Elementary Watson
Commercial Thinning & Density Management
Environmental Assessment

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Roseburg District
Swiftwater Field Office
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Chapter 1. Purpose and Need for Action

A. Background

The Bureau of Land Management (BLM), Swiftwater Field Office proposes commercial thinning and density management of approximately 288 acres of mid-seral forest stands, 40-64 years old in the proposed Elementary Watson timbersale. Within the 288 acres, approximately 3 acres would be cleared or brushed for spur rights-of-way or roads to access the harvest areas.

The proposed sale is located in the Little River, Lower North Umpqua, and Lower South Umpqua fifth-field watersheds within the Adaptive Management Area (AMA), General Forest Management Area (GFMA), and Riparian Reserves in section 13, T.27 S., R. 4 W. and section 7 T.27 S., R. 3 W., Willamette Meridian.

It is anticipated that the proposed timbersale would yield approximately 4 million board feet (4 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 ROD/RMP, this analysis is tiered to and incorporates by reference the assumptions and analysis of consequences provided by the following NEPA analyses:

- The *Final Supplemental Environmental Impact Statement* (FSEIS) *on Management of Habitat for Late-Successional and Old-Growth Related Species Within the Range of the Northern Spotted Owl* (USDA and USDI 1994);
- The *Final Supplement to the 2004 Supplemental Environmental Impact Statement to Remove or Modify the Survey and Manage Mitigation Measure Standard and Guidelines* (USDA and USDI 2007);

Implementation of the actions proposed in this analysis would conform to the requirements of the ROD/RMP, incorporating the standards and guidelines of the Northwest Forest Plan as amended.

C. Objectives

The overall objective of the proposed action is to provide timber, improve stand quality and vigor, and accelerate the development of late successional habitat on forest land within the AMA, GFMA, and Riparian Reserve land-use allocations, in accordance with the ROD/RMP. Specific objectives of the proposed action are to:

1) Comply with Section 1 of the O&C Act (43 USC § 1181a) which stipulates that O & C Lands be managed "… for permanent forest production, and the timber thereon shall be sold, cut, and removed in conformity with the principal of sustained yield for the purpose

of providing a permanent source of timber supply, protecting watersheds, regulating stream flow, and contributing to the economic stability of local communities and industries, and providing recreational facilities…"

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

3) Within the Riparian Reserve, apply silvicultural treatments to restore large conifers in Riparian Reserves (ROD/RMP, pg. 21) and perform density management to help forest stands develop late-successional characteristics and attain forest conditions that contribute to the Aquatic Conservation Strategy (ROD/RMP, pgs. 151-152).

4) Within the AMA, protect riparian areas in a manner comparable to that prescribed for other federal land areas and manage coarse woody debris, green trees, and snags in a manner which meets the intent of the management actions/direction for the Matrix (ROD/RMP, pgs. 32-33).

5) Select logging systems based on the suitability and economic efficiency of each system for the successful implementation of the silvicultural prescription, for the protection of soil and water quality, and for meeting other land use objectives (ROD/RMP, pg. 61). Also, provide a harvest plan flexible enough to facilitate harvesting within a three year timber sale contract.

6) Seek a balance between reducing the risk of wildfire and a fuel profile that supports land allocation objectives (ROD/RMP, pg. 78).

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 density management 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 ROD/RMP;
- 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; and
- Provide revenue to the government from the sale of timber resources in a cost efficient manner.

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. Under the ROD/RMP, the majority of harvest and silvicultural activities are scheduled to occur within the Matrix land use allocation. If the no action alternative were selected there would be no commercial thinning or density management of timber or treatment of the mid-seral stands within the bounds of the project area at this time.

Harvest at the proposed locations for purposes of analysis would be deferred for the foreseeable future. Selection of this alternative would not constitute a decision to re-allocate these lands to non-commodity uses. Future harvesting in this area would not be precluded and could be considered again under a subsequent EA. Road maintenance would be 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 the Elementary Watson timbersale that would result in commercial thinning and density management of approximately 285 acres of mid-seral stands expected to yield approximately 4 MMBF of timber. In addition, approximately 3 acres would be cleared or brushed for spur rights-of-way or roads to access the harvest areas. The proposed action consists of the following activities (also summarized in Table 1):

Table 1. Elementary Watson Proposed Activity Summary.

Activity		Total
Timber Harvest	Commercial Thinning	
	General Forest Management Area	73 acres
	Adaptive Management Area	134 acres
	Density Management	
	Riparian Reserve	78 acres
Yarding	Cable	275 acres
	Ground Based*	10 acres
Hauling	Wet or Dry Season Haul	8.00 miles
	Total Haul Route	8.00 miles
Road Activities	New, Permanent Construction	0.60 miles
	Renovation of Existing Roads	7.40 miles

Fuels Treatment	Machine Pile and Burn at Landings

*Up to 10 acres of additional, incidental ground-based logging could occur.

Elementary Watson includes lands within the Adaptive Management Area (AMA, 136 acres), General Forest Management Area (GFMA, 74 acres), and Riparian Reserve (78 acres) land-use allocations. Elementary Watson is located on Revested Oregon and California Railroad Lands (O&C Lands).

The Swiftwater Field Office initially proposed harvest of approximately 400 acres. After interdisciplinary team review, approximately 112 acres were dropped from consideration because: the stream and riparian network was more extensive than anticipated, low timber volume per acre in some areas, inaccessibility for cable or ground-based yarding, and buffers to two hairy sedge (*Carex gynodynama*) sites. The interdisciplinary team reduced the proposed project to 288 acres.

1. Timber Harvest

a) Treatment Prescription

Units proposed would be commercially thinned and have density management treatments applied (Appendix E; Figures 2 and 3). These units consist of approximately 285 acres of mid-seral forest, aged 40 to 64 years.

Commercial thinning and density management treatments would be used to reduce the number of trees in generally even aged stands dominated by Douglas-fir. These treatments would be developed consistent with management objectives for the individual land use allocations. Trees would primarily be removed from the suppressed and intermediate canopy classes, although some co-dominant and dominant trees would be removed where necessary to meet specific land use objectives.

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 the unit, it is possible that suppressed trees designated for cutting may include trees older than the prevailing stand age.

Stands would be thinned by leaving 90-120 square feet of basal area. A variable spacing marking prescription would be used. In AMA, GFMA, and Riparian Reserve land use allocations, minor conifer and hardwood species would be retained where possible to maintain stand diversity. In Riparian Reserves, canopy openings would be created or enlarged to maintain trees with large limbs, full crowns, promote tree regeneration, shrubs, and forbs.

Conifer and hardwood snags 10 inches or larger in diameter breast height and at least 16 feet in height would be marked for retention in the GFMA, AMA, and Riparian Reserve.

Existing snags would be felled only if they pose a safety concern. If snags are felled within GFMA or AMA lands due to safety concerns, then they could be removed if they possess commercial value. Snags felled for safety reasons in the Riparian Reserve would be retained on site as coarse woody debris. Existing coarse woody debris in decay classes 3, 4, and 5 would be retained in GMFA and AMA lands, and all coarse woody debris would be retained in the Riparian Reserve.

The residual stands following harvest would provide a pool of candidate trees for future snag and coarse woody debris recruitment. Additional coarse woody debris and snags may be created incidentally through the harvest operations (e.g. damage leading to broken-out tops or individual tree mortality) or through weather damage (e.g. wind and snow break).

b) Stream Buffers

Within Riparian Reserves, variable-width "no-harvest" buffers would be established to protect stream bank integrity, maintain streamside shade and provide a filtering strip for overland run-off. Variable buffer width would be based on site conditions and would have a width between 20 to 60 feet measured from the edges of the stream channel. Actual widths would vary subject to an on-the-ground evaluation and consideration of factors such as period of flow, unique habitat features, streamside topography, vegetation, and fish presence. At the very minimum, a one-tree retention will be maintained along the stream bank for bank stability. Minimum buffer widths will be used primarily on ephemeral or highly interrupted intermittent streams, which lack riparian vegetation and where riparian habitat components, soil stability issues, and potential impact to downstream fisheries are also absent.

Where yarding across streams is necessary, logs would be fully suspended over the stream to avoid disturbing the stream channel and banks. No equipment operation would be allowed within the "no-harvest" buffers. If necessary to fell trees within the "no-harvest" buffers for operational purposes, the felled trees would be left in place to provide in-stream wood and protection for stream banks.

c) Timber Cruising

Timber cruising would employ methods that could include the felling of sample trees in upland stands to formulate local volume tables. 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 and density

management activities are completed.

2. Timber Yarding

The Proposed Action would require a mix of skyline cable yarding (275 acres) and ground-based yarding (10 acres). Up to 10 acres of additional, incidental ground-based logging may be necessary (i.e. removal of guyline anchor trees, isolated portions of units, etc.) and would occur on gentle slopes (less than 35 percent) during the dry season.

Table 2. Elementary Watson Yarding Methods.

Unit	Yarding Method (acres)			Roads/Right-of-Way (acres)	Total (acres)
	Aerial	Cable	Ground-Based		
7A	0	38	0	0.5	39
7B	0	27	0	0.5	28
13A	0	207	10	1.5	218
13B	0	3	0	0	3
Total	**0**	**275**	**10**	**3**	**288**

3. Timber Hauling

Approximately 8.0 miles of rocked roads would be used for timber hauling in either the dry-season or the wet-season.

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, Renovation, & Decommissioning)

The proposed project would include dry season and wet season logging activities and use existing roads to the greatest extent practical. Road construction and renovation 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 an extended wet season beyond May 15th).

Construction – Approximately 0.6 miles of new, permanent roads and landings would be constructed (Table 3). These roads would be rocked and would remain open after harvest is completed and would not be decommissioned.

Renovation – A total of approximately 7.3 miles of the existing rocked roads and natural surface roads would be renovated by brushing, grading, replacing drainage structures and surfacing with rock where absent or deficient (Table 3). These roads would be rocked and would remain open after harvest is completed and would not be decommissioned.

In addition, the 27-3-7.0 road has two minor subgrade failures, one approximately 150 feet long and the other approximately 75 feet long. The first 150 foot subgrade failure would be excavated and the subgrade replaced with larger rock and a drainage structure would be added. The 27-3-7.0 road at the 75 foot subgrade failure would be re-aligned into the cut bank and a drainage structure would be added.

Decommissioning – The latter 950 feet of the 27-4-13.2 road not used for timber hauling and 1,430 feet of a skid trail extending from it up a ridge nose to the 27-4-13.0 road would be subsoiled and waterbarred in Unit 13A.

Table 3. Elementary Watson Roads & Spurs.

Road #	New Construction (miles)	Renovation (miles)	Surfacing		Decommissioning
			Existing	Proposed	
27-3-7.0	-	1.50	Rock	Rock	None
27-3-7.6	-	0.24	Rock	Rock	None
27-4-12.0	-	1.41	Rock	Rock	None
27-4-12.1	-	0.85	Rock	Rock	None
27-4-13.0	-	1.23	Bank Run	Rock	None
27-4-13.1	-	0.60	Native	Rock	None
27-4-13.2	-	0.50	Native	Rock	None
27-4-14.0	-	0.80	Rock	Rock	None
Spur 7a	-	0.13	Rock	Rock	None
Spur 7b	0.18	-	-	Rock	None
Spur 13a	0.06	-	-	Rock	None
Spur 13b	0.18	-	-	Rock	None
Spur 13c	0.07	-	-	Rock	None
Landing 13a	0.02	-	-	Rock	None
Landing 13b	0.02	-	-	Rock	None
Landing 13c	0.02	-	-	Rock	None
Landing 13d	0.02	-	-	Rock	None
Landing 13e	0.02	-	-	Rock	None
TOTAL	**0.59**	**7.26**	**Rock/Native**	**Rock**	**None**

C. Additional Project Design Features as part of the Action Alternative

1. To protect riparian habitat:

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

b. 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. If, for safety reasons, it would be necessary to fall a reserve tree in the Riparian Reserves then it would be left as coarse woody debris.

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

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

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

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

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

(1) Use of cable logging systems that limit ground disturbance. This would include the use of partial or full suspension (BMP I C1a; RMP, pg. 130). In some areas, partial suspension may not be physically possible due to terrain. Where excessive soil furrowing occurs, it would be hand waterbarred and filled with limbs or other organic debris.

(2) Limiting ground-based logging to the dry season (normally May 15th to October 15th; BMP I C2d; RMP, pg. 131).

(3) If soil moisture levels would cause the amount of compaction to exceed 10 percent or more of the ground-based area (including landings, log decks, and trails), operations would be suspended during unseasonably wet weather in the dry season. The soil scientist and the contract administrator would monitor soil moisture and compaction to determine when operations may need to be suspended.

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

(5) Harvesters would cut trees less than twelve inches above the ground to allow subsoiling excavators to pass over the stumps.

(6) Harvesters would place tree limbs in the trails in front of the equipment to minimize compaction. Slash would be placed near the boles of the reserved trees adjacent to trails to protect the large roots at or near the surface.

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

(1) Burning of slash during the late fall to mid-spring season when the soil, duff layer (soil surface layer consisting of fine organic material), and large down log moisture levels are high (BMP III D1b, pg. 140). This would confine burn impacts to the soil underneath the piles and lessen the depth of the impacts (i.e., loss of organic matter, and the change of soil physical properties, ecology and soil nutrients).

e. **Measures to protect slope stability would consist of:**

(1) New spur roads and realigned road segments would be located on geologically stable areas (BMP II B2; RMP, pg. 132) constructed with a narrow road width (i.e. maximum of 14 foot running surface) to minimize soil disturbance (BMP II C6; RMP, pg. 132). Road construction on side slopes greater than 45 percent would be full-bench construction with no sidecasting.

(2) Cable yarding would not be permitted on very steep slopes (i.e. 70 percent and greater) when soil moisture levels are high enough to squeeze water from soil samples by hand. Soil moisture would be considered too high if cable yarding creates glazed imprints on the soil and channels water down-slope. This generally occurs when the soil moisture is greater than 30 percent.

(4) Higher tree retention would be prescribed in swale bottoms, headwalls, and scarps in Unit 13A.

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

a. Numerous large (> 20 inches diameter) pieces of coarse woody debris in the ground-based harvest area would be protected from disturbance to maintain habitat for amphibians, mollusks, and small mammals.

4. To protect air quality:

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

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

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

6. To protect cultural resources:

If any objects of cultural value (e.g. historic or prehistoric ruins, graves, fossils, or

artifacts) are found during the implementation of the proposed action, operations would be suspended until the site has been evaluated to determine the appropriate mitigation action.

7. To protect Special Status Plants and Animals:

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

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

c. There are currently no known northern spotted owl sites or activity centers within 65 yards of the proposed unit boundaries. There is unsurveyed suitable habitat within 65 yards of the boundaries of Units 7B and 13A. Therefore, harvest activities (e.g. falling, bucking, and yarding) in portions of these units would be seasonally restricted from March 1st through June 30th unless current calendar year surveys indicate that: 1) spotted owls are not present 2) spotted owls are present, but not attempting to nest, or 3) spotted owls are present, but nesting attempt has failed. Waiver of seasonal restriction is valid until March 1st of the following year.

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

e. There is a historic golden eagle nest site within ¼ mile of Unit 7A. Harvest activities (e.g. falling, bucking and yarding) in portions of Unit 7A would be seasonally restricted from March 1st through July 15th unless current year surveys indicate that golden eagles are not nesting at the site. Waiver of seasonal restriction is valid until March 1st of the following year.

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

The operator would be required to comply with all applicable State and Federal laws and regulations concerning the storage, use and disposal of industrial chemicals and other hazardous materials. All equipment planned for in-stream work (e.g. culvert replacement) would be inspected beforehand for leaks. Accidental spills or discovery of the dumping of any hazardous materials would be reported to the Authorized Officer and the procedures outlined in the "Roseburg District Hazardous Materials

(HAZMAT) Emergency Response Contingency Plan" would be followed. Hazardous materials (particularly petroleum products) would be stored in appropriate and compliant UL-Listed containers and located so that any accidental spill would be fully contained and would not escape to ground surfaces or drain into watercourses. Other hazardous materials such as corrosives and/or those incompatible with flammable storage shall be kept in appropriate separated containment. All construction materials and waste would be removed from the project area.

D. 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.

There are currently no energy transmission or transport facilities, and/or utility rights-of-way in proximity to any of the proposed commercial thinning or density management units.

2. Cultural Resources

Elementary Watson was inventoried for cultural resources and none were discovered (November 1999; June 2008). It was determined that there would be no effect to any cultural resources since none were identified in the Elementary Watson project area. The Swiftwater Field Office has completed its Section 106 responsibilities under the 1997 National Programmatic Agreement and the 1998 Oregon Protocol. Cultural resources will not be discussed further.

3. Visual Resource Management

The VRM classification for this area is IV. The basic elements of form, line, color and texture as required by the ROD/RMP (pg. 52) would be maintained under the proposed action. Visual resources will not be discussed further.

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[a] of the alternatives over time. 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 PRMP/EIS and FSEIS, incorporated herein by reference.

A. Forest Vegetation

1. Affected Environment

The proposed units are predominantly Douglas-fir forested stands 40 to 64 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 chinkapin, big leaf maple, red alder, ponderosa pine, salal, Oregon grape, and sword fern). The majority of the stands had been actively managed with precommercial thinning between 1972 and 1983. Unit 13A had a fertilizer treatment applied in 1985. The stands are currently 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 and density management.

The ORGANON modeling program version 8.2 was used to model current conditions, silviculture prescriptions, and expected post-treatment stand conditions. The current stand conditions for the Elementary Watson units are summarized in Table 4.

[a] Cumulative effects are the impacts of an action when considered with past, present, and reasonably foreseeable future actions. (40 CFR 1508.7)

Table 4. Current Stand Conditions.

Unit Number	Stand Age (years)	Trees per Acre	Basal Area (sq. ft.)	Quadratic Mean Diameter (inches)	Relative Density Index	Canopy Closure* (%)	Average Crown Ratio (%)
7A	48	245	160	11.0	0.54	115	35
7B	40	316	170	9.9	0.59	131	33
13A**	54; 64	265; 278	240; 260	12.8; 13.0	0.75; 0.80	140; 151	35; 30
13B	64	278	260	13.0	0.80	151	30

* 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 Organon model estimates canopy cover by summing the individual tree crown areas and dividing that by the area of an acre. Estimates can exceed 100 percent of the stand due to crown overlap in dense stands and/or the presence of understory trees.
** Unit 13A includes two different stands; hence two values are given in the table.

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).

The stands would not develop into multi-storied stands without altering the current growth and developmental trajectories (DeBell, et al. 1997). In the absence of treatment, shade-tolerant species (e.g. western hemlock, western red cedar) would remain suppressed in the understory. There would be insufficient sunlight to allow for shrub, conifer, and hardwood regeneration.

3. Proposed Action Alternative

Thinning results in increased diameter growth, stabilization of height to diameter ratios, 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).

Commercial thinning in AMA and GFMA would produce relative stand densities ranging from 0.41 to 0.43 (Table 5). Within that range of relative densities, commercial thinning would produce high rates of volume growth (Curtis and Marshall 1986).

Density management in the Riparian Reserves would be thinned to relative stand densities ranging from 0.32 to 0.34 (Table 5). Density management in Riparian Reserves would also reduce canopy closure to between approximately 57 and 75 percent (Table 5). Reducing the canopy closure would allow sunlight to reach the forest floor to encourage establishment and/or further development of an understory and vertical stratification of canopy layers (Hayes, et al. 1997).

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

After determining where the Riparian Reserves are located, some units have a minimal amount of GFMA or AMA acreage remaining and therefore the entire unit would have the density management prescription applied. Conversely, some small areas of Riparian Reserves would have prescriptions similar to the adjacent GFMA or AMA prescriptions applied.

Table 5. Post-Treatment Stand Conditions.

Unit Number	LUA*	Trees per Acre	Basal Area (sq. ft.)	Quadratic Mean Diameter (inches)	Relative Density Index	Canopy Closure (%)	Average Crown Ratio (%)
7A	AMA	171	120	11.7	0.42	89	35
7A	Riparian	136	90	11.4	0.32	67	35
7B	AMA	213	120	10.4	0.43	96	34
7B	Riparian	172	90	10.2	0.34	75	33
13A	AMA/ GFMA	136; 133	120	13.4; 13.6	0.41	75	35; 30
13A	Riparian	107; 110	90	13.0; 13.3	0.32	57	31; 36
13B	GFMA	133	120	13.6	0.41	75	30

* Land-Use Allocation: AMA = Adaptive Management Area, GFMA = General Forest Management Area, Riparian = Riparian Reserve.

4. Cumulative Effects

While the proposed treatments in Elementary Watson would reduce tree densities, they would not affect stand ages or seral stages. In the long-term, the treatment would accelerate the development of late-successional (seral) stand conditions because the proposed project would retain the dominant and co-dominant trees giving them more room to grow and produce multiple canopy layers by allowing more sunlight to reach the forest floor and encourage the establishment and development of understory vegetation.

Through 2010, the Swiftwater Field Office is planning commercial thinning or density management in mid-seral forested stands on approximately 980 acres in the Little River, Lower South Umpqua, and Lower North Umpqua watersheds combined and no regeneration harvests (Table 6). In addition, the South River Field Office is planning 57 acres of commercial thinning and density management in the Little River Watershed and 233 acres of regeneration harvest in the Lower South Umpqua watershed through 2010 (Table 6).

Table 6. Planned Timbersales through 2010 in Little River, Lower South Umpqua, and Lower North Umpqua Fifth-field Watersheds.

	SW	SW	SR	SR
Fifth-field Watershed	CT/DM (acres)	Regen. Harvest (acres)	CT/DM (acres)	Regen. Harvest (acres)
Little River	280	0	57	0
Lower South Umpqua	350	0	0	233
Lower North Umpqua	350	0	n/a	n/a
TOTAL	980	0	57	233

*CT/DM = Commercial Thinning & Density Management, Regen. Harvest = Regeneration Harvest.

The PRMP/EIS (Vol. I, p. 4-4) assumed that most private lands would be intensively managed with final harvest on commercial economic rotations averaging 50 years. Based on this assumption, the PRMP/EIS (Vol. I, p. 4-30) concluded that private forest lands would contribute very little, if any, late-seral forest habitat in the watershed. Because the objectives are different for each private landowner, the timing of harvest would vary throughout the watershed. Forest lands would maintain a mosaic pattern of age classes in the watershed as different forest stands are harvested and replanted. The majority of private lands would maintain young plantations or early and mid-seral forest type characteristics.

B. Wildlife

1. Federally Threatened & Endangered Wildlife Species

a) Northern Spotted Owl

(1) Affected Environment

There are no known spotted owl sites within 1.2 miles (Cascades provincial home range) of the proposed Elementary Watson units. The stands within the proposed Elementary Watson harvest units are considered to be dispersal habitat for the northern spotted owl.

The Elementary Watson harvest units were included as part of the consultation package with the U. S. Fish and Wildlife Service (USFWS) regarding the

Reinitiation of Consultation on Roseburg District Bureau of Land Management FY 2005-2008 Management Activities (Ref. # 1-15-05-I-0511) (USDI 2005).

The Elementary Watson harvest units are not within 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 and Endangered species.

(2) No Action Alternative

The quality and availability of northern spotted owl habitat would be unaffected under the No Action alternative. The 288 acres of mid-seral stands included in Elementary Watson would provide dispersal habitat similar to current levels. Suitable habitat characteristics would develop more slowly when compared to the proposed action (see discussion of effects to forest vegetation, pgs. 13-15).

(3) Proposed Action Alternative

Local, project specific impacts to northern spotted owls due to commercial thinning and density management activities would include the modification of approximately 288 acres of dispersal habitat.

Though dispersal habitat would be temporarily degraded post-treatment, the capability of the habitat to function for dispersing spotted owls would be maintained. Vertical and horizontal cover would be reduced in treated areas through tree removal with varying levels of residual tree density. Spotted owls would be expected to continue using these stands because post-treatment canopy cover would still be 57 percent or more and the average tree diameter would generally be 11 inches or larger (Table 5), figures equal to or greater than those widely used as a threshold for dispersal function (Thomas et al. 1990). Spotted owls would likely use unthinned stands over the newly thinned stands until the canopy cover in thinned stands returns to pre-treatment levels in about 10 to 15 years (Meiman et al. 2003).

The USFWS concurred with the Roseburg District's determination that the effect on northern spotted owls by modifying dispersal-only habitat in the proposed Elementary Watson harvest units was "*may affect, is not likely to adversely affect*" (USDI, 2005; pgs. 19-20).

Based on past survey data, there are no known spotted owl nest sites within 65 yards of the unit boundaries, but there is unsurveyed suitable habitat within 65 yards of the boundaries for Units 7B and 13A. Therefore, harvest activities (e.g. falling, bucking, and yarding) in portions of these units would be seasonally restricted from March 1st through June 30th unless current calendar year surveys indicate: 1) spotted owls are not present 2) spotted owls are present, but not attempting to nest, or 3) spotted owls are present, but nesting attempt has failed. Waiver of the seasonal restriction is valid until March 1st of the following year. If

future surveys locate an activity center or nest within 65 yards of a proposed unit, seasonal restrictions from March 1st through June 30th would be applied to that portion of the harvest unit to mitigate disturbance impacts to nesting spotted owls and pre-dispersal fledglings.

Density management within the Riparian Reserves would accelerate the development of late-successional habitat characteristics used by spotted owls (e.g. large diameter trees, multiple canopy layers, and hunting perches). Development of late-successional characteristics and suitable habitat would be expected in approximately 50 years, roughly 100 years sooner than through natural stand development.

2. Bureau Sensitive Species

Bureau Sensitive species suspected to occur within the project area and that may be affected by the proposed action are discussed below. Other Bureau Sensitive and Bureau Strategic species suspected to occur on the Roseburg BLM District but not in the project area are discussed briefly in Appendix A.

a) No Action Alternative

No suitable habitat or habitat features for BLM Special Status Species would be affected under the No Action Alternative and any species sites in or adjacent to the project area would be expected to persist. The development of suitable 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 (see discussion of effects to forest vegetation, pgs. 13-15). As such, the effects of the No Action Alternative are not discussed on a species-by-species basis below.

b) Fisher (Bureau Sensitive)

(1) Affected Environment

Fishers primarily use mature closed-canopy forests with the presence of large diameter trees, snags, and downed wood for natal and foraging behaviors, and with some deciduous component, frequently along riparian corridors. Although the project area does not contain suitable natal or foraging habitat, the fisher may use the proposed units as dispersal habitat. The nearest known observation is more than 18 miles south of the proposed project area; however, fishers may use the proposed units because they are capable of traveling six miles within a few hours and more than 29 miles in two days (Verts and Carraway, 1998).

(2) Proposed Action Alternative

Treatment of the mid-seral stands would improve the quality of dispersal habitat by reducing stand densities, thus creating conditions favorable for the development of a multi-canopy understory habitat and larger trees. Additionally, the project design retains snags and coarse woody debris (pgs. 4-5) which would maintain habitat for potential prey species (i.e. small mammals) that use these

habitat features. Fishers would be able to continue to use the proposed units for dispersal habitat post-harvest.

Development of late-successional characteristics in the Riparian Reserves would be expected in approximately 50 years, roughly 100 years sooner than through natural stand development. The proposed action would produce suitable fisher natal and foraging habitat sooner than through natural stand development.

c) Purple Martin (Bureau Sensitive)

(1) Affected Environment

Purple martins nest in colonies within snag cavities located in forest openings, meadows, and other open areas. The project area does contain snags and some snags are located in open areas typical of purple martin colonies. There are currently no known purple martin sites within the project area and the nearest known purple martin colony is approximately 9 miles northwest of the proposed project area. However, purple martins would be expected to forage above the canopies within the project area.

(2) Proposed Action Alternative

Snags are expected to be retained in the proposed units due to the protection afforded snags in the project design (pgs. 4-5). The thinning and density management prescription would provide additional openings around those snags that are currently in open area, improving the suitability of the stands for colonization by purple martins. Purple martins would continue to forage above the canopies within the units post-harvest.

d) Townsend's Big-eared Bat (Bureau Sensitive) & Fringed Myotis (Bureau Sensitive)

(1) Affected Environment

Townsend's big-eared bat and the fringed myotis can roost in snags or trees with deeply furrowed bark, loose bark, cavities, or with similar structures typically found in late-successional conifers. Surveys have not been conducted for either bat species since surveys are not practical. Potential bat roosts are typically located within the overstory canopy, thus it is unknown if the Townsend's big-eared bat or the fringed myotis is present within the proposed project area. There are an unknown number of snags and potential bat roosting trees in the proposed units. No caves were found within the harvest units during field review.

(2) Proposed Action Alternative

Existing snag habitat is expected to be retained in the harvest units due to the protection afforded them by the project design (pgs. 4-5). As described under the Proposed Action (pg. 5), snags may be created incidentally through harvest operations or weather damage, thus providing additional snag recruitment as future habitat for bats.

e) White-tailed Kite (Bureau Sensitive)

(1) Affected Environment

Kites will forage in open farmlands and meadows and nest in open, wooded habitat along the edges of meadows. Farmland and meadows adjacent to the project units could provide foraging areas for kites and open, forested areas within the project area could provide nesting habitat. Surveys have not been conducted for white-tailed kites so it is unknown if the species is present within the project area.

(2) Proposed Action Alternative

The project will not occur within foraging habitat for the kite therefore use is expected to remain the unchanged. The project would thin forested habitat adjacent to foraging habitat and may provide additional edge nesting habitat for the kite.

f) Golden Eagle (Bureau Sensitive)

(1) Affected Environment

A historic golden eagle nest site is located within one-quarter mile of Unit 7A. Private farmland and meadows adjacent to the nest grove and the proposed units provide foraging areas for eagles. Surveys have not shown golden eagles to be present during 2008 within the project area.

(2) Proposed Action Alternative

The proposed units would not modify nesting or foraging habitat for golden eagles. A seasonal restriction from March 1st to July 15th would be implemented within one-quarter mile around the known nest site unless surveys for the current season indicate that eagles are not nesting or are not present. Development of late-successional characteristics in the Riparian Reserves would be expected in approximately 50 years, roughly 100 years sooner than through natural stand development. The proposed action would provide additional, suitable nesting habitat for golden eagles sooner than through natural stand development.

3. Wildlife Cumulative Effects

Currently, there is less late-successional forest habitat available than on historic average. As such, the availability of late-successional forest habitat is the primary wildlife concern in the Lower South Umpqua, Lower North Umpqua, and Little River watersheds based on the effects of past and expected future timber harvest on federal and private land. Stands in this area begin functioning as late-seral habitat at approximately 80 years of age when characteristics like large diameter trees, a secondary canopy layer, snags, and cavities have developed. Early and mid-seral habitat is expected to be common on both BLM and private land in the watershed due to past and future timber harvest, but not all this habitat is useful to wildlife. Private lands in particular may be managed for a

densely-stocked Douglas-fir, with few large residual trees remaining after harvest and deciduous and minor conifer species are targeted for elimination through herbicide treatment and thinning. These stands are not expected to provide high levels of habitat for wildlife species that use attributes like herbaceous understory vegetation, a shrub or mid-story layer, or large residual trees and snags. The proposed thinning and density management would help moderate this trend by providing high-quality mid-seral wildlife habitat.

While the proposed action will reduce tree densities, it will not affect overall stand ages or affect the ability of the project area to grow into late seral habitat in the Riparian Reserves included in the project. The proposed action may temporarily reduce the utility of the project area for some wildlife species by removing canopy cover and horizontal structure. However, sufficient residual tree density, snags, and coarse woody debris will remain to provide continued wildlife habitat and treated stands will regain pre-project cover characteristics as discussed in *Forest Vegetation* (pgs. 13-15). Consequently, the proposed action will not affect the availability of late-seral habitat in the watershed, and will contribute to the development of functional mid-seral habitat. Additionally, late seral habitat will be continually developing in the watershed as the RMP is implemented. These factors indicate that the proposed action would not cause cumulative effects to the continued availability and functionality of wildlife habitat in the Lower South Umpqua, Lower North Umpqua, or Little River watersheds or to species associated with it.

C. Fire and Fuels Management

1. Affected Environment

The Elementary Watson project falls within the Wildland Urban Interface (WUI) boundary as identified in the Roseburg District Fire Management Plan. In most areas, current fuel conditions are best described by photo 1-MC-2 in *Photo Series for Quantifying Natural Forest Residues in Common Vegetation Types of the Pacific Northwest* (Maxwell and Ward, 1980). There are patches of larger trees that could be described by photo 1-MC-3 in Maxwell and Ward (1980). Based on this photo series, the estimate for downed woody debris in Elementary Watson is 6 – 10 tons per acre although there are some areas that have a lighter fuel load. The project is located behind several gates along the access roads which would decrease the risk of human-caused wildfires by limiting access to the public. There are homes distant from the project but they are not directly threatened by fire from this area due to proximity and extensive defensible space around the homes. Therefore, the current risk of wildfire in the Elementary Watson project is low to moderate.

2. No Action Alternative

Downed fuels would continue to gradually accumulate adding to the existing fuel conditions of 6 – 10 tons per acre. The risk of wildfire would also gradually increase as fine fuels continue to accumulate.

3. Proposed Action Alternative

After commercial thinning and density management, the down woody debris would increase from 6-10 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.

4. Cumulative Effects

The additional amount of down woody debris (i.e. five to nine tons per acre) would not dramatically increase the fire risk to the area. In addition, most of the fine fuels, less than one inch in diameter, would degrade within two years after harvest and decrease the risk of a fire building in intensity that would be capable of consuming larger diameter fuels.

D. Soils

1. Affected Environment

The topography within the proposed units varies from gently sloping terrain (0 to 30 percent) to very steep terrain (greater than 70 percent) and is highly dissected with drainages (Table 7).

Table 7. Slope Distribution, Amount, and Percent of Project Area.

Unit	Percent Slope	Area	
		(acres)	(percent)
7A	0 to 70	37	12.8
	greater than 70	2	0.7
7B	0 to 70	25	8.7
	greater than 70	3	1.0
13A	0 to 70	176	61.1
	greater than 70	42	14.6
13B	0 to 70	3	1.0
	greater than 70	0.2	0.1
TOTAL	0 to 70	241	83.7
	greater than 70	47	16.3

Ground-based yarding was used extensively in Units 7A and 13A when logged in the 1950s and 1960s based on field investigation and 1964 and 1970 aerial photo interpretation. Substantial soil displacement and soil compaction resulted from trail construction, haul road construction, and skidding on slopes up to 75 percent. The

density of these disturbances is approximately 25 percent of the ground-based area on gentle slopes (0 to 35 percent slopes). Moderate to heavy compaction is still present on many trails and road surfaces, decking areas, and landings. Soil productivity is recovering very slowly on roughly five percent of the project area where the topsoil had been displaced and the highly compacted subsoil is exposed or where there is less than ten inches to bedrock. Some organic matter incorporation and soil structure development is occurring on skid trails where native understory vegetation is growing well. Unit 7B was cable-yarded in the 1960's and currently exhibits little soil displacement or soil compaction from past harvest activities based on field investigation and 1970 aerial photo interpretation.

With few exceptions, little erosion is now occurring because: (1) vegetation and woody debris dissipate rainfall energy and hold soil in place (2) natural soil structure and porosity outside of old ground-based trails allow high water infiltration rates into the soil, and (3) the near absence of new disturbance helps keep erosion low. One notable exception is the latter 950 feet of the 27-4-13.2 road and 1,430 feet of skid trail extending from it up a ridge nose to the 27-4-13.0 road where there are ruts and rill erosion.

Twenty-seven shallow-seated landslides ranging from 0.03 to 0.35 acres (24 in Unit 13A and three in Unit 7B) were identified from aerial photo interpretation and field investigations. Eight of these were road-related and 19 were harvest-related. Most of the historic landslide activity occurred at headwalls and inner gorges of streams following clear-cut harvesting on the very steep slopes of Unit 13A in the 1950's and 1960's. Two deep-seated, earth flows approximately 0.4 and 2.0 acres in size initiated on moderate to steep slopes (30 to 60 percent) at the head of swales in Unit 13A. Most of the historic landslide activity was concentrated in the eastern part of Unit 13A north of the 27-4-13.0 road. In the southwest corner of Unit 7B, there is a small, active slump in the 27-3-7.0 roadbed creating a one foot high scarp. No historic landslides or active slope failures were identified in Unit 7A.

About 30 acres of the soils on very steep slopes are considered to be fragile due to slope gradient but suitable for forest management with mitigation for surface erosion and shallow-seated landslides. These fragile soils are classified as FGR under the Timber Production Capability Classification (TPCC) system (Appendix B, Table B-1). The majority (i.e. 90 percent) of these FGR acres are in Unit 13A. Scattered across the moderate to steep slopes (30 to 70 percent) in Unit 13A are about five acres of swale heads and hollows that may be sensitive to slump-earth flow movements with disturbance but are suitable for management (fragile soils with the FPR classification). Soil creep is occurring at one of these swale heads (approximately 0.2 acres) as evidenced by the presences of conifers with S-curves in their boles.

2. No Action Alternative

a) Soil Compaction/Displacement & Productivity

Without timber harvesting or road construction, no additional soil compaction or displacement would occur beyond the current level and soil erosion would remain low.

Compacted soils within the skid trails would continue to recover 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 classified as FGR and FPR (about 30 to 40 acres) would have a low probability of occurring (less than ten percent chance in a given year). If landslides do occur within the next ten years they would likely be less than 0.1 acre in size and few in number. This assessment is based on:

- No in-unit landslides that were solely related to harvest (no influence from road disturbance) have apparently occurred after 1970 (aerial photo interpretation and field observations ; Cressy, 2007);
- Two thirds of the historic, harvest-related landslides within the project area were 0.03 to 0.10 acres in size (aerial photo landslide inventory and field observations; Cressy, 2007);
- Most historic landslides were probably triggered by an exceptionally large storm event (e.g. the December 1964 storm) when Unit 13A was in an early seral stage. The proposed units are now in a mid-seral stage. 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 previously in the 1950's and 1960's. This left the FGR and FPR slopes in a more stable state.

3. Proposed Action Alternative

a) Soil Compaction/Displacement & Productivity

The proposed road construction would result in approximately 0.9 acres of new soil disturbance where no road or trail imprint previously existed. Disturbance would be in the form of soil displacement and compaction. Since use of these spurs is anticipated for future harvest and since subsoiling would not be done, this new disturbance would be considered an irretrievable loss of soil productivity. Subsoiling and waterbarring the latter 950 feet of the 27-4-13.2 road not needed for timber haul because of a very steep grade and 1,430 feet of the skid trail connecting it with the 27-4-13.0 road would correct the erosion problem there and bring about 0.7 acres back into productive surface.

Ground-based yarding would occur on a narrow 10 acre strip located on a ridge top in Unit 13A where the 27-4-13.0 road runs along and where slopes are generally less than 35 percent. Since all yarding distances to the 27-4-13.0 road and connecting spurs and landings would be short, the length of trail needed would also be short. Up to 0.3 acres of soil compaction would result from ground-based yarding. 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. The relatively high

clay content of the surface makes these soils highly sensitive to compaction. Limiting the area of harvest disturbance and restricting operating periods for ground-based operations would reduce soil productivity loss (as included in the project design features, pg. 8). Compaction levels resulting from all ground-based yarding methods would be within the ROD/RMP direction that the cumulative main skid trails, landings, and large pile areas affect less than ten percent of the ground-based harvest unit (USDI, 2007; pgs. 58-59).

Approximately 275 acres would be cable-yarded. Cable yarding corridors would cover about three percent of the treatment area's surface (Adams 2003) or about eight acres. Soil disturbance from cable yarding would vary by topography (convex vs. concave slope, slope steepness, and the presence or absence of pronounced slope breaks), and 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 to achieve 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 (project design features, pg. 8).

Surface soil erosion in disturbed areas would be controlled by applying erosion control measures (e.g. new cut and fill slopes would be mulched with weed-free straw, or equivalent, and seeded; pgs. 8). 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. The effects to soils would be consistent with those identified and considered in the *Roseburg District Proposed Resource Management Plan/Environmental Impact Statement* (Chapter 4, pgs. 12-16).

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 these high infiltration soils covered with slash and the "no harvest" buffers would prevent disturbance to stream channels and stream banks. The "no harvest" buffers would also intercept run-off from roads allowing for deposition of sediment transported by overland flow before it reached active stream channels. No sediment from newly constructed spurs would reach streams because spur roads would be at least 430 feet from streams and any sediment generated would be filtered out by the forest floor.

b) Landslides & Slope Stability

Proposed spurs would be located on stable ridge top positions that would not be destabilized with construction. Because concentrated drainage would not be directed onto any potentially unstable ground further down slope, there would not be any additional landslide potential (based on the monitoring of spurs constructed on similar stable terrain).

Where soils are classified as FGR and FPR (about 30 to 40 acres), 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 1965 and 1970 aerial photos). The risk would range from "low" to "low and moderate", depending on specific location. Most of the landslide risk activity would be in the eastern part of Unit 13A north of the 27-4-13.0 road. 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 be few in number and likely be less than 0.15 acre in size, for similar reasons as stated previously under the No Action Alternative (pg. 23).

4. Cumulative Effects

Soil productivity would not be maintained in the short-term following implementation of the proposed action on less than one percent of the area because the total area of soil displacement and compaction resulting from the Elementary Watson action would exceed the area of compacted ground being subsoiled by 1.1 acres. Road construction, cable yarding, and ground-based yarding would cause soil displacement and compaction on about two acres while subsoiling to reduce compaction of old road or trails surfaces and new ground-based impacts would be about 0.9 acres. In the long-term, (i.e. one harvest rotation), soil productivity would be maintained or improved at the watershed scale on BLM-administered land because of natural recovery and subsoiling ground-based yarding trails and roads after final harvests. As a result, cumulative effects to soil productivity at the site scale and fifth-field watershed scale would be negligible. These effects would not exceed the level and scope of effects considered and addressed in the Proposed Resource Management Plan/Environmental Impact Statement (USDI 1994). The effects of forest management on private timber lands in the watershed would be variable.

Landslide aerial photo inventories within the Swiftwater Resource Area show a declining number of landslides during the past 50 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 management improvements and Riparian Reserves, the distribution of landslides in time and space and their effects, now, more closely resemble those within relatively unmanaged forests (Skaugset and Reeves 1998). The distribution would be approaching natural variability.

E. Hydrology

1. Stream Temperature, Water Quality, & Beneficial Uses

a) Affected Environment

The Elementary Watson project area lies within the Buckhorn Creek and Fall Creek drainages of the Little River fifth-field watershed, and the North Fork Deer Creek drainage of the Lower South Umpqua fifth-field watershed. In addition, three acres are in the Lower North Umpqua watershed. Thinning three ridge top acres of the 106,000 acre

Lower North Umpqua watershed would result in no measurable change to any watershed parameter. Therefore, the Lower North Umpqua watershed will not be discussed further under the effects to hydrology.

There are 25 first or second-order headwater streams and two third-order streams (Fall Creek and Buckhorn Creek) adjacent to or within the proposed units totaling 3.6 miles of stream length. Approximately 15 percent of this stream length is classified as perennial (flows year-round) and 85 percent is classified as intermittent or ephemeral (flow ceases for some portion of the year). There are no fish-bearing streams in the project area.

The only affected beneficial use of water within the project area is aquatic life. Beneficial uses of water downstream of the project area consist primarily of: livestock watering, domestic water supply, irrigation, and fish and aquatic life. There are no water quality limited streams (303(d) listed) near the project area.

No surface water rights for domestic use exist within one mile downstream of the proposed thinning units. Two points of diversion for irrigation use and one for livestock use are within one mile downstream of the project area. The Little River portion of the project area is within the drinking water protection area for the cities of Roseburg and Winchester approximately 25 miles downstream. The North Fork Deer Creek portion is within the drinking water protection area for the City of Elkton approximately 80 miles downstream.

b) No Action Alternative

Generally, there would be no impact to water quality, Beneficial Uses of Water, or hydrologic processes under the No Action Alternative. Trees within the Riparian Reserve would continue to compete for space and stands would persist in an overly dense condition and not attain potential growth rates (see *Forest Vegetation* section above). 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.

Should a stand-replacing event (e.g. wildfire) occur, it would result in an increase in water yield and peak flows due to a loss of vegetation and reduction in evapotranspiration. Subsequent impacts to water quality and Beneficial Uses of Water would then follow.

Road renovation would not repair existing sediment sources. 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. In general, the poorer the road condition and the larger the storm event, the greater the amount of sediment produced.

The likelihood of a landslide reaching a stream would be low since slopes with potential instability are located above gentle to moderate slopes away from streams. Landslides impacting streams would produce a short-term increase in sedimentation until the

material is dispersed downstream and they increase the potential for an increase in large wood. 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.

c) Proposed Action Alternative

(1) Water Temperature

Approximately 85 percent of the streams in the project area are ephemeral (i.e., they transport water only in response to precipitation events) or intermittent (i.e., they stop flowing in the dry season), which makes them less susceptible to propagating temperature impacts downstream during the warm dry season. Approximately 15 percent of the streams are perennial (i.e., flow continues year round), which makes them more susceptible to temperature impacts. However, variable width (20 to 60 feet) "no-harvest" buffers would be established along streams to retain direct shading as necessary for maintenance of water temperatures. The final width of the "no-harvest" buffers would be based on consideration of factors such as unique habitat features, streamside topography and vegetation, the nature of the stream (intermittent or perennial), fish presence, and susceptibility to solar heating.

Buffer widths of 60 feet would be used for streams flowing into the summer or having poor slope stability. Minimum buffer widths (i.e. 20 feet or single tree retention) would be used on first or second order, ephemeral or intermittent streams, which lack riparian vegetation and where riparian habitat components are also absent. Vegetation that provides primary shading for stream channels would be protected by the "no-harvest" buffers. Consequently, stream shading would not be affected by thinning or density management and therefore stream temperatures would not be affected.

(2) Water Quality

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

According to Reid (1981) and Reid and Dunne (1984), forest roads can be a major contributor of fine sediment to streams, through down cutting of ditch lines and erosion of unprotected road surfaces by overland flow. Under this alternative, there would be no entries by new road construction into the no-harvest buffer. All new road construction would be at ridge-top locations, away from streams, with no hydrologic connection to the drainage network. Since road segments must be

connected directly to channels in order to deliver sediment-laden water, the new road construction would have no effect on stream sediment. Along the haul route, there would be 17 stream crossings on existing roads. Thirteen of these crossings would be on ephemeral or intermittent streams. The other four would cross perennial streams. The distance to a fish stream, from each stream crossing, ranges from 0.4 to 3.8 miles and averages 2 miles. The closest perennial stream crossing is 1.8 miles from a fish stream.

Prior to timber hauling, renovations to haul road surfaces and drainage structures would be made. Timber hauling could occur in both the dry and wet seasons. Since stream crossings used for wet season haul would be rocked, the amount of sediment contributed from these crossings would be negligible when compared to the amount of sediment contributed along the entire length of the stream from all natural sources. Hauling during the 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 would be a flush of sediment from the roads near stream crossings. The amount of sediment contributed from these crossings during the first seasonal rains would be negligible when compared to the amount of initial sediment naturally flushed from ephemeral channel beds and stream banks within the drainages.

The Elementary Watson project is within the drinking water source area for the cities of Roseburg, Winchester, and Elkton. Project Design Features on pages 7-10 are designed to prevent impacts to water quality. As discussed above, water quality impacts from the proposed action would be negligible. Therefore, there would be no impact to Roseburg's, Winchester's or Elkton's source water.

2. Stream Flow (Water Yield & Peak Flow)

a) Affected Environment

Average annual precipitation in the Elementary Watson project area ranges from 50 to 56 inches, occurring primarily between October and April. Precipitation occurs mostly as rainfall since 68-97 percent of the drainage is less than 2,000 feet in elevation. Therefore, more of the annual streamflow is concentrated to this period (Harr, et al. 1979).

Water yield and peak flows are dependent upon the capture, storage, and runoff of precipitation. Water yield is the total amount of water that comes out of a watershed or drainage measured over a period of time. Timber harvest can result in increases in water yield due to a decrease in evapotranspiration and interception (Satterlund and Adams, 1992).

Roads can affect the hydrologic function of a watershed in a number of ways. They can increase the drainage density of a watershed and act as a preferential pathway for surface runoff. The increase in surface runoff can decrease the volume of water that infiltrates into groundwater or soil water storage. The increase in surface runoff also can increase

the rate at which runoff is routed through a basin, which can result in higher peak flows and less time between a precipitation event and peak runoff (Harr, et al. 1975).

b) No Action Alternative

Existing roads and landings may modify storm peaks by reducing infiltration, 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 project area, roads occupy three to four percent of the land. Therefore, no statistically significant increase in peak flows would be expected to occur due to road effects. Also, with no change in the vegetative cover there would be no change in the average water yield from the project area drainages.

c) Proposed Action Alternative

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

Bosch and Hewlett (1982, pg. 16) concluded that water yield increases are usually detectable when at least 20 percent of the forest cover has been removed in a watershed. Stednick (1996, pg. 88) evaluated twelve studies in the Pacific Coast hydrologic region and determined there was no measurable annual yield increase until at least 25 percent of the watershed was harvested. These relationships are based on watersheds that were clearcut logged with minimal stream buffers. To date, no research has been published that describes the effect that thinning and density management treatments designed following Northwest Forest Plan guidelines have on stream flow.

No measurable effect to water yield or peak flow would be anticipated as a result of the proposed action because the Elementary Watson project would involve thinning approximately five percent of the Buckhorn Creek drainage and less than one percent of the Fall Creek and North Fork Deer Creek drainages. Without a measurable effect to peak flow, the proposed action would also have no measurable effect on channel geometry. In addition, 73 percent the proposed project is located below the transient snow zone (i.e. less than 2,000 feet). The remainder of the project area amounts to less than one percent of the total transient snow zone area within these drainages and would have no potential to impact the amount or timing of snow-melt runoff.

3. Cumulative Effects

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

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

Road densities and condition within the project area would remain the same into the reasonably foreseeable future for the North Fork Deer Creek and Fall Creek drainages. Road density would increase from 4.92 to 4.99 in the Buckhorn Creek drainage. This amount of increase would not result in any measurable change. At present, the road densities are not sufficient to cause a measurable increase in peak flows (pgs. 29-30).

"No-harvest" buffers would be established on all streams adjacent to the proposed units. These "no-harvest" buffers would prevent disturbance to stream channels and stream banks. They would also intercept surface run-off and prevent sedimentation of streams, such that there would be no cumulative degradation of water quality in the Little River or Lower South Umpqua watersheds.

F. Aquatic Habitat & Fisheries

1. Aquatic Habitat

a) Affected Environment

There are no fish-bearing streams present within the project area. The nearest segment of fish-bearing stream downstream of the Elementary Watson project area is approximately 1.5 miles (North Fork Deer Creek). Because there are no fish in the project area, Oregon Department of Fish and Wildlife (ODFW) Aquatic Habitat Inventory surveys have not been performed on streams in the project area.

b) No Action Alternative

Aquatic habitat in fish-bearing streams downstream of the project area would remain unaffected.

c) Proposed Action Alternative

Key factors defining the quality of aquatic habitat are water temperature (previously discussed in hydrology section; pgs. 27) substrate/sediment, large woody debris, pool quality, and habitat access. Due to the lack of fish-bearing streams within the project area, there would be no mechanisms for this project to affect large woody debris, pool quality, or habitat access in fish-bearing streams.

2. Fish Populations

a) Affected Environment

(1) Proposed Federally Threatened Species

On February 4, 2008 NOAA Fisheries announced it is listing the Oregon coast coho salmon evolutionary significant unit (ESU) as threatened under the Endangered Species Act. This includes the designation of critical habitat. The BLM is required to consult with NOAA Fisheries on any action that the BLM determines "may affect" the Oregon coast coho salmon.

Coho salmon are not present within the Elementary Watson project area. The closest coho presence is approximately 1.5 miles downstream of the project area in North Fork Deer Creek.

(2) Bureau Sensitive Species

Bureau Sensitive fish species and their habitats are managed by the BLM so as not to contribute to the need to list under the Endangered Species Act, and to recover the species (ROD/RMP, pg. 41). Bureau Sensitive fish species present in the Little River, Lower South Umpqua, and Lower North Umpqua watersheds include the Oregon Coast coho salmon (discussed above), chum salmon (*Oncorhynchus keta*), Oregon Coast steelhead (*Oncorhynchus mykiss*), and the Umpqua chub (*Oregonichthys kalawatseti*). However, as there are no fish-bearing streams in the project area there are also no fish populations in the project area.

b) No Action Alternative

Fish species and populations would remain unaffected.

c) Proposed Action Alternative

There are no fish populations present within the project area. The proposed action would have no direct effects on fish populations. In addition, project design features would ensure that no indirect effects to fish populations would occur downstream of the project area.

3. Cumulative Effects

Sediment regime, stream temperature, water chemistry, peak flows, and water yield together influence fish habitat or aquatic species. Since water temperature, water chemistry, sediment regime, peak flows, and water yield would not be affected by the proposed action (pg. 31); fish habitat and aquatic species would not be affected.

Therefore, fish habitat and fish populations would not be incrementally affected by the proposed action at the project level nor would they add to the cumulative effects at the fifth-field watershed.

4. Essential Fish Habitat

a) Affected Environment

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 (North Fork Deer Creek) is approximately 1.5 miles down stream form the proposed project.

b) No Action Alternative

There is no essential fish habitat within the project area.

c) Proposed Action Alternative

The proposed action would have no direct or indirect effects on essential fish habitat. Because the proposed action would not affect the components of essential fish habitat, the action "W*ill Not Adversely Affect*" essential fish habitat for coho or Chinook salmon in the Little River, Lower South Umpqua, and Lower North Umpqua watersheds. Without any mechanisms for an adverse effect to essential fish habitat, no mitigation measures are proposed.

5. Aquatic Conservation Strategy

The BLM 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 C). 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. 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

The project area is within the known range of Kincaid's lupine (*Lupinus sulphureus* ssp. *kincaidii*), a Federally Threatened plant and the popcorn flower (*Plagiobothrys hirtus*), a

Federally Endangered plant. Kincaid's lupine habitat occurs in the project area but habitat for the popcorn flower is not present in the project area.

Field surveys were conducted in the spring and summer of 2008 to comply with Departmental Manual 6840 directives and the Special Status Species plant program (ROD/RMP, pg. 41). Three populations of hairy sedge (*Carex gynodynama*) and one of *Tayloria serrata* (a moss species) were discovered in the vicinity of the proposed Elementary Watson project (see Appendix E, Figures 2 and 3). Kincaid's lupine was not discovered in the project area during surveys.

b) No Action Alternative

No suitable habitat or habitat features for *Tayloria serrata* or hairy sedge would be affected under the No Action Alternative and populations in or adjacent to the project area would be expected to persist.

c) Proposed Action Alternative

The *Tayloria serrata* population and one of the hairy sedge populations are outside of the unit boundaries currently proposed. A second hairy sedge population would be included in one of the variable width stream buffers in Unit 13A. The third hairy sedge population adjacent and north of the 27-4-13.2 road would be protected with a tagged, three acre buffer and excluded from Unit 13A. However, there are some individuals plants in the ditchline of the 27-4-13.2 road that would be lost due to the renovation of this road, but the overall population of hairy sedge at this location would be managed with the three acre buffer.

2. Noxious Weeds

a) Affected Environment

There are noxious weeds infestations scattered throughout the project area. The severity of infestations ranges from low to high and the weeds are generally located within the road prism or previously used landings in the project area. The primary species of noxious weeds in the project area include approximately 2 acres Scotch broom (*Cytisus scoparius*) and 2 acres of Himalayan blackberry (*Rubus discolor*).

Several other species of noxious weeds are also present, primarily on roadsides, including: Meadow knapweed (*Centaurea pratensis*), Canada thistle (*Cirsium arvense*), bull thistle (*Cirsium vulgare*), field bindweed (*Convolvulus arvensis*), common St. John's wort (*Hypericum perforatum*), pennyroyal (*Mentha pulegium*), evergreen blackberry (*Rubus laciniatus*), and tansy ragwort *(Senecio jacobea*).

Noxious weeds were treated in the project area in 2008. Treatments were performed by manual removal and/or applying an approved herbicide.

b) No Action Alternative

Noxious weeds within the project area would be managed as part of the Roseburg District's Noxious Weed Program and would be monitored and evaluated for treatment at regular intervals (USDI 1995a). A follow-up treatment for noxious weed populations is planned for 2010 by applying approved herbicides 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

Soil disturbance associated with commercial thinning and density management (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. Project design features that require logging and construction equipment to be clean and free of weed seed prior to entry onto BLM lands would help control and/or prevent the spread of noxious weeds in the project area (pg. 9).

Scotch broom is known to have long lived seeds, which can remain viable up to 80 years. Existing infestations of Scotch broom would be treated prior to commercial thinning and density management operations in order to limit the development and spread of seeds. As under the No Action Alternative, noxious weeds would be monitored, evaluated, and treated under the Roseburg District's Noxious Weed Program.

Chapter 4. Contacts, Consultations, and Preparers

A. Agencies, Organizations, and Persons Consulted

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

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

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

b. The Swiftwater fisheries staff has determined that this project would have no mechanism for an effect on Oregon Coast coho salmon. The proposed action and its interrelated and interdependent actions would have no direct effects on the Oregon Coast coho salmon and will not destroy or adversely modify designated critical habitat. In addition, project design features would ensure that no indirect effects to Oregon Coast coho salmon or their habitat would occur. Therefore it has been determined that the proposed action would have "*no effect*" on the species and "*will not adversely affect*" essential fish habitat" for coho or Chinook salmon.

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 Project Tracking Forms dated November 2, 1999 and June 17, 2008. A "No Effect" determination was made. It has been determined that there would be no effect to scientific, cultural, or historical resources.

B. Public Notification

1. Notification was sent (June 23, 2008) to 13 **adjacent landowners**, **landowners along the proposed haul route, holders of registered water rights within one mile downstream of the project area**, and interested members of the **general public**. One comment was received. Comments received typically concerned the general design of the proposed project. The comments were considered, although not specifically for each comment, in the design of the proposed project.

2. Notification was provided (June 23, 2008) to affected **Tribal Governments**

(Confederated Tribes of Grand Ronde, Confederated Tribes of Siletz, and the Cow Creek Band of Umpqua Tribe of Indians). No comments were received.

3. The **general public** was also notified via the *Roseburg District Planning Updates* (i.e. Winter 2007, Spring 2008, and Summer 2008) which were sent to approximately 150 addressees. These addressees consist of members of the public that have expressed interest in Roseburg District BLM projects.

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

5. A 30-day **public comment period** would be established for review of this EA. A Notice of Availability would be published in *The News-Review*. The public comment period will begin with publication of the notice published in *The News-Review* on August 5, 2008 and end close of business September 4, 2008. Comments must be received during this period to be considered for the subsequent decision. This EA and its associated documents will be sent to all parties who request them. If the decision is made to implement this project, a notice will be published in *The News-Review* and notification sent to all parties who request them.

C. List of Preparers

Core Team

Brad Talbot	Project Lead / Layout
Al James	Management Representative
Jeff McEnroe	Fisheries
Dan Cressy	Soils
Dan Dammann	Hydrology
Krisann Kosel	Fuels Management
Melanie Roan	Wildlife
Rex McGraw	Planning & Environmental Coordinator
Trixy Moser	Silviculture
Terrie King	Engineering
Ron Wickline	Botany/Weeds
Doug Snider	Cruising
Joe Keady	Cruising

Expanded Team (Consulted)

Isaac Barner	Cultural Resources
Erik Taylor	Recreation / Visual Resource Management

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Appendix A. Wildlife Special Status Species

Project: Elementary Watson Commercial Thinning
Prepared By: Melanie Roan
Date: April 17, 2008
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 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	Status[1]	Present in Project Area?[2]	General Habitat Requirements
BUREAU SENSITIVE			
American Peregrine Falcon *Falco peregrinus anatum*	BS, SE	No Habitat	Cliffs, rock outcrops; open habitats for hunting birds
Bald Eagle *Haleaeetus leucocephalus*	BS, ST	No Known Nest/ Roost Sites	Late successional forests with multi-canopies, generally within two miles of a major water source
Chace Sideband *Monadenia chaceana*	BSO	Out of Range	Rocky, talus habitats in the Klamath Province and southwards
Columbian White Tailed Deer *Odocoileus virginianus leucurus*	BSO, CR	No Habitat	Bottomlands, oak/hardwood forests; cover for fawning
Crater Lake Tightcoil *Pristiloma arcticum crateris*	BSO	No Habitat	Perennially wet areas in late seral forests above 2000ft elevation and east of Interstate-5; seeps, springs, riparian areas
Fisher *Martes pennanti*	BS	Suspected	Structurally complex forests; mature open forests with large live trees, snags, and down wood.
Foothill Yellow-legged Frog *Rana boylii*	BSO, V	No Habitat	Low gradient streams/ponds; gravel/cobble, bedrock pools
Fringed Myotis *Myotis thysanodes*	BSO, V	Suspected	Late-successional forest features (e.g. snags or trees with deeply furrowed bark, loose bark, cavities), caves, mines, bridges, rock crevices

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

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

Appendix B. Soils

Project: Elementary Watson Commercial Thinning & Density Management
Prepared By: Dan Cressy
Date: April 15, 2008

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)
7A	1	0	NA	0	0	NA
7B	2	0	NA	0	0	NA
13A	30	5	NA	0	0	NA
13B	0	0	NA	0	0	NA
Total	**33**	**5**	**NA**	**0**	**0**	**NA**

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

Table B-2. Mass Wasting & Landslides in the Action Area. 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.

Unit	# Debris Torrents	# Landslides			
	Large (>0.5 acre)	Small (< 0.1 acre)	Medium (0.1-0.5 acre)	Large (> 0.5 acre)	All
7A	0	0	0	0	0
7B	0	3	1	0	4 (0.3 acres)
13A	0	16	9	1	26 (5.4 acres)
13B	0	0	0	0	0
Total	**0**	**19**	**10**	**1**	**30 (5.4 acres)**
Probability of occurrence expected within units:					
No Action Alternative	low	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] Nine of the identified landslides were road-related and twenty one were harvest-related.
[2] "Unchanged" indicates that the current conditions and current probabilities of mass wasting or landslide events are expected to be essentially the same at the 6th field watershed scale.

Appendix C. Aquatic Conservation Strategy Assessment

Project: Elementary Watson Commercial Thinning & Density Management
Prepared By: Jeff McEnroe and Dan Dammann
Date: May 7, 2008

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:

(1) Riparian Reserves (ACS Component #1)

Riparian Reserves were established. The ROD/RMP (pg. 24) specifies Riparian Reserve widths equal to the height of two site potential trees on each side of fish-bearing streams and one site-potential tree on each side of perennial or intermittent non-fish bearing streams, wetlands greater than an acre, and constructed ponds and reservoirs. Data has been analyzed from District inventory plots and the height of a site-potential tree in the Little River Watershed has been determined to be the equivalent of 180 ft. The height of a site-potential tree for the Lower South Umpqua Watersheds has been determined to be the equivalent of 160 feet (Lower South Umpqua Watershed Analysis). Approximately 78 acres of this treatment are within Riparian Reserves. One of the objectives of this project is to accelerate the development of late seral characteristics in the Riparian Reserves.

(2) Key Watersheds (ACS Component #2)

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

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

In developing the project, the Little River (1995) and Lower South Umpqua (2000) Watershed Analysis was used to evaluate existing conditions, establish desired future conditions, and assist in the formulation of appropriate alternatives. The Little River and Lower South Umpqua Watershed Analysis is available for public review at the Roseburg District office or can be viewed under "Plans & Projects" on the Roseburg District website at www.blm.gov/or/districts/roseburg/index.php.

Existing watershed conditions are described in the Hydrology (pgs. 25-29) and Aquatic Habitat & Fisheries (pgs. 31-32) sections of the EA and in the Little River and Lower South Umpqua Watershed Analysis. The short and long term effects to aquatic resources are also described in these sections of the EA.

(4) Watershed Restoration (ACS Component #4)

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

Additionally, since 1994, a variety of watershed 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, replacing culverts identified as barriers to fish passage to open up access to additional habitat, or improving or decommissioning roads to reduce road sediment impacts to aquatic systems. This work has been done in collaboration with private timber companies, the Partnership for Umpqua Rivers watershed council, Oregon Department of Fish and Wildlife, and the BLM. Future opportunities for restoration are discussed in the Little River and Lower South Umpqua Watershed Analysis.

Range of Natural Variability within the Watersheds:

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.

Little River Watershed Aquatic Habitat Conditions

Disturbances: Natural disturbance events to aquatic systems in the Pacific Northwest include wildfires, floods, and landslides. Little River 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. Most of the Little River watershed is dominated by an underlying geology of volcanic rock. The rest of the 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 watershed. This diverse geology has created several different landforms within watershed which are controlled by differing erosional processes and weathering rates (Little River WA, 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 Watershed. However, there is a downward trend in landslide incidence over the last 50 years that is associated with improved

management practices (Little River WA, Appendix A-13). On BLM land, future landslides, mostly during large storm events, are expected to deliver large wood and rock fragments to lower-gradient streams because of BLM Riparian Reserves. These events would more closely resemble landslides within relatively unmanaged forests. These disturbance events are the major natural sources of sediment and wood to a stream system and are very episodic in nature.

Instream Large Wood. 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 Little River mostly in the third through sixth-order streams. Aquatic habitat survey data from the Little River watershed indicates that most of the tributaries are lacking large woody debris. While this condition is considered typical at any given site scale, it is considered atypical for most streams to be devoid of wood at the larger 5th field scale. This is likely the result of "stream cleaning" efforts of the past (Little River WA, pg. Aquatic 58-59). One of BLM's objectives for managing Riparian Reserves is to maintain and enhance a source of large wood along streams.

Fine Sediment. 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 Little River watershed. 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 1950s and 60s triggered the largest number of these landslides and debris flows (Little River WA, pg. Aquatic-61).

Water Tempeature. Stream temperatures vary naturally in this watershed as a result of variation in geographic location, elevation, climate, precipitation, and distance from the source water. Stream temperatures also naturally vary as a response to the natural disturbance events mentioned in the previous paragraphs, as well as current practices on private forest, agricultural, and residential properties. Due to the large amount of riparian clearing that has occurred in the past, especially the conversion of valley bottom forests into farmland, and water withdrawals for agricultural and domestic use, it is likely that stream temperature increases have been greater than observed naturally. The entire Little River Watershed has about 336 miles of perennial streams. Of this total, approximately 77 percent of the perennial stream length is effectively shaded by riparian canopy (Little River WA, pg. Aquatic-26). One of BLM's objectives for managing Riparian Reserves is to maintain and enhance shade providing vegetation along streams.

Stream Flow. Changes in stream flow can result from consumptive withdrawals and effects of land use activities on storm water runoff, infiltration, storage and delivery. Domestic water withdrawals, irrigation, agriculture, and livestock watering are common along Little River (Little River WA, pg. Aquatic-60). Over the last 150 years, much of the lower elevation forest land has been converted to farmland. Many tributaries within Little River have also been cleaned (had large wood removed) or salvage logged. BLM Forest management in Little River would be designed to reduce or prevent watershed impacts.

Riparian Vegetation. Based on interpretation of historic stand conditions from aerial photos, 72-88 percent of the riparian areas within 360 feet of fish bearing streams in the basin was in late seral condition with large conifers and large hardwoods dominating the stands. Today, roughly 30 percent of riparian stands along fish-bearing streams in the watershed are considered to have late seral characteristics (Litter River Watershed Analysis pg Aquatic-25). One of BLM's objectives for managing Riparian Reserves is to maintain and enhance late seral vegetation conditions along streams.

Lower South Umpqua Watershed Aquatic Habitat Conditions

Disturbances: Natural disturbance events to aquatic systems in the Pacific Northwest include wildfires, floods, and landslides. The Lower South Umpqua is classified as having a high severity fire regime. In high-severity fire regimes, fires are infrequent (generally more than 100 years between fires) and occur under unusual conditions, such as during droughts, during 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 WA, pg. 22). For the Lower South Umpqua Watershed, these fires are the main natural disturbance and provide major natural sources of sediment and wood to the stream system. However, they are very episodic in nature.

Instream Large Wood. 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 only been conducted on three tributaries in the Lower South Umpqua Watershed but give an indication of what stream conditions may be like in this area. Aquatic habitat survey data indicates that most of the tributaries are lacking large woody debris. This is likely the result of "stream cleaning" efforts of the past (Lower South Umpqua WA, pg. 93). One of BLM's objectives for managing Riparian Reserves is to maintain and enhance a source of large wood along streams.

Fine Sediment. Because of its dynamic nature, sediment effects to streams can only be described in general terms. Reference sites are often used to define desired conditions within a given watershed. Suitable reference sites could not be found in the Lower South Umpqua Watershed. ODFW habitat surveys found high amounts of fines in riffles in the lower reaches of Deer Creek with lesser amounts in higher reaches (Lower South Umpqua WA, pg. C-3). However, because reference sites could not be found, a comparison to natural conditions within this watershed could not be made.

Water Tempeature. Stream temperatures vary naturally in this watershed as a result of variation in geographic location, elevation, climate, precipitation, and distance from the source water. Stream temperatures also naturally vary as a response to the natural disturbance events mentioned in the previous paragraphs, as well as current practices on private forest and residential properties. Approximately 38 percent (1,576 acres out of 4,155 acres) of the BLM-administered land within the Lower South Umpqua Watershed is in forest stands at least 80 years old and in late seral condition (Lower South Umpqua WA, pg.39). One of BLM's objectives for

managing Riparian Reserves is to maintain and enhance shade providing vegetation along streams.

Stream Flow. Changes in stream flow can result from consumptive withdrawals and effects of land use activities on storm water runoff, infiltration, storage and delivery. USGS flow gauging stations are located in three locations (South Umpqua River near the lower watershed boundary and in Deer Creek and South Fork Deer). Stream flow follows the precipitation pattern of large seasonal variations with higher stream flows in the winter and lower stream flows in the summer. Ninety-seven percent of the annual runoff at the South Umpqua near Brockway and Deer Creek near Roseburg stream gages occurred from November through May (Lower South Umpqua WA, pg.70).

Riparian Vegetation. Of the BLM managed Riparian Reserves, approximately 30% is considered to be late seral habitat and is expected to have sufficient quantities of large wood and snags (lower South Umpqua WA, pg. 39). One of BLM's objectives for managing Riparian Reserves is to maintain and enhance late seral vegetation conditions along streams. In about 60 years approximately 80 percent of the Riparian Reserves would be at least 80 years old (Lower South Umpqua WA pg 43).

Table G-1. Individual Aquatic Conservation Strategy Objective Assessment.
Little River and Lower South Umpqua River Watersheds

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*) totaling roughly 19,740 acres in size. The BLM manages approximately 5,670 acres in these drainages (29%). Units proposed for treatment represent 2% of the total drainage area, and 6% of the BLM-managed lands in the drainages.	Scale Description: This project is located in the Little River 5th field watershed. This watershed is roughly 132,000 acres in size. The BLM manages approximately 19,450 acres in this watershed (15%). Units proposed for treatment represent approximately 0.19% of the total watershed area, and 1% of the BLM-managed lands in the watershed. This project also located in the Lower South Umpqua fifth-field watershed. This watershed is roughly 110,000 acres in size. The BLM manages approximately 4,150 acres in this watershed (4%). Units proposed for treatment represent approximately 0.07% of the total watershed area, and 2% of the BLM-managed lands in the watershed. A small portion of the project (3 acres) is also within the Lower North Umpqua watershed but only 0.0003 percent of the watershed (3 acres out of 106,000 acres) would be affected. This amount of activity in the Lower North Umpqua watershed would have no measurable effect so effects

ACS Objective	Site/Project Scale Assessment	Fifth-Field Watershed Scale Assessment
		in this watershed were not considered further.
1. Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations, and communities are uniquely adapted.	Within the drainages, the proposed action would result in 78 acres of thinned riparian stands. Trees within these treated stands would attain larger heights and diameters in a shorter amount of time than if left untreated. PDF's such as variable width "no-harvest" buffers established along streams would retain shading and 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 (EA, pg. 27-28) and would prevent impacts to aquatic resources. This treatment would speed attainment of this objective.	This treatment would also speed attainment of this objective at the watershed scale.
2. Maintain and restore spatial and temporal connectivity within and between watersheds	Within the drainage, the proposed project would have no influence on aquatic connectivity. Therefore this treatment would maintain the existing connectivity condition at the site scale.	Within the watershed, the proposed project would have no influence on aquatic connectivity. Therefore this treatment would maintain the existing connectivity condition at the watershed scale.
3. Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations	Treatments would not reduce canopy closure to an extent that could potentially influence in-stream flows (EA, pgs. 28-30). In addition, "no-harvest" buffers established on all streams in or adjacent to proposed units would prevent disturbance to stream channels and stream banks (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, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.	Project design features (PDF) would ensure that water quality would not be adversely impacted by the proposed action. PDF's such as variable width "no-harvest" buffers established along streams would retain shading and hence maintain water temperature. "No-harvest" buffers established on streams in or adjacent to proposed units would prevent disturbance to stream channels and stream banks and intercept surface run-off allowing sediment transported by overland flow to be filtered out before reaching active waterways (EA, pgs. 27-28). Therefore, this treatment	Based on the information discussed at the site scale, this project would also maintain water quality at the watershed scale.

ACS Objective	Site/Project Scale Assessment	Fifth-Field Watershed Scale Assessment
	would maintain the existing water quality at the site scale.	
5. Maintain and restore the sediment regime under which aquatic ecosystems evolved.	As mentioned above, "No-harvest" buffers established on streams in or adjacent to proposed units would prevent disturbance to stream channels and stream banks and intercept surface run-off allowing any management related sediment transported by overland flow to settle out before reaching active waterways (EA, pgs. 27-28). 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 (EA, pgs. 28-29). The project would involve partial removal of vegetation on areas constituting three percent or less of each affected sub-watershed. In addition, new road construction would not extend the drainage network or contribute to a potential increase in peak flow because the new roads would be located on ridge tops or stable side slopes with adequate cross drain structures. Therefore, this treatment would maintain stream flows within the range of natural variability at the site scale.	As discussed at the site scale, thinning treatments would not reduce canopy closure to an extent that could potentially influence in-stream flows. Therefore, at the larger watershed scale, this treatment would also maintain stream flows within the range of natural variability.
7. Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and woodlands.	As discussed in #6 above, this project would maintain stream flows within the range of natural variability at the site scale. Therefore, it would also maintain stream interactions with the floodplain and respective water tables at the site scale.	At the watershed scale, this project would also maintain stream interactions with the floodplain and respective water tables within the range of natural variability.
8. Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.	The proposed treatment is designed to return riparian stands to a more natural density and growth trajectory. Therefore this treatment would serve to restore plant species composition and structural diversity at the site scale.	The proposed treatment is designed to return riparian stands to a more natural density and growth trajectory. Therefore this treatment would serve to restore plant species composition and structural diversity at the larger watershed scale as well.
9. Maintain and restore habitat to support well-distributed populations of	As mentioned previously, one of the objectives of this project is to restore riparian stand conditions in the proposed treatment	As mentioned previously, the intent of this project is to restore riparian stand conditions in the proposed treatment areas.

ACS Objective	Site/Project Scale Assessment	Fifth-Field Watershed Scale Assessment
native plant, invertebrate and vertebrate riparian-dependent species.	areas. Implementation of riparian restoration projects will help restore adequate habitat to support riparian-dependent species at the site and watershed scales.	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 three seventh-field drainages:

1) The **Buckhorn Creek** drainage is roughly 4,300 acres in size. The BLM manages approximately 1,300 acres in this drainage (30%). Units proposed for treatment represent 4% of the total drainage area, and 14% of the BLM-managed lands in the drainage.
2) The **Fall Creek** drainage is roughly 5,550 acres in size. The BLM manages approximately 3,320 acres in this drainage (60%). Units proposed for treatment represent 0.52% of the total drainage area, and 1% 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 1,050 acres in this drainage (11%). Units proposed for treatment represent 0.76% of the total drainage area, and 7% of the BLM-managed lands in the drainage.

ACS Summary:

Based upon the information listed above, the proposed action would meet ACS objectives at the site and watershed scale. In addition, based upon the restorative nature of the action, this project would not retard or prevent attainment of ACS objectives; 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 D. Botany Special Status Species

Project: Elementary Watson Commercial Thinning
Prepared By: R.S.Wickline
Date: June 9, 2008
SSSP List Date: February 8, 2008 (IM-OR-2008-038)

Those Bureau Strategic species which are suspected or documented to occur within the Roseburg District BLM area are detailed below in Tables H-1 and H-2 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 D-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**	N/A	Surveys performed, not detected.	May/June 2008	N/A
Plagiobothrys hirtus Rough popcorn flower (E)	**Yes**	No	N/A	No habitat present.	N/A	N/A
Sensitive Species						
Chiloscyphus gemmiparus Liverwort	**Yes**	No	N/A	No habitat present.	N/A	N/A
Diplophyllum plicatum Liverwort	**Yes**	No	N/A	No habitat present	N/A	N/A
Entosthodon fascicularis Moss	**Yes**	No	N/A	No habitat present	N/A	N/A
Gymnomitrion concinnatum Liverwort	**Yes**	No	N/A	No habitat present.	N/A	N/A
Helodium blandowii Moss	**Yes**	No	N/A	No habitat present	N/A	N/A
Meesia uliginosa Moss	**Yes**	No	N/A	No habitat present	N/A	N/A
Schistostega pennata Moss	**Yes**	No	N/A	No habitat present	N/A	N/A
Tayloria serrata	**Yes**	**Yes**	**Yes**	1 known population	May/June 2008	Buffer from

Species	Within species range?	Habitat Present?	Species Present?	Reason for concern or no concern	Surveys Completed	Mitigation Measures
Moss				in proposed unit.		treatment area.
Tetraphis geniculata Moss	**Yes**	No	N/A	No habitat present	N/A	N/A
Tetraplodon mnioides Moss	**Yes**	No	N/A	No habitat present	N/A	N/A
Tomentypnum nitens Moss	**Yes**	No	N/A	No habitat present	N/A	N/A
Tortula mucronifolia Moss	**Yes**	No	N/A	No habitat present	N/A	N/A
Trematodon boasii Moss	**Yes**	No	N/A	No habitat present.	N/A	N/A
Bridgeoporus nobilissimus Giant polypore fungus	No	No	N/A	Out of range.	N/A	N/A
Cudonia monticola *Fungi*	**Yes**	No	N/A	No habitat present	N/A	N/A
Dermocybe humboldtensis Fungus	**Yes**	No	N/A	No habitat present	N/A	N/A
Gomphus kauffmanii Fungus	**Yes**	No	N/A	No habitat present	N/A	N/A
Helvella crassitunicata Fungus	**Yes**	No	N/A	No habitat present	N/A	N/A
Leucogaster citrinus Fungus	**Yes**	No	N/A	No habitat present	N/A	N/A
Otidea smithii Fungus	**Yes**	No	N/A	No habitat present	N/A	N/A
Phaeocollybia californica Fungus	**Yes**	No	N/A	No habitat present	N/A	N/A
Phaeocollybia dissiliens Fungus	**Yes**	No	N/A	No habitat present	N/A	N/A
Phaeocollybia gregaria Fungus	**Yes**	No	N/A	No habitat present	N/A	N/A
Phaeocollybia olivacea Fungus	**Yes**	No	N/A	No habitat present	N/A	N/A
Phaeocollybia oregonensis Fungus	**Yes**	No	N/A	No habitat present	N/A	N/A
Phaeocollybia pseudofestiva Fungus	**Yes**	No	N/A	No habitat present	N/A	N/A
Phaeocollybia scatesiae Fungus	**Yes**	No	N/A	No habitat present	N/A	N/A
Phaeocollybia sipei Fungus	**Yes**	No	N/A	No habitat present	N/A	N/A
Phaeocollybia spacidea Fungus	**Yes**	No	N/A	No habitat present	N/A	N/A
Pseudorhizina californica Fungus	**Yes**	No	N/A	No habitat present	N/A	N/A
Ramaria amyloidea Fungus	**Yes**	No	N/A	No habitat present	N/A	N/A
Ramaria gelatiniaurantia Fungus	**Yes**	No	N/A	No habitat present	N/A	N/A
Ramaria largentii Fungus	**Yes**	No	N/A	No habitat present	N/A	N/A
Ramaria spinulosa var. *diminutiva*	**Yes**	No	N/A	No habitat present	N/A	N/A

Species	Within species range?	Habitat Present?	Species Present?	Reason for concern or no concern	Surveys Completed	Mitigation Measures
Fungus						
Rhizopogon chamalelotinus Fungus	**Yes**	No	N/A	No habitat present	N/A	N/A
Rhizopogon exiguus Fungus	**Yes**	No	N/A	No habitat present	N/A	N/A
Sowerbyella rhenana Fungus	**Yes**	No	N/A	No habitat present	N/A	N/A
Adiantum jordanii California maiden-hair	**Yes**	No	N/A	No habitat present.	N/A	N/A
Arabis koehleri var. *koehleri* Koehler's rockcress	**Yes**	No	N/A	No habitat present.	N/A	N/A
Arctostaphylos hispidula *Hairy manzanita*	**Yes**	No	N/A	No habitat present.	N/A	N/A
Asplenium septentrionale Grass-fern	**Yes**	No	N/A	No habitat present.	N/A	N/A
Bensoniella oregana Bensonia	**Yes**	No	N/A	No habitat present.	N/A	N/A
Botrychium minganense Gray moonwort	**Yes**	No	N/A	No habitat present.	N/A	N/A
Calochortus coxii Crinite mariposa-lily	**Yes**	No	N/A	No habitat present.	N/A	N/A
Calochortus umpquaensis Umpqua mariposa-lily	**Yes**	No	N/A	No habitat present.	N/A	N/A
Camassia howellii Howell's camas	**Yes**	No	N/A	No habitat present.	N/A	N/A
Carex brevicaulis Short stemmed sedge	**Yes**	No	N/A	No habitat present.	N/A	N/A
Carex comosa Bristly sedge	**Yes**	No	N/A	No habitat present.	N/A	N/A
Carex gynodynama Hairy sedge	**Yes**	**Yes**	**Yes**	3 known populations in proposed units.	May/June 2008	Buffer from treatment area.
Carex serratodens Saw-tooth sedge	**Yes**	No	N/A	No habitat present.	N/A	N/A
Cimicifuga elata Tall bugbane	**Yes**	**Yes**	No	Surveys performed, not detected.	May/June 2008	N/A
Cypripedium fasciculatum Clustered lady slipper	**Yes**	**Yes**	No	Surveys performed, not detected.	May/June 2008	N/A
Delphinium nudicaule Red larkspur	**Yes**	**Yes**	No	Surveys performed, not detected.	May/June 2008	**N/A**
Epilobium oreganum Oregon willow-herb	**Yes**	**Yes**	No	Surveys performed, not detected.	May/June 2008	**N/A**
Eschscholzia caespitosa Gold poppy	**Yes**	No	N/A	No habitat present.	N/A	**N/A**
Eucephalus vialis Wayside aster	**Yes**	**Yes**	No	Surveys performed, not detected.	May/June 2008	**N/A**
Horkelia congesta ssp. *congesta* Shaggy horkelia	**Yes**	**Yes**	No	Surveys performed, not detected.	May/June 2008	**N/A**
Horkelia tridentata ssp. *tridentate* Three-toothed horkelia	**Yes**	**Yes**	No	Surveys performed, not detected.	May/June 2008	N/A
Iliamna latibracteata California globe-mallow	**Yes**	No	N/A	No habitat present.	N/A	N/A

