United States Department of the Interior

BUREAU OF LAND MANAGEMENT
COOS BAY DISTRICT OFFICE
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In Reply Refer To:

1792 (OR-120)
EA OR128-08-02
Slater Rocks

November 10, 2008

Dear Citizen:

Enclosed is a finding of no significant impact (FONSI) for commercial thinning and density management analyzed in the "King Myrtle Environmental Assessment" (EA OR128-08-02). These projects were designed to implement management objectives described in the BLM Coos Bay District Resource Management Plan and Northwest Forest Plan. The environmental assessment analyzes a no-action alternative and a proposed-action alternative.

The Myrtlewood Field Office would thin approximately 724 acres of 30-70 year old forest stands. Management actions would occur within the Matrix, Late-Successional Reserve and Riparian Reserve land-use allocations in the following sub-watersheds listed in Table 1.

Table: 1 Project Area Location by Sub-watershed or Drainage

Watershed (5th field)	Sub-watershed (6th field)	Acres	Treatment Acres
Middle Fork Coquille River	Indian Creek	15,449	248
	Belieu Creek	11,357	294
	Rock Creek	25,544	182
Totals		**52,350**	**724**

The legal descriptions for the proposed project are depicted in the following table:

Table 2: Legal Description for all Units

Township	Range	Sections
29 S.	10 W.	17, 31
29 S.	11 W.	17, 24, 25, 27, 29, 31, 33
29 S.	12 W.	13
30 S.	10 W.	5, 6, 7, 17, 19
30 S.	11 W.	6, 12, 23, 26

You are encouraged to read the EA and comment on the appropriateness of the FONSI prior to the end of the 30-day comment period, December 11, 2008. This EA is located on our BLM web site at http://www.blm.gov/or/districts/coosbay/plans/index.php. The harvests could be accomplished by multiple timber sale contracts in FY 2009 to FY2010. A Decision Document will be published prior to the sale of timber.

Comments, including names and street addresses of respondents, will be available for public review at the address above during regular business hours (8:00 a.m. to 4:30 p.m.), Monday through Friday, except holidays, and may be published as part of the EA document or other related documents. Individual respondents may request confidentiality. If you wish to withhold your name or street address from public review or from disclosure under Freedom of Information Act, you must state this prominently at the beginning of your written comment. Such requests will be honored to the extent allowed by law. All submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, will be made available for public inspection in their entirety.

Questions should be directed to Aimee Hoefs at (541) 751-4498.

Written comments on the EA and appropriateness of the FONSI may be sent to:

BLM Coos Bay District
Attn: Aimee Hoefs
1300 Airport Lane
North Bend, OR 97459-2000

You may e-mail your comments to: OR_CoosBay_Mail@blm.gov, RE: King Myrtle EA OR128-08-02, Aimee Hoefs

Sincerely,

Paul T. Flanagan

Paul T. Flanagan
Myrtlewood Field Manager

Enclosure

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
COOS BAY DISTRICT OFFICE
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In Reply Refer To:
1792 (OR-120)
EA-OR-128-08-02

FINDING OF NO SIGNIFICANT IMPACT (FONSI)
For the
King Myrtle Environmental Assessment
EA-OR-128-08-02

I. Introduction

An Interdisciplinary Team has prepared an Environmental Assessment (EA) for the King Myrtle Project located within the Myrtlewood Field Office of the Coos Bay District Bureau of Land Management. This EA is hereby incorporated by reference. Within this document, the team analyzed two alternatives: a no-action alternative and a proposed action alternative. The no-action alternative describes the effects of not conducting management activities on these lands at this time. The proposed action alternative describes the effects of managing tree densities on approximately 724 acres, creating snags and downed wood, constructing 2.5 miles of new road, renovating or improving 8.5 miles of road, and decommissioning 5.9 miles of roads. The locations for the project area/units are shown in Table 1. Stand treatments would occur in the Matrix, Late-Successional Reserve and Riparian Reserve land-use allocations.

Table 1: Legal Description for all Units

Township	Range	Sections
29 S.	10 W.	17, 31
29 S.	11 W.	17, 24, 25, 27, 29, 31, 33
29 S.	12 W.	13
30 S.	10 W.	5, 6, 7, 17, 19
30 S.	11 W.	6, 12, 23, 26

II. Background

The Coos Bay District (CBD) of the Bureau of Land Management (BLM) is under the direction of the Final Coos Bay District Proposed Resource Management Plan Final Environmental Impact Statement (USDI-BLM 1994) and it's Record of Decision (USDI-BLM 1995), and the Final Supplemental Environmental Impact Statement on Management of Habitat for Late Successional and Old Growth Forest Related Species Within the Range of the Northern Spotted Owl (FSEIS), commonly referred to as the "Northwest Forest Plan" [NFP] (USDA-FS; USDI-BLM 1994a) and its Record of Decision (USDA-FS; USDI-BLM 1994b) as supplemented and amended by:

> *Management of Port-Orford-cedar in Southwest Oregon Final Supplemental Environmental Impact Statement* (USDA and USDI 2004), and its *Record of Decision* (USDI 2004).
>
> *The Final Supplement to The 2004 Environmental Impact Statement to Remove or Modify The Survey and Manage Mitigation Measure Standards and Guidelines* (USDA and USDI BLM 2007) and its *Record of Decision* (USDI 2007).

This EA is also tiered to and in conformance with the *Final Programmatic Environmental Impact Statement Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17Western States* (USDI 2007b) and it's Record of Decision (USDI 2007c).

As stated in the ROD for the NFP, the Aquatic Conservation Strategy (ACS) was developed to restore and maintain the ecological health of watersheds and aquatic ecosystems on public lands within the range of Pacific Ocean anadromy. Consistency of the proposed alternative with the ACS Objectives is included in Chapter 3 of the King Myrtle EA.

III. Finding of No Significant Impact

I am adopting the EA, which indicates that there would not be a significant impact on the quality of the human environment from the implementation of any of the alternatives. This finding and conclusion is based on my consideration of the Council of Environmental Quality's (CEQ) criteria for significance (40 CFR 1508.27), both with regard to the context and intensity of the impacts described in the EA.

Context

The proposed activities are not national or regional in scope. The King Myrtle EA comprises 724 project acres. Table 2 summarizes the project area/units by the three sub-watersheds.

Table 2: Project acres by applicable Sub-watershed or Drainage

Watershed (5th field)	Sub-watershed (6th field)	Acres	Treatment Acres	Percent of Sub-watershed
Middle Fork Coquille River	Indian Creek	15,449	248	1.6
	Belieu Creek	11,357	294	2.6
	Rock Creek	25,544	182	0.7
Totals		**52,350**	**724**	**2.3**

Intensity

Impacts that may be both beneficial and adverse (40 CFR 1508.27(b)(1))

Any impacts, both beneficial and adverse, are not significant as they are consistent with the range and scope of those effects analyzed and described in the 1994 Coos Bay District Final Proposed Resource Management Plan/Environmental Impact Statement to which the EA is tiered.

Public Health and Safety (40 CFR 1508.27(b)(2))

The proposed activities would not significantly affect public health and safety. Adherence to the Oregon Smoke Management Plan (OAR 629-43-043) and the State of Oregon Administrative Rule No. 340-108, *Oil and Hazardous Materials Spills and Releases*, would minimize impacts to Air Quality and from Solid/Hazardous Wastes.

Unique characteristics of the geographic area (40 CFR 1508.27(b)(3))

The proposed activities will have no impact on unique characteristics of the geographic are such as historic or cultural resources, park lands, prime or unique farmlands, wetlands or floodplains, Wild and Scenic Rivers, wilderness, or ecologically significant or critical areas.

Degree to which effects are likely to be highly controversial (40 CFR 1508.27(b)(4))

The effects on the quality of the human environment of the proposed activities are not highly controversial. Four comments were received in response to Scoping for this project (May 8 – June 7, 2007). Comments focused on project design and implementation. No comments were received that I consider highly controversial.

Degree to which effects are highly uncertain or involve unique or unknown risks (40 CFR 1508.27(b)(5))
The possible effects of the proposed activities on the quality of the human environment are not highly uncertain and do not involve unique or unknown risk.

Consideration of whether the action may establish a precedent for future actions with significant impacts (40 CFR 1508.27(b)(6))
The proposed projects do not establish a precedent for future actions or represent a decision in principle about future actions with potentially significant effects.

Consideration of whether the action is related to other actions with cumulatively significant impacts (40 CFR 1508.27(b)(7))
There are no significant cumulative effects identified by this assessment. Although there would be removal of vegetation within the Riparian Reserves and potentially ground-disturbing activities, potential adverse impacts to the aquatic environment (including water quality) are eliminated or substantially avoided through the implementation of project design features such as no-harvest buffers.

Scientific, cultural, or historical resources, including those listed in or eligible for listing in the National Register of Historic Places (40 CFR 1508.27(b)(8))
The proposed activities would not affect districts, sites, highways, structures or objects listed in or potentially eligible for listing in the National Register of Historic Places. Nor would the activities cause a loss or destruction of significant scientific, cultural or historical resources.

Threatened or endangered species and their critical habitat (40 CFR 1508.27(b)(9))

- The Myrtlewood Field Office is in the process of consulting on the effects of noise disturbance and habitat removal on marbled murrelets and northern spotted owls with the U.S. Fish and Wildlife Service in accordance with Section 7(A)(4) of the Act. A Biological Opinion is anticipated and applicable Terms and Conditions would be implemented. The results of this consultation would be disclosed in the decision records for the resulting timber sales.

- Informal consultation with the National Marine Fisheries Service has been initiated concerning effects to the federally listed coho salmon. A Letter of Concurrence is anticipated. The result of this consultation would also be disclosed in the applicable decision records.

- The proposed action would also not result in adverse effects to Essential Fish Habitat as designated by the Magnuson-Stevens Fishery Conservation and Management Act (MSA; 16 U.S.C. 1855 as amended).

Any effects that threaten a violation of Federal, State, or local laws or requirements imposed for the protection of the environment (40 CFR 1508.27(b)(10))
The proposed activities would not violate Federal, State or local laws imposed for the protection of the environment. These include the Clean Air Act and the Clean Water Act.

Analysis has also concluded that implementation of the proposed actions would not contribute to the need to list any Special Status Species as identified in BLM Manual 6840 and BLM OR/WA 6840 policy.

Pursuant to Executive Order 13212, the BLM must consider the effects of this decision on the President's National Energy Policy. As there would be no impact to the exploration, development or transportation of undeveloped energy sources from the proposed action, a Statement of Adverse Energy Impacts is not required.

Based on the analysis of potential impacts contained in the King Myrtle environmental assessment, I have determined that the proposed action would not have a significant impact on the human environment within the meaning of section 102(2) (c) of the National Environmental Policy Act of 1969, and that an Environmental Impact Statement is not required. I have determined that the effects of the proposed silvicultural treatments and associated road management activities are within those anticipated and already analyzed in the *Final Coos Bay District Proposed Resource Management Plan/Environmental Impact Statement* and would be in conformance with the *Record of Decision/Resource Management Plan* for the Coos Bay District.

/s/ Paul T. Flanagan ***November 7, 2008***

Paul T. Flanagan
Myrtlewood Field Manager

King Myrtle

EA OR128-08-02
Coos Bay District
Bureau of Land Management
1300 Airport Lane
North Bend OR 97459

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Chapter I Purpose and Need for Action

1.1 Need for the Project

The *Final - Coos Bay District Resource Management Plan and Environmental Impact Statement* (RMP) (USDI 1994)and its *Record of Decision* (ROD) (USDI 1995) responds to two needs: the need for forest habitat and the need for forest products. These needs were addressed in the RMP through an ecosystem management strategy under which BLM lands "will be managed to maintain healthy, functioning ecosystems from which a sustainable production of natural resources can be provided." The proposed action, as described in this Environmental Assessment, is to implement the Coos Bay District's RMP in the King Myrtle project area. The proposed project would improve stand health, provide a commercial product to support local communities, and restore desired forest habitats within the Riparian Reserve and Late-Successional Reserve land-use allocations. Other than the "no action" alternative, in order for an alternative to be seriously considered, it must be designed to satisfy the objectives described below.

The Coos Bay District declared in the RMP an Allowable Sale Quantity (ASQ) of 27 MMbf per year, which is to be harvested entirely from the Matrix land-use allocation. The Matrix LUA consists of two sub-sets, General Forest Management Area (GFMA) and Connectivity/Diversity Blocks. The King Myrtle stands are a combination of GFMA, Riparian Reserves, and Late-successional Reserves. Timber volume removed from the Riparian Reserves and Late-Successional Reserves do not contribute to the ASQ.

1.2 Purpose (Objectives) of the Project

A reasonable action alternative must meet the objectives provided in the ROD/RMP for projects to be implemented within the planning area. The ROD/RMP and applicable statutes specify the following objectives to be accomplished in managing the lands in the project area:

1. Provide a sustainable supply of timber and other forest commodities to provide jobs and contribute to community stability (p.22) by:
   - Conducting timber harvest and other silvicultural activities in that portion of the Matrix with suitable forest lands (p.22).
   - Selecting logging systems based on the suitability and economic efficiency of each system for the successful implementation of the silvicultural prescription, for protection of soil and water quality, and for meeting other land use objectives (p.52).
   - Providing timber sale volume toward the Coos Bay District Allowable Sale Quantity as required in the Oregon and California Act (O&C Act) of August 28, 1937. The BLM has a statutory obligation under the O&C Act to manage suitable commercial forest lands revested by the government from the Oregon and California Railroad grant (O&C lands) for permanent forest production in accordance with the sustained yield principle.

2. Manage developing stands on available lands to promote tree survival and growth and to achieve a balance between wood volume production, quality of wood, and timber value at harvest (p.52) by:

- Applying silvicultural systems that are planned to produce, over time, forests with desired species composition, structural characteristics, and distribution of seral or age classes (p.53).
- Basing silvicultural treatments and harvest designs on the functional characteristics of the ecosystem and the characteristics of each forest stand site. Treatments would be designed – as much as possible – to prevent the development of undesirable stand characteristics (p.53).

3. Manage the riparian-dependent resources to maintain the existing condition or implement actions to restore conditions by:
   - Applying silvicultural practices for Riparian Reserves to control stocking, re-establish and manage stands, and acquire desired vegetation characteristics (p.13).

4. Manage Late-successional reserves to enhance stocking, structure, or composition by:
   - Conducting thinning operations in forest stands up to 80 years of age. This will be accomplished by precommercial and/or commercial thinning of stands regardless of origin (e.g. planted after logging or naturally regenerated after fire or blowdown) (p.19).

5. Protect, manage, and conserve federally listed and proposed species and their habitats to achieve their recovery in compliance with the Endangered Species Act, approved recovery plans, and the Bureau Special Status Species Program (p.32) by:
   - Providing for important ecological functions such as dispersal of organisms, carryover of some species from one stand to the next, and maintