hauling would be limited to surfaced roads. Hauling and other road related activities 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 sediment from all other intermittent channel beds and stream banks that has accumulated within the stream network during the dry season. Following the first seasonal rains, erosion rates would stabilize and sediment delivery would be indistinguishable from background levels resulting in no measureable change to water quality.

The risk of landslides impacting streams would be slightly higher than under the No Action Alternative for a given year. If these landslides occur, they would still be occurring at near natural rates and impacts would be similar to the No Action Alternative. Some stream reaches would still have low risks and others would have low to moderate risks. The likely size of a landslide reaching a stream would still be less than 0.15 acre. "No-harvest" buffers would remove from harvest the steepest inner gorge slopes where there are higher risks for failure, and where the greatest potential for initiating stream impacting landslides exists. The period of increased vulnerability would be about ten years as the roots and canopies of the residual trees expand.

In summary, "no-harvest" buffers and the project design features referenced above would prevent disturbance to stream channels and stream banks. The buffers would also intercept surface run-off and prevent sedimentation of streams, such that there would be no cumulative degradation of water quality in the Little River or Lower South Umpqua River Watersheds. Beneficial uses of water and municipal drinking water sources would not be affected.

2. Stream Flow

a) Affected Environment

Average annual precipitation in the Slim Sherlock project area ranges from 50 to 60 inches, occurring primarily between October and April. Precipitation occurs mostly as rainfall in the Slim Big Jim project area since all of the area is less than 2,500 feet in elevation (i.e. below the rain-on-snow zone). Elevations in the Sherlock Home project area range from 2,500 to 3,400 feet putting it within the rain-on-snow hydroregion where shallow snow accumulations come and go through out the wet season.

Stream flows are dependent upon the capture, storage, and runoff of precipitation. Timber harvest can alter the amount and timing of peak flows by changing site-level hydrologic processes. These hydrologic processes include changes in evapotranspiration of forest trees, forest canopy interception of water, snow and snowmelt rates, roads intercepting surface and subsurface flow, and changes in soil infiltration rates and soil structure (2008 Final EIS, pg. 352). Based on a compilation of watershed studies in the Northwest, completed in small catchments, a peak flow response is only detected where at least 29 percent of the drainage area is harvested (Grant *et al.*, 2008). There are no peak-flow experimental study results in the rain dominated hydroregion showing a peak-flow increase where less than 29 percent of a drainage area is harvested (2008 Final EIS, pg. 353). In the rain-on-snow hydroregion, snowmelt can provide extra water for runoff, especially from large open areas created from regeneration harvests. In contrast, research (Poggi et al., 2004) suggests that forest thinning treatments maintains normal patterns of snow accumulation and have little effect on snowmelt rates during rain-on-snow events (2008 Final EIS, pg. 355).

Although the Sherlock Home project area is within the rain-on-snow hydroregion, the subwatershed it is in (i.e. Upper Deer Creek) is considered a rain dominated hydroregion because the vast majority of the watershed is below the rain-on-snow elevations. Upper Deer Creek (currently 29% harvested) was one of the subwatersheds found to be susceptible to increases in peak flows (2008 Final EIS, pg. 755). Slim Big Jim is within the Lower Little River subwatershed (currently 11% harvested) and is not susceptible to peak flow increases at this time (2008 Final EIS).

b) No Action Alternative

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

Within the drainages of the Slim Sherlock project area, roads occupy approximately between three to five percent of the land. Therefore, no statistically significant increase in peak flows would be expected to occur due to road effects. Also, with no change in the vegetative cover there would be no change in runoff from the Slim Sherlock project area drainages.

c) Proposed Action Alternative

The Slim Big Jim and Sherlock Home projects are forest thinning treatments. It is presumed that hydrologic impacts, such as peak flow increases, decrease with the intensity of treatment, (i.e. regeneration harvest having the greatest impact and thinning treatments having the least impact) although past experimental studies in the Pacific Northwest did not fully examine the differences (Grant *et al*., 2008; 2008 Final EIS, pg. 353).

The 2008 Final EIS (pgs.753-759) analyzed peak flow effects from forest management at 6th Field Subwatersheds across the planning area. Although some subwatersheds would be susceptible to increases in peak flows, this does not automatically imply adverse effects on stream form. This is because stream flow runoff normally fluctuates with climate, and channels have developed over time under a wide range of stream flows, including infrequent peak flows. These stream flows have the potential to affect the frequency of sediment transport and the depth of scour. However, the potential for peak flow effects would vary for

different stream types (Grant et al., 2008). The 2008 Final EIS (pg. 758) indicates effects are not expected within the high gradient cascade and step-pool stream types. All of the streams within the Sherlock Home project area would fall into these categories. In summary, effects to peak flows are not expected for the following reasons:

- The silvicultural treatment would be thinning which has the least hydrologic effect.
- All of the stream types within the Sherlock Home project area are cascade or step-pool streams which are the most resistant to peak flow effects to channel form.
- The Slim Big Jim project area is within the Lower Little River subwatershed which is not susceptible to peak flow effects at this time.

There would be a slight increase in road density from 4.82 miles per square mile to 4.86 miles per square mile in the combined project area drainages due to new road construction, but the percent surface area in road would remain at approximately four percent. The road densities would not be sufficient (i.e. greater than 12 percent of the watershed) to cause a measurable increase in peak flows (refer to *Stream Flow: No Action Alternative*; pg. 29).

F. Aquatic Habitat & Fisheries

a) Affected Environment

There are two fish bearing streams within the Slim Sherlock project area (Jim Creek and South Fork Deer Creek). Both creeks contain good quality fish habitat due to large wood in the stream channels that creates complex pools for juvenile habitat and traps gravels for spawning habitat. The project area for the fisheries analysis includes the proposed thinning units and haul route to the nearest paved road. There are 1.2 miles of haul route adjacent (30 to 250 feet) to fish bearing streams in the project area (Jim Creek). Timber haul on these roads can be either summer or winter haul. Ditch banks along the haul route are well vegetated and there are no direct connections to fish bearing streams.

On February 4, 2008 NOAA Fisheries listed the Oregon coast coho salmon evolutionary significant unit (ESU) as threatened under the Endangered Species Act. This includes the designation of critical habitat. Jim Creek contains Oregon Coast coho salmon and its critical habitat.

Bureau Sensitive fish species present in the Little River and Deer Creek watersheds include the Oregon Coast coho salmon, chum salmon (*Oncorhynchus keta*), Oregon coast steelhead (*Oncorhynchus mykiss*), and the Umpqua chub (*Oregonichthys kalawatseti*). Both Jim Creek and South Fork Deer Creek contain Oregon Coast steelhead and cutthroat trout. Chum salmon and Umpqua chub are not present in the project area.

b) No Action Alternative

Without a mechanism to affect either water quality (pgs. 27-28) or stream flow (pgs. 29-30) aquatic habitat in fish-bearing streams within and downstream of the project area would remain unaffected under the No Action Alternative. Without a mechanism to affect aquatic habitat, fish species and populations would remain unaffected under the No Action Alternative.

c) Proposed Action Alternative

Key factors defining the quality of aquatic habitat are water temperature, substrate/sediment quality, large woody debris, pool quality, and habitat access. Water temperature would not be affected by this project (refer to *Water Quality: Proposed Action Alternative,* pg. 27). Substrate/sediment quality is affected by altering the amount or timing of peak flows or from road derived sediment input. No effects to peak flows are expected as a result of this project (refer to *Stream Flow: Proposed Action Alternative,* pgs. 29-30). No harvest buffers and well vegetated ditch banks would protect aquatic habitat from road sediment within the project area.

Large woody debris and pool quality are affected by quality of trees in the riparian area that have the potential to enter the stream by natural processes. By thinning the RMA stands, riparian stand diversity and tree diameter growth rates would increase (refer to *Forest Vegetation: Proposed Action Alternative*, pg. 15), resulting in higher quality wood entering the stream in the future. Large wood and pool quality would be unaffected by this project in the short-term and would benefit from this project in the long-term.

Habitat access is affected by road crossings. All stream crossings used by the haul route would be on existing roads. Without any new stream crossings, there is no mechanism to affect habitat access.

Overall, the proposed project would not have any direct or indirect effects on water temperature, substrate/sediment quality, large woody debris, pool quality, or habitat access in the project area, and thus aquatic habitat quality in Jim Creek or South Fork Deer Creek will remain unaffected.

Without any direct or indirect effects to aquatic habitat quality, this project has no mechanism to affect fish species or populations within or outside of the project area. Coho salmon and their critical habitat would be unaffected by this project. Over the long term, the quality of large wood in the stream channel would increase and would have a positive effect on aquatic habitat quality and fish populations.

d) Essential Fish Habitat

Essential fish habitat is designated for fish species of commercial importance by the Magnuson-Stevens Fishery Conservation and Management Act of 1996 (Federal Register 2002, Vol. 67/No. 12). Streams and habitat that are currently or were historically accessible to Chinook and coho salmon are considered essential fish habitat. The nearest essential fish habitat is within the project area in Jim Creek.

The proposed action would have no direct or indirect effects on aquatic habitat within or downstream of the project area, thus essential fish habitat will remain unaffected. Without any mechanisms for an adverse effect to essential fish habitat, no mitigation measures are proposed.

e) Aquatic Conservation Strategy

The Swiftwater Field Office assessed the effect of the proposed project on the Aquatic Conservation Strategy (ACS) objectives at both the site and watershed scale (assessment included in Appendix D). The proposed action would meet ACS objectives and would not retard or prevent attainment of ACS objectives at the site or watershed scales. Instead, the

proposed action would 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. Special Status Species

a) Affected Environment

Field surveys for special status botanical species were conducted in the spring and summer of 2008 to comply with Departmental Manual 6840 directives and the Special Status Plant program.

(1) Federally Listed Species

The project is within the known range of Kincaid's Lupine (*Lupinus sulphureus* ssp. *kincaidii*), a Federally Threatened plant. Habitat for Kincaid's Lupine occurs in the project area. The project area is also within the known range of the Federally Endangered popcorn flower (*Plagiobothrys hirtus*); however, habitat for the popcorn flower is not present.

No Federally listed plant species were detected within the project area during surveys (Appendix C: Botany Summary).

(2) Bureau Sensitive & Strategic Species

One population of *Tayloria serrata*, a Bureau Sensitive species, was located near Sherlock Home Unit 25D but outside of the areas where road renovation/construction or commercially thinning would occur (Appendix D, Figure 3). *Tayloria serrata* is a moss that colonizes old dung, rotten wood, or soil enriched by dung on roadsides, trails, in dry to moist coniferous forest of various age classes. It is dependent on flies to disperse the spores to new substrate. Because of the ephemeral substrate, *Tayloria serrata* may disappear from a locality the following season as the nutrient enrichment from the dung dissipates (USDA, USDI; 2009). The *Tayloria serrata* population in Sherlock Home was located on coyote dung.

b) No Action Alternative

Under the No Action Alternative, the known population of *Tayloria serrata* would likely disappear from its documented location with time as the coyote dung substrate decomposes and the nutrients are depleted. The ability of flies to disperse the spores and establish new populations of *Tayloria serrata* would be unaltered.

c) Proposed Action Alternative

The effects to the known *Tayloria serrata* population in Sherlock Home would be similar to the effects under the No Action Alternative, described previously. The population is not within the proposed units or in areas of road construction or renovation so it would not be disturbed by the proposed action. In addition, it is probable that the life-cycle of *Talyoria serrata* would be completed before activities on-the-ground begin, given the ephemeral nature of the substrate.

2. Noxious Weeds

a) Affected Environment

Slim Sherlock has approximately 18 acres of noxious weed infestations of Scotch broom and Himalayan blackberry (Table 10). These areas were treated in 2008 as part of the ongoing Roseburg District Noxious Weed Program. Other species of noxious weeds present in the project area include: Meadow knapweed (*Centaureaarvested pratensis*), Canada thistle (*Cirsium arvense*), bull thistle (*Cirsium vulgare*), common St. John's wort (*Hypericum perforatum*), English holly (*Ilex aquifolium*), evergreen blackberry (*Rubus laciniatus*), and tansy ragwort *(Senecio jacobea*). These other species are not likely to establish invasive populations in forested habitats because they are typically out-competed by the forest canopy. Biocontrols, primarily insects that target specific noxious weed species, are present throughout the range of Scotch broom, meadow knapweed, Canada thistle, bull thistle, St. John's wort, and tansy ragwort.

Table 10. Noxious Weed Infestations.

Weed Species	**Proposed Sale Areas**		**Total** (acres)
	Slim Big Jim (acres)	**Sherlock Home** (acres)	
Scotch Broom	9	3	12
Himalayan Blackberry	3	3	6
Total	12	6	18

b) No Action Alternative

Noxious weeds within the project area would continue to be managed under the Roseburg District's Noxious Weed Program. This area would be monitored for other weed populations and evaluated for treatment at regular intervals (USDI, 1995a). Under the Roseburg District Noxious Weed Program, control of weed populations within the project area is planned for treatment in 2011, contingent on funding and workload priorities, by applying approved herbicides and/or manual removal.

Over time, the distribution and abundance of noxious weeds in the project area would decline. Repeated treatments of existing noxious weed populations, limited opportunities (e.g. disturbed soil) for establishment of new infestations, and ongoing competition from native vegetation would reduce the noxious weed numbers in the project area.

c) Proposed Action Alternative

Existing infestations of Scotch broom and Himalayan blackberry would be treated, prior to commercial thinning operations, in order to limit the development and spread of seeds. In addition, *Additional Project Design Features* (pg .11) would limit the spread of weed seed by washing logging and construction equipment prior to entry on BLM lands. As under the No Action Alternative, noxious weed populations would be monitored, evaluated, and treated under the Roseburg District's Noxious Weed Program.

Soil disturbance associated with commercial thinning (e.g. ground-based yarding, cable-yarding corridors, spur construction, and slash pile burning) would create areas of exposed mineral soil, which would serve as habitat for noxious weeds. New weed infestations on exposed mineral soil would be expected while there are openings in the canopy. As the

conifer canopy closes, noxious weeds would decrease in abundance as native understory species eventually overtop and out-compete weeds for sunlight, soil moisture, and soil nutrients.

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) U.S. Fish & Wildlife Service

In accordance with the Endangered Species Act, consultation with the U.S. Fish and Wildlife Service (USFWS) has been completed for the Slim Big Jim timbersale and is in process for the Sherlock Home timbersale for the northern spotted owl and its critical habitat. A Letter of Concurrence was received from the U.S. Fish and Wildlife Service (Tails#: 13420-2009-I-0109; pgs. 34-35) dated June 9, 2009 which concurred with the District's conclusion in the Biological Assessment for *Commercial Thinning and Programmatic Actions Proposed by the Roseburg District BLM in Fiscal Years 2009 and 2010* (pgs. 71-73) that the commercial thinning activity described for the Slim Big Jim timbersale *may affect, but is not likely to adversely affect* the northern spotted owl or its designated critical habitat. Results of consultation with USFWS for Sherlock Home will be disclosed in the FONSI issued with the Decision Record for that timbersale.

b) NOAA Fisheries Service

The Swiftwater fisheries staff has determined that this project would have no mechanism for an effect on Oregon Coast coho salmon (refer to *Aquatic Habitat & Fisheries: Proposed Action Alternative*, pg. 31). The proposed action, and its interrelated and interdependent actions, would have no direct effects on Oregon Coast coho salmon and would not adversely modify its designated critical habitat. In addition, the project design features would ensure that no indirect effects to Oregon Coast coho salmon or their habitat would occur. Therefore, the proposed project would not have an effect on Oregon Coast coho salmon or its habitat and further consultation with the NOAA Fisheries Service is not required.

2. Cultural Resources Section 106 Compliance

Compliance with Section 106 of the National Historic Preservation Act under the guidance of the 1997 National Programmatic Agreement and the 1998 Oregon Protocol has been documented with a Project Tracking Form dated March 20, 2009. It was determined that there would be no effect to any cultural or historical resources since none would be included within the Slim Sherlock harvest units.

B. Public Notification

1. Notification of Landowners

A letter was sent (February 26, 2009) to **adjacent landowners**, **landowners along the proposed haul route**, **registered water-rights users**, and **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). A letter was sent (April 3, 2009) to holders of

registered rights-of-way for the Lane Mountain Communication Site. No comments were received.

2. Roseburg District Planning Updates

The **general public** was notified via the *Roseburg District Planning Updates* (i.e. Winter 2008 and Spring 2009) which was published on the Roseburg District BLM Internet website. Electronic notification of the availability of the Roseburg District Planning was sent to approximately 40 addressees. These addressees consist of members of the public that have expressed interest in Roseburg District BLM projects.

3. State, County, and Local Government Agencies

This EA, and its associated documents, would be provided to certain **State, County and local government** offices including: U.S. Fish & Wildlife Service, NOAA Fisheries Service, Oregon Department of Environmental Quality, and the Oregon Department of Fish and Wildlife. If the decision is made to implement this project, the Decision Document and FONSI would be sent to the aforementioned State, County, and local government offices.

4. Public Comment Period

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 June 23, 2009 and end close of business July 23, 2009. Comments must be received during this period to be considered for the subsequent decisions. 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 it.

C. List of Preparers

Core Team

Project Lead	Paul Meinke
Management Rep.	Al James
Botany/Noxious Weeds	Julie Knurowski
Engineering	Terrie King
Fisheries	Jeff McEnroe
Fuels Management	Krisann Kosel
Hydrology	Brooke Shakespeare
Hydrology	Dan Dammann
Layout	Brad Talbot (Bucko, General Lee)
Layout	Bruce Baumann
Layout	Cary Swain (Bear Bones, Cox Pit)
Layout	Casey Steenhoven (Mr. Bennet)
NEPA Writer/Editor	Rex McGraw
Silviculture	David Moser
Soils	Dan Cressy
Timber Cruising	Joe Keady
Wildlife	Katrina Krause

Expanded Team (Consulted)

Isaac Barner	Cultural Resources

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Appendix A. Bureau Sensitive & Bureau Strategic Wildlife Species

Project: Slim Sherlock Commercial Thinning
Prepared By: Katrina Krause
Date: March 13, 2009
SSSP List Date: July 26, 2007 (IM-OR-2007-072)

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 below 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. If sites are located, collect occurrence data and record in corporate database.

Table A-1. Bureau Sensitive & Strategic Wildlife Species.

Species	General Habitat Requirements	Present in Project Area?	Impacts to Species	
			No Action	Proposed Action
BUREAU SENSITIVE				
American Peregrine Falcon *Falco peregrinus anatum*	Cliffs, rock outcrops; open habitats for hunting birds	No Habitat	No Effects	
Bald Eagle *Haleaeetus leucocephalus*	Late successional forests with multi-canopies, generally within two miles of a major water source	No Known Nest/ Roost Sites	No Effects	
Chace Sideband *Monadenia chaceana*	Rocky, talus habitats in the Klamath Province and southwards	Out of Range	No Effects	
Columbian White Tailed Deer *Odocoileus virginianus leucurus*	Bottomlands, oak/hardwood forests; cover for fawning	No Habitat	No Effects	
Crater Lake Tightcoil *Pristiloma arcticum crateris*	Perennially wet areas in late seral forests above 2000ft elevation and east of Interstate-5; seeps, springs, riparian areas	Suspected	No Effect	No measurable effects to habitat due to 60-foot buffer along perennial streams within RMA.
Fisher *Martes pennanti*	Natal and foraging habitat consists of structurally complex forests; mature open forests with large live trees, snags, and down wood.	Suspected	No Effect	No effects to suitable natal and foraging habitat.
Foothill Yellow-legged Frog *Rana boylii*	Low gradient streams/ponds; gravel/cobble, bedrock pools	No Habitat	No Effects	

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

Appendix B. Soils

Project: Slim Sherlock Commercial Thinning
Prepared By: Dan Cressy
Date: January 29, 2009

Table B-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)
Slim Big Jim 9A	7	0	NA	0	0	NA
Slim Big Jim 9B	7	2	NA	0	0	NA
Slim Big Jim 9C	0	1	NA	0	0	NA
Slim Big Jim 9E	1	0	NA	0	0	NA
Slim Big Jim-Total	15	5	NA	0	0	NA
Sherlock Home 19A	0	0	NA	0	0	NA
Sherlock Home 19B	1	0	NA	0	0	NA
Sherlock Home 19C	30	6	NA	0	0	NA
Sherlock Home 25A	1	0	NA	0	0	NA
Sherlock Home 25B	5	2	NA	0	0	NA
Sherlock Home 25D	8	0	NA	0	0	NA
Sherlock Home 31A	3	0	NA	0	0	NA
Sherlock Home-Total	48	8	NA	0	0	NA
Grand Total	**63**	**13**	**NA**	**0**	**1**	**NA**

[1] **FGR** = fragile soils that are subject to unacceptable soil and organic matter losses from surface erosion or mass soil movements as a result of forest management activities, unless mitigating measures (BMPs) are used to protect the soil.
[2] **FPR** = fragile soils that may contain tension cracks and/or sag ponds; because of the slow rate of movement, forest management is feasible.
[3] **FSR** = fragile soils that typically have loamy fine sands and sandy loam textures with high amounts of coarse fragments (i.e. rock); they generally have between one and ½ inch of available water holding capacity in the top 12 inches (i.e. water deficiency).
[4] **FGNW** = fragile soils where unacceptable soil and organic matter losses could occur from surface erosion or mass soil movements as a result of forest management activities; these losses cannot be mitigated even using best management practices.
[5] **FPNW** = fragile soils that have active, deep-seated slump-earthflow types of mass movement; because of the rapid rate of movement, forest management is not feasible on these sites.
[6] **Category 1** = soils that are highly sensitive to broadcast burning due to shallow soil depths, that have A horizons less than 4 inches in depth, and/or that are on slopes over 70 percent.

Table B-2. <u>Mass Wasting & Landslides in the Action Area.</u> An analysis of mass wasting events initiating inside the proposed thinning unit was done using aerial photo interpretation covering 1960 to 2004 and field reconnaissance. Documented are landslides that occurred after clear cut harvest.

Sale Name	**# Debris Torrents**	**# Landslides[1]**			
	Large (>0.5 acre)	Small (< 0.1 acre)	Medium (0.1-0.5 acre)	Large (> 0.5 acre)	All
Slim Big Jim	0	16	1	0	17(0.77 acres)
Sherlock Home	1	45	16	2	63 (7.62 acres)
Total	1	61	17	2	80(8.39 acres)
Probability of occurrence expected within units:					
No Action Alternative	none	low	low	low	low
Action Alternative (Treatment)	low	low-mod	low-mod	low	low
Cumulative Effects	Unchanged[2]	Unchanged[2]	Unchanged[2]	Unchanged[2]	Unchanged[2]

[1] 27 of the identified landslides were road-related and 53 were harvest-related; 55 percent of these landslides initiated in Sherlock Home Unit 19C. The landslides in Unit 19C accounted for 82 percent of the total landslide area and the largest landslide was approximately 0.9 acres in size.

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

Appendix C. Botany Summary

Project: Slim Sherlock Commercial Thinning
Prepared By: Ron Wickline
Date: September 30, 2008
SSSP List Date: February 8, 2008 (IM-OR-2008-038)

Those Bureau Sensitive or Bureau Strategic species which are suspected or documented to occur within the Roseburg District BLM area are detailed below 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 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. If sites are located, collect occurrence data and record in the corporate database.

Table C-1. Federally Listed & Bureau 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.	May/June 2008	N/A
Plagiobothrys hirtus Rough popcorn flower (E)	**Yes**	No	No	No habitat present.	May/June 2008	N/A
Sensitive Species						
Chiloscyphus gemmiparus Liverwort	No	No	No	No habitat present.	May/June 2008	N/A
Diplophyllum plicatum Liverwort	No	No	No	No habitat present	May/June 2008	N/A
Entosthodon fascicularis Moss	No	No	No	No habitat present	May/June 2008	N/A
Gymnomitrion concinnatum Liverwort	No	No	No	No habitat present.	May/June 2008	N/A
Helodium blandowii Moss	No	No	No	No habitat present	May/June 2008	N/A
Meesia uliginosa Moss	No	No	No	No habitat present	May/June 2008	N/A
Schistostega pennata Moss	No	No	No	No habitat present	May/June 2008	N/A
Tayloria serrata Moss	**Yes**	**Yes**	**Yes**	Surveys preformed species found	May/June 2008	**Yes**
Tetraphis geniculata Moss	No	No	No	No habitat present	May/June 2008	N/A

Species	Within species range?	Habitat Present?	Species Present?	Reason for concern or no concern	Surveys Completed	Mitigation Measures
Tetraplodon mnioides Moss	No	No	No	No habitat present	May/June 2008	N/A
Tomentypnum nitens Moss	No	No	No	No habitat present	May/June 2008	N/A
Tortula mucronifolia Moss	No	No	No	No habitat present	May/June 2008	N/A
Trematodon boasii Moss	No	No	No	No habitat present.	May/June 2008	N/A
Bridgeoporus nobilissimus Giant polypore fungus	No	No	N/A	No habitat present.	May/June 2008	N/A
Cudonia monticola *Fungi*	No	No	N/A	Surveys Not Practical. [1]	N/A	N/A
Dermocybe humboldtensis Fungus	No	No	N/A	Surveys Not Practical. [1]	N/A	N/A
Gomphus kauffmanii Fungus	No	No	N/A	Surveys Not Practical. [1]	N/A	N/A
Helvella crassitunicata Fungus	No	No	N/A	Surveys Not Practical. [1]	N/A	N/A
Leucogaster citrinus Fungus	No	No	N/A	Surveys Not Practical. [1]	N/A	N/A
Otidea smithii Fungus	No	No	N/A	Surveys Not Practical. [1]	N/A	N/A
Phaeocollybia californica Fungus	No	No	N/A	Surveys Not Practical. [1]	N/A	N/A
Phaeocollybia dissiliens Fungus	No	No	N/A	Surveys Not Practical. [1]	N/A	N/A
Phaeocollybia gregaria Fungus	No	No	N/A	Surveys Not Practical. [1]	N/A	N/A
Phaeocollybia olivacea Fungus	No	No	N/A	Surveys Not Practical. [1]	N/A	N/A
Phaeocollybia oregonensis Fungus	No	No	N/A	Surveys Not Practical. [1]	N/A	N/A
Phaeocollybia pseudofestiva Fungus	No	No	N/A	Surveys Not Practical. [1]	N/A	N/A
Phaeocollybia scatesiae Fungus	No	No	N/A	Surveys Not Practical. [1]	N/A	N/A
Phaeocollybia sipei Fungus	No	No	N/A	Surveys Not Practical. [1]	N/A	N/A
Phaeocollybia spacidea Fungus	No	No	N/A	Surveys Not Practical. [1]	N/A	N/A
Pseudorhizina californica Fungus	No	No	N/A	Surveys Not Practical. [1]	N/A	N/A
Ramaria amyloidea Fungus	No	No	N/A	Surveys Not Practical. [1]	N/A	N/A
Ramaria gelatiniaurantia Fungus	No	No	N/A	Surveys Not Practical. [1]	N/A	N/A
Ramaria largentii Fungus	No	No	N/A	Surveys Not Practical. [1]	N/A	N/A
Ramaria spinulosa var. *diminutiva* Fungus	No	No	N/A	Surveys Not Practical. [1]	N/A	N/A
Rhizopogon chamalelotinus Fungus	No	No	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
Rhizopogon exiguus Fungus	No	No	N/A	Surveys Not Practical. [1]	N/A	N/A
Sowerbyella rhenana Fungus	No	No	N/A	Surveys Not Practical. [1]	N/A	N/A
Bryoria subcana Lichen	No	No	N/A	No habitat present.	May/June 2008	N/A
Calicium adspersum Lichen	No	No	N/A	No habitat present	May/June 2008	N/A
Chaenotheca subroscida Lichen	No	No	N/A	No habitat present.	May/June 2008	N/A
Dermatocarpon meiophyllizum Lichen	No	No	N/A	No habitat present.	May/June 2008	N/A
Hypogymnia duplicata Lichen	No	No	N/A	No habitat present.	May/June 2008	N/A
Leptogium cyanescens Lichen	No	No	N/A	No habitat present.	May/June 2008	N/A
Lobaria linita Lichen	No	No	N/A	No habitat present.	May/June 2008	N/A
Pannaria rubiginosa Lichen	No	No	N/A	No habitat present.	May/June 2008	N/A
Pilophorus nigricaulis Lichen	No	No	N/A	No habitat present.	May/June 2008	N/A
Stereocaulon spathuliferum Lichen	No	No	N/A	No habitat present.	May/June 2008	N/A
Adiantum jordanii California maiden-hair	**Yes**	No	N/A	No habitat present.	May/June 2008	N/A
Arabis koehleri var. *koehleri* Koehler's rockcress	**Yes**	No	N/A	No habitat present.	May/June 2008	N/A
Arctostaphylos hispidula *Hairy manzanita*	**Yes**	No	N/A	No habitat present.	May/June 2008	N/A
Asplenium septentrionale Grass-fern	**Yes**	No	N/A	No habitat present.	May/June 2008	N/A
Bensoniella oregana Bensonia	**Yes**	No	N/A	No habitat present.	May/June 2008	N/A
Botrychium minganense Gray moonwort	**Yes**	No	N/A	No habitat present.	May/June 2008	N/A
Calochortus coxii Crinite mariposa-lily	**Yes**	No	N/A	No habitat present.	May/June 2008	N/A
Calochortus umpquaensis Umpqua mariposa-lily	**Yes**	No	N/A	No habitat present.	May/June 2008	N/A
Camassia howellii Howell's camas	**Yes**	No	N/A	No habitat present.	May/June 2008	N/A
Carex brevicaulis Short stemmed sedge	**Yes**	No	N/A	No habitat present.	May/June 2008	N/A
Carex comosa Bristly sedge	**Yes**	No	N/A	No habitat present.	May/June 2008	N/A
Carex gynodynama Hairy sedge	**Yes**	No	N/A	No habitat present	May/June 2008	N/A
Carex serratodens Saw-tooth sedge	**Yes**	No	N/A	No habitat present.	May/June 2008	N/A
Cicendia quadrangularis Timwort	**Yes**	No	N/A	No habitat present	May/June 2008	N/A
Cimicifuga elata var. elata	**Yes**	No	No	No habitat present	May/June 2008	N/A

Species	Within species range?	Habitat Present?	Species Present?	Reason for concern or no concern	Surveys Completed	Mitigation Measures
Tall bugbane1						
Cypripedium fasciculatum Clustered lady slipper	**Yes**	No	No	No habitat present.	May/June 2008	N/A
Delphinium nudicaule Red larkspur	**Yes**	No	No	No habitat present.	May/June 2008	**N/A**
Epilobium oreganum Oregon willow-herb	**Yes**	No	No	No habitat present	May/June 2008	**N/A**
Eschscholzia caespitosa Gold poppy	**Yes**	No	No	No habitat present.	May/June 2008	**N/A**
Eucephalus vialis Wayside aster	**Yes**	No	No	No habitat present	May/June 2008	**N/A**
Horkelia congesta ssp. *congesta* Shaggy horkelia	**Yes**	No	No	No habitat present	May/June 2008	**N/A**
Horkelia tridentata ssp. *tridentate* Three-toothed horkelia	**Yes**	No	No	No habitat present	May/June 2008	N/A
Iliamna latibracteata California globe-mallow	**Yes**	No	N/A	No habitat present.	May/June 2008	N/A
Kalmiopsis fragrans Fragrant kalmiopsis	**Yes**	No	N/A	No habitat present.	May/June 2008	N/A
Lathyrus holochlorus Thin-leaved peavine	**Yes**	No	N/A	No habitat present.	May/June 2008	N/A
Lewisia leana Lee's lewisia	**Yes**	No	N/A	No habitat present.	May/June 2008	N/A
Limnanthes gracilis var. *gracilis* Slender meadow-foam	**Yes**	No	N/A	No habitat present.	May/June 2008	N/A
Lotus stipularis *Stipuled trefoil*	**Yes**	No	N/A	No habitat present.	May/June 2008	N/A
Meconella oregana *White fairypoppy*	**Yes**	No	N/A	No habitat present.	May/June 2008	N/A
Pellaea andromedifolia Coffee fern	**Yes**	No	N/A	No habitat present	May/June 2008	N/A
Perideridia erythrorhiza Red-rooted yampah	**Yes**	No	N/A	No habitat present.	May/June 2008	N/A
Polystichum californicum California sword-fern	**Yes**	No	N/A	No habitat present.	May/June 2008	N/A
Romanzoffia thompsonii *Thompson's mistmaiden*	**Yes**	No	N/A	No habitat present.	May/June 2008	N/A
Schoenoplectus subterminalis Water clubrush	**Yes**	No	N/A	No habitat present.	May/June 2008	N/A
Scirpus pendulus *Drooping rush*	**Yes**	No	N/A	No habitat present.	May/June 2008	N/A
Sisyrinchium hitchcockii Hitchcock's blue-eyed grass	**Yes**	No	N/A	No habitat present.	May/June 2008	N/A
Utricularia gibba Humped bladderwort	**Yes**	No	N/A	No habitat present	May/June 2008	N/A
Utricularia minor Lesser bladderwort	**Yes**	No	N/A	No habitat present.	May/June 2008	N/A
Wolffia borealis Dotted water-meal	**Yes**	No	N/A	No habitat present.	May/June 2008	N/A
Wolffia columbiana Columbia water-meal	**Yes**	No	N/A	No habitat present.	May/June 2008	N/A

[1] Surveys are considered not practical for these species based on the 2003 Annual Species Review (IM-OR-2004-034).

Table C-2. Bureau 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	Surveys Not Practical. [1]
Choiromyces alveolatus	Suspected	Surveys Not Practical. [1]
Clavariadelphus subfastigiatus	Documented	Surveys Not Practical. [1]
Endgame oregonensis	Documented	Surveys Not Practical. [1]
Blomus pubescens	Suspected	Surveys Not Practical. [1]
Gymnomyces monosporus	Documented	Surveys Not Practical. [1]
Helvella elastica	Documented	Surveys Not Practical. [1]
Hygrophorus albicarneus	Suspected	Surveys Not Practical. [1]
Mycena quinaultensis	Suspected	Surveys Not Practical. [1]
Nolanea verna var. *isodiametrica*	Suspected	Surveys Not Practical. [1]
Plectania milleri	Suspected	Surveys Not Practical. [1]
Psathyrella quercicola	Suspected	Surveys Not Practical. [1]
Ramaria abietina	Documented	Surveys Not Practical. [1]
Ramaria bothryis var. aurantiiramosa	Suspected	Surveys Not Practical. [1]
Ramaria concolor f. tsugina	Suspected	Surveys Not Practical. [1]
Ramaria conjunctipes var. sparsiramosa	Suspected	Surveys Not Practical. [1]
Ramaria coulterae	Suspected	Surveys Not Practical. [1]
Ramaria rubribrunnescens	Suspected	Surveys Not Practical. [1]
Ramaria suecica	Documented	Surveys Not Practical. [1]
Ramaria thiersii	Suspected	Surveys Not Practical. [1]
Rhizopogon brunneiniger	Suspected	Surveys Not Practical. [1]
Rhizopogon clavitisporus	Suspected	Surveys Not Practical. [1]
Rhizopogon flavofibrillosus	Documented	Surveys Not Practical. [1]
Rhizopogon variabilisporus	Suspected	Surveys Not Practical. [1]
Sarcodon fuscoindicus	Documented	Surveys Not Practical. [1]
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

[1] Surveys are considered not practical for these species based on the 2003 Annual Species Review (IM-OR-2004-034).

Appendix D. Aquatic Conservation Strategy

Project: Slim Sherlock Commercial Thinning
Prepared By: Dan Dammann and Jeff McEnroe
Date: June 17, 2009

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).

ACS Components:

Riparian Reserves (ACS Component #1)

Riparian Management Areas (RMAs) were established under the 2008 ROD/RMP. Fish-bearing streams and perennial, non-fish bearing streams would have a RMA one site-potential tree height in width and silvicultural activities (e.g. thinning) would not be applied within 60 feet (2008 ROD/RMP, pg. 35). Intermittent, non-fish bearing streams would have a Riparian Management Area half of one site-potential tree height in width and silvicultural activities (e.g. thinning) would not be applied within 35 feet of the stream (2008 ROD/RMP, pg. 35). Management objectives for the Slim Sherlock project include providing for the conservation of special status fish and other aquatic species and providing for riparian and aquatic conditions that supply stream channels with shade, sediment filtering, leaf litter and large wood, and streambank stability (2008 ROD/RMP, pg. 37).

Key Watersheds (ACS Component #2)

Under the 1995 ROD/RMP, Key Watersheds were established "as refugia . . . for maintaining and recovering habitat for at-risk stocks of anadromous salmonids and resident fish species [1995 ROD/RMP, pg. 20]." There are no key watersheds within the Little River or Lower South Umpqua River fifth-field watersheds.

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

The Little River Watershed Analysis (USDA & USDI, 1995) and the South Umpqua Watershed Analysis Water Quality Restoration Plan (USDI, 2001) were used to evaluate existing conditions, establish desired future conditions, and assist in the formulation of appropriate alternatives. The Umpqua Basin Watershed Council also completed a Watershed Assessment for Deer Creek in 2002. Existing watershed conditions and effects to aquatic resources are described in the aforementioned watershed analyses and in the Hydrology (pgs. 27-31) and Aquatic Habitat & Fisheries (pgs. 31-33) sections of this EA.

Watershed Restoration (ACS Component #4)

A component of the project design is to apply thinning prescriptions to speed development of large trees to provide an eventual source of large woody debris to stream channels (EA, pg. 5). Therefore, the treatments within the RMA as part of the proposed action would be considered to be a watershed restoration project.

Additionally, since 1994, numerous stream enhancement projects have been implemented in the Little River and Lower South Umpqua Watersheds. This includes placing instream structures (e.g. logs, boulders, root wads, etc…) to improve aquatic habitat on over 5.0 miles of stream, replacing over 10 culverts identified as barriers to fish passage to open up access to additional habitat, or improving or decommissioning over 5.0 miles of road to reduce road sediment impacts to aquatic systems. This work has been done in collaboration with private timber companies, the Partnership for Umpqua Rivers watershed council, Douglas Soil and Water Conservation District, and the Oregon Department of Fish and Wildlife. Future opportunities for restoration are discussed in the Little River and Lower South Umpqua Watershed Analyses. This work would be planned contingent on funding and other workload considerations.

Range of Natural Variability within Little River 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 percent 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 fifth-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. The Lower South Umpqua Watershed Analysis Unit is considered to have a high-severity fire regime. High-severity fire regimes typically occur in cool, moist forest types. In high-severity fire regimes, fires are infrequent (generally more than 100 years between fires) and occur under unusual conditions, such as during droughts or east wind weather events (hot and dry foehn winds) and with an ignition source such as lightning. Fires are often of short duration (lasting from days to weeks) but of high intensity and severity (Lower South Umpqua Watershed Analysis, pg. 22). The Little River watershed is classified as having a moderate severity fire regime. Prior to the advent of fire suppression, average fire return intervals at the drainage scale were calculated between 20 and 100 years with individual fires showing a range of effects (Little River Watershed Analysis, pg. Terrestrial-29). The overall effect is one of patchiness at the landscape level; fires covered a large area, varied in intensities, and burned often.

The Lower South Umpqua watershed is comprised of sedimentary, igneous, and metamorphic rocks (Lower South Umpqua Watershed Analysis, pg. 50). Most of the Little River watershed is dominated by an underlying geology of volcanic rock. The rest of the Little River watershed (the westernmost portion) has a diverse assemblage of underlying rock that includes sediments, siltstones, sandstones, greenstones, and serpentines. Many different types of volcanic rocks are found within the Little River watershed. This diverse geology has created several different landforms which are controlled by differing erosional processes and weathering rates (Little River Watershed Analysis, pg. Terrestrial-24).

Timber harvesting and road construction coupled with storm events over the past 50 years have substantially increased the frequency and distribution of landslides above natural levels in the Little River and Lower South Umpqua watersheds. However, there is a downward trend in landslide incidence over the last 25 years that corresponds with improved management practices (EA, pg. 27; Little River Watershed Analysis, pg. Appendix A-13). On BLM-administered lands, future landslides, mostly during large storm events, are expected to deliver large wood and rock fragments to lower-gradient streams because of RMAs. These events would more closely resemble landslides that occurred within relatively unmanaged forests. These disturbance events are the major natural sources of sediment and wood to a stream system and are very episodic in nature. Due to the dynamic nature of these disturbance events,

stream channel conditions vary based on the time since the last disturbance event. This results in a wide range of aquatic habitat conditions at the site level.

Site level habitat conditions can be summarized by Oregon Department of Fish and Wildlife (ODFW) habitat surveys. Surveys have been conducted throughout the Lower South Umpqua and Little River watersheds, mostly in the third through sixth-order streams. Aquatic habitat survey data from the Lower South Umpqua and Little River watersheds indicates that most of the tributaries are lacking large woody debris. While this condition is considered typical at any given site scale, it is considered atypical for most streams to be devoid of wood at the larger 5th field scale. This is likely the result of "stream cleaning" efforts of the past (Little River Watershed Analysis, pgs. Aquatic-58 to -59; Lower South Umpqua Watershed Analysis, pg. 91). Part of Slim Sherlock's project design is to apply thinning treatments to speed development of large trees to provide an eventual source of large woody debris to stream channels (EA, pg. 5).

Because of its dynamic nature, sediment effects to streams can only be described in general terms. Relatively high levels of fine sediment appear to be present in spawning gravels found in the Lower South Umpqua and Little River watersheds. While much of this sediment is a result of natural processes and geology, landslide frequencies increased within the basin when land management activities began. Flood events in the 1950's and 1960's triggered the largest number of these landslides and debris flows.

Stream temperatures vary naturally in these watersheds as a result of variation in geographic location, elevation, climate, precipitation, and distance from source water. Stream temperatures also naturally vary as a response to the natural disturbance events mentioned above, as well as current practices on private forest, agricultural, and residential properties. Over the last 150 years, much of the lower elevation forest land has been converted to farmland. Many tributaries have also been "cleaned" (had large wood removed) or salvage logged. Due to the large amount of riparian clearing that has occurred historically, especially the conversion of valley bottom forests into farmland, and water withdrawals for agricultural and domestic use. Domestic water withdrawals, irrigation, agriculture, and livestock watering are common within the Little River and Lower South Umpqua watersheds.

Due to the conversion of valley bottoms into farmland, historical stream cleaning, and water withdrawals, it is likely that stream temperature increases have been greater than observed naturally. In addition, changes in stream flow can result from consumptive water withdrawals and effects of land use activities on storm water runoff, infiltration, storage and delivery. One of Slim Sherlock's objectives for managing RMAs is to provide for riparian and aquatic conditions that supply stream channels with shade, sediment filtering, leaf littler and large wood, and streambank stability (EA, pg. 2).

Table D-1. Individual Aquatic Conservation Strategy Objective Assessment.

ACS Objective	Site/Project Scale Assessment	Fifth-Field Watershed Scale Assessment
	Scale Description: Units identified in this project are located in three separate seventh-field drainages (detailed below*) distributed throughout the watersheds totaling roughly 18,200 acres in size. The BLM manages approximately 3,240 acres in these drainages (17%). Units proposed for treatment represent 3% of the total drainage area, and 16% of the BLM-managed lands in the drainage.	Scale Description: This project is located in the Little River and Lower South Umpqua fifth-field watersheds. These watersheds are roughly 131,800 and 110,400 acres in size respectively. The BLM manages approximately 19,800 acres in the Little River watershed (15%) and 4,150 acres in the Lower South Umpqua watershed (3%). Units proposed for treatment represent

ACS Objective	Site/Project Scale Assessment	Fifth-Field Watershed Scale Assessment
		less than 1% of the total watershed areas, and less than 8% of the BLM-managed lands in the watershed.
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.	Trees within the treated riparian stands would attain larger heights and diameters in a shorter amount of time than if left untreated. Project Design Features (PDF's) such as "no-harvest" buffers established along streams would retain shading and therefore 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 (refer to *Hydrology*: *Water Quality*; EA, pgs. 27-29) 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 watersheds, 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	Treatments would not reduce canopy closure to an extent that could potentially influence in-stream flows (refer to *Hydrology*: *Stream Flow*; pgs. 29-31). In addition, "no-harvest" buffers established on streams in, or adjacent to, proposed units would prevent disturbance to stream channels and stream banks (refer to *Riparian Management Area Prescription*,; EA, pg. 5). Therefore, these treatments 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,	PDF's would ensure that water quality would not be adversely impacted by the proposed action. PDF's such as variable	Based on the information discussed at the site scale, this project would also maintain water quality at the watershed

ACS Objective	Site/Project Scale Assessment	Fifth-Field Watershed Scale Assessment
aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.	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 (refer to *Hydrology*: *Water Quality*; pgs. 27-29). Therefore, this treatment would maintain the existing water quality at the site scale.	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 (refer to *Hydrology*: *Water Quality*; pgs. 27-29). 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.	Treatments would not reduce canopy closure to an extent that could potentially influence in-stream flows (refer to *Hydrology*: *Stream Flow*; pgs. 29-31). The project would involve partial removal of vegetation on areas constituting ten percent or less of each affected sub-watershed. In addition, new road construction would not noticeably 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 preventing channel extension on roads that do cross streams. Therefore, this treatment would maintain stream flows within the range of natural variability at the site scale.	As discussed at the site scale, density management 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.

ACS Objective	Site/Project Scale Assessment	Fifth-Field Watershed Scale Assessment
7. Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and woodlands.	As discussed in #6 above, this project would maintain stream flows within the range of natural variability at the site scale. Therefore, it would also maintain stream interactions with the floodplain and respective water tables at the site scale.	At the watershed scale, this project would also maintain stream interactions with the floodplain and respective water tables within the range of natural variability.
8. Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.	The proposed treatment is designed to return riparian stands to a more natural density and growth trajectory. Therefore this treatment would serve to restore plant species composition and structural diversity at the site scale.	The proposed treatment is designed to return riparian stands to a more natural density and growth trajectory. Therefore this treatment would serve to restore plant species composition and structural diversity at the larger watershed scale as well.
9. Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.	As mentioned previously, one of the objectives 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, one of the objectives 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.

*Detailed scale description of the seven seventh-field drainages: Jim Creek, Fall Creek, and North Fork Deer Creek.

1) The **Jim Creek** drainage is roughly 2,800 acres in size. The BLM manages approximately 1,190 acres in this drainage (43%). Units proposed for treatment represent 8% of the total drainage area, and 18% of the BLM-managed lands in the drainage.
2) The **Fall Creek** drainage is roughly 5,500 acres in size. The BLM manages approximately 1,390 acres in this drainage (25%). Units proposed for treatment represent 3% of the total drainage area, and 13% of the BLM-managed lands in the drainage.
3) The **North Fork Deer Creek** drainage is roughly 9,900 acres in size. The BLM manages approximately 660 acres in this drainage (7%). Units proposed for treatment represent 2% of the total drainage area, and 28% of the BLM-managed lands in the drainage.

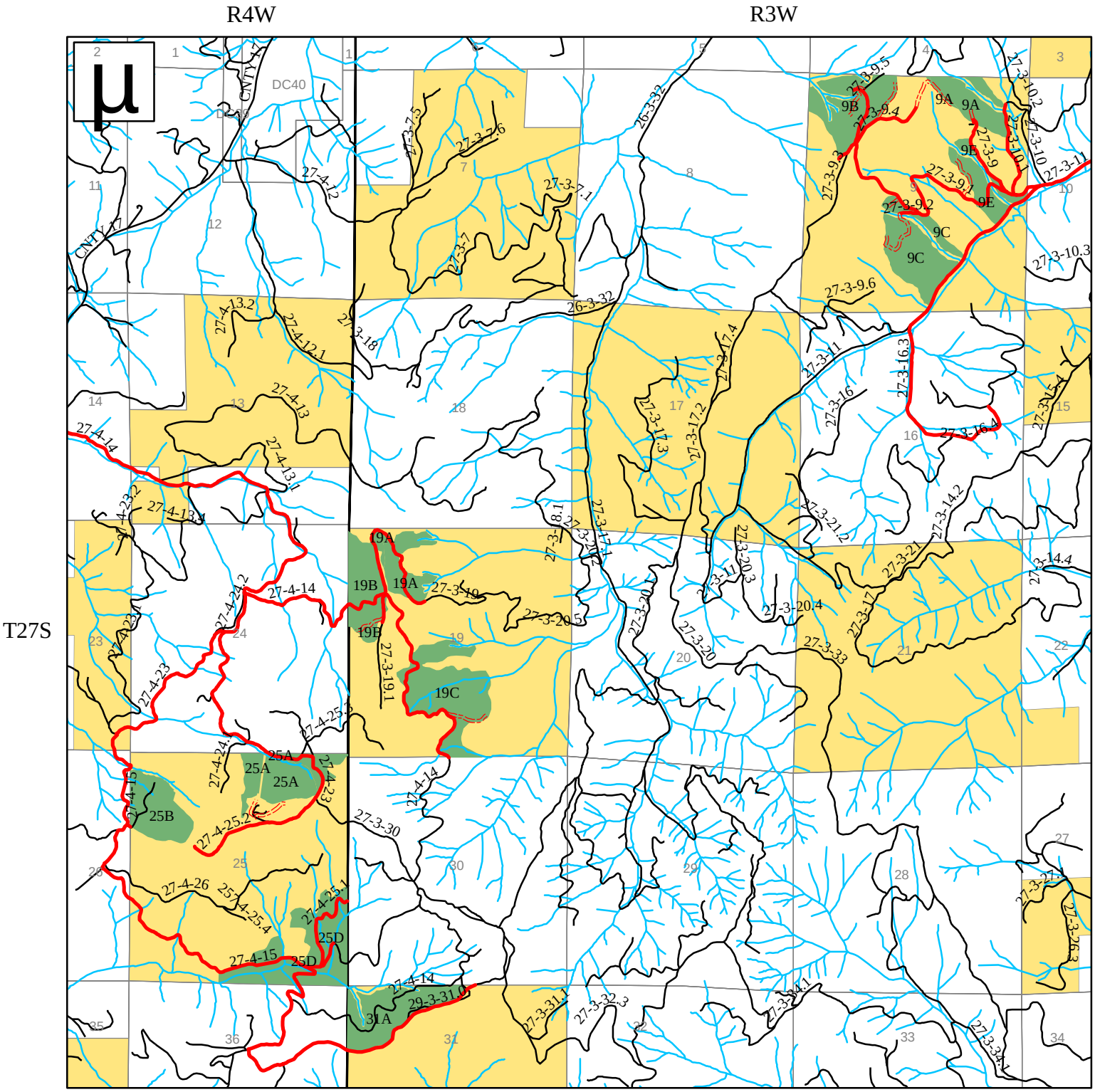
ACS Summary:

Based upon the information presented above (Table D-1: *Individual Aquatic Conservation Strategy Objective Assessment*; Appendix D), 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; it would actually speed attainment of these objectives. Therefore, this action is consistent with the ACS and its objectives at both the site and watershed scales.