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

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

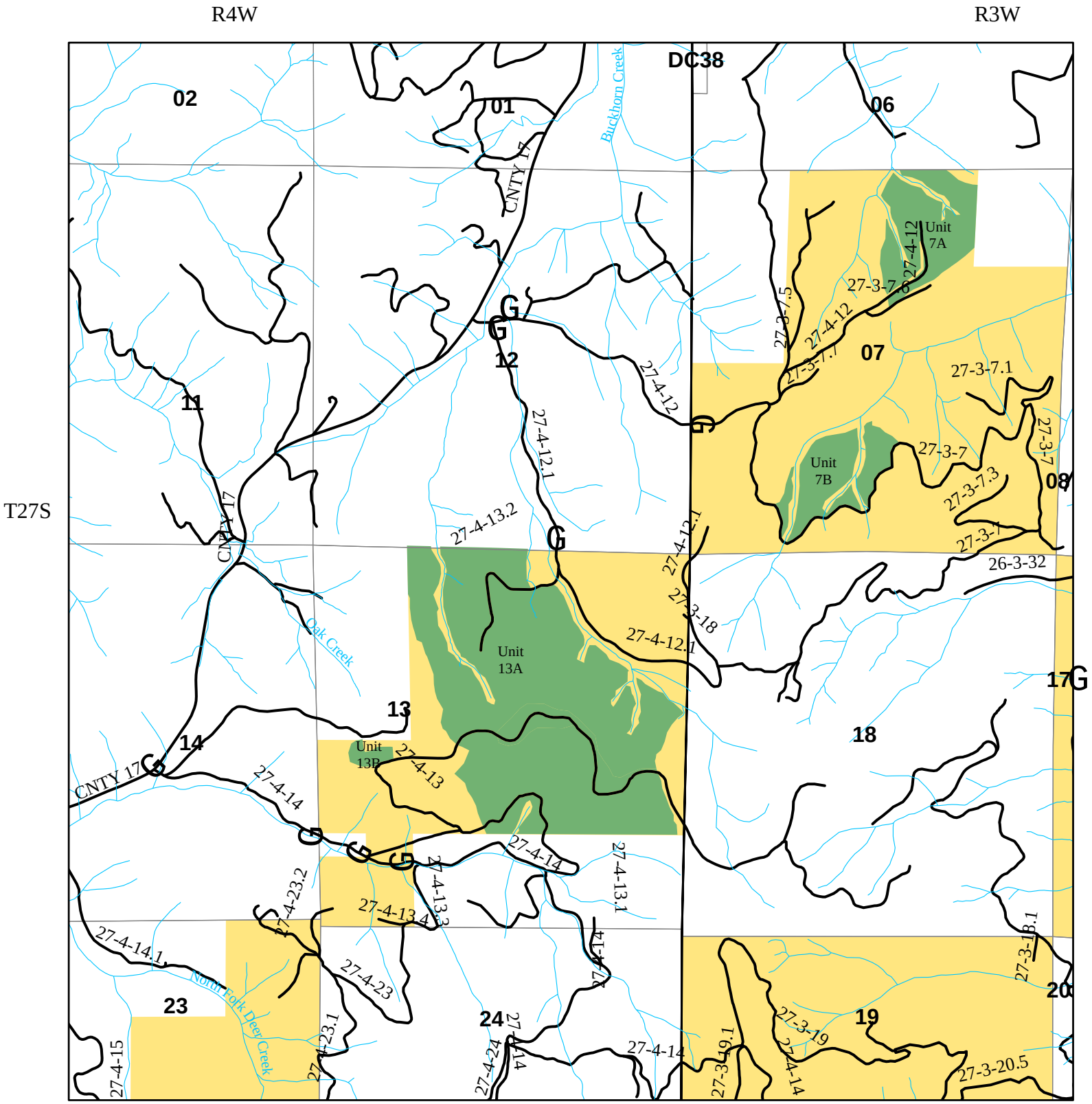
Table D-2. Bureau Strategic Botanical Species.

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	None Observed
Choiromyces alveolatus	Suspected	None Observed
Clavariadelphus subfastigiatus	Documented	None Observed
Gymnomyces monosporus	Documented	None Observed
Helvella elastica	Documented	None Observed
Hygrophorus albicarneus	Suspected	None Observed
Mycena quinaultensis	Suspected	None Observed
Nolanea verna var. *isodiametrica*	Suspected	None Observed
Plectania milleri	Suspected	None Observed
Psathyrella quercicola	Suspected	None Observed
Ramaria abietina	Documented	None Observed
Ramaria rubribrunnescens	Suspected	None Observed
Ramaria suecica	Documented	None Observed
Ramaria thiersii	Suspected	None Observed
Rhizopogon brunneiniger	Suspected	None Observed
Rhizopogon clavitisporus	Suspected	None Observed
Rhizopogon flavofibrillosus	Documented	None Observed
Rhizopogon variabilisporus	Suspected	None Observed
Sarcodon fuscoindicus	Documented	None Observed
Lichens		
Buellia oidalea	Suspected	None Observed
Lecanora pringlei	Suspected	None Observed
Lecidea dolodes	Suspected	None Observed
Leptogium rivale	Documented	None Observed
Leptogium teretiusculum	Documented	None Observed
Peltula euploca	Suspected	None Observed
Vezdaea stipitata	Documented	None Observed
Vascular Plants		
Camissonia ovata	Suspected	None Observed
Frasera umpquaensis	Suspected	None Observed

Appendix E. Map Packet Table of Contents

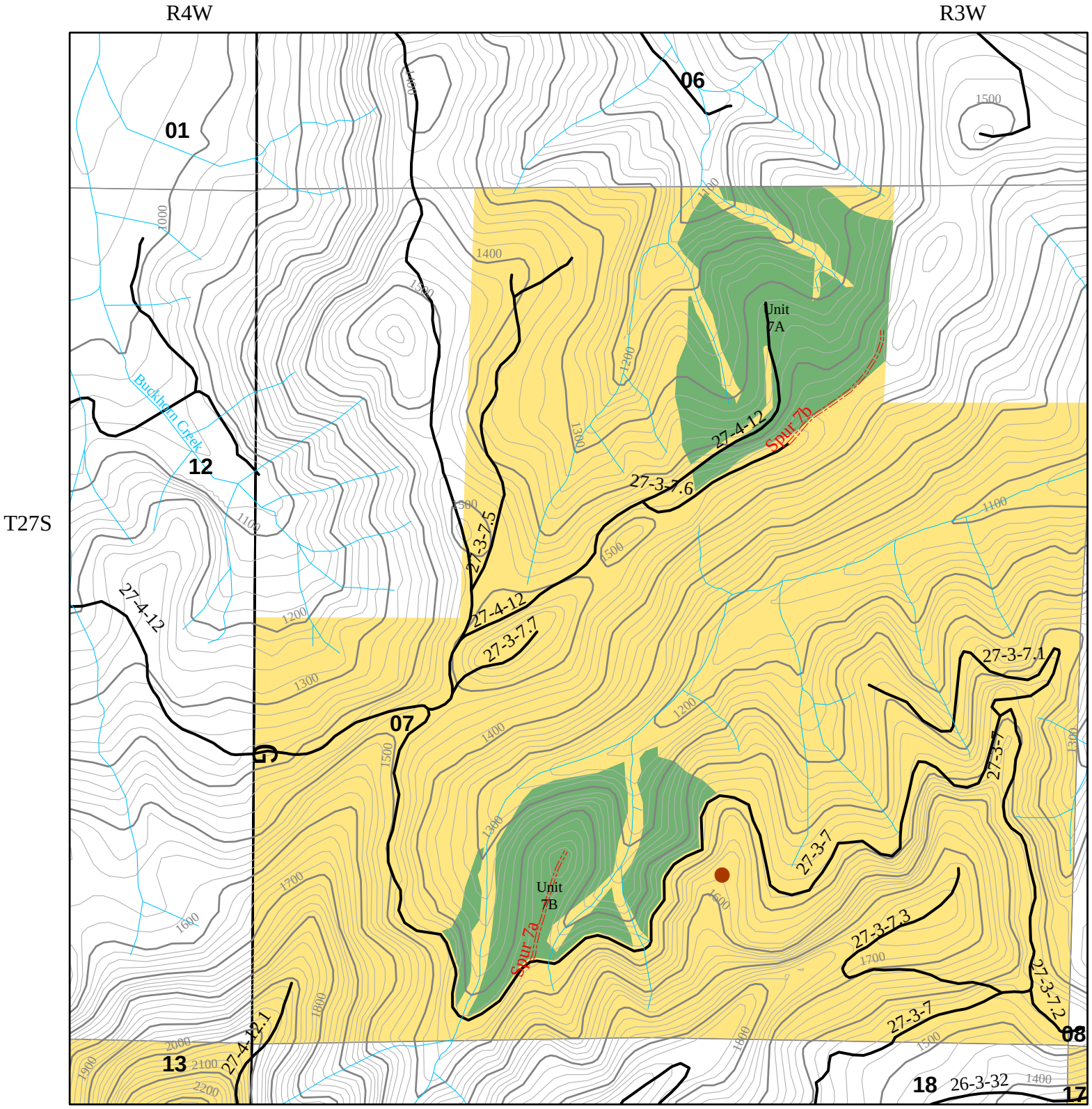
Figure 1 …… Elementary Watson Vicinity Map
Figure 2 …… Elementary Watson - Section 7 Map
Figure 3 …… Elementary Watson - Section 13 Map

Figure 1. Elementary Watson Commercial Thinning and Density Management Vicinity Map



No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

Figure 2. Elementary Watson Commercial Thinning and Density Management



Legend

0 1,000 2,000 3,000 Feet

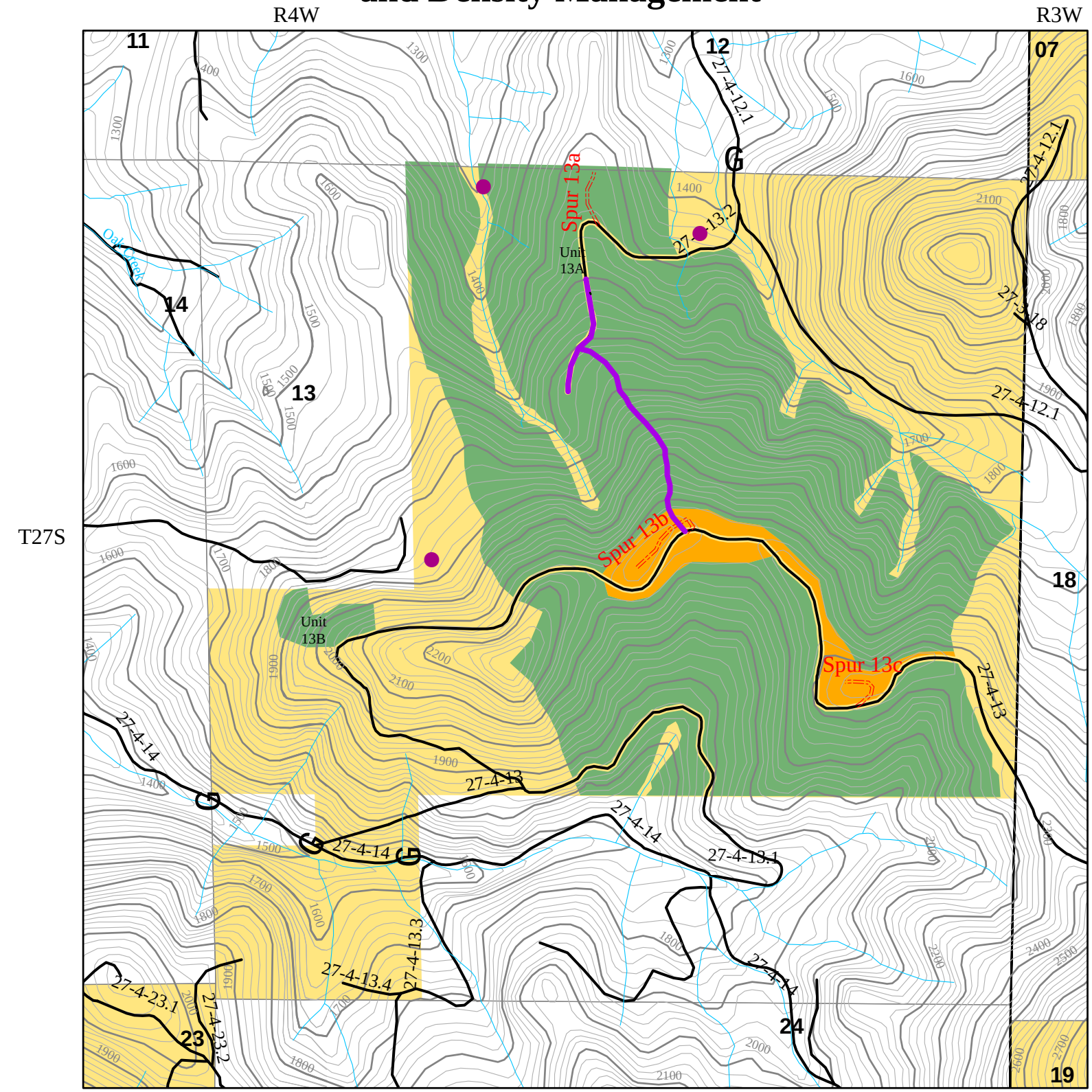
1:10,000

Logging System
- CABLE
- GROUND
- Roads
- New Road Construction
- G Gates
- Streams
- Township/Range
- Section
- BLM
- Moss (Tayloria serrata) Site

N W E S

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

Figure 3. Elementary Watson Commercial Thinning and Density Management



Legend

Logging System
- CABLE
- GROUND
- Roads
- New Road Construction
- G Gates
- Streams

- Township/Range
- Section
- BLM
- Hairy Sedge (Carex gynodynama) Site
- Road and Trail to be Subsoiled

0 1,000 2,000 3,000 Feet

1:10,000

N W E S

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.