Blackbird
Commercial Thinning
Environmental Assessment

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

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U.S. Department of the Interior, Bureau of Land Management
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Chapter 1. Purpose and Need for Action

A. Purpose & Need

The Bureau of Land Management (BLM), Swiftwater Field Office proposes commercial thinning of approximately 953 acres of mid-seral forest stands, 38-50 years old, in three separate proposed timber sales: Corvid (291 acres), Craven Raven (341 acres), and Old Crow (321 acres). In addition, up to approximately five acres per timber sale would be cleared or brushed for spur right-of-ways or roads to access the harvest areas.

There is a need to treat mid-seral stands that are currently overstocked to maintain stand vigor in the General Forest Management Area (GFMA) and Connectivity/Diversity Block (C/D) and maintain/enhance stand diversity in the Riparian Reserve. The purpose of the proposed project would be to reduce the stand densities through thinning prescriptions in a cost-efficient manner following 1995 ROD/RMP management direction.

These proposed sales are located in the Rock Creek and Lower North Umpqua River Watersheds. It is anticipated that the proposed timber sales would yield approximately 9.5 million board feet (9.5 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 1995 *Roseburg District Record of Decision and Resource Management Plan* (1995 ROD/RMP) and periodic plan maintenance as published in the *Roseburg District Annual Program Summary and Monitoring Report Fiscal Year 2008* (2008 APS), this analysis tiers to 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 1995 ROD/RMP, incorporating the standards and guidelines therein.

C. Objectives

The management objectives of the proposed action vary based on land-use allocation, in accordance with the 1995 ROD/RMP. Specific objectives of the proposed action are outlined below.

- 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…"

- 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 (1995 ROD/RMP, pg. 61). Also, provide a harvest plan flexible enough to facilitate harvesting within a three year timber sale contract.

- Seek a balance between reducing the risk of wildfire and a fuel profile that supports land allocation objectives (1995 ROD/RMP, pg. 78).

Within the General Forest Management Area:

- Perform commercial thinning on forest stands less than 80 years of age. Design commercial thinning to assure high levels of volume productivity (1995 ROD/RMP, pg. 151).

Within the Connectivity/Diversity Block:

- Perform thinning on forest stands less than 120 years of age. Design thinning to usually assure high levels of volume productivity. Retain patches of denser habitat where desired to meet wildlife habitat criteria (1995 ROD/RMP, pg. 153).

Within the Riparian Reserve:

- Apply silvicultural treatments to restore large conifers in Riparian Reserves (1995 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 (1995 ROD/RMP, pgs. 153-154).

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 thinning would be conducted with respect to cost, the method(s) of yarding, and type of equipment; season(s) of operations; and the manner in which access would be provided, including road renovation, and the types and locations of road construction;

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

- Compliance with management direction from the 1995 ROD/RMP; and

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

- 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. If the no action alternative were selected there would be no commercial thinning of timber or treatment of the mid-seral stands within the bounds of the project area at this time.

Selection of this alternative would not constitute a decision to re-allocate these lands to non-commodity uses. Future harvesting in this area would not be precluded and could be considered again under a subsequent EA. Road maintenance would be conducted as-needed to provide resource protection, accommodate reciprocal users, and protect the federal investment.

B. The Proposed Action Alternative

The action alternative proposes the offering of three timbersales (i.e. Corvid, Craven Raven, and Old Crow) that would result in commercial thinning of approximately 953 acres of mid-seral stands and is expected to yield approximately 9.5 million board feet of timber (Appendix E, Figures 1-4). The proposed action consists of the following activities, summarized in Table 1.

Table 1. Blackbird Proposed Activity Summary.

Activity		Total
Commercial Thinning	General Forest Management Area Connectivity/Diversity Block Riparian Reserve	953 acres
Yarding	Cable Yarding Ground Based Yarding Combination of Cable & Ground Based Yarding	98 acres 92 acres 763 acres
Hauling	Dry Season Haul Only Wet or Dry Season Haul	52,605 feet 32,850 feet
Road Activities	New, Temporary Construction Decommissioning (i.e. waterbar, block, and mulch) Renovation of Existing Roads	11,360 feet 24,005 feet 74,095 feet
Fuels Treatment	Machine Pile and Burn at Landings	

* The distribution of project acreage between the GFMA, C/D, and Riparian Reserve would be disclosed in the individual timbersale decisions.

Blackbird includes lands within the GFMA, C/D, and Riparian Reserve land use allocations and would total approximately 953 acres. The extent of the Riparian Reserve within the proposed sales would be determined following completion of field work to define the spatial arrangement of intermittent, perennial, and fish-bearing streams. The Riparian Reserve width for perennial, fish-bearing streams would be 360 feet (two site potential tree heights). The Riparian Reserve width would be 180 feet (one site potential tree height) for perennial, non-fish bearing streams and also for

intermittent streams. The distribution of project acreage between the GFMA, C/D, and Riparian Reserve would be disclosed in the individual timbersale decisions once field work delineating the extent of the Riparian Reserves is completed. Blackbird is located on Revested Oregon and California Railroad Lands (O&C Lands). The land use allocation and yarding method(s) for each of the proposed units is displayed in Table 2.

Table 2. Blackbird Land Use Allocations & Yarding Methods.

Unit	Township-Range-Section	Acres	Land Use Allocation	Yarding Method(s)
Corvid				
35A	T25S-R03W-Sec. 35	261	GFMA; Riparian Reserve	Cable; Ground-based
35B	T25S-R03W-Sec. 35	22	GFMA; Riparian Reserve	Cable
3A	T26S-R03W-Sec. 3	8	GFMA; Riparian Reserve	Cable
Craven Raven				
13C	T25S-R03W-Sec. 13	54	GFMA; Riparian Reserve	Cable; Ground-based
13D	T25S-R03W-Sec. 13	25	GFMA; Riparian Reserve	Cable
13E	T25S-R03W-Sec. 13	43	GFMA; Riparian Reserve	Cable
23A	T25S-R03W-Sec. 23	48	GFMA; Riparian Reserve	Ground-based
23B	T25S-R03W-Sec. 23	25	GFMA; Riparian Reserve	Cable; Ground-based
23C	T25S-R03W-Sec. 23	45	GFMA; Riparian Reserve	Cable; Ground-based
25A	T25S-R03W-Sec. 25	101	C/D; Riparian Reserve	Cable; Ground-based
Old Crow				
23D	T25S-R03W-Sec. 23	48	GFMA; Riparian Reserve	Cable; Ground-based
27A	T25S-R03W-Sec. 27	64	C/D; Riparian Reserve	Cable; Ground-based
27B	T25S-R03W-Sec. 27	3	C/D; Riparian Reserve	Ground-based
27C	T25S-R03W-Sec. 27	10	C/D; Riparian Reserve	Cable; Ground-based
27D	T25S-R03W-Sec. 27	37	C/D; Riparian Reserve	Cable; Ground-based
33A	T25S-R03W-Sec. 33	41	GFMA; Riparian Reserve	Ground-based
33B	T25S-R03W-Sec. 33	118	GFMA; Riparian Reserve	Cable; Ground-based
Total		**953**		

1. Timber Harvest

a) Treatment Prescription

Tree Marking

GFMA and C/D stands would have 120 - 130 square feet of basal area retained. In Riparian Reserves, 90-130 square feet of basal area would be retained. A variable spacing marking prescription would be used in all land use allocations. Minor conifer and hardwood species would be retained where possible to maintain stand diversity and canopy openings would be created or enlarged to maintain trees with large limbs, full crowns, promote tree regeneration, shrubs, and forbs.

Older remnant trees may be present, but are not the numerically predominant stand components or the focus of the treatments. 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. Since thinning

would focus on removal of intermediate and suppressed canopy layers, it is possible that suppressed trees designated for cutting may be older than the prevailing stand age.

Snags & Coarse Woody Debris

In GFMA, C/D, and Riparian Reserves, conifer and hardwood snags 10 inches or larger in diameter breast height (dbh) and at least 16 feet in height would be marked for retention. Existing snags would be felled only if they pose a safety concern. 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 GFMA and C/D 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

Perennial or Fish-bearing Streams

The thinning prescription would not be applied within a "no-cut" harvest area that would be 60 feet (slope distance) on either side of the edge of the stream channel, as measured from the ordinary high water line for perennial or fish-bearing streams.

Intermittent Streams

The thinning prescription would not be applied within a "no-cut" harvest area that would be 35 feet (slope distance) on either side of the edge of the stream channel, as measured from the ordinary high water line for intermittent streams.

c) Timber Cruising

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

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

d) Firewood

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

2. Timber Yarding

Proposed units would require a mixture of skyline cable yarding and ground-based yarding (Table 2). Up to 10 acres of additional, incidental ground-based logging within each of the timbersales may be necessary (i.e. removal of guyline anchor trees, isolated portions of units, etc.).

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. When within a tree length of the Riparian Reserve, trees would be directionally felled away from or parallel to the Riparian Reserve (1995 ROD/RMP, pg. 130). 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.

Cable Yarding

Cable logging systems that limit ground disturbance would be used to obtain partial or full suspension (1995 ROD/RMP, pg. 130). Intermediate supports would be used as necessary to obtain partial suspension at slope breaks. Where excessive soil furrowing occurs, it would be hand waterbarred and filled with limbs or other organic debris.

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 soil that channels water down slope. This generally occurs when the soil moisture is greater than 30 percent.

Where practical, require full suspension over streams.

Ground-Based Yarding

Ground-based logging would be limited to the dry season (normally May 15th to October 15th (1995 ROD/RMP, pg. 131). 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.

Ground-based yarding equipment would be limited to slopes generally less than 35 percent (2001 Plan Maintenance; 2008 APS, pgs. 65-66). Ground-based equipment would be confined to designated skid and forwarder trails and would re-use existing skid trails as much as practical. 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. In addition, machines used for ground-based logging would be limited to a track width no greater than 10.5 feet.

Harvesters would also place tree limbs in the trails in front of the equipment to minimize compaction. In harvester trail segments that are within five feet of reserved trees, slash would be placed to protect the large roots at or near the surface.

3. Timber Hauling

Approximately 32,850 feet of rocked roads would be hauled across either in the dry- or wet-season while 24,005 feet of natural surface roads and 28,600 feet of rocked roads that have inadequate rock to support winter haul would be limited to dry-season hauling (Tables 3a, 3b, 3c).

Prior to any wet season haul on surfaced roads, sediment reducing measures (e.g., placement of straw bales and/or silt fences and sediment filters) would be placed near stream crossings, if necessary, to prevent sediment from reaching the streams. Timber hauling would be suspended during wet weather if road run-off would deliver sediment at higher concentrations than existing conditions to the receiving stream.

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. 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).

Slash would be burned 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 (1995 ROD/RMP, pg. 140).

5. Road Activities

The proposed project would include dry season and wet season logging activities and use existing roads to the greatest extent practical. Roads and landings would be located on geologically stable locations; e.g., ridge tops, stable benches or flats, and gentle-to-moderate side-slopes (1995 ROD/RMP, pg. 132). Roads and spurs would be designed no wider than needed for the specific use (i.e. 14 foot running surface) to minimize soil disturbance (1995 ROD/RMP, pg. 132).

Road construction, renovation, maintenance, overwintering, and decommissioning would be restricted to the dry season (normally May 15th to October 15th). The operating season could be adjusted if unseasonable conditions occur (e.g. an extended dry season beyond October 15th or wet season beyond May 15th). In-stream work, including culvert replacement and/or installation, would be limited to periods of low or no flow (between July 1st and September 15th).

Construction

Approximately 11,360 feet of new, temporary spur roads would be constructed and no new, permanent spur roads would be constructed (Tables 3a, 3b, 3c). New cut and fill slopes would be mulched with weed-free straw, or equivalent, and seeded with a native or sterile hybrid mix. Temporary spurs would be decommissioned after harvest. Up to approximately five acres per timber sale (i.e. up to 15 acres in total for Blackbird) would be cleared or brushed for spur right-of-ways or roads to access the harvest areas.

Temporary spur roads may be rocked at purchaser's expense *except* for Spur CR2 and Spur OC6 (Table 3b, 3c) because they would be within the Riparian Reserve and are not anticipated to be used for subsequent stand treatments. Spurs that are rocked at purchaser's expense would be decommissioned by blocking with trench barriers. Existing roads may have additional rock placed at the purchaser's expense and would remain open following thinning.

Renovation

There would be a total of approximately 74,095 feet of renovation in Blackbird. Approximately 12,645 feet of existing, native surfaced roads in Blackbird would be renovated by brushing, grading, and replacing drainage structures (Tables 3a, 3b, 3c). Approximately 61,450 feet of existing, rock surfaced roads in Blackbird would be renovated by brushing, grading, replacing drainage structures, and adding rock where needed (Tables 3a, 3b, 3c). These rocked roads would then remain open following thinning. Road renovation would generally be performed by the purchaser.

Maintenance

Approximately 79,890 feet of existing roads would be maintained. Road maintenance would consist of brushing, grading, maintaining or replacing drainage structures (culverts and drainage ditches), and adding spot rock where needed (1995 ROD/RMP, pgs. 137-138). Road maintenance would generally be performed by the Roseburg BLM District maintenance crew.

Decommissioning
Approximately 11,360 feet of newly constructed, native-surface spur roads and 12,645 feet of renovated, native-surface roads would be decommissioned following their use (Tables 3a, 3b, 3c). These roads and spurs would be decommissioned by water-barring, mulching with logging slash where available (or with straw if logging slash is not available), and blocking with trench barriers.

In addition, approximately 1,000 feet of trails that have off-highway vehicle traffic in Craven Raven 23C, Craven Raven 25A, Old Crow 27A, and Old Crow 33B would be covered with logging slash and would have waterbars constructed.

Over-wintering
Over-wintering natural surface spur roads would be done by building, using, and winterizing natural surface spur roads prior to the end of the dry season. Over-wintering would include: installation of waterbars, mulching the running surface with weed-free straw, seeding and mulching bare cut and fill surfaces with native species (or a sterile hybrid mix if native seed is unavailable), and blocking.

Table 3a. Corvid Roads & Spurs[1]

Spur/Road #	Temporary Construction (feet)	Renovation (feet)	Surfacing		Decommissioning
			Existing	Proposed	
Spur C1	1,815	0	none	Native[2]	Water-bar, mulch, block
Spur C3	625	0	none	Native[2]	Water-bar, mulch, block
Spur C6	2,050	0	none	Native[2]	Water-bar, mulch, block
Spur C8	1,015	0	none	Native[2]	Water-bar, mulch, block
Spur C9	0	1,300	Native	Native[2]	Water-bar, mulch, block
25-3-25.0 Seg. C1,C2, D	0	12,675	Rock	Rock[3]	none
25-3-26.1	0	4,755	Rock	Rock[3]	none
25-3-34	0	795	Native	Native	Water-bar, mulch, block
25-3-35	0	8,500	Rock	Rock[3]	none
25-3-35.1	0	2,640	Rock	Rock	none
25-3-35.2	0	790	Rock	Rock	none
TOTAL	**5,505**	**31,455**			

[1]Approximately 19,540 feet of existing roads would be maintained for Corvid in addition to the roads and spurs described in the table.
[2] Allow purchaser to rock at their expense; block and mulch when harvest complete.
[3] Rocked road that will not support winter haul.

Table 3b. Craven Raven Roads & Spurs[1]

Spur/Road #	Temporary Construction (feet)	Renovation (feet)	Surfacing		Decommissioning
			Existing	Proposed	
Spur CR2	340	0	none	Native	Water-bar, mulch, block

Spur/Road #	Temporary Construction (feet)	Renovation (feet)	Surfacing		Decommissioning
			Existing	Proposed	
Spur CR3	1,030	200	none	Native[2]	Water-bar, mulch, block
Spur CR5	915	0	none	Native[2]	Water-bar, mulch, block
Spur CR 7	625	0	none	Native[2]	Water-bar, mulch, block
Spur CR 8	200	0	none	Native[2]	Water-bar, mulch, block
Spur CR 9	0	450	Native	Native[2]	Water-bar, mulch, block
Spur CR 10	110	0	Native	Native[2]	Water-bar, mulch, block
Spur CR 11	100	0	Native	Native[2]	Water-bar, mulch, block
25-3-13.1	0	900	Rock	Rock	none
25-3-13.4	0	2,115	Rock	Rock	none
25-3-13.6	0	1,005	Native	Native	Water-bar, mulch, block
25-3-13.7	0	865	Native	Native	Water-bar, mulch, block
25-3-13.8	0	530	Rock	Rock	none
25-3-23.0 Seg. A & B	0	11,090	Rock	Rock	None
25-3-23.0 Seg. C	0	2,670	Rock	Rock[3]	Blocked
25-3-23.1	0	1,745	Native	Native	Water-bar, mulch, block
25-3-23.2	0	1,740	Rock	Rock	none
25-3-23.4	0	795	Rock	Rock	none
25-3-25.4	0	4,120	Rock	Rock	none
TOTAL	**3,320**	**28,225**			

[1]Approximately 18,320 feet of existing roads would be maintained for Craven Raven in addition to the roads and spurs described in the table.
[2] Allow purchaser to rock at their expense; block and mulch when harvest complete.
[3] Rocked road that will not support winter haul.

Table 3c. Old Crow Roads & Spurs[1]

Spur/Road #	Temporary Construction (feet)	Renovation (feet)	Surfacing		Decommissioning
			Existing	Proposed	
Spur OC1	1,060	0	none	Native[2]	Water-bar, mulch, block
Spur OC5	655	0	none	Native[2]	Water-bar, mulch, block
Spur OC6	820	0	none	Native	Water-bar, mulch, block
25-3-27.0	0	4,750	Rock	Rock	none
25-3-27.1	0	2,325	Rock	Rock	none
25-3-27.5	0	1,055	Rock	Rock	none
25-3-33.0	0	1,690	Native	Native	Water-bar, mulch, block
25-3-33.2	0	2,115	Native	Native	Water-bar, mulch, block
25-3-33.7	0	1,425	Native	Native	Water-bar, mulch, block
25-3-33.8	0	1,055	Native	Native[2]	Water-bar, mulch, block
TOTAL	**2,535**	**14,415**			

[1]Approximately 42,030 feet of existing roads would be maintained for Old Crow in addition to the roads and spurs described in the table.
[2] Allow purchaser to rock at their expense; block and mulch when harvest complete.

C. Additional Project Design Features of the Action Alternative

1. 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.

2. Noxious Weeds:

Manual, mechanical, or chemical treatments would be used to manage invasive plant infestations. Existing infestations of, Scotch broom and Himalayan blackberry would be treated prior to commercial thinning operations.

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

3. Special Status Plants and Animals:

Federally listed (Threatened or Endangered), or proposed, plants and animals and their habitats would be managed to achieve their recovery in compliance with the Endangered Species Act, approved recovery plans, and bureau special status species policies (1995 ROD/RMP, pg. 41). Bureau Sensitive species and their habitats would be managed so as not to contribute to the need to list, and to recover the species (1995 ROD/RMP, pg. 41).

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 as necessary and appropriate protective measures would be implemented before operations would be resumed.

Northern Spotted Owls

Based on 2008 and 2009 survey data, harvest activities (e.g. falling, bucking, and yarding of timber) in six of the proposed units (see list below) within 65 yards of suitable habitat would be seasonally restricted from March 1st through July 15th unless current calendar year surveys indicate: 1) spotted owls not detected, 2) spotted owls present, but not attempting to nest, or 3) spotted owls present, but nesting attempt has failed. Waiver of seasonal restriction is valid until March 1st of the following year. Proposed units that would have northern spotted owl seasonal restrictions include: Craven Raven 13D & 13E and Old Crow 27A, 27B, 27D, & 33B. These units would be seasonally restricted because spotted owls responded in the vicinity of these units during surveys although nesting was not confirmed.

The remaining 11 units (see list below) would *not* have seasonal restrictions until March 1, 2012 unless spotted owls are discovered in the future. Proposed units that would *not* have northern spotted owl restrictions include: Corvid 35A, 35B, & 3A; Craven Raven 13C, 23A, 23B, 23C, & 25A; and Old Crow 23D, 27C, & 33A. These units would *not* have seasonal restrictions because no spotted owl responses were detected during surveys in 2008 and 2009.

Suitable spotted owl habitat is located within 65 yards of the proposed units *except* for Craven Raven Units 13C, 23A, and Old Crow Unit 27C (Appendix E, Figures 5-8). None of the proposed units are occupied by spotted owls based on 2008 and 2009 survey data. Surveys for northern spotted owls near the proposed Blackbird units are planned to continue during the 2010 nesting season; contingent on funding and other workload considerations.

Prescribed burning (i.e. slash piles) within 440 yards of suitable habitat or spotted owl activity centers would be seasonally restricted from March 1st through July 15th unless current calendar year surveys indicate: 1) spotted owls not detected, 2) spotted owls present, but not attempting to nest, or 3) spotted owls present, but nesting attempt has failed. Waiver of seasonal restriction is valid until March 1st of the following year.

4. Petroleum Products or other Hazardous Material:

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

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

D. Resources that Would be Unaffected by Either Alternative

1. Resources Not in Project Area

The following resources or concerns are not present and would not be affected by either of the alternatives: Areas of Critical Environmental Concern (ACECs), Research Natural Areas (RNAs), prime or unique farm lands, floodplains/wetlands, solid or hazardous waste, Wild and Scenic Rivers, and Wilderness.

The proposed action is consistent with Executive Order 12898 which addresses Environmental Justice in minority and low-income populations. The BLM has not identified any potential impacts to low-income or minority populations, either internally or through the public involvement process. No Native American religious concerns were identified by the team or through correspondence with local tribal governments.

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

2. Cultural Resources

Inventories for cultural resources in the proposed Blackbird units were completed in May 2009.

The only cultural resources found during the inventories were two isolated, biface fragments, which are not considered historic properties. Therefore, there would be no effect to historic properties as a result of the project.

3. Visual Resource Management

The Visual Resource Management (VRM) classification for this area is Class IV. The basic elements of form, line, color and texture as required by the 1995 ROD/RMP (pg. 52) would be maintained under the proposed action.

E. Alternatives Considered but Not Analyzed in Detail

1. Additional Blackbird Units

An alternative was considered that included additional units in Corvid (Unit 35C) and Craven Raven (Units 13A and 13B). These additional units were mid-seral forest approximately 42-43 years old and totaled approximately 24 acres. These units currently have relatively short trees (i.e. one log length) that the interdisciplinary team considered would not be economical to thin at this time because of the low volume available from these trees. Consequently, Unit 35C, 13A, and 13B were deferred from further analysis in the Blackbird EA.

2. Helicopter Yarding

An alternative that used more helicopter (aerial) yarding and less road construction in lieu of ground-based yarding and cable yarding was considered by the interdisciplinary team. However, typical expenses for helicopter yarding are $400 per 1,000 board feet (1MBF) in contrast to the cost for ground-based yarding ($80 per 1MBF) and cable-yarding systems ($170 per 1MBF). The current (pond) value of logs that would typically be produced by a thinning operation such as those in Blackbird are $340 per 1MBF. Based on these expenses and values, extensive use of helicopter yarding would not produce an economically viable timbersale and it would therefore be unlikely that helicopter thinning of these mid-seral stands would be accomplished without the costs being subsidized heavily by the government. Consequently, the use of helicopter yarding was not analyzed further in the Blackbird EA due to economic reasons.

Chapter 3. Affected Environment & Consequences by Resource

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

The cumulative effects of the BLM timber management program in western Oregon have been described and analyzed in the 1994 *Final - Roseburg District Proposed Resources Management Plan / Environmental Impact Statement* (1994 PRMP/EIS), incorporated herein by reference.

A. Forest Vegetation

1. Affected Environment

The proposed units are predominantly Douglas-fir forested stands 38-50 years old. Other conifer species in the stands include incense-cedar, western hemlock, western red cedar, grand fir, and sugar pine. Hardwoods and ground vegetation are common where there is sufficient light available (e.g. Pacific madrone, golden chinquapin, big leaf maple, red alder, tan oak, salal, Oregon grape, and sword fern). All of the proposed units were originally harvested between 1959 and 1971. Eighty-five percent of the stands had been precommercially thinned and seventy-seven percent of the stands had fertilization treatments.

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

Table 4. Current Stand Conditions[1].

Sale Name	Stand Age (years)	Trees Per Acre	Basal Area (sq. ft.)	Quadratic Mean Diameter (inches)	Relative Density Index	Canopy Closure[2] (%)	Crown Ratio (%)
Corvid	38-42	180-230	155-200	11.4-13.7	0.5-0.6	86-92	30-44
Craven Raven	38-50	182-307	155-255	10.7-14.5	0.5-0.8	88-100	29-54
Old Crow	38-44	124-296	175-235	10.4-13.9	0.5-0.7	84-97	28-50

[1] Data shown are for trees 6 inches DBH and larger.
[2] Canopy Closure is the proportion of the forest floor covered by the vertical projection of tree crowns, which is adjusted for crown overlap in closed canopy stands.

2. No Action Alternative

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

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

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

3. Proposed Action Alternative

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

Thinning in the GFMA and C/D would leave relative stand densities up to 0.40 (Table 5). At that density, thinning would produce high rates of volume growth (Curtis and Marshall, 1986). Thinning in the Riparian Reserve would result in relative stand densities ranging from 0.26 to 0.40 (Table 5). Stands thinned to an average relative density of 0.23-0.45 would produce high rates of diameter growth (Curtis and Marshall, 1986). Riparian Reserves would be treated with a range of treatments leaving residual square feet of basal area to 90 – 130. The post-thinning stand conditions for the Blackbird sales are summarized below in Table 5.

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 in response to thinning (Daniel, et al. 1979).

Table 5. Post-Treatment Stand Conditions[1]

Sale Name	LUA	Trees Per Acre	Basal Area (sq. ft.)	Quadratic Mean Diameter (inches)	Relative Density Index	Canopy Closure[2] (%)	Crown Ratio (%)
Corvid	GFMA, C/D	129-173	130	11.4-13.7	0.4	75-80	30-44
	Riparian	82-173	90-130	11.4-14.3	0.28-0.4	62-80	30-44
Craven Raven	GFMA, C/D	118-193	120-130	10.7-14.5	0.4	75-83	29-54
	Riparian	63-193	90-130	10.7-16.2	0.26-0.4	62-83	29-54
Old Crow	GFMA, C/D	99-201	120-130	10.4-13.9	0.4	75-80	28-50
	Riparian	64-201	90-130	10.4-13.9	0.26-0.4	56-80	28-50

[1] Data shown are for trees 6" DBH and larger.
[2] Canopy Closure is the proportion of the forest floor covered by the vertical projection of tree crowns, which is adjusted for crown overlap in closed canopy stands.

The proposed thinning would reduce tree densities, allowing selected trees more room to grow, while at the same time allowing for the capturing of anticipated mortality through harvest. In the long-term, the treatment would maintain or increase growth rates of the residual tree species and promote stem quality and tree vigor. This would reduce stand susceptibility to disturbances such as wildfire, windstorm, disease or insect infestation. Additionally, in the Riparian Reserve snags

and down logs are retained, and live trees would provide future source material for these structures.

While the proposed thinning would reduce tree densities in individual stands, it would not alter the seral stage of the stands, or the seral stage distribution of BLM-managed lands in the Rock Creek and Lower North Umpqua fifth-field watersheds. Approximately 10 acres of regeneration harvest is planned in the Rock Creek watershed in 2011. There is approximately 600 acres of thinning planned in the Rock Creek watershed through 2012. There is approximately 30 acres of thinning planned in the Lower North Umpqua watershed through 2011.

B. Wildlife

1. Federally Threatened & Endangered Wildlife Species

a) Northern Spotted Owl

(1) Affected Environment

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

There are five known spotted owl activity centers within 1.2 miles of the proposed Blackbird units (Table 6). The closest spotted owl activity center (Scotts Terrace, IDNO 4013O) is currently located approximately 120 yards from Corvid Unit 35A. The other four activity centers are currently located approximately 440 to 765 yards (0.25 to 0.4 miles) away from proposed unit boundaries.

Core Area – Within the home range, the core area for spotted owls is a 0.5 mile radius circle around the spotted owl activity center used to describe the area most heavily utilized by spotted owls during the nesting season (USDI, USFWS *et al*, 2008b). Core areas represent areas defended by territorial spotted owls and generally do not overlap the core areas of other spotted owl pairs. Thinning of dispersal habitat within core areas that are less 50 percent (i.e. less than 250 acres) nesting, roosting, and foraging (NRF) habitat is considered likely to adversely affect the suitability of the activity center (USDI BLM 2009) on a temporary basis until the canopy closes in again. Four of the five owl centers in the project area have less than 250 acres of NRF habitat within their core areas while one (French Creek [IDNO 4014O]) has 293 acres (58 percent) of NRF habitat within it's core area (Table 7). Proposed units would fall within the core area of all five spotted owl activity centers (Appendix E, Figures 5-8).

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

within this area are considered likely to adversely affect the reproductive success of spotted owls and are used in determination of incidental take. The two key elements of spotted owl habitat within a nest patch are: (1) canopy cover of dominant, co-dominant, and intermediate trees (conifers and hardwoods) and (2) the amount of down wood (USDI, USFWS et al., 2008b; pg. 13).

Corvid Unit 35A would fall within the 70 acre nest patch of a known spotted owl activity center (Scotts Terrace, IDNO 4013O), but the remaining units are outside of known nest patches (Appendix E, Figures 5-8).

Known Owl Activity Centers (KOACs) – KOACs were designated to retain 100 acres of the best northern spotted owl habitat as close as possible to the nest site or activity center for those spotted owls known as of January 1, 1994 (1995 ROD/RMP; pg. 48). There are five KOACs within the proposed project area, one associated with each owl activity center. The proposed project would not treat habitat located within any KOAC.

Designated Critical Habitat – Critical Habitat is a specific geographical area designated by the USFWS as containing habitat essential for the conservation of a Threatened or Endangered species. Blackbird is outside of designated Critical Habitat for the northern spotted owl under the 1992 Final Rule for Determination of Critical Habitat for the Northern Spotted Owl (Fed. Register; Vol. 57, No. 10; Jan. 15, 1992; pgs. 1796-1838). , Critical Habitat for the spotted owl was re-designated in 2008 (Fed. Register; Vol. 73 No. 157; Aug. 13, 2008; pgs. 47326-47374) and the proposed Blackbird units are also located outside of 2008 designated Critical Habitat for northern spotted owls.

Dispersal Habitat – Forest types described as dispersal habitat are essential to dispersing juvenile and non-territorial northern spotted owls. Dispersal habitat can occur in intervening areas between or within blocks of NRF habitat. Dispersal habitat is essential to maintaining stable owl populations to be able to fill territorial vacancies when resident owls die or leave their territories, and to providing adequate gene flow across the range of the species (USDI, USFWS, 2008a). Dispersal habitat typically consists of stands with adequate tree size ($\geq$ 11 inch DBH) and canopy closure ($\geq$ 40 percent) to provide protection from avian predators and minimal foraging opportunities (USDI BLM, 2009; pg. 18; Thomas *et al.*, 1990). Some of the stands (approximately 48 acres) proposed for treatment do not meet this definition of dispersal habitat since they have a Quadratic Mean Diameter of 10.4 inches or 10.7 inches (Table 4); however, these stands are likely currently functioning as dispersal habitat.

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

The quality and availability of northern spotted owl habitat would be unaffected under the No Action alternative. The 953 acres of mid-seral stands included in Blackbird would continue to function as dispersal habitat, however, stand diversity would decrease over time as hardwoods and shrubs, important components of owl habitat, are lost due to suppression as described in the *Forest Vegetation* section above. The development of suitable habitat characteristics within Riparian Reserve, such as larger diameter trees with large crowns, would continue but at a slower rate than with the proposed thinning treatment. Spotted owl activity centers would continue to function at current levels.

(3) <u>Proposed Action Alternative</u>

Disturbance or disruption to nesting spotted owls would not occur because no known spotted owl activity centers are located in the proposed units or within 65 yards of the proposed units. In addition, the project design features include seasonal restrictions for nesting spotted owls if they are discovered in the future and for those units where spotted owls responded during surveys but nesting was not confirmed (*Additional Project Design Features: Special Status Plants and Animals*, pgs. 10-11).

Home Range –Approximately 843 acres of dispersal-only habitat would be modified within the home ranges of five known spotted owl activity centers (Table 7). No suitable habitat within the home range of any known owl activity center would be thinned under the proposed action.

Core Area – A total of 297 acres of dispersal-only habitat are proposed for commercial thinning within the core areas associated with the five spotted owl activity centers (Table 7). No suitable habitat would be thinned within the core area of any known spotted owl activity center under the proposed action.

Nest Patch – Approximately 23 acres of dispersal-only habitat would be thinned under the proposed action in the nest patch of one known spotted owl activity center (Scotts Terrace, IDNO 4013O) (Tables 6 & 7). The thinning may temporarily downgrade the suitability of the activity center (USDI BLM, 2009); however, this site is not occupied and condition of the habitat will improve as the stand grows and canopy closure occurs.

Dispersal Habitat – Approximately 953 acres of dispersal-only habitat for spotted owls would be modified due to commercial thinning activities (Table 7).

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

Though the quality of dispersal-only habitat within the proposed units would be temporarily reduced by commercial thinning, the capability of the habitat to function for dispersing spotted owls would be maintained. Vertical and horizontal cover would be reduced within the proposed units through the reduction in canopy cover with varying levels of residual tree density. These stands are expected to continue functioning as dispersal habitat because post-treatment canopy closure would be maintained between 56-83 percent and the quadratic mean diameter would be 10.4-16.2 inches (Table 5). Those stands that currently are below the typical definition for dispersal habitat (i.e. they have a quadratic mean diameter < 11 inches diameter) would also continue to function as dispersal habitat and foraging opportunities would improve post-thinning in all treated stands as the canopies develop and crown closure occurs.

Current research has shown that spotted owls are likely to increase the size of their home ranges to utilize untreated stands in preference to newly treated stands both during and after harvest. Factors that reduce the quality of habitat within a home range or cause increased movement by owls in order to meet prey requirements may decrease the survival and reproductive fitness of owls at that site (Meiman *et al.*, 2003). Thinning of

953 acres of dispersal habitat in Blackbird units could temporarily reduce the quality of habitat, however, there are an additional 26,356 acres of dispersal habitat (including both suitable habitat and dispersal-only habitat) available in the project area and surrounding areas within the Lower North Umpqua River and Rock Creek watersheds. Of the 26,356 acres of additional dispersal habitat available, thinning is currently planned for approximately 630 acres through 2012.

There are also 11,708 acres of Late Successional Reserves (USDI, 1996; pgs.1-9) within the Rock Creek watershed that would, over the long-term, provide both dispersal and suitable habitat for spotted owls. There are currently 8,293 acres of Late Succesional Reserves, greater than 40 years old, that are functioning as dispersal habitat. There is no Late Successional Reserve within the Lower North Umpqua River watershed.

Thus, although the proposed action would temporarily degrade the quality of dispersal habitat within the project area, it would still continue to function for the dispersal of spotted owls. Therefore, this project would not preclude or appreciably reduce spotted owl movement between Critical Habitat Units or within the physiographic province.

Table 6. Northern Spotted Owl Habitat within Known Home Ranges.

Northern Spotted Owl Site (IDNO)		Federal Land (acres)	Habitat on Federal Lands Only (acres)			
			Suitable Habitat		Dispersal-Only Habitat	
			Current Condition	Habitat Modified through Proposed Action	Current Condition	Habitat Modified* through Proposed Action
French Creek (4014O)	Home Range (2,895 acres)	1067	406	0	294	159
	Core Area (502 acres)	401	293	0	40	40
	Nest Patch (70 acres)	70	63	0	0	0
Kelly Creek (1794O)	Home Range (2,895 acres)	1229	377	0	320	329
	Core Area (502 acres)	352	208	0	37	37
	Nest Patch (70 acres)	70	70	0	0	0
Kelly Green (2053O)	Home Range (2,895 acres)	1307	467	0	528	167
	Core Area (502 acres)	274	192	0	6	6
	Nest Patch (70 acres)	61	61	0	0	0
Scotts Terrace (4013O)	Home Range (2,895 acres)	1142	312	0	431	339
	Core Area (502 acres)	338	33	0	187	170
	Nest Patch (70 acres)	61	24	0	25	23
Taylor Creek (0359O)	Home Range (2,895 acres)	1425	324	0	565	111
	Core Area (502 acres)	308	149	0	49	27
	Nest Patch (70 acres)	58	54	0	0	0

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

Table 7. Northern Spotted Owl Habitat within Blackbird Proposed Units.

Sale	Unit	Unit Acres	Unit Acres within…						Unit Total	
			Nest Patch		Core Area		Home Range			
			Suitable Habitat	Dispersal-only Habitat	Suitable Habitat	Dispersal-only Habitat	Suitable Habitat	Dispersal-only Habitat	Suitable Habitat	Dispersal-only Habitat
Corvid	35A	261	0	23	0	148	0	261	0	261
	35B	22	0	0	0	22	0	22	0	22
	3A	8	0	0	0	0	0	8	0	8
Corvid Sub-Total		**291**	**0**	**23**	**0**	**170**	**0**	**291**	0	**291**
Craven Raven	13C	54	0	0	0	0	0	43	0	54
	13D	25	0	0	0	0	0	25	0	25
	13E	43	0	0	0	27	0	43	0	43
	23A	48	0	0	0	0	0	0	0	48
	23B	25	0	0	0	0	0	21	0	25
	23C	45	0	0	0	0	0	45	0	45
	25A	101	0	0	0	6	0	101	0	101
Craven Raven Sub-Total		**341**	**0**	**0**	**0**	**33**	**0**	**278**	0	**341**
Old Crow	23D	48	0	0	0	0	0	1	0	48
	27A	64	0	0	0	0	0	64	0	64
	27B	3	0	0	0	0	0	3	0	3
	27C	10	0	0	0	0	0	6	0	10
	27D	37	0	0	0	35	0	37	0	37
	33A	41	0	0	0	2	0	41	0	41
	33B	118	0	0	0	57	0	118	0	118
Old Crow Sub-Total		**321**	**0**	**0**	**0**	94	**0**	**274**	**0**	**321**
TOTAL		**953**	0	**23**	**0**	297	**0**	**843**	**0**	**953**

2. Bureau Sensitive Species

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

a) No Action Alternative

Under the No Action Alternative, no suitable habitat or habitat features for BLM Special Status Species would be affected. Species within, or adjacent to the project area, would be expected to persist at their current levels. It is expected that the mid-seral wildlife habitat that is currently present would continue to function in its current capacity. Within both the Matrix and Riparian Reserve, the development of suitable and/or late-successional habitat characteristics such as large trees and a well-developed understory would occur more slowly

than compared to the proposed action (refer to *Forest Vegetation*, pgs. 14-15). The assemblage of wildlife species and the wildlife populations currently utilizing the stands in the project area would be expected to continue using those stands.

As the stands mature, structural features (i.e., snow breaks, forked tops, decay) will develop and result in snags, cavities, and a multi-layered canopy. In addition, structural diversity on the forest floor would continue to develop with the growth of the shrub layer and accumulation of down wood. This diversity would benefit many of the Bureau Sensitive and Strategic Species. The effects of the No Action Alternative on individual Bureau Sensitive and Strategic Species are summarized in *Appendix A: Bureau Sensitive & Bureau Strategic Species*.

b) Proposed Action Alternative

Under the Proposed Action Alternative, post-treatment canopy closure would be reduced to 56-83 percent within the proposed units (Table 5). The proposed action may temporarily reduce the utility of the project area for some wildlife species by removing canopy cover and horizontal structure.

While the proposed action would reduce tree densities, it would not affect overall stand ages or affect the ability of the project area to grow into late seral habitat within the Riparian Reserve. Canopy closure within the riparian would be reduced to 56-83 percent, where harvest would be permitted, and would be maintained at current levels within the 35 and 60 foot no-harvest stream buffers. Snags and coarse woody debris would be retained within the Riparian Reserve. As discussed earlier regarding spotted owls (pg. 17), the development of some late-successional characteristics such as larger diameter trees, multiple canopy layers, understory development and hunting perches would be accelerated by reducing tree densities.

C. Fire and Fuels Management

1. Affected Environment

Part of Corvid is within the Wildland Urban Interface (WUI) boundary as identified in the Roseburg District Fire Management Plan. The remainder of the Blackbird projects are outside the WUI boundary. Current fuel conditions are best described by photo 1-MC-3 in *Photo Series for Quantifying Natural Forest Residues in Common Vegetation Types of the Pacific Northwest* (Maxwell and Ward, 1980). Based on this photo series, the estimate for downed woody debris in Corvid is 11 tons per acre, although there are some areas that have a lighter fuel load. This area is used recreationally, but is not near any homes. Therefore, the current risk of wildfire in the Blackbird project is low to moderate.

2. No Action Alternative

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

3. Proposed Action Alternative

After commercial thinning, the down woody debris would increase from 11 tons per acre to approximately 15 tons per acre as depicted in the photo 2-DF-3-PC from *Photo Series for Quantifying Forest Residues in the Coastal Douglas-Fir – Hemlock Type* (Maxwell and Ward, 1976). The down woody debris created at landings by the proposed action would be machine

piled and burned to reduce concentrated fuel loads. The remaining fuels created by the proposed action would be predominately small (i.e. less than three inches in diameter) and scattered over the harvest area.

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

D. Soils

1. Soil Disturbance & Productivity

a) Affected Environment

The terrain varies from near level and gently sloping (0 to 35 percent) to very steep (greater than 70 percent) within the proposed units. However, the very steep slopes are only a small component (1 percent) of the proposed sales. The greatest concentration of very steep slopes is in Craven Raven 13C where ledge rock outcroppings are present.

Many soil profiles in Blackbird have very high gravel, cobble and stone content. The soils with high clay content are highly susceptible to compaction under moist conditions and recover very slowly when compacted. Very high rock fragment content in the surface soil can lessen the susceptibility to compaction to a moderate degree but can also prohibit tillage amelioration. The highest concentration of cobble, stone, and boulder fields are in Corvid 35A and Old Crow 33B. Soils on the gentle slopes are generally well drained but there are concentrations of soils with poorer drainage (i.e. those with high water tables that support hydrophitic vegetation). Poorly drained soils are concentrated in Corvid 34A, Corvid 35A, and the eastern portion of Craven Raven 25A.

Previous ground-based yarding occurred on about 60 percent of the combined sale areas, primarily on the gentle to moderate slopes based on 1964, 1965, 1970 and 1978 aerial photo interpretation. Substantial soil displacement and compaction resulted. The skid trail density is generally high on gentle slopes where soil displacement and compaction often exceeded 25 percent of the ground-based harvest area. Heavy compaction is still present in some skid trails, decking areas, and landings 40 to 45 years later. Soil productivity is recovering very slowly where the topsoil had been displaced and the highly compacted subsoil is exposed or where there is less than ten inches of soil depth. Some organic matter incorporation and recovery of soil compaction is occurring on skid trails where native understory vegetation is growing well.

Currently, little in-unit erosion is occurring because: (1) vegetation and woody debris dissipate rainfall energy, (2) natural soil structure and porosity outside of roads and old ground-based yarding features (i.e. trails; log decking areas) allow high water infiltration rates into the soil, and (3) the near absence of new disturbance, such as off-highway vehicle traffic in the trails helps keep erosion low. However, there are approximately 1,000 feet of trails that have off-highway vehicle traffic and eroding in Craven Raven 23C and 25A and in Old Crow 27A and 33B. The 25-3-35.0 road in Corvid 34A also has disrupted ditch drainage

that flows down the travel surface in deep rills.

b) No Action Alternative

Without timber harvesting or road construction, no additional soil compaction or displacement would occur beyond the current level. Erosion would remain low except for the 1,000 feet of trail receiving off-high vehicle traffic and the 25-3-35.0 road in Corvid 34A. Compacted soils within the skid trails would continue to recover slowly over time, as plant roots penetrate through the soil, organic matter becomes incorporated into the soil, and small animals burrow through the soil layers. The duff layer would increase with the accumulation of needles, twigs, and small branches, along with decomposing larger woody material, absent a fire of sufficient intensity to consume the material.

c) Proposed Action Alternative

The proposed road construction would create approximately 2.9 acres of new soil disturbance and compaction where soil impacts due to past management are currently light or non-existent (Table 8). Of the 2.9 acres of new soil disturbance, approximately 2.6 acres would be effectively removed from timber or forest production. The other 0.3 acres of new soil disturbance would be fill-slopes associated with road construction and would still provide for future timber production. Re-disturbance of existing roads or trails would occur on 1.9 acres where there is currently moderate to heavy residual soil impact and varying degrees of re-vegetation (Table 8).

Table 8. Soil Disturbance from Road Construction in Blackbird.

Sale	Soil Disturbance acres		
	New Disturbance	Re-disturbance of Existing Roads/Trails	Total Soil Disturbance
Corvid	1.5	0.5	2.0
Craven Raven	0.7	0.4	1.1
Old Crow	0.7	1.0	1.7
Total	**2.9**	**1.9**	**4.8**

Detrimental compaction is defined, for this analysis, as an increase in soil bulk density of 15 percent or more and an alteration of soil structure to platy or massive to a depth of four inches or more that limits tree growth. Restricting ground-based operations to the dry season, as included in the project design (refer to *Timber Yarding: Ground-Based Yarding*, pg.6), would reduce soil productivity loss. Generally, slopes greater than 35 percent would not be ground-based yarded.

Where there is no existing compaction, ground-based yarding with a tractor or rubber-tired skidder would detrimentally compact approximately six to seven percent of the ground-based area (D. Cressy, 2006; pers. obs.). If a feller-buncher is used to cut trees instead of hand-falling in a skidding operation, up to nine percent of the ground-based area would be detrimentally compacted (D. Cressy, 2009; pers. obs. monitoring Adams Apple). A harvester-forwarder operation, where slash is plentiful, would detrimentally compact approximately three percent of the ground-based area (D. Cressy, 2006; pers. obs.). The amount of new detrimental compaction would be reduced by using existing compacted trails to the extent practical. Landings and log deck ground would account for approximately an additional two percent of the ground-based harvest area.

In total (including trails,landings, and log deck ground), up to nine percent of the ground-based harvest area would be detrimentally compacted if tractors or rubber-tired skidders are used and approximately five percent of the ground-based harvest area would be detrimentally compacted if harvesters and forwarders are used. Where a feller-buncher is used in conjunction with skidding on trails spaced 150 feet apart, the total detrimental compaction would be up to approximately 11 percent of the ground-based harvest area.

Cable-yarding corridors would cover about three percent of the cable-yarding area's surface (Adams, 2003). Soil disturbance from cable-yarding would vary by topography (e.g. convex vs. concave slope, slope steepness, and the presence or absence of pronounced slope breaks) and by the amount of logs yarded. Compaction would typically be absent or light with little soil displacement in the cable-yarding corridors, partly because intermediate supports would be required where necessary for one-end suspension. Light compaction would be confined to the topsoil and would recover without mitigation. There would be areas with heavier compaction, especially along terrain breaks. Excessive furrowing created by cable yarding would be hand waterbarred and filled with limbs or other organic debris to prevent erosion, sedimentation and the channeling of water (refer to *Timber Yarding: Cable Yarding*, pg.6).

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; *Road Activities: Construction*, pg. 7). 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 1994 PRMP/EIS (Chapter 4, pgs. 12-16) due to the project design.

Spurs and the 1,000 feet of trails that have off-highway vehicle traffic in Craven Raven 23C, Craven Raven 25A, Old Crow 27A, and Old Crow 33B would be covered with logging slash to discourage use following thinning operations and would have waterbars constructed to help prevent erosion. In addition, drainage and erosion issues identified on the 25-3-35.0 road would be repaired through proposed road renovation.

Burning slash in the late-fall to mid-spring (refer to *Fuels Treatment*, pg. 7) 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).

2. Landslides & Slope Stability

a) Affected Environment

Ten small- to medium-sized post-harvest landslides (0.03 to 0.33 acres) were identified within or touching the Blackbird units (including landslides within the stream buffers) from field investigations and interpretation of aerial photographs dating back to 1964 (Appendix B; Table B-2). The combined extent of the ten landslides is approximately 1.2 acres. Half liikely resulted from timber harvest and the other half from roads. All but one landslide occurred 30 to 45 years ago under clear-cut or early-seral conditions. The exception is a boulder-strewn slide in the 25-4-12.1 road cut bordering Old Crow 33B that occurred during winter 2008-2009.

In addition to the landslides, a half acre debris flow that occurred during winter 2008-2009 covered the 25-3-23.0 road between Craven Raven 13D and E with debris seven feet in

height and diverted part of the stream flow onto the road. The debris flow scar has yet to stabilize as more debris moved during spring 2009. Tension cracks above the debris flow's head scarp indicate the potential for more movement.

Approximately 5 acres of the proposed units are considered to be fragile due to slope gradient but suitable for forest management with mitigation for surface erosion and shallow-seated landslides (classified as FGR under the Timber Production Capability Classification [TPCC] system; Appendix B, Table B-1). Approximately 8 acres of moderate to steep slopes are suitable for forest management with mitigation for slump-earth flow movements (classified as FPR under the TPCC system; Appendix B, Table B-1). No additional tension cracks or fresh scarps (those that have occurred after tree establishment) were discovered from field investigation, indicating no recent slope movements other than localized soil creep had occurred in the FGR and FPR areas.

b) No Action Alternative

Based on an assessment by the interdisciplinary team, the debris flow that deposited earth over the 25-3-23.0 road would likely remain active in the short-term. Future movement of the debris flow would render long-term repairs futile until the slope stabilizes. Consequently, repairs to the 25-3-23.0 road would be postponed and the road beyond this point would remain closed.

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

- No in-unit landslides occurring under mid- or late-seral forest conditions were identified by aerial photo interpretation landslide inventory or field observations; (pers. obs.; Cressy, 2009).
- No actively failing slopes were discovered in the in-unit FGR and FPR areas (pers. obs.; Cressy, 2009).
- Approximately 60 percent of historic, post-timber harvest landslides within the project area were 0.03 to 0.10 acres in size (aerial photo landslide inventory; field observations; Cressy, 2009; Appendix B, Table B-2).
- The Oregon Department of Forestry found that landslide numbers were lowest in mid-and old-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 clear cut in the early 1960s and then subjected to an intense rain-on-snow event. This left the FGR and FPR slopes in an overall more stable state.

c) Proposed Action Alternative

As under the No Action Alternative, the debris flow over the 25-3-23.0 road would render long-term repairs futile until the slope stabilizes. Consequently, repairs to the 25-3-23.0 road would be postponed other than clearing the road to provide access to Craven Raven 13E. Following thinning operations in Craven Raven 13E, the 25-3-23.0 road would be temporarily closed.

Landslide aerial photo inventories within the Swiftwater Resource Area show a declining number of landslides during the past 25 years. The declining number of landslides corresponds with improved management practices. The rate of road-related landslides has

declined the most. Fluctuations occur because of variations in weather and levels of management activity. Because of improvements in land management practices, the distribution of landslides in time and space, and their effects, more closely resemble those within relatively unmanaged forests (Skaugset and Reeves, 1998).

Where soils are classified as FGR or FPR (13 acres; Appendix B, Table B-1), the risk of in-unit landslide occurrence would fall between the low risk of the No Action Alternative and the moderate risk under clear-cut conditions (moderate risk determined from interpretation of 1964, 1965, 1970 and 1978 aerial photos and on-site field investigations). The period of maximum vulnerability would be the ten year period immediately following harvest as root systems and canopies expand. If in-unit landslides do occur during this period of vulnerability, then they would likely be few in number and would be less than 0.10 acre in size, for similar reasons as stated previously under the No Action Alternative.

All new spur construction and road renovation would be located in stable positions that have: (1) gently sloping benches or ridge top positions and side slopes up to 35 percent and (2) have no apparent signs of potential instability, such as highly curved or pistol-butted conifer boles or instability such as, tension cracks, scarps, or jack-strawed trees that indicate active slope movement. Based on the monitoring of spurs constructed on similar stable terrain, the proposed road construction and renovation in Blackbird would not create instability (D. Cressy, 2007, 2008, and 2009; pers. obs.).

E. Hydrology

1. Water Quality

a) Affected Environment

The Blackbird project area lies within the Taylor, Kelly, McComas and Lower Rock Creek drainages of the Rock Creek fifth field watershed and the Idleyld Park and French Creek drainages of the Lower North Umpqua River fifth field watershed. Approximately 80 percent of the project area is within the Rock Creek watershed.

In the Taylor, Kelly, McComas and Lower Rock Creek drainages of the Rock Creek watershed there are approximately 49 miles of first and second order headwater streams. These headwater tributaries feed Taylor Creek, Kelly Creek, and McComas Creek. Approximately 38 percent of the total stream network in these drainages is classified as perennial (i.e. flows year-round) and the remaining 62 percent are intermittent (i.e. may stop flowing in the dry season).

In the Idleyld Park and French Creek drainages of the Lower North Umpqua River watershed there are approximately 43 miles of first and second order headwater streams. These generally intermittent, headwater tributaries feed Old Hatchery Creek and French Creek, which are perennial. Perennial streams comprise approximately 33 percent of the stream network within the drainage while intermittent streams comprise the remaining 67 percent.

In Corvid 34A and 35A and Craven Raven 13C, 23A, and 25A, it is not uncommon for streams to be found flowing on steeper slopes that terminate in the flat regions below. These flat areas occasionally host bog-like conditions where there is no defined channel and no drainage beyond the bog. It is likely that surface water is retained in the bogs and any

drainage is completely subsurface and not detectable. The uneven topography and soils which occasionally consist of gravel, cobble, and bedrock tend to lead to hydrologic interruption and numerous springs and seeps – some with and some without surface connection to the stream network.

Rock Creek and the North Umpqua River (both approximately one mile downstream from the project area at their closest points) were previously listed on the Oregon 303(d) list for excessive summer temperatures. These streams are now covered under ODEQ's 2006 Umpqua Basin Total Maximum Daily Load (TMDL) and Water Quality Management Plan (WQMP).

The potentially affected beneficial uses of water within the project area are: resident fish and aquatic life and salmonid spawning and rearing. Beneficial uses of water immediately downstream of the project area include: domestic water supply, fish, irrigation and power development. Within one mile downstream of the project area there are 33 surface water rights for domestic use and ten points of diversion for fish, irrigation, or power development. The project area lies completely within the municipal drinking water source area for the community of Glide, Oregon. The drinking water intake for Glide is located approximately four miles downstream from the proposed thinning units.

The existing roads in the six drainages of the project area total approximately 117 miles. Of these 117 road miles, 47 percent (55 miles) are paved or surfaced with rock and the remaining 53 percent (62 miles) are natural surface. The average road density in the project area is 4.6 road miles per square mile. Based on average road width, roads cover approximately 201 acres and represent 1.2 percent of the six drainages that comprise the project area.

Roads which cross streams represent potential sources for sediment delivery depending upon the road's surface condition and the volume of water passing the road at a given time. Road segments linked to the stream network also increase flow routing efficiency and offer a plausible mechanism for peak flow increases (Wemple *et al*. 1996). Within the six drainages there are approximately 233 road crossings (Table 9).

Table 9. Stream Crossings within the Six Drainages of Blackbird[1].

Stream Periodicity	Road Ownership	Stream Crossings	
		Surfaced Road	Natural Surfaced Road
Intermittent	*BLM*	*72*	*20*
	private	*15*	*62*
Perennial	*BLM*	*29*	*5*
	private	*6*	*24*
Totals	**-**	**122**	**111**

[1] The six drainages include: Taylor, Kelly, McComas, and Lower Rock Creek drainages of the Rock Creek fifth field watershed and the Idleyld Park and French Creek drainages of the Lower North Umpqua River fifth field watershed.

b) No Action Alternative

There would be no impact to water quality, Beneficial Uses of Water or hydrologic processes under the No Action Alternative. Trees within the Riparian Reserve would continue to compete for light and water resulting in overly dense stand conditions and not attain potential

growth rates (refer to *Forest Vegetation: No Action Alternative*, pgs. 13-14). Overly dense stands of timber in the Riparian Reserve would lead to greater transpiration rates, effectively reducing water availability to the streams themselves. The slower growth rate would result in a smaller size of potential wood for long-term recruitment to streams and slower canopy development to provide shade.

Existing infrastructure (e.g. culverts, ditches, and roads) is subject to ongoing degradation or failure in the event of a storm as these structures age. Most road or culvert failures would result in direct input of sediment to the stream drainage network. The amount of sediment would vary depending on the size of the storm event, the condition and stability of the infrastructure, and the proximity to a stream.

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

If a landslide occurs, it would produce a short-term increase in sedimentation until the material is dispersed downstream. Effects of sediment in the stream 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 sediment transport due to their small size and low flows.

c) Proposed Action Alternative

Vegetation that provides primary shading for stream channels that have the potential for summer flow (i.e. perennial streams) would be protected by the 60 foot "no-harvest" stream buffer and maintaining upwards of 56 percent canopy closure outside of this buffer within the Riparian Reserve (Table 5). Therefore, effective shade for these streams would not be affected by thinning and consequently stream temperatures would also not be affected (2008 Final EIS, pgs. 759-760).

Thinning within the Riparian Reserve can cause localized soil disturbance and a short term potential for erosion associated with yarding operations and road spur construction. However, "no-harvest" buffers would be established for all streams in and immediately adjacent to proposed thinning units and full suspension of timber would be required when yarding across streams of any size. "No-harvest" buffers effectively prevent disturbance to stream channels and stream banks. "No-harvest" buffers also filter surface run-off allowing sediment to be deposited on the forest floor before entering a stream.

According to Reid (1981) and Reid and Dunne (1984), forest roads can be a major contributor of fine sediment to streams, through down cutting of ditch lines and erosion of unprotected road surfaces by overland flow. Under the Action Alternative there is one new stream crossing being proposed in Craven Raven 13C (Spur CR2). However, aerial photo interpretation and on-the-ground reconnaissance indicates that an old road bed exists beyond where the road records indicate. Spur CR2 would follow this existing road bed for its duration and utilize the site of the old stream crossing. After Spur CR2 is no longer needed for the thinning operation, the drainage structure removed and the streambanks would be reconfigured to a suitable angle of repose to prevent erosion and sedimentation.

Road construction and renovation would occur on existing roads during the dry season (refer to *Road Activities*, pg. 7). Timber hauling could occur in both the dry and wet seasons,

although during the wet season hauling would be limited to surfaced roads. Hauling and other road related activities during dry season would not deliver road-derived sediment to live stream channels because without precipitation there would be no mechanism for the transport of fine sediment into streams. However, during the first seasonal rains there could be a flush of sediment from the roads near stream crossings.

The amount of sediment generated from yarding trails and corridors would be too small to reliably measure. Little sediment would reach streams because overland flow is rare on soils with high infiltration and covered with slash such as the soils in the project area. The 35 or 60 foot "no-harvest" stream buffers as described in *Stream Buffers* (pg. 5) would also intercept run-off from roads allowing for deposition of sediment transported by overland flow before it reached active stream channels and would prevent soil disturbance to stream channels and stream banks. The amount of sediment contributed from these sources during the first seasonal rains would be negligible when compared to the amount of sediment from all other intermittent channel beds and stream banks that has accumulated within the stream network during the dry season. Following the first seasonal rains, erosion rates would stabilize and sediment delivery would be indistinguishable from background levels resulting in no measureable change to water quality.

The risk of landslides to streams and water quality would be slightly higher than under the No Action Alternative in a given year, although such an occurrence would remain a low probability. If these landslides occur, they would still be occurring at near natural rates and impacts would be similar to the No Action Alternative. Most of the streams in the project area have stable stream banks with relatively broad floodplains. Unstable or excessively steep streambanks that have a greater risk of failure were generally included in the "no-harvest" stream buffer. Potentially unstable slopes outside the "no-harvest" stream buffers do have the potential to trigger small landslides which could reach first and second order streams in Craven Raven 13C or 25A. The likely size of a landslide reaching a stream would be no greater than 0.1 acres and the probability of such an occurrence would be low.

In summary, "no-harvest" stream buffers and the project design features referenced above would prevent changes to the temperature and sediment regimes of the streams and their associated ecosystems. These mitigation measures would also prevent disturbance to stream channels, stream banks and riparian areas. Beneficial uses of water and drinking water sources would not be affected. There will be no cumulative degradation of water quality in the Lower North Umpqua River or Rock Creek watersheds stemming from the proposed action alternative.

2. Stream Flow

a) Affected Environment

Average annual precipitation in the Blackbird project area ranges from 56 to 80 inches, occurring primarily between October and April. Elevation in the Corvid and Craven Raven sale areas is split between a rain dominated hydroregion (i.e. less than 2,100 feet elevation) and a rain-on-snow dominated hydroregion (i.e. greater than 2,100 feet elevation) where some snow accumulation is expected to transiently occur throughout the wet season. Elevation in the Old Crow sale area is entirely located within the rain-on-snow dominated hydroregion since it is located above 2,100 feet elevation.

Stream flows are dependent upon the capture, storage, and runoff of precipitation. Timber harvest can alter the magnitude and timing of peak flows by changing site-level hydrologic

processes. These hydrologic processes include changes in transpiration of forest trees, forest canopy interception of water, snow and snowmelt rates, roads intercepting surface and subsurface flow and changes in soil infiltration rates and soil structure (2008 Final EIS, pg. 352). Based on a compilation of watershed studies in the Northwest, completed in small catchments, a peak flow response is only detected where at least 29 percent of the drainage area is harvested (Grant *et al.*, 2008). There are no peak flow experimental study results in the rain dominated hydroregion showing a peak flow increase where less than 29 percent of a drainage area is harvested (2008 Final EIS, pg. 353).

Research by Poggi *et al.* (2004) suggests that forest thinning treatments maintains normal patterns of snow accumulation and have little effect on snowmelt rates during rain-on-snow events (2008 Final EIS, pg. 355). Increases in the peak flow of rain-on-snow hydroregions can also be found when the roads and other impermeable areas contained within occupy more than 12 percent of a catchment scale watershed (2008 Final EIS, pg. 355). Within the project area, roads occupy between one and two percent of the respective watersheds and do not pose a risk to peak flow enhancement. None of the subwatersheds contained within the Lower North Umpqua River or Rock Creek watersheds are considered susceptible to increases in peak flow (2008 Final EIS, pg. 755).

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 Blackbird project area, roads occupy between 1 and 2 percent of the watershed. Therefore, no statistically significant increase in peak flows would be expected to occur due to road-related effects. With no proposed change to vegetative cover, there would be no change in the magnitude or rate of surface water runoff delivery to the stream network.

c) Proposed Action Alternative

The proposed sale units in the Blackbird project area are all forest thinning treatments. It is presumed that hydrologic impacts such as peak flow increases will decrease with decreasing intensity of treatment (i.e. regeneration harvest having the greatest impact and thinning treatments having the least impact) although past experimental studies in the Pacific Northwest did not fully examine the differences (Grant *et al*., 2008; 2008 Final EIS, pg. 353).

The 2008 Final EIS (pgs.753-759) analyzed peak flow effects from forest management at sixth field subwatersheds across western Oregon. Although some subwatersheds would be susceptible to increases in peak flows, this does not automatically imply adverse effects on stream form. Stream flow runoff normally fluctuates with climate, and over time channels have developed under a wide range of stream flows including infrequent peak flows. These stream flows have the potential to affect the frequency of sediment transport and the depth of scour. However, the potential for peak flow effects would vary for different stream types (Grant et al., 2008). The 2008 Final EIS (pg. 758) indicates that within the high gradient cascade and step-pool stream types there is little potential to affect sediment transport and peak flow enhancement. All of the streams within the Blackbird project area are these types of streams.

New, temporary road construction in the Blackbird project area would total approximately 2.2 miles (11,360 feet) and would increase road density from 4.6 miles per square mile to 4.7 miles per square mile. The new, temporary road construction would add approximately three acres to the total roaded area which would increase the roaded area from 1.2 percent to 1.3 percent within the respective watersheds. Risk of peak flow enhancement does not occur until roaded area reaches at least 12 percent of the watershed (Harr, *et al*. 1975).

In summary, the silvicultural treatment within the project area consists entirely of thinning which has the least hydrologic effect of active forest management and would subsequently not pose any risk to peak flow enhancement. The stream types encountered within the project area consist entirely of cascade and step-pool streams which pose little potential to affect peak stream flows. None of the subwatersheds within the project are susceptible to peak flow enhancement. New road construction will not increase road density or total roaded area within the project area beyond susceptibility thresholds.

F. Aquatic Habitat & Fisheries

a) Affected Environment

There is one fish bearing stream within the Blackbird project area (Kelly Creek). The project area for the fisheries analysis includes the proposed thinning units, the haul route to the nearest paved road, and the extent of each respective drainage area downstream from the units and haul route where any potential effects could be observed. None of the proposed thinning units are adjacent to fish bearing streams. There are 0.6 miles of haul route adjacent (300 to 1,000 feet) to the fish bearing stream in the project area. Timber haul on these roads can be either dry-season (summer) or wet-season (winter) haul. Ditch banks along the haul route are well vegetated and there are no direct connections to fish-bearing streams.

ODFW habitat surveys on Kelly Creek indicate an average of 130 pieces of large wood per mile of stream habitat (ODFW 1999). Field observations have also noted an abundance of small wood along with the large wood in Kelly Creek (McEnroe, personal observation).

On February 4, 2008 NOAA Fisheries listed the Oregon coast coho salmon evolutionary significant unit (ESU) as threatened under the Endangered Species Act. This included the designation of critical habitat. There are no coho salmon within the project area. The closest coho presence is 1.3 miles downstream of the nearest harvest unit and 0.6 miles downstream from the end of the haul route.

The Oregon Coast steelhead (*Oncorhynchus* mykiss) is a Bureau Sensitive fish species. Kelly Creek contains Oregon coast steelhead and cutthroat trout (*Oncorhynchus clarki*). Steelhead and cutthroat trout are present along 0.6 miles of the haul route. The nearest thinning unit is 0.2 miles upstream of fish presence.

b) No Action Alternative

Without a mechanism to affect either water quality (refer to *Water Quality: No Action Alternative*, pg. 28) or stream flow (refer to *Stream Flow: No Action Alternative*, pgs. 30-31) aquatic habitat in fish-bearing streams within and downstream of the project area would remain unaffected under the No Action Alternative. Without a mechanism to affect aquatic

habitat, fish species and populations would remain unaffected under the No Action Alternative.

c) Proposed Action Alternative

Key factors defining the quality of aquatic habitat are water temperature, substrate/sediment quality, large wood, pool quality, and habitat access. Water temperature would not be affected by this project (refer to *Water Quality: Proposed Action Alternative*, pg. 28). Substrate and sediment quality is affected by altering the amount or timing of peak flows or from road derived sediment input. No effects to peak flows are expected as a result of this project (refer to *Stream Flow: Proposed Action Alternative*, pg. 31). Sixty foot "No-harvest" stream buffers, a large volume of stream wood, and well-vegetated ditch banks would protect aquatic habitat from road sediment within the project area (Luce and Black, 1999; Rashin *et al*. 2006).

The amount of instream large wood (i.e. trees >20 inches in diameter, and 50 feet in length) and pool habitat are highly correlated with the number and size of trees in the riparian area that have the potential to enter the stream by natural processes. By thinning the Riparian Reserve, riparian stand diversity and tree diameter growth rates would increase (refer to *Forest Vegetation: Proposed Action Alternative*, pgs. 14-15) thereby providing larger wood for recruitment into the stream in the future. Thinning outside the no-harvest buffer would temporarily decrease the amount of large wood available to fall into the stream. This short-term decrease in large wood availability would not impact fish habitat because there are no thinning units adjacent to fish bearing streams. Additionally, streams in the project area already have a large volume of large wood (ODFW 1999).

Small functional wood also has the potential to affect fish habitat. Smaller trees and logs that enter stream channels provide temporary pool habitat and slow-water refugia. Pools formed by small functional wood generally are not as deep or complex as those formed by large wood. Small wood also does not persist for long periods of time because it deteriorates quickly and is more likely to be flushed from the system (Naiman et al. 2002, Keim et al. 2002). Thinning outside of the no-harvest buffers would temporarily decrease the amount of small functional wood available to fall into the stream. This short-term decrease in small functional wood availability would not impact fish habitat because there are no thinning units adjacent to fish bearing streams. Additionally, streams in the project area already have a large volume of small functional wood (McEnroe, personal observation 2009).

Habitat access is affected by road crossings. There are no road crossings over fish-bearing streams in the project area, so there would be no mechanism to affect habitat access.

Overall, any impacts to water temperature, substrate/sediment quality, large wood, pool quality, or habitat access within the project area would be non-existent or immeasurable above background levels. Aquatic habitat in Kelly Creek and its tributaries would be unaffected, except for short-term reductions in the amount of large and small functional wood available to the stream. Due to the high volume of wood already in the stream, no-harvest buffers, and lack of fish-bearing streams adjacent to harvest units fish species and populations in Kelly Creek and downstream would be unaffected. Coho salmon and their critical habitat would be unaffected by this project.

Over the long term, the quality of large wood in the stream channel would increase and would have a positive effect on aquatic habitat quality and fish populations. Wood recruitment modeling has determined that the potential large wood contribution to fish bearing and non-

fish-bearing stream channels would increase over time after thinning harvests (2008 Final EIS, pg. 781).

d) Essential Fish Habitat

Essential fish habitat is designated for fish species of commercial importance by the Magnuson-Stevens Fishery Conservation and Management Act of 1996 (Federal Register 2002, Vol. 67/No. 12). Streams and habitat that are currently or were historically accessible to Chinook and coho salmon are considered essential fish habitat. There is a 0.6 mile segment of essential fish habitat within the project area in Kelly Creek.

Essential Fish Habitat will be unaffected by the proposed project (see above). Without any mechanisms for an adverse effect to essential fish habitat, no mitigation measures are proposed.

e) Aquatic Conservation Strategy

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

G. Botany

1. Special Status Species

a) Affected Environment

Field surveys for special status botanical species were conducted in the spring and summer of 2009 to comply with Departmental Manual 6840 directives and the Special Status Plant program.

(1) Federally Listed Species

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

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

(2) Bureau Sensitive & Strategic Species

A population of *Romanzoffia thompsonii*, a Bureau Sensitive vascular plant, was located on the southeastern edge of Craven Raven 13A in a rock outcrop seep on gentle slope with a southeasterly aspect (Appendix E, Figure 3). The habitat for *Romanzoffia thompsonii* is described by Marttala (1996) as: seasonally wet, usually open, rocky, sunny habitats; elevation varies from approximately (750-6,000 feet); and sites most commonly face south to southwest (very rarely north).

b) No Action Alternative

Under the No Action Alternative, the known population of *Romanzoffia thompsonii* would likely continue to colonize the available habitat for the foreseeable future.

c) Proposed Action Alternative

Craven Raven Unit 13A was eliminated from detailed analysis because of low timber volume and poor economics (*Alternatives Considered but Not Analyzed in Detail*, pg. 12). Therefore, there are no anticipated impacts to the known *Romanzoffia thompsonii* population as a result of the action proposed described in this EA. The population is not located within an area proposed for timber harvest, road construction, or road renovation and would likely continue to colonize the available habitat for the foreseeable future

2. Noxious Weeds

a) Affected Environment

The Blackbird project has approximately 0.7 acres of noxious weed infestations of Scotch broom (*Cytisus scoparius*) and Himalayan blackberry (*Rubus armeniacus*) collectively (Table 10). These areas were treated in 2008 as part of the ongoing Roseburg District Noxious Weed Program. Other species of noxious weeds present in the project area include: Canada thistle (*Cirsium arvense*), tansy ragwort *(Senecio jacobea*), and Meadow knapweed (*Centaurea pratensis*). These other species are not likely to establish invasive populations in forested habitats because they are typically out-competed by the forest canopy. Biocontrols, primarily insects that target specific noxious weed species, are present throughout the range of Scotch broom, Canada thistle, tansy ragwort, and meadow knapweed.

Table 10. Noxious Weed Infestations in Blackbird.