Appendix E. Map Packet Table of Contents

Figure 1…….Slim Sherlock Vicinity Map
Figure 2…….Slim Big Jim Map
Figure 3…….Sherlock Home Map
Figure 4…….Slim Big Jim Northern Spotted Owl Map
Figure 5…….Sherlock Home Northern Spotted Owl Map

Figure 1. Slim Sherlock Vicinity Map



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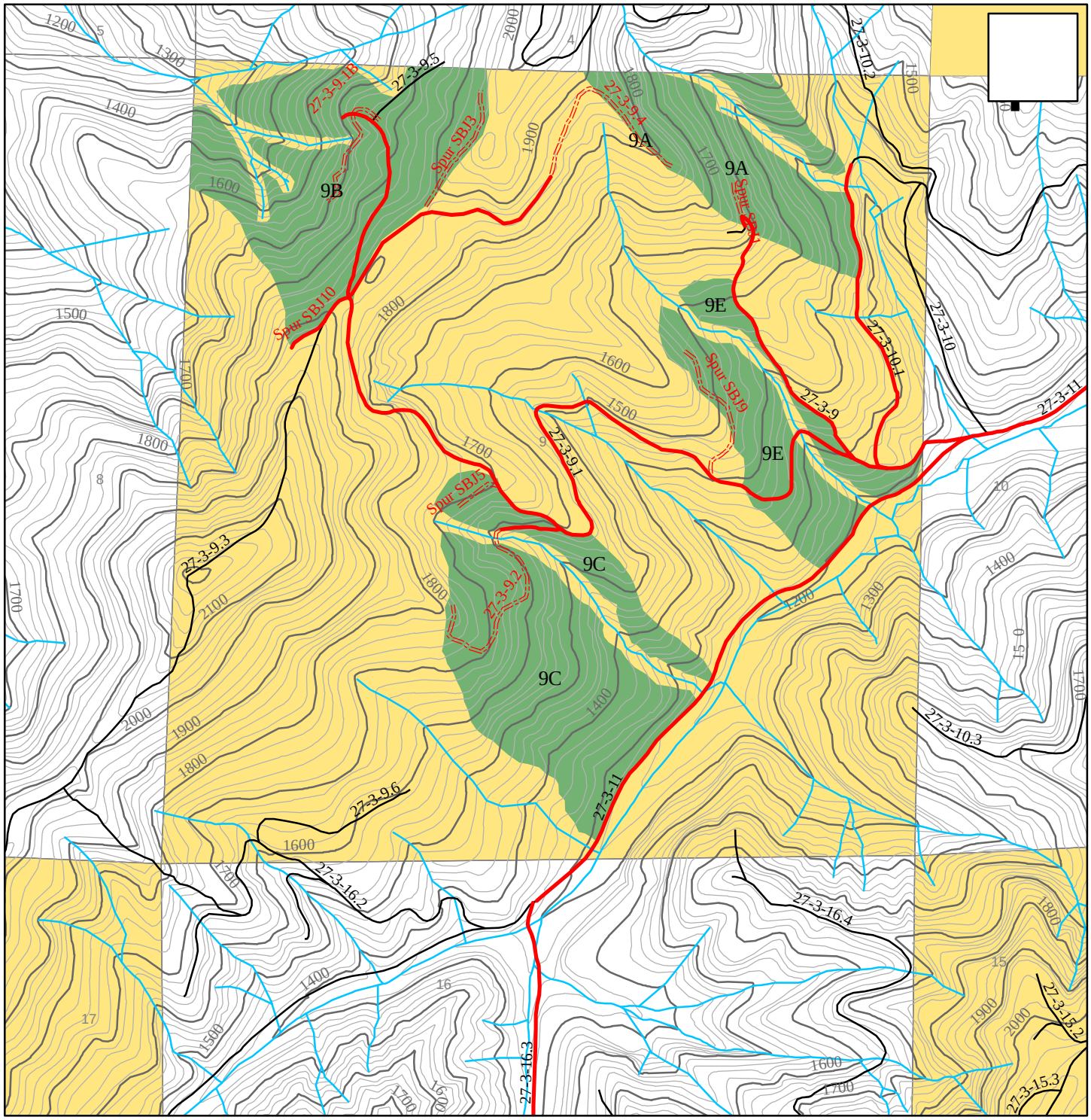
NATIONAL SYSTEM OF PUBLIC LANDS

Figure 2. Slim Big Jim Commercial Thinning

R3W

T27S



0 1,000 2,000 3,000 Feet

1:12,000

Legend

- New Road Construction
- Haul Routes
- Roads
- Streams
- Proposed Units
- Township/Range
- Section

Administered Lands

- BLM
- Other

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Figure 3. Sherlock Home Commercial Thinning

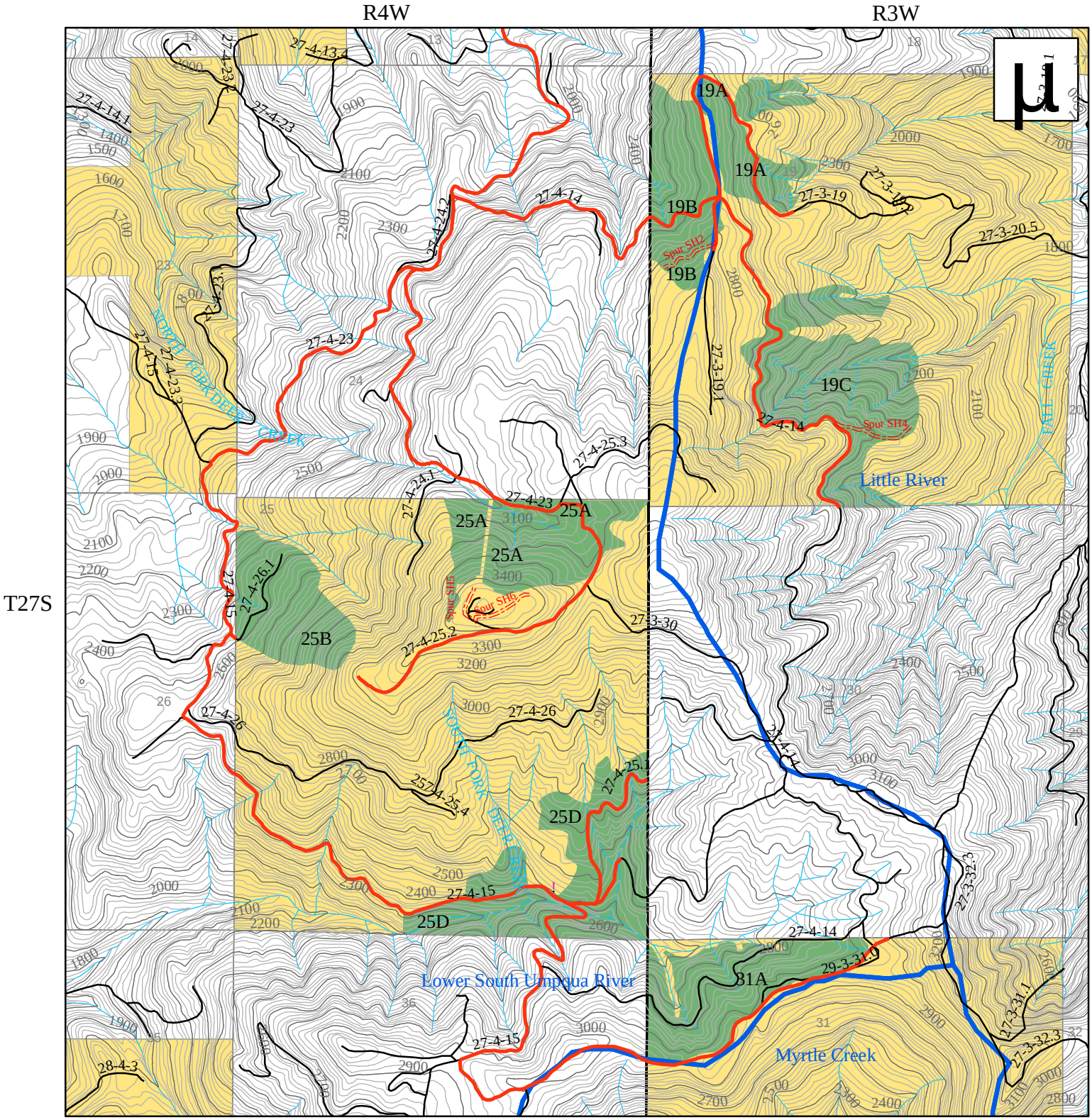

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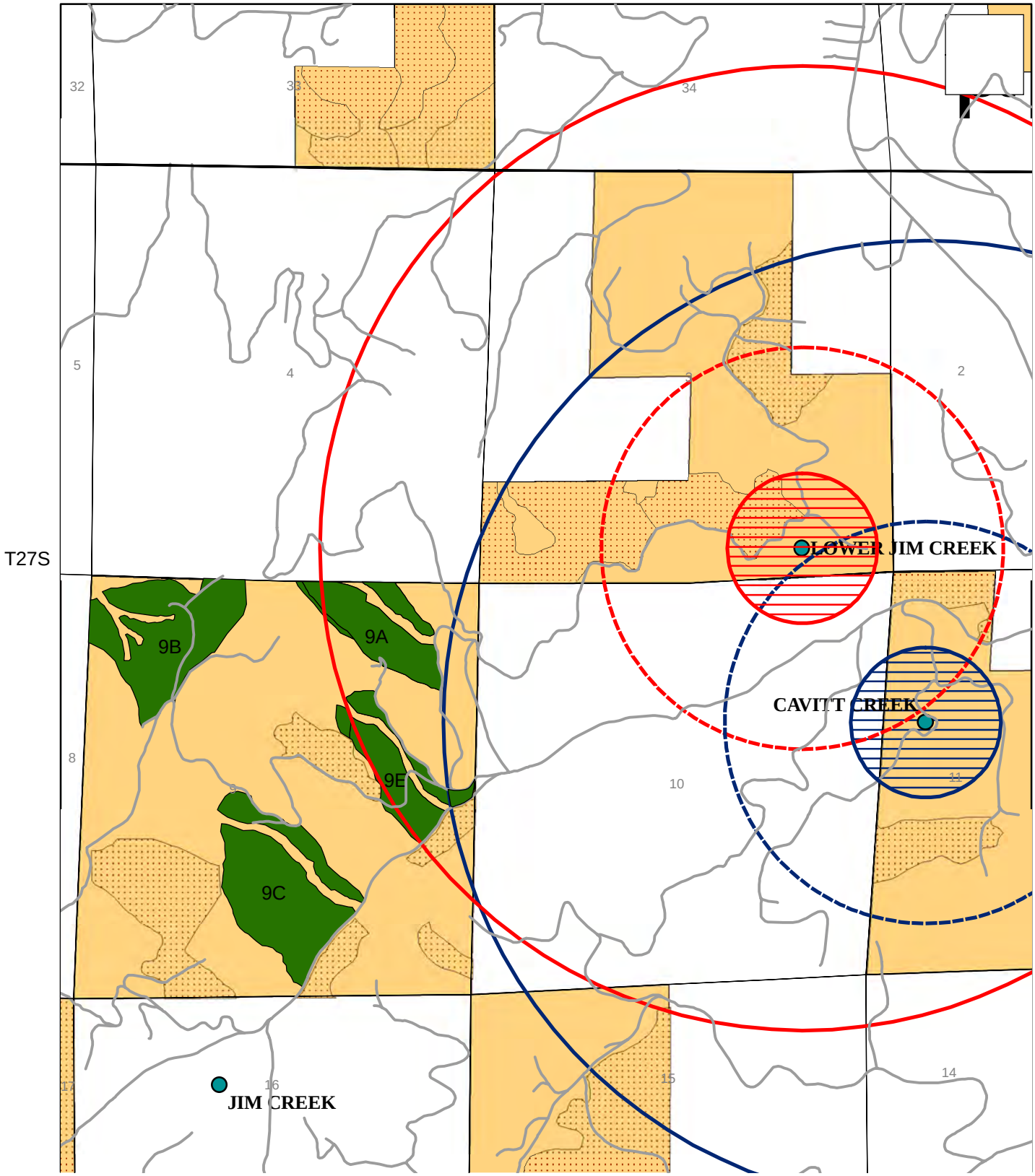
Figure 4. Northern Spotted Owl Sites
Slim Big Jim Commercial Thinning



1,400 700 0 1,400 Feet

1:21,845

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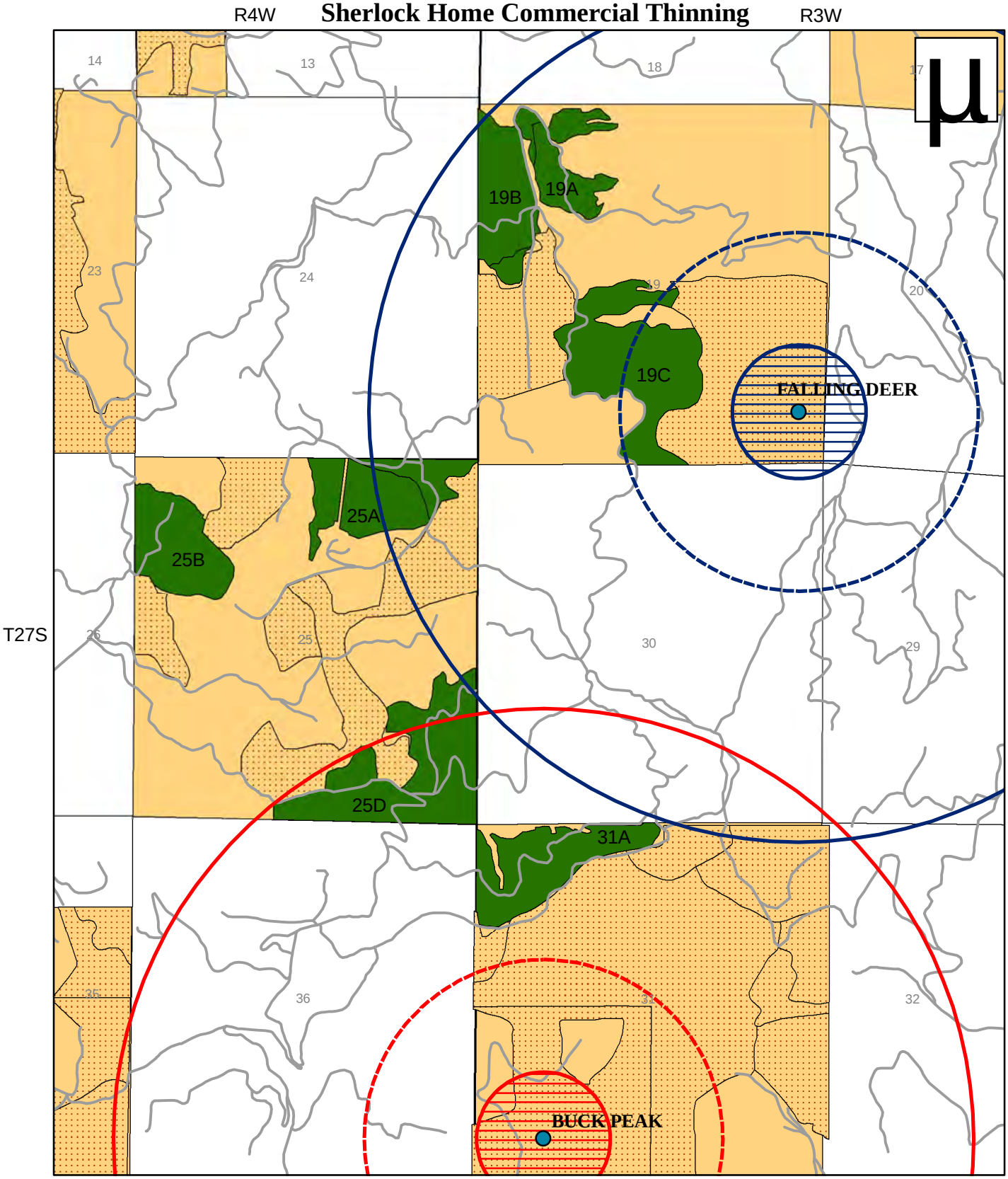
Legend

- Slim Big Jim Spotted Owl Sites
- Cavitt Creek Home Range (1.2 mi)
- Cavitt Creek Core Area (0.5 mi)
- Cavitt Creek Nest Patch (300 m)
- Lower Jim Creek Home Range (1.2 mi)
- Lower Jim Creek Core Area (0.5 mi)
- Lower Jim Creek Nest Patch (300 m)
- Slim Big Jim Units
- Suitable Habitat (80+ years old)
- BLM O&C Lands
- Roads

Figure 5. Northern Spotted Owl Sites
Sherlock Home Commercial Thinning



0 1,300 2,600 3,900 Feet

1:24,000

Legend

- Sherlock Home Spotted Owl Sites
- Falling Deer Home Range (1.2 mi)
- Falling Deer Core Area (0.5 mi)
- Falling Deer Nest Patch (300 m)
- Buck Peak Home Range (1.2 mi)
- Buck Peak Core Area (0.5 mi)
- Buck Peak Nest Patch (300 m)
- Sherlock Home Units
- Suitable Habitat (80+ years old)
- BLM O&C Lands
- Roads

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