Weed Species	Infestations in Proposed Sale Areas (acres)			Total (acres)
	Craven Raven	Corvid	Old Crow	
Scotch Broom	0.1	0.1	0.1	**0.3**
Himalayan Blackberry	0.1	0.3	0	**0.4**
Canada Thistle	0.1	0	0	**0.1**
Tansy ragwort	0.1	0.1	0.2	**0.4**
Meadow knapweed	0.2	0	0.1	**0.3**
Total	**0.6**	**0.5**	**0.4**	**1.5**

b) No Action Alternative

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

Over time, the distribution and abundance of noxious weeds in the project area would decline. Repeated treatments of existing noxious weed populations, limited opportunities

(e.g. disturbed soil) for establishment of new infestations, and ongoing competition from native vegetation would reduce the noxious weed numbers in the project area.

c) Proposed Action Alternative

Existing infestations of Scotch broom and Himalayan blackberry would be treated, prior to thinning operations, in order to limit the development and spread of seeds. In addition, *Additional Project Design Features* (pg .10) would limit the spread of weed seed by washing logging and construction equipment prior to entry on BLM lands. As under the No Action Alternative, noxious weed populations would be monitored, evaluated, and treated under the Roseburg District's Noxious Weed Program.

Soil disturbance associated with thinning (e.g. ground-based yarding, cable-yarding corridors, spur construction, and slash pile burning) would create areas of exposed mineral soil, which would serve as habitat for noxious weeds. New weed infestations on exposed mineral soil would be expected while there are openings in the canopy. As the conifer canopy closes, noxious weeds would decrease in abundance as native understory species eventually overtop and out-compete weeds for sunlight, soil moisture, and soil nutrients. Therefore, new weed infestations that take advantage of the soil exposed from the proposed action would be short-lived due to competition from the residual forest stand coupled with continued monitoring, evaluation, and treatment 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) U.S. Fish & Wildlife Service

Consultation with the U.S. Fish & Wildlife Service has been completed for the northern spotted owl for *Actions Proposed by the Roseburg District BLM for Fiscal Years 2009-2010*. A Biological Opinion was received from the USFWS (*Roseburg District BLM Fiscal Year 2009-2010 Program of Activities* [Tails#: 13420-2009-F-0125]) dated July 31, 2009. The biological opinion stated (pgs. 64-65) that thinning of dispersal habitat (such as that proposed in the Blackbird commercial thinnings) is *likely to adversely affect* spotted owls by negatively affecting forage species (e.g. flying squirrels) that the owls may feed upon. However, the USFWS concluded in their biological opinion (pg. 75, Ref. No. 13420-2009-F-0125) that the Roseburg District's program of commercial thinning (which included the individual sales in Blackbird project) *are not likely to jeopardize the continued existence* of the spotted owl because thinning is not likely to completely eliminate mammalian prey species and the network of reserved land use allocations would maintain a sufficient amount of dispersal habitat.

b) NOAA Fisheries Service

The Swiftwater fisheries staff has determined that any impacts from the proposed action to water temperature, substrate/sediment quality, large wood, pool quality, or habitat access within the project area would be non-existent or immeasurable above background levels (refer to *Aquatic Habitat & Fisheries: Proposed Action Alternative*, pg. 32). Aquatic habitat in Kelly Creek and its tributaries would be unaffected, except for short-term reductions in the amount of large and small functional wood available to the stream. Due to the high volume of wood already in the stream, no-harvest buffers, and lack of fish-bearing streams adjacent to harvest units fish species and populations in Kelly Creek and downstream would be unaffected. Coho salmon and their critical habitat would be unaffected by this project. Therefore, the proposed project would not have an effect on Oregon Coast coho salmon or its habitat and further consultation with the NOAA Fisheries Service is not required.

2. Cultural Resources Section 106 Compliance

Compliance with Section 106 of the National Historic Preservation Act under the guidance of the 1997 National Programmatic Agreement and the 1998 Oregon Protocol has been documented with Project Tracking Forms dated September 21, 2009. Inventories for cultural resources were completed (May 2009) and resulted in the discovery of two isolated biface fragments. Since, by definition, isolated artifacts are not historic properties, there would be no effect to historic properties as a result of the proposed action.

B. Public Notification

1. **Notification of Landowners**

   A letter was sent (August 26, 2009) to **adjacent landowners**, **landowners along the proposed haul route**, **registered water-rights users**, and **tribal governments** (Confederated Tribes of Grand Ronde, Confederated Tribes of Siletz, Cow Creek Band of Umpqua Tribe of Indians, and the Komemma Cultural Protection Association). Comments received were taken into consideration during the analysis of the proposed action.

2. **Roseburg District Planning Updates**

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

3. **State, County, and Local Government Agencies**

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

4. **Public Comment Period**

   A 30-day **public comment period** would be established for review of this EA. A Notice of Availability would be published in *The News-Review*. The public comment period will begin with publication of the notice published in *The News-Review* on November 24, 2009 and end close of business December 24, 2009. Comments must be received by close of business December 24, 2009 to be considered for the subsequent decision. If the decision is made to implement this project, a notice will be published in *The News-Review* and notification sent to all parties who request it.

C. List of Preparers

Interdiscplinary Team

Project Lead	Paul Meinke
Management Rep.	Al James
Botany/Noxious Weeds	Julie Knurowski
Cultural Resources	Isaac Barner
Engineering	Terrie King
Fisheries	Jeff McEnroe
Fuels Management	Krisann Kosel
Hydrology	Jonas Parker
Layout	Brad Talbot (Corvid)
Layout	Cary Swain (Craven Raven)
Layout	Casey Steenhoven (Old Crow)
Layout	Jered Bowman (Craven Raven)
NEPA; Writer/Editor	Rex McGraw
Rights-of-Way	Chuck White
Silviculture	Trixy Moser
Soils	Dan Cressy

Timber Cruising	Brandon Payer (Corvid)
Timber Cruising	Doug Snider (Old Crow)
Timber Cruising	Jeremy Bochart (Craven Raven)
Wildlife	Melanie Roan

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Appendix A. Bureau Sensitive & Bureau Strategic Wildlife Species

Project: Blackbird Density Management
Prepared By: Melanie Roan
Date: June 12, 2009
SSSP List Date: July 26, 2007 (IM-OR-2007-072)

The following tables include those species which are documented or suspected to occur within the Roseburg District BLM. Those Bureau Sensitive or Bureau Strategic species which are suspected or documented to occur within the project area are detailed below.

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

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

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

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

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

Species	General Habitat Requirements	Present in Project Area?	Impacts to Species	
			No Action	Proposed Action
BUREAU SENSITIVE				
American Peregrine Falcon *Falco peregrinus anatum*	Cliffs, rock outcrops; open habitats for hunting birds; cliffs south of Craven Raven 13D.	Suspected	No Effects	No effects to nesting or foraging habitat
Bald Eagle *Haleaeetus leucocephalus*	Late successional forests with multi-canopies, generally within two miles of a major water source; 2.6 miles to nearest known site; 1.0 mile from North Umpqua River (Corvid 35A, B).	No Known Nest/ Roost Sites	No Effects	No effects to nesting or foraging habitat
Chace Sideband *Monadenia chaceana*	Rocky, talus habitats in the Klamath Province and southwards.	Out of Range	No Effects	
Columbian White Tailed Deer *Odocoileus virginianus leucurus*	Bottomlands, oak/hardwood forests; cover for fawning.	No Habitat	No Effects	
Crater Lake Tightcoil *Pristiloma arcticum crateris*	Perennially wet areas in late seral forests above 2000ft elevation and east of Interstate-5; seeps, springs, riparian areas.	Suspected	No Effect	No measurable effects to habitat due to 60-foot buffer along perennial streams within Riparian Reserve.
Fisher *Martes pennanti*	Natal and foraging habitat consists of structurally complex forests; mature open forests with large live trees, snags, and down wood; nearest sighting 30 miles southeast.	Suspected	No Effect	No effects to suitable natal and foraging habitat.
Foothill Yellow-legged Frog *Rana boylii*	Low gradient streams/ponds; gravel/cobble, bedrock pools.	No Habitat	No Effects	

Species	General Habitat Requirements	Present in Project Area?	Impacts to Species	
			No Action	Proposed Action
Fringed Myotis *Myotis thysanodes*	Late-successional forest features (e.g. snags or trees with deeply furrowed bark, loose bark, cavities), caves, mines, bridges, rock crevices.	Suspected	No Effect	Snags retained in Riparian Reserve; potential loss of roosting snags in GFMA & C/D.
Green Sideband *Monadenia fidelis beryllica*	Coast Range, riparian forests at low elevations; deciduous trees & shrubs in wet, undisturbed forest.	Out of Range	No Effects	
Harlequin Duck *Histrionicus histrionicus*	Mountain Streams in forested areas on west slope of the Cascade Mountains.	No Habitat	No Effects	
Lewis' Woodpecker *Melanerpes lewis*	Open woodland habitat near water; open woodland canopy and large diameter dead/dying trees, snag cavities.	No Habitat	No Effects	
Northwestern Pond Turtle *Clemmys marmorata marmorata*	Ponds, low gradient rivers; upland over-wintering habitat, CWD; sighting in Corvid 35A.	Documented	No Effect	No measurable effects to over-wintering habitat; retention of existing CWD; wetland breeding areas excluded from treatment
Oregon Shoulderband *Helminthoglypta hertleini*	Talus and rocky substrates, grasslands or other open areas with low-lying vegetation.	No Habitat	No Effects	
Oregon Vesper Sparrow *Pooecetes gramineus affinis*	Open habitats such as grasslands, meadows, farmlands.	No Habitat	No Effects	
Pallid Bat *Antrozous pallidus*	Usually rocky outcroppings near dry open areas; occasionally near evergreen forests; cliffs south of Craven Raven 13D.	Suspected	No Effect	No effect to roosting sites in cliff area
Purple Martin *Progne subis*	Snags cavities in open habitats (e.g. grasslands, brushlands, open woodlands); foraging habitat in units.	Suspected	No Effect	No measurable effect to foraging habitat.
Rotund Lanx *Lanx subrotundata*	Major rivers and large tributaries with cold, well-aerated water and rocky substrate.	Out of Range	No Effects	
Scott's Apatanian Caddisfly *Allomyia scotti*	High-elevation (>4,000ft), cold streams in the mountainous regions of Oregon.	Out of Range	No Effects	
Spotted Tail-dropper *Prophysaon vannattae pardalis*	Mature conifer forests in the Coast Range; associated with significant deciduous tree/shrub component.	Out of Range	No Effects	
Townsend's Big-eared Bat *Corynorhinus townsendii*	Late-successional forest features (e.g. snags or trees with deeply furrowed bark, loose bark, cavities), caves, mines, buildings, bridges, tunnels; known colony at Mt. Scott 0.6 miles west of Old Crow 27C.	Documented	No Effect	Snags retained in Riparian Reserve; potential loss of roosting snags in GFMA & C/D.
Western Ridgemussel *Gonidea angulata*	Creeks, rivers, coarse substrates; Umpqua R. and possibly major tribs.	Out of Range	No Effects	
White-Tailed Kite *Elanus leucurus*	Open grasslands, meadows, emergent wetlands, farmlands, lightly, wooded areas; wooded riparian habitats close to open hunting; tall trees and shrubs.	No Habitat	No Effects	
BUREAU STRATEGIC				
Broadwhorl Tightcoil *Pristiloma johnsoni*	Moist forest sites, typically with deciduous component; Coast/Cascades in WA, Coast Range in OR, as far south as Lane County.	Out of Range	No Effects	
Klamath Tail-Dropper *Prophysaon sp. nov.*	Moist, open areas along streams or springs in Ponderosa Pine forests; as far North as Crater Lake.	Out of Range	No Effects	
Merlin *Falco columbarius*	Coniferous forests adjacent to open habitats, along forest edges; units within winter range.	Suspected	No Effect	No measurable effect to foraging habitat.

Species	General Habitat Requirements	Present in Project Area?	Impacts to Species	
			No Action	Proposed Action
Pristine Springsnail *Pristinicola hemphilli*	Shallow, cold, clear springs/seeps; strongly spring-influenced streams, slow-moderate flow; Umpqua River drainage.	Out of Range	No Effects	
Oregon Giant Earthworm *Driloleirus macelfreshi*	Deep, moist, undisturbed soils of riparian forests.	Out of Range	No Effects	

Appendix B. Soils

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

Table B-1. Timber Production Capability Classification (TPCC).

Unit	FGR[1] (acres)	FPR[2] (acres)	FSR[3] (acres)	FGNW[4] (acres)	FPNW[5] (acres)	Category 1[6] (acres)
Corvid 35A	0	0	NA	0	0	NA
Corvid 35B	0	6	NA	0	0	NA
Corvid 3A	0	6	NA	0	0	NA
Corvid-Total	0	6	NA	0	0	NA
Craven Raven 13C	2	1	NA	0	0	NA
Craven Raven 13D	<1	0	NA	0	0	NA
Craven Raven 13E	0	0	NA	0	0	NA
Craven Raven 23A	0	0	NA	0	0	NA
Craven Raven 23B	0	0	NA	0	0	NA
Craven Raven 23C	<1	0	NA	0	0	NA
Craven Raven 25A	1	0	NA	0	0	NA
Craven Raven-Total	4	1	NA	0	0	NA
Old Crow 23D	0	0	NA	0	0	NA
Old Crow 27A	0	0	NA	0	0	NA
Old Crow 27B	0	0	NA	0	0	NA
Old Crow 27C	0	0	NA	0	0	NA
Old Crow 27D	0	0	NA	0	0	NA
Old Crow 33A	0	0	NA	0	0	NA
Old Crow 33B	1	1	NA	0	0	NA
Old Crow-Total	1	1	NA	0	0	NA
Grand Total	**5**	**8**	**NA**	**0**	**0**	**NA**

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

Table B-2. Mass Wasting & Landslides Inside Units. An analysis of mass wasting events initiating inside the proposed thinning units was done using aerial photo interpretation covering 1960 to 2004 and field reconnaissance. Documented are landslides that occurred after clear-cut harvest.

Sale Name	# Debris Torrents	# Landslides[1]			
	Large (>0.5 acre)	Small (< 0.1 acre)	Medium (0.1-0.5 acre)	Large (> 0.5 acre)	All
Corvid	0	0	1	0	1 (0.33 acres)
Craven Raven	0	3	1	0	4 (0.42 acres)
Old Crow	0	3	2	0	5 (0.46 acres)
Total	0	6	4	0	10 (1.21 acres)
Probability of occurrence expected within units:					
No Action Alternative	none	low	low	low	low
Action Alternative (Treatment)	low	low	low	low	low
Cumulative Effects	Unchanged[2]	Unchanged[2]	Unchanged[2]	Unchanged[2]	Unchanged[2]

[1] Five of the identified landslides were road-related and five 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

Project: Blackbird Commercial Thinning & Density Management
Prepared By: Jonas Parker and Jeff McEnroe
Date: June 17, 2009

The Aquatic Conservation Strategy (ACS) was developed to restore and maintain the ecological health of watersheds and aquatic ecosystems contained within them on public lands. The ACS must strive to maintain and restore ecosystem health at watershed and landscape scales to protect habitat for fish and other riparian-dependent species and resources and restore currently degraded habitats. This approach seeks to prevent further degradation and restore habitat over broad landscapes as opposed to individual projects or small watersheds.

ACS Components:

Riparian Reserves (ACS Component #1)

Riparian Reserves were established. The 1995 ROD/RMP (pg. 24) specifies Riparian Reserve widths equal to the height of two site potential trees on each side of fish-bearing streams and one site-potential tree on each side of perennial or intermittent non-fish bearing streams, wetlands greater than an acre, and constructed ponds and reservoirs. The height of a site-potential tree in the Rock Creek and Lower North Umpqua watersheds has been determined to be 180 feet based on average tree heights of the respective watershed. One of the objectives of this project (pg. 2) is to accelerate the development of late seral characteristics in the Riparian Reserves.

Key Watersheds (ACS Component #2)

Under the 1994 ROD/RMP, Key Watersheds were established "as refugia . . . for maintaining and recovering habitat for at-risk stocks of anadromous salmonids and resident fish species [1994 ROD/RMP, pg. 20]." There are no key watersheds within the Rock Creek or Lower North Umpqua River fifth-field watersheds.

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

In developing the project, the *Rock Creek Watershed Analysis* prepared by the Swiftwater Field Office (USDI, BLM 1996) was used and an additional *Rock Creek Watershed Analysis* prepared by Partnership for Umpqua Rivers (PUR) was used (Winn, 2006). PUR also prepared the *Lower North Umpqua River Watershed Assessment and Action Plan* (Geyer, 2003) which was used to evaluate existing conditions, establish desired future conditions, and assist in the formulation of appropriate alternatives. Existing watershed conditions are described in the above documents and also in the *Hydrology* and *Aquatic Habitat & Fisheries* sections of this EA (pgs. 25-31). The short and long term effects to aquatic resources are also described in these sections of the EA.

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 treatments within the Riparian Reserve are considered to be a watershed restoration project.

Additionally, since 1994, numerous stream enhancement projects have been implemented in the Rock Creek Watershed. This includes placing instream structures (e.g. logs, boulders, root wads, etc.) to improve aquatic habitat on over 3.0 miles of stream, replacing over 10 culverts identified as barriers to fish passage to open up access to additional habitat, or improving or decommissioning over 2.0 miles of road to reduce road sediment impacts to aquatic systems. This work has been done in collaboration with private timber companies, the Partnership for Umpqua Rivers watershed council, Douglas Soil and Water Conservation District, Oregon Department of Fish and Wildlife, and the BLM. Future opportunities for restoration are discussed in the Rock Creek Watershed Analyses. This work would be implemented as budgets allow.

Due in part to lack of block ownership in the watershed, restoration efforts in the Lower North Umpqua River Watershed are largely limited to work implemented at the North Bank Habitat Management Area (NBHMA) and includes placing instream structures on over 3.0 miles of stream. Future restoration actions in the watershed are also limited to work at the NBHMA, but include over 2.0 miles of instream structure placement and approximately 10 acres of wetland restoration.

Range of Natural Variability within Rock Creek and Lower North Umpqua River 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.

Natural disturbance events to aquatic systems in the Pacific Northwest include, but are not limited to wildfires, floods and landslides. Rock Creek is classified as having a moderate to high 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 (Winn, 2006). The overall effect is one of patchiness at the landscape level. Fires covered a large area, varied in intensities, and burned often. Historic conditions in the Lower North Umpqua River watershed were similar; fires regularly occurred and were widespread prior to fire suppression. These fires played an integral part in the establishment and development of seasonal wetland prairies – which comprise much of the watershed (Geyer, 2003).

Over the course of the past several decades, landslide frequency and distribution has decreased as forest vegetation matures and stabilizes hillslopes. However, timber harvesting and road construction coupled with storm events have increased the frequency and distribution of landslides above historic levels in the Rock Creek Watershed (Winn, 2006). Sediment inputs have increased between two and twelve times beyond natural levels and fish habitat and waterways have been negatively impacted (Winn, 2006). On BLM land, future landslides, mostly occurring during large storm events, are expected to deliver large wood and rock to lower gradient streams from sources within BLM riparian reserves. These episodic deliveries of large wood and rock closely mimic natural conditions.

Due to the dynamic nature of these disturbance events, stream channel conditions vary based on the time since the last disturbance event. This results in a wide range of aquatic habitat conditions at the site level. Site level habitat conditions can be summarized by Oregon Department of Fish and Wildlife (ODFW) habitat surveys. Surveys have been conducted throughout the Rock Creek watershed - mostly in third through sixth-order streams. Aquatic habitat survey data from the Rock Creek and Lower North Umpqua River watersheds indicate that most of the tributaries are lacking large woody debris. While this condition is considered typical at sixth and seventh field catchments, it is considered atypical for most streams to be devoid of wood at the larger fifth field scale. The general absence of large woody debris is likely the result of historic "stream cleaning" efforts (Geyer, 2003). One of BLM's objectives for managing Riparian Management Areas is to maintain and enhance a source of large wood along streams.

Because of its dynamic nature, sediment effects to streams can only be described in general terms. Spawning gravels were largely lost in historic logging activities which included splash dams (Geyer, 2003). Increased sediment delivery stemming from roads, timber harvest and landslides have contributed relatively high levels of fine sediment throughout spawning reaches of the Rock Creek and Lower Umpqua River watersheds (Winn, 2006; Geyer, 2003). 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 1960s triggered the largest number of these landslides and debris flows (Winn, 2006; Geyer, 2003).

Stream temperatures vary naturally in these watersheds 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 stream and 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

Rock Creek Watershed has about 24 miles of perennial streams while the Lower North Umpqua River Watershed has about 18 miles of perennial streams. Of these totals, approximately 70 percent of the perennial streams in the Rock Creek and Lower North Umpqua River Watersheds are effectively shaded (Winn, 2006; Geyer, 2003) One of BLM's objectives for managing Riparian Management Areas is to maintain and enhance shade providing vegetation along streams.

Changes in stream flow can result from consumptive withdrawals and effects of land use activities on storm water runoff, infiltration, storage and delivery. Domestic water withdrawals, irrigation, agriculture, and livestock watering are common along Rock Creek and the Lower North Umpqua River. Over the last 150 years, much of the lower elevation forest land has been converted to farmland. Many tributaries within the Rock Creek and Lower North Umpqua River watersheds have also been cleaned (had large wood removed) or salvage logged. Approximately 21 percent of the total riparian area in the Rock Creek Watershed has been harvested since 1972 (Winn, 2006). BLM forest management in the Rock Creek and Lower North Umpqua River watersheds would be designed to reduce or prevent watershed impacts.

Approximately 66 percent of the riparian areas in the Rock Creek Watershed were in mid- or late-seral condition with large conifers and large hardwoods dominating the stands (Winn, 2006). More than half of the Lower North Umpqua Watershed is agricultural or comprised of areas of non-forest. Approximately 21 percent of the entire watershed is in mid- or late-seral condition (Geyer, 2003). One of BLM's objectives for managing Riparian Management Areas is to provide for riparian and aquatic conditions that supply stream channels with shade, sediment filtering, leaf littler and large wood, and streambank stability.

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

ACS Objective	Site/Project Scale Assessment	Fifth-Field Watershed Scale Assessment
	Scale Description: Units identified in this project are located in six separate seventh-field drainages (detailed below*) distributed throughout the watersheds totaling 16,176 acres in size. The BLM manages 6,433 acres in these drainages (40%). Units proposed for treatment represent 6% of the total drainage area, and 15% of the BLM-managed lands in the drainage.	Scale Description: This project is located in the Rock Creek and Lower North Umpqua River fifth-field watersheds. These watersheds are 62,691 and 106,343 acres in size respectively. The BLM manages approximately 28,298 acres in the Rock Creek Watershed (45%) and 12,252 acres in the Lower North Umpqua River Watershed (12%). Units proposed for treatment represent less than 1% of the total watershed areas, and less than 3% of the BLM-managed lands in the watershed.
1. Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations, and communities are uniquely adapted.	Trees within the treated riparian stands would attain larger heights and diameters in a shorter amount of time than if left untreated. Design features, such as 35 or 60 foot "no-harvest" buffers established along perennial streams (*Stream Buffers*, pg. 5), would retain shading and therefore maintain water temperature. "No-harvest" buffers established on perennial 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 (*Water Quality: Proposed Action Alternative*, pg. 28-29) and would prevent impacts to aquatic resources.	This treatment would also speed attainment of this objective at the watershed scale.

ACS Objective	Site/Project Scale Assessment	Fifth-Field Watershed Scale Assessment
	This treatment would speed attainment of this objective.	
2. Maintain and restore spatial and temporal connectivity within and between watersheds	Within the drainage, the proposed project would have no influence on aquatic connectivity. Therefore this treatment would maintain the existing connectivity condition at the site scale.	Within the watersheds, the proposed project would have no influence on aquatic connectivity. Therefore this treatment would maintain the existing connectivity condition at the watershed scale.
3. Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations	Treatments would not reduce canopy closure to an extent that could potentially influence in-stream flows. In addition, "no-harvest" buffers established on all continuous streams in or adjacent to proposed units would prevent disturbance to stream channels and stream banks (*Water Quality: Proposed Action Alternative*, pg. 28-29). 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.	The project design would ensure that water quality would not be adversely impacted by the proposed action. PDF's will maintain shading and hence water temperature (*Water Quality: Proposed Action Alternative*, pgs. 28). "No-harvest" buffers established on continuous 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 (*Water Quality: Proposed Action Alternative*, pg. 28-29). Therefore, this treatment would maintain the existing water quality at the site scale.	Based on the information discussed at the site scale, this project would also maintain water quality at the watershed scale.
5. Maintain and restore the sediment regime under which aquatic ecosystems evolved.	As mentioned above, "No-harvest" buffers established on continuous 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 (*Water Quality: Proposed Action Alternative*, pg. 28-29). Therefore, this project would maintain the existing sediment regime.	This project would maintain the existing sediment regime at the watershed scale as well.
6. Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing.	Treatments would not reduce canopy closure to an extent that could potentially influence in-stream flows. The project would involve partial removal of vegetation on areas constituting ten percent or less of each affected sub-watershed. In addition, although new, temporary road	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.

ACS Objective	Site/Project Scale Assessment	Fifth-Field Watershed Scale Assessment
	construction would increase the road density from 1.2 to 1.3 percent of the project area (pg. 29), the proposed project would not increase the peak flow because risk of peak flow enhancement does not occur until roaded area reaches at least 12 percent of the watershed (*Stream Flow: Proposed Action Alternative*, pg. 30). Therefore, this treatment would maintain stream flows within the range of natural variability at the site scale.	
7. Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and woodlands.	As discussed in #6 above, this project would maintain stream flows within the range of natural variability at the site scale. Therefore, it would also maintain stream interactions with the floodplain and respective water tables at the site scale.	At the watershed scale, this project would also maintain stream interactions with the floodplain and respective water tables within the range of natural variability.
8. Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.	The proposed treatment is designed to return riparian stands to a more natural density and growth trajectory. Therefore, this treatment would serve to restore plant species composition and structural diversity at the site scale.	The proposed treatment is designed to return riparian stands to a more natural density and growth trajectory. Therefore, this treatment would serve to restore plant species composition and structural diversity at the larger watershed scale as well.
9. Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.	As mentioned previously, one of the objectives of this project is to restore riparian stand conditions in the proposed treatment areas. Implementation of riparian restoration projects will help restore adequate habitat to support riparian-dependent species at the site and watershed scales.	As mentioned previously, one of the objectives of this project is to restore riparian stand conditions in the proposed treatment areas. Implementation of riparian restoration projects will help restore adequate habitat to support riparian-dependent species at the site and watershed scales.

*Detailed scale description of the six, seventh-field drainages:

1) The **French Creek** drainage is 2,988 acres in size. The BLM manages 1,049 acres in this drainage (35%). Units proposed for treatment represent 2% of the total drainage area and 5% of the BLM-managed lands in the drainage.
2) The **Idleyld Park** drainage is 4,017 acres in size. The BLM manages 976 acres in this drainage (24%). Units proposed for treatment represent 3% of the total drainage area and 14% of the BLM-managed lands in the drainage.
3) The **Kelly Creek** drainage is 2,966 acres in size. The BLM manages 1,311 acres in this drainage (44%). Units proposed for treatment represent 14% of the total drainage area and 31% of the BLM-managed lands in the drainage.

4) The **Lower Rock Creek** drainage is 2,335 acres in size. The BLM manages 994 acres in this drainage (43%). Units proposed for treatment represent 2% of the total drainage area and 5% of the BLM managed lands in the drainage.
5) The **McComas Creek** drainage is 2,075 acres in size. The BLM manages 1,063 acres in this drainage (51%). Units proposed for treatment represent 13% of the total drainage area and 26% of the BLM managed lands in the drainage.
6) The **Taylor Creek** drainage is 1,797 acres in size. The BLM manages 1,039 acres in this drainage (58%). Units proposed for treatment represent 4% of the total drainage area and 7% of the BLM managed lands in the drainage.

Aquatic Conservation Strategy Summary:

Based upon the information presented above (Table C-1), 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 Summary

Project: Blackbird Commercial Thinning
Prepared By: Julie Knurowski
Date: June 10, 2009
SSSP List Date: February 8, 2008 (IM-OR-2008-038)

Those Bureau Sensitive or Bureau Strategic species which are suspected or documented to occur within the Roseburg District BLM area are detailed below.

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

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

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

Strategic Species. If sites are located, collect occurrence data and record in the corporate database.

Table 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**	No	Surveys performed, not detected.	May/June 2009	N/A
Plagiobothrys hirtus Rough popcorn flower (E)	**Yes**	No	No	No habitat present.	May/June 2009	N/A
Sensitive Species						
Chiloscyphus gemmiparus Liverwort	**Yes**	No	No	No habitat present.	May/June 2009	N/A
Diplophyllum plicatum Liverwort	**Yes**	No	No	No habitat present	May/June 2009	N/A
Entosthodon fascicularis Moss	**Yes**	No	No	No habitat present	May/June 2009	N/A
Gymnomitrion concinnatum Liverwort	**Yes**	No	No	No habitat present.	May/June 2009	N/A
Helodium blandowii Moss	**Yes**	No	No	No habitat present	May/June 2009	N/A
Meesia uliginosa Moss	**Yes**	No	No	No habitat present	May/June 2009	N/A
Schistostega pennata Moss	**Yes**	No	No	No habitat present	May/June 2009	N/A
Tayloria serrata Moss	**Yes**	**Yes**	No	Surveys performed, not detected.	May/June 2009	N/A
Tetraphis geniculata Moss	**Yes**	No	No	No habitat present	May/June 2009	N/A

Species	Within species range?	Habitat Present?	Species Present?	Reason for concern or no concern	Surveys Completed	Mitigation Measures
Tetraplodon mnioides Moss	**Yes**	**Yes**	No	Surveys performed, not detected.	May/June 2009	N/A
Tomentypnum nitens Moss	**Yes**	No	No	No habitat present	May/June 2009	N/A
Tortula mucronifolia Moss	**Yes**	**Yes**	No	Surveys performed, not detected.	May/June 2009	N/A
Trematodon boasii Moss	**Yes**	No	No	No habitat present.	May/June 2009	N/A
Bridgeoporus nobilissimus Giant polypore fungus	**Yes**	No	N/A	No habitat present.	May/June 2009	N/A
Cudonia monticola *Fungi*	**Yes**	No	N/A	Surveys Not Practical. [1]	N/A	N/A
Dermocybe humboldtensis Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	N/A	N/A
Gomphus kauffmanii Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	N/A	N/A
Helvella crassitunicata Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	N/A	N/A
Leucogaster citrinus Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	N/A	N/A
Otidea smithii Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	N/A	N/A
Phaeocollybia californica Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	N/A	N/A
Phaeocollybia dissiliens Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	N/A	N/A
Phaeocollybia gregaria Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	N/A	N/A
Phaeocollybia olivacea Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	N/A	N/A
Phaeocollybia oregonensis Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	N/A	N/A
Phaeocollybia pseudofestiva Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	N/A	N/A
Phaeocollybia scatesiae Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	N/A	N/A
Phaeocollybia sipei Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	N/A	N/A
Phaeocollybia spacidea Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	N/A	N/A
Pseudorhizina californica Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	N/A	N/A
Ramaria amyloidea Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	N/A	N/A
Ramaria gelatiniaurantia Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	N/A	N/A
Ramaria largentii Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	N/A	N/A
Ramaria rubella var. blanda Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	N/A	N/A
Ramaria spinulosa var. *diminutiva* Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	N/A	N/A

Species	Within species range?	Habitat Present?	Species Present?	Reason for concern or no concern	Surveys Completed	Mitigation Measures
Rhizopogon chamalelotinus Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	N/A	N/A
Rhizopogon exiguus Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	May/June 2009	N/A
Sowerbyella rhenana Fungus	**Yes**	**Yes**	N/A	Surveys Not Practical. [1]	May/June 2009	N/A
Bryoria subcana Lichen	**Yes**	No	N/A	No habitat present.	May/June 2009	N/A
Calicium adspersum Lichen	**Yes**	No	N/A	No habitat present	May/June 2009	N/A
Chaenotheca subroscida Lichen	**Yes**	**Yes**	No	Surveys performed, not detected.	May/June 2009	N/A
Dermatocarpon meiophyllizum Lichen	**Yes**	No	N/A	No habitat present.	May/June 2009	N/A
Hypogymnia duplicata Lichen	**Yes**	No	N/A	No habitat present.	May/June 2009	N/A
Lobaria linita Lichen	**Yes**	No	N/A	No habitat present.	May/June 2009	N/A
Pannaria rubiginosa Lichen	**Yes**	No	N/A	No habitat present.	May/June 2009	N/A
Pilophorus nigricaulis Lichen	**Yes**	No	N/A	No habitat present.	May/June 2009	N/A
Stereocaulon spathuliferum Lichen	**Yes**	No	N/A	No habitat present.	May/June 2009	N/A
Adiantum jordanii California maiden-hair	**Yes**	No	N/A	No habitat present.	May/June 2009	N/A
Arabis koehleri var. *koehleri* Koehler's rockcress	**Yes**	No	N/A	No habitat present.	May/June 2009	N/A
Arctostaphylos hispidula *Hairy manzanita*	**Yes**	No	N/A	No habitat present.	May/June 2009	N/A
Asplenium septentrionale Grass-fern	**Yes**	No	N/A	No habitat present.	May/June 2009	N/A
Bensoniella oregana Bensonia	**Yes**	No	N/A	No habitat present.	May/June 2009	N/A
Botrychium minganense Gray moonwort	**Yes**	No	N/A	No habitat present.	May/June 2009	N/A
Calochortus coxii Crinite mariposa-lily	**Yes**	No	N/A	No habitat present.	May/June 2009	N/A
Calochortus umpquaensis Umpqua mariposa-lily	**Yes**	No	N/A	No habitat present.	May/June 2009	N/A
Camassia howellii Howell's camas	**Yes**	No	N/A	No habitat present.	May/June 2009	N/A
Carex comosa Bristly sedge	**Yes**	No	N/A	No habitat present.	May/June 2009	N/A
Carex gynodynama Hairy sedge	**Yes**	**Yes**	No	Surveys performed, not detected.	May/June 2009	N/A
Carex serratodens Saw-tooth sedge	**Yes**	No	N/A	No habitat present.	May/June 2009	N/A
Cicendia quadrangularis Timwort	**Yes**	No	N/A	No habitat present	May/June 2009	N/A
Cimicifuga elata var. elata Tall bugbane1	**Yes**	**Yes**	No	Surveys performed, not detected.	May/June 2009	N/A
Cypripedium fasciculatum	**Yes**	No	No	No habitat present.	May/June 2009	N/A

Species	Within species range?	Habitat Present?	Species Present?	Reason for concern or no concern	Surveys Completed	Mitigation Measures
Clustered lady slipper						
Delphinium nudicaule Red larkspur	**Yes**	No	No	No habitat present.	May/June 2009	**N/A**
Epilobium oreganum Oregon willow-herb	**Yes**	No	No	No habitat present	May/June 2009	**N/A**
Eschscholzia caespitosa Gold poppy	**Yes**	No	No	No habitat present.	May/June 2009	**N/A**
Eucephalus vialis Wayside aster	**Yes**	No	No	No habitat present	May/June 2009	**N/A**
Horkelia congesta ssp. *congesta* Shaggy horkelia	**Yes**	No	No	No habitat present	May/June 2009	**N/A**
Horkelia tridentata ssp. *tridentate* Three-toothed horkelia	**Yes**	No	No	No habitat present	May/June 2009	N/A
Iliamna latibracteata California globe-mallow	**Yes**	No	N/A	No habitat present.	May/June 2009	N/A
Kalmiopsis fragrans Fragrant kalmiopsis	**Yes**	No	N/A	No habitat present.	May/June 2009	N/A
Lathyrus holochlorus Thin-leaved peavine	**Yes**	No	N/A	No habitat present.	May/June 2009	N/A
Lewisia leana Lee's lewisia	**Yes**	No	N/A	No habitat present.	May/June 2009	N/A
Limnanthes gracilis var. *gracilis* Slender meadow-foam	**Yes**	No	N/A	No habitat present.	May/June 2009	N/A
Lotus stipularis *Stipuled trefoil*	**Yes**	No	N/A	No habitat present.	May/June 2009	N/A
Meconella oregana *White fairypoppy*	**Yes**	No	N/A	No habitat present.	May/June 2009	N/A
Pellaea andromedifolia Coffee fern	**Yes**	**Yes**	No	Surveys performed, not detected.	May/June 2009	N/A
Perideridia erythrorhiza Red-rooted yampah	**Yes**	No	N/A	No habitat present.	May/June 2009	N/A
Polystichum californicum California sword-fern	**Yes**	No	N/A	No habitat present.	May/June 2009	N/A
Romanzoffia thompsonii Thompson's mistmaiden	**Yes**	**Yes**	**Yes**	Surveys performed, species detected.	May/June 2009	Population not within area of proposed activities
Schoenoplectus subterminalis Water clubrush	**Yes**	No	N/A	No habitat present.	May/June 2009	N/A
Scirpus pendulus *Drooping rush*	**Yes**	No	N/A	No habitat present.	May/June 2009	N/A
Sisyrinchium hitchcockii Hitchcock's blue-eyed grass	**Yes**	No	N/A	No habitat present.	May/June 2009	N/A
Utricularia gibba Humped bladderwort	**Yes**	No	N/A	No habitat present	May/June 2009	N/A
Utricularia minor Lesser bladderwort	**Yes**	No	N/A	No habitat present.	May/June 2009	N/A
Wolffia borealis Dotted water-meal	**Yes**	No	N/A	No habitat present.	May/June 2009	N/A
Wolffia columbiana Columbia water-meal	**Yes**	No	N/A	No habitat present.	May/June 2009	N/A

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

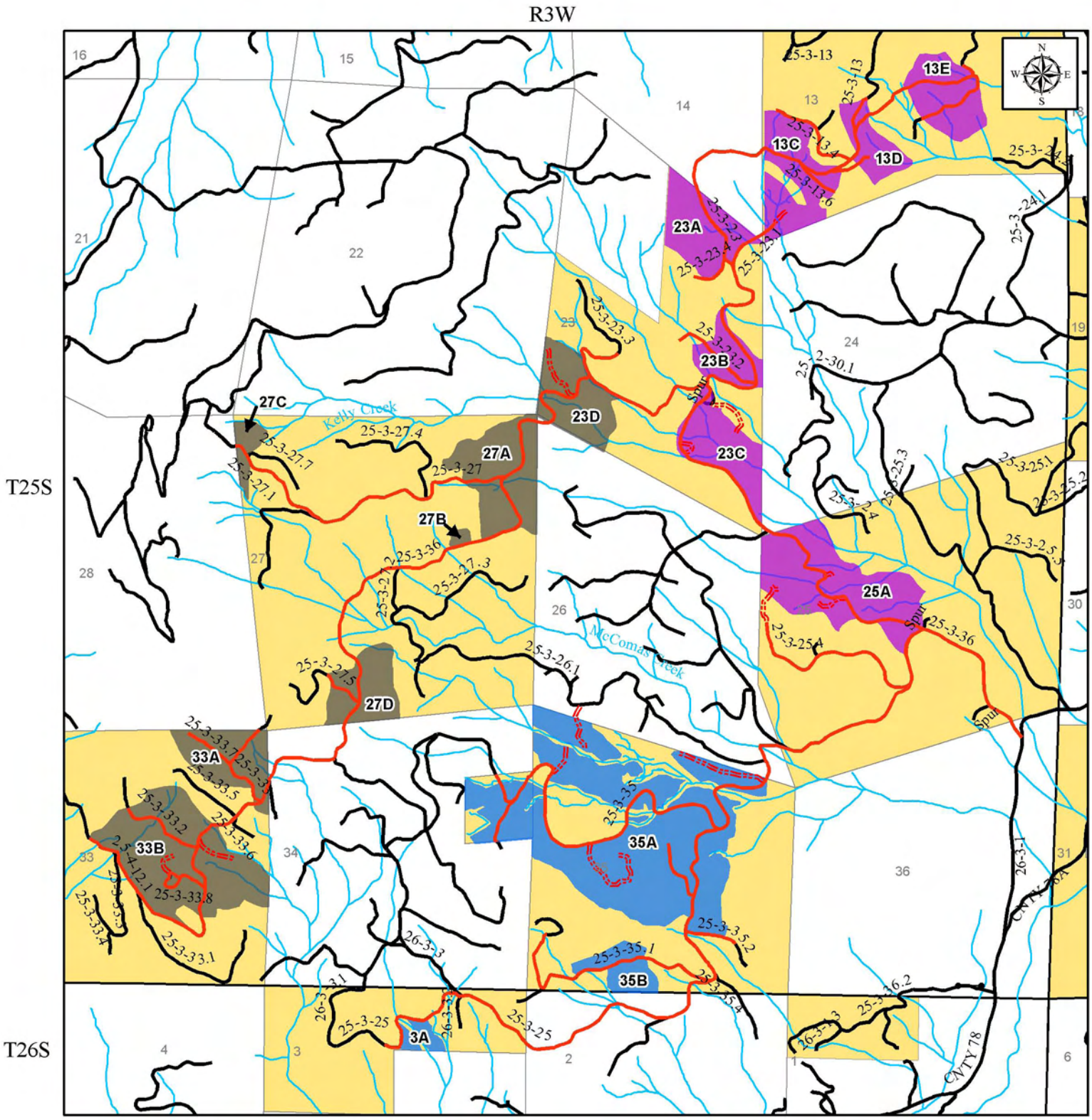
Table D-2. Bureau Strategic Botanical Species.

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	Surveys Not Practical. [1]
Choiromyces alveolatus	Suspected	Surveys Not Practical. [1]
Clavariadelphus subfastigiatus	Documented	Surveys Not Practical. [1]
Endogone oregonensis	Documented	Surveys Not Practical. [1]
Glomus pubescens	Suspected	Surveys Not Practical. [1]
Gymnomyces monosporus	Documented	Surveys Not Practical. [1]
Helvella elastica	Documented	Surveys Not Practical. [1]
Hygrophorus albicarneus	Suspected	Surveys Not Practical. [1]
Mycena quinaultensis	Suspected	Surveys Not Practical. [1]
Nolanea verna var. *isodiametrica*	Suspected	Surveys Not Practical. [1]
Plectania milleri	Suspected	Surveys Not Practical. [1]
Psathyrella quercicola	Suspected	Surveys Not Practical. [1]
Ramaria abietina	Documented	Surveys Not Practical. [1]
Ramaria bothryis var. aurantiiramosa	Suspected	Surveys Not Practical. [1]
Ramaria concolor f. tsugina	Suspected	Surveys Not Practical. [1]
Ramaria conjunctipes var. sparsiramosa	Suspected	Surveys Not Practical. [1]
Ramaria coulterae	Suspected	Surveys Not Practical. [1]
Ramaria rubribrunnescens	Suspected	Surveys Not Practical. [1]
Ramaria suecica	Documented	Surveys Not Practical. [1]
Ramaria thiersii	Suspected	Surveys Not Practical. [1]
Rhizopogon brunneiniger	Suspected	Surveys Not Practical. [1]
Rhizopogon clavitisporus	Suspected	Surveys Not Practical. [1]
Rhizopogon flavofibrillosus	Documented	Surveys Not Practical. [1]
Rhizopogon variabilisporus	Suspected	Surveys Not Practical. [1]
Sarcodon fuscoindicus	Documented	Surveys Not Practical. [1]
Lichens		
Buellia oidalea	Suspected	None Observed
Lecanora pringlei	Suspected	None Observed
Lecidea dolodes	Suspected	None Observed
Leptogium rivale	Documented	None Observed
Leptogium teretiusculum	Documented	None Observed
Peltula euploca	Suspected	None Observed
Vezdaea stipitata	Documented	None Observed
Vascular Plants		
Camissonia ovata	Suspected	None Observed
Frasera umpquaensis	Suspected	None Observed

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

Appendix E. Map Packet Table of Contents

Figure 1. Blackbird Vicinity Map.



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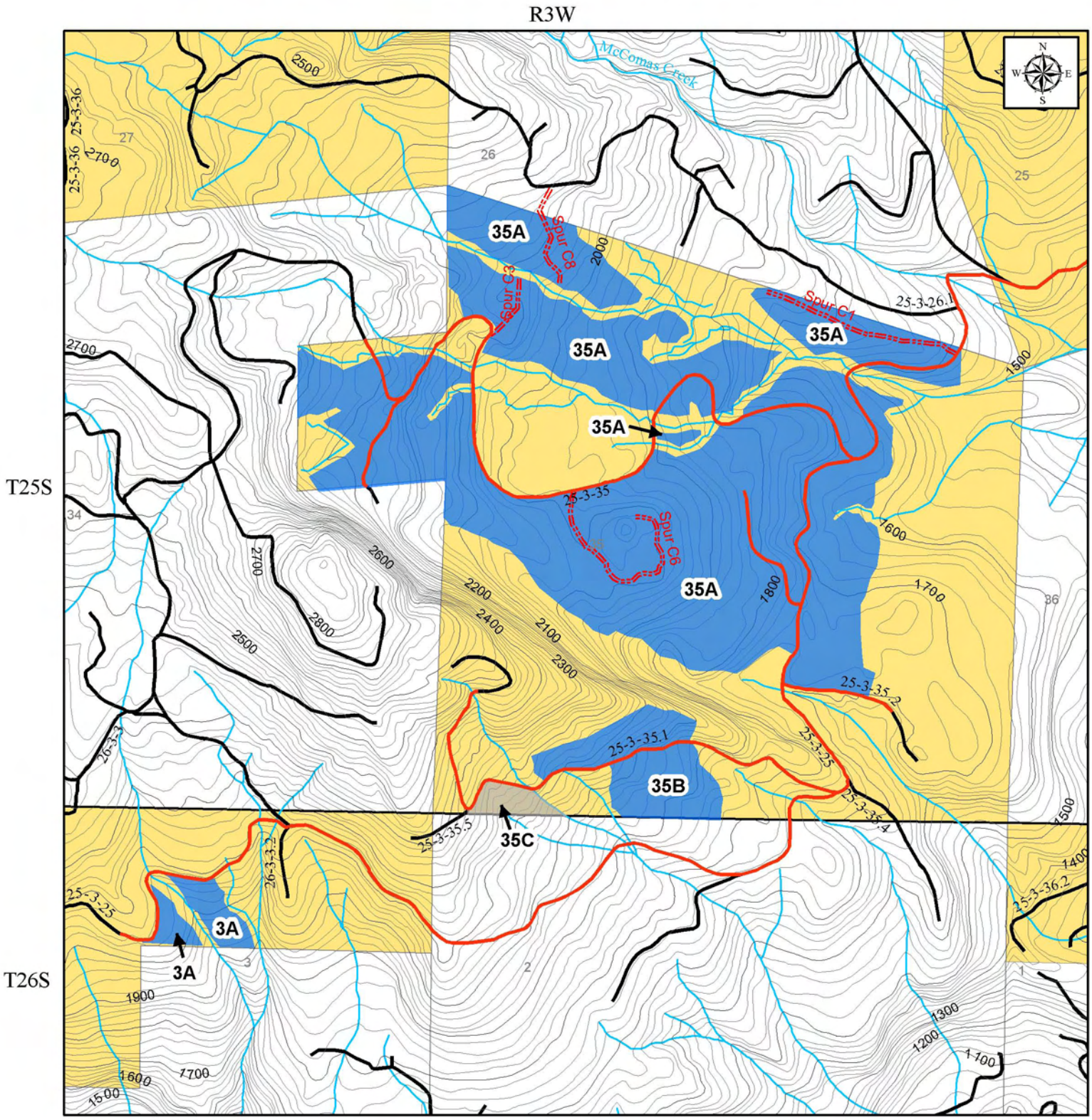
Map Date: 09-18-2009

Figure 2. Corvid Commercial Thinning.



0 1,000 2,000 3,000 Feet

1 inch = 1,250 feet 1:15,000

Legend

- Proposed Unit
- Deferred Unit
- Existing Road
- New Road Construction
- Haul Route
- Stream
- Township & Range
- Section

Administered Land

- BLM
- Other

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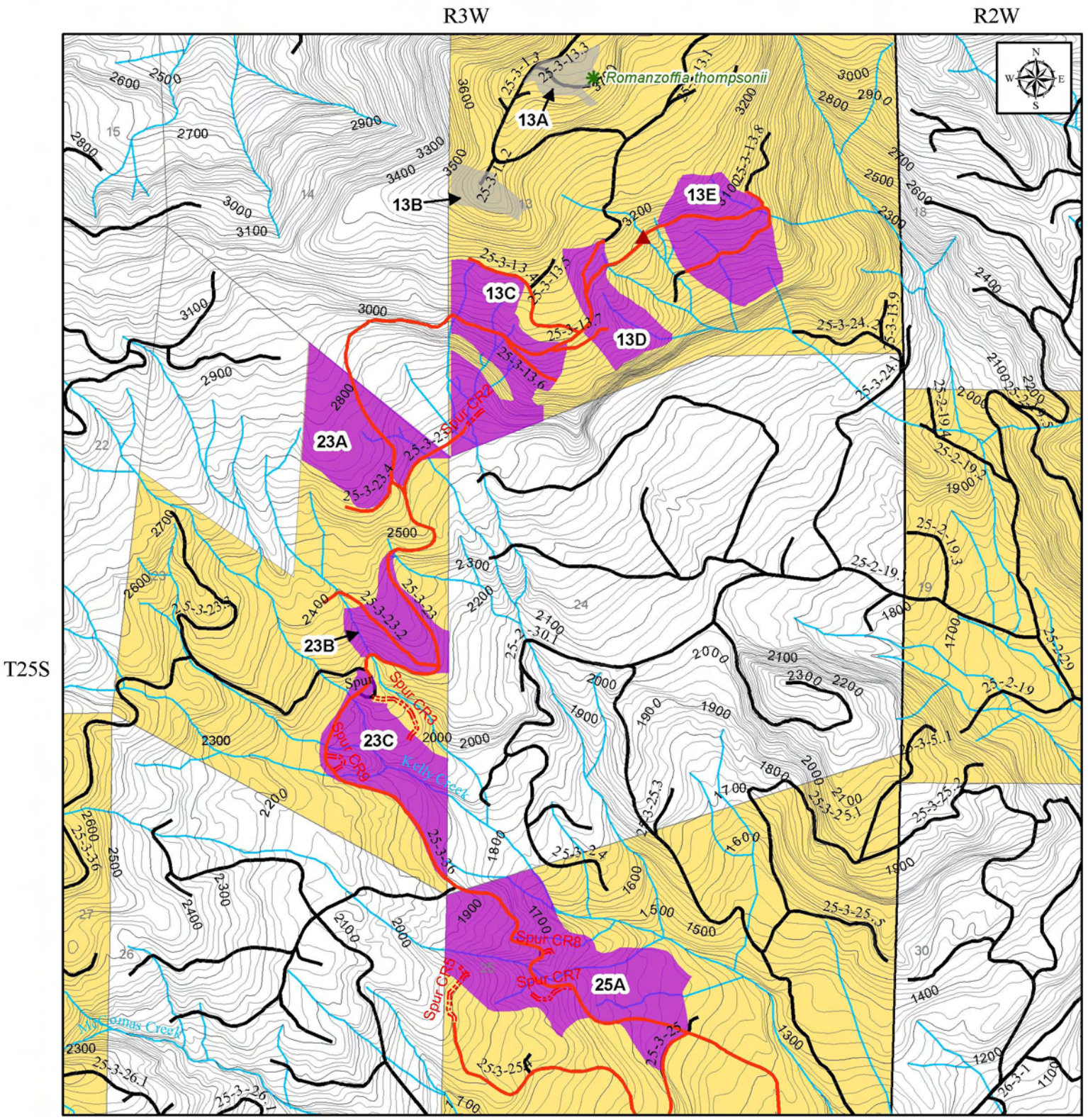
Map Date: 09-18-2009

Figure 3. Craven Raven Commercial Thinning.



0 1,000 Feet

1 inch = 1,833 feet 1:22,000

Legend

- Proposed Unit
- Deferred Unit
- Existing Road
- New Road Construction
- Haul Route
- Stream
- Township & Range
- Section
- Administered Land
  - BLM
  - Other
- Landslide

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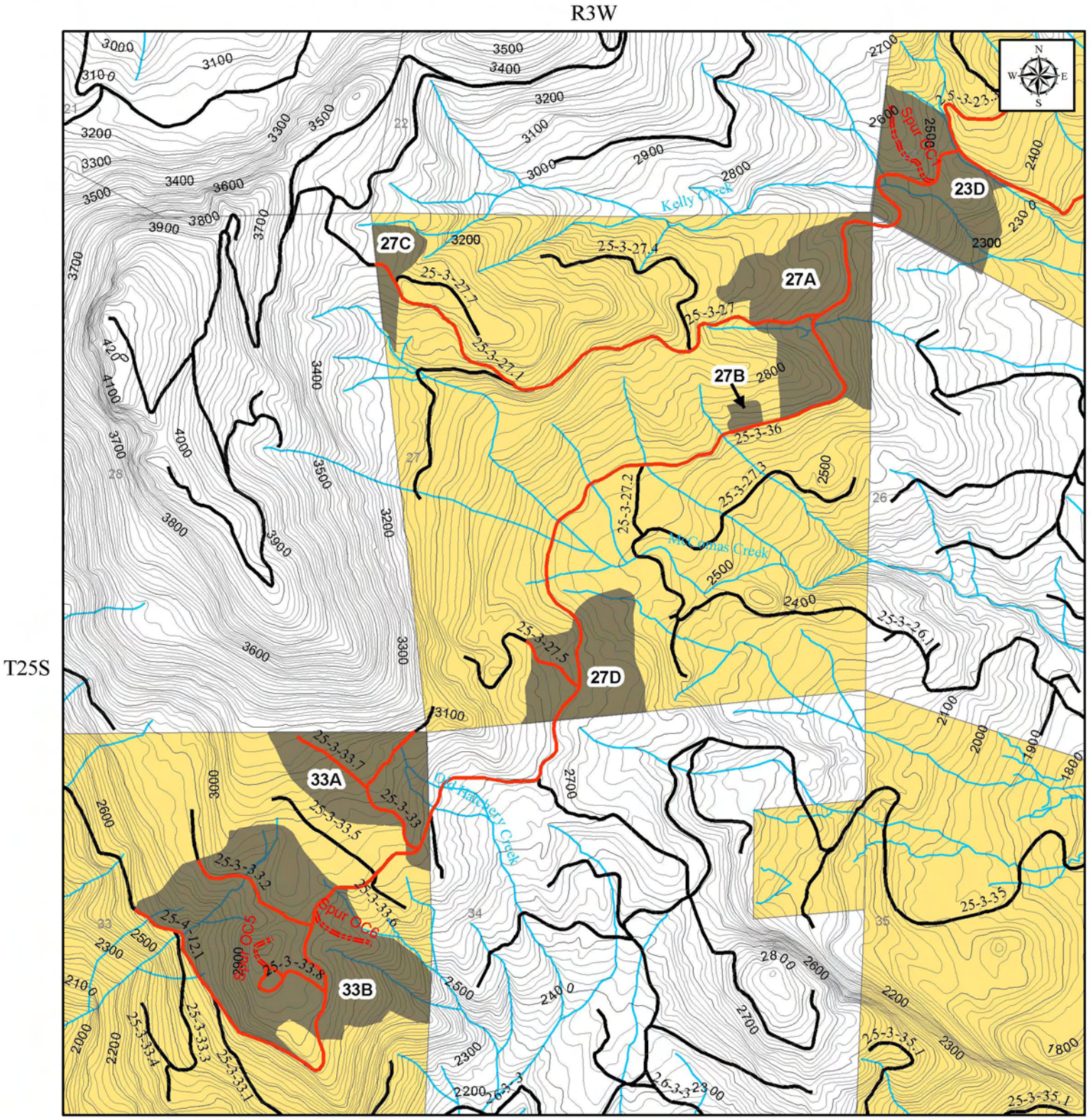
Map Date: 11-2-2009

Figure 4. Old Crow Commercial Thinning.



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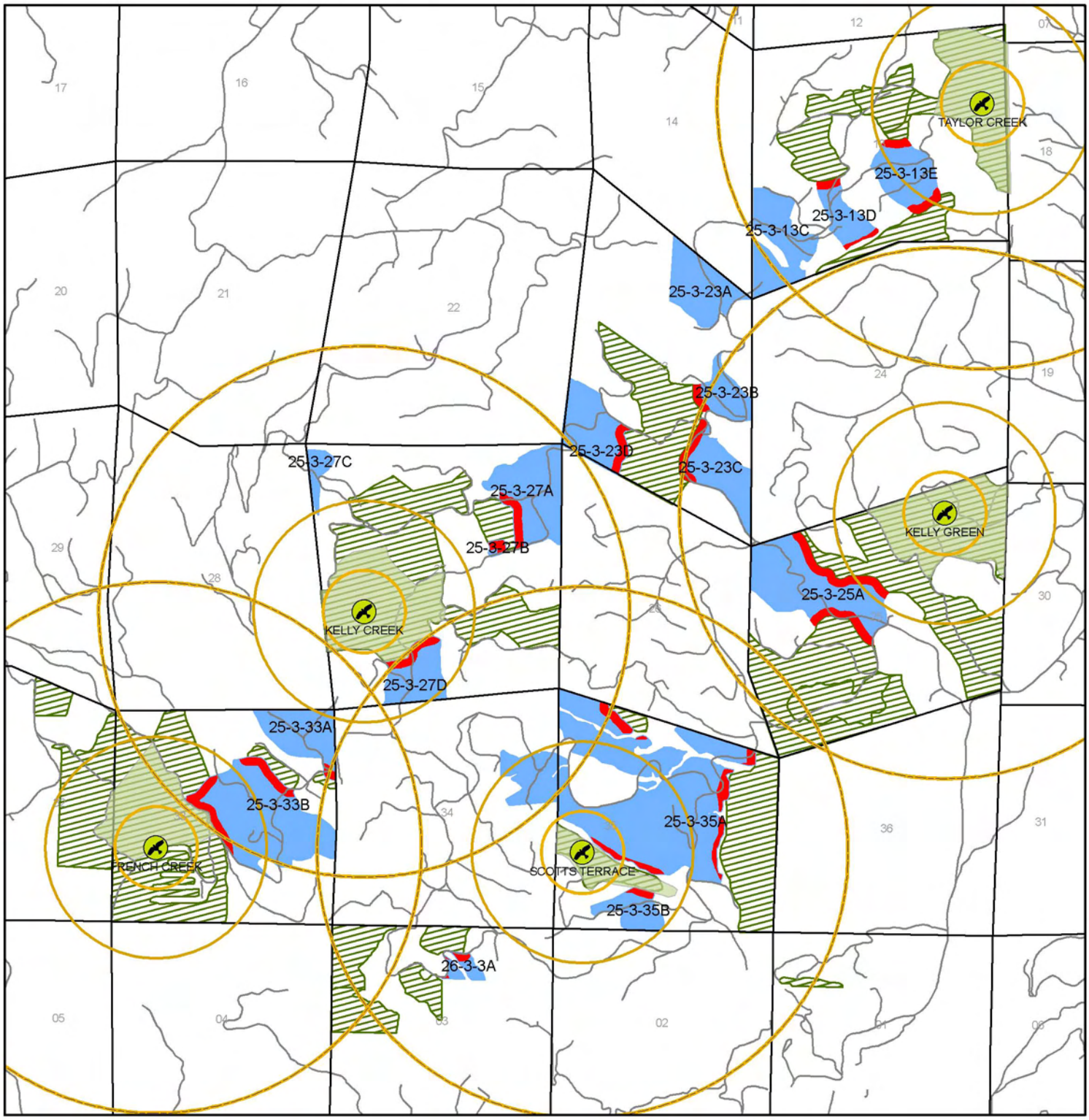
Map Date: 09-18-2009

Figure 5. Blackbird DM / CT Units and Northern Spotted Owl Habitat



Legend

- Owl Activity Center
- Nest Patch
- Core Area
- Home Range
- KOAC
- Suitable Habitat (80+ years)
- Proposed Units
- Unit Area w/in 65 yds of Suitable Habitat
- Roads

0 3,200 6,400 12,800 Feet

N W E S

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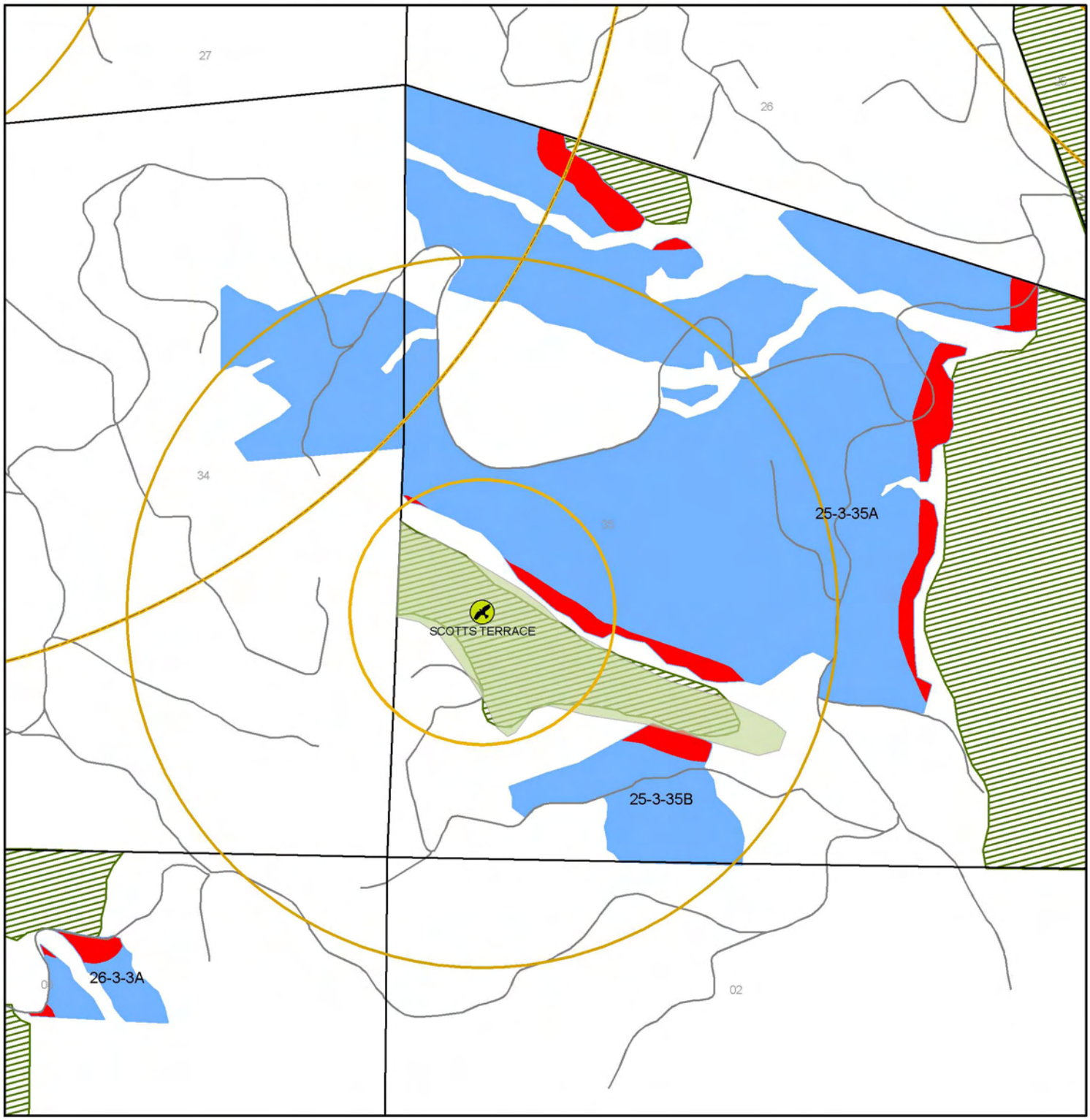
Figure 6. Corvid DM / CT Units and Northern Spotted Owl Habitat



Legend

- Owl Activity Center
- Nest Patch
- Core Area
- Home Range
- KOAC
- Suitable Habitat (80+ years)
- Proposed Units
- Corvid Unit Area w/in 65 yds of Suitable Habitat
- Roads

0 1,000 2,000 4,000 Feet

N W E S

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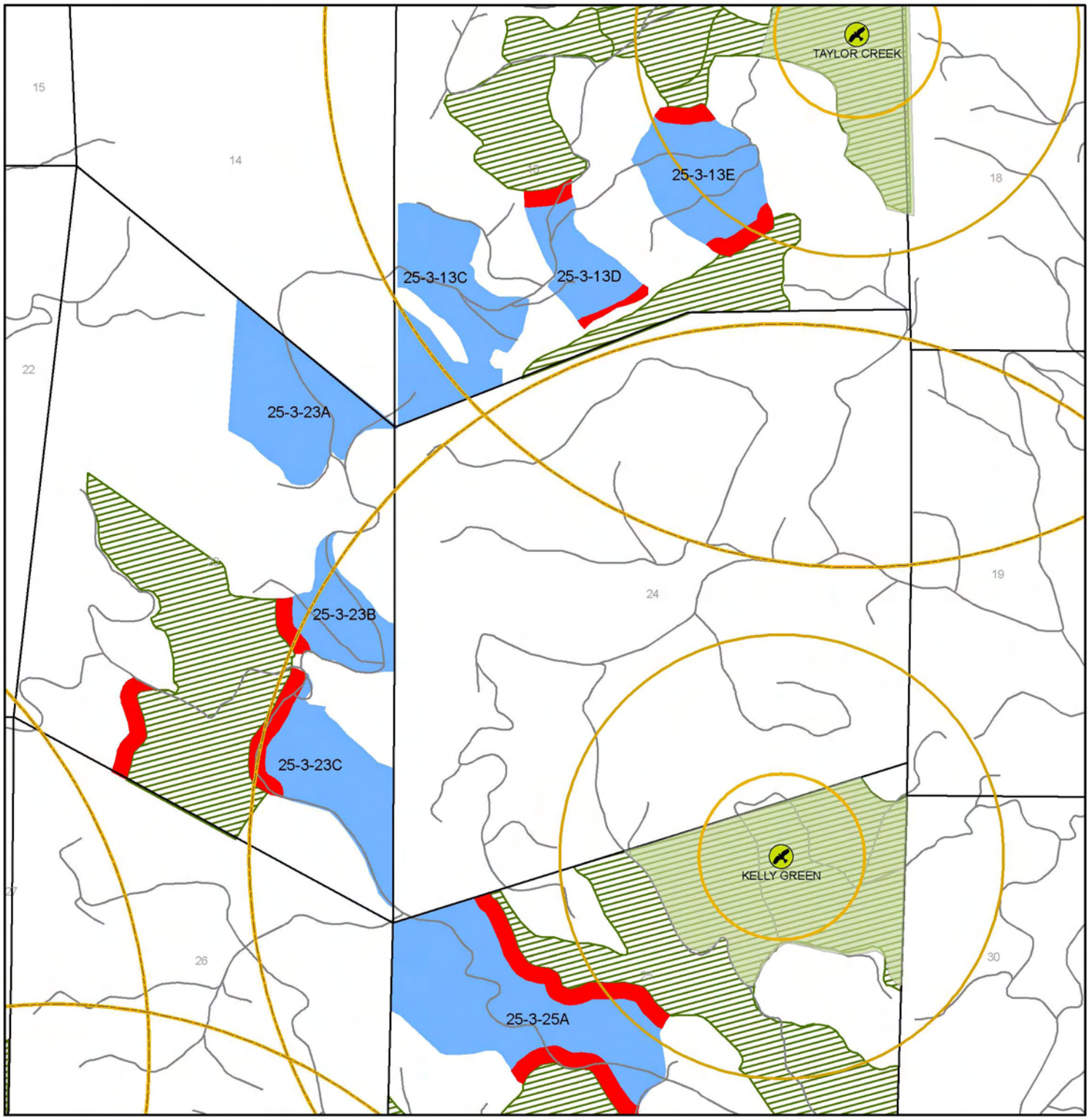
Figure 7. Craven Raven DM / CT Units and Northern Spotted Owl Habitat



Legend

- Owl Activity Center
- Nest Patch
- Core Area
- Home Range
- KOAC
- Suitable Habitat (80+ years)
- Proposed Units
- Craven Raven Unit w/in 65 yds of Suitable Habitat
- Roads

0 1,650 3,300 6,600 Feet

N W E S

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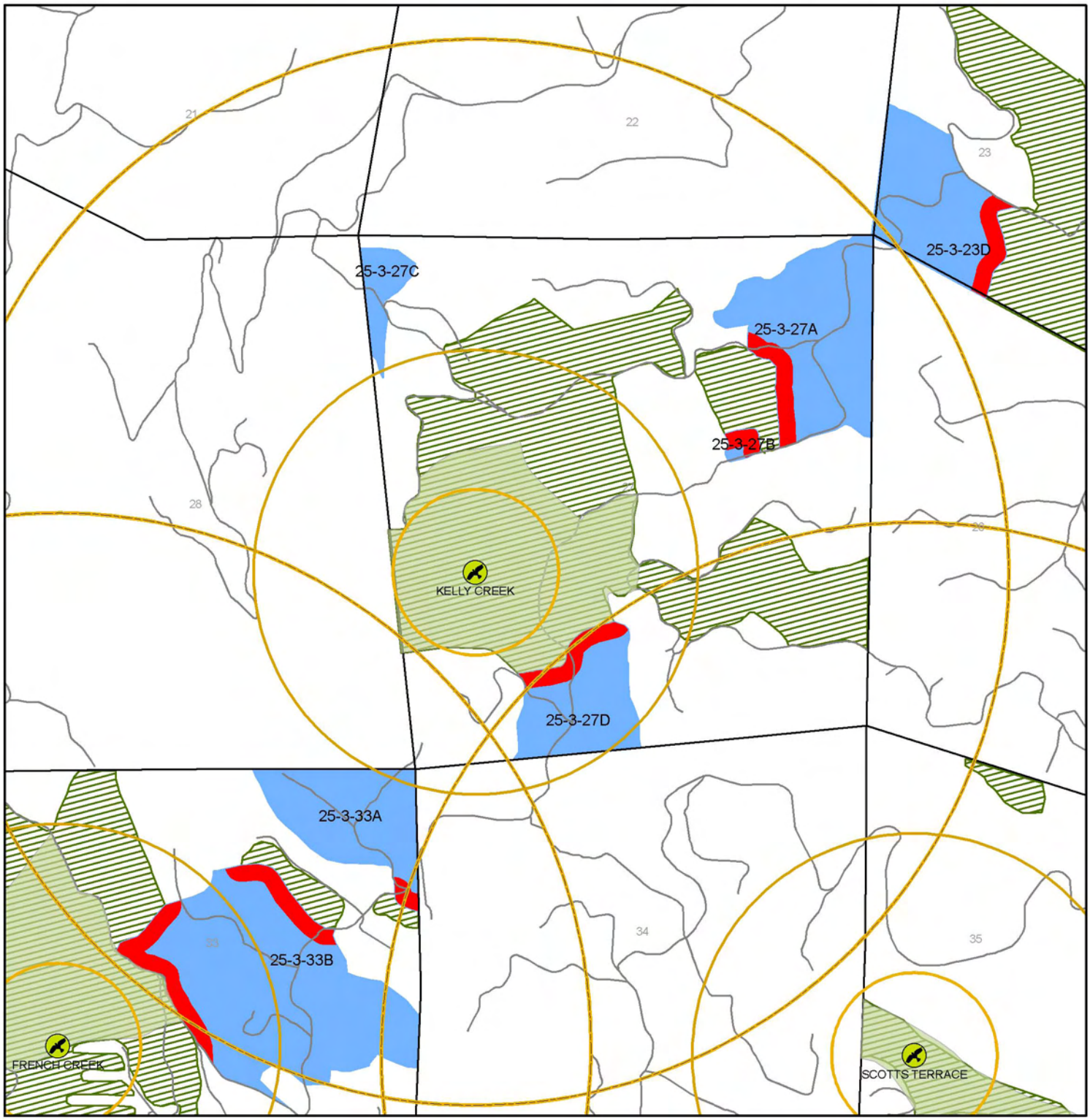
Figure 8. Old Crow DM / CT Units and Northern Spotted Owl Habitat



0 1,450 2,900 5,800 Feet

Legend

- Owl Activity Center
- Nest Patch
- Core Area
- Home Range
- KOAC
- Suitable Habitat (80+ years)
- Proposed Units
- Old Crow Unit Area w/in 65 yds of Suitable Habitat
- Roads

N W E S

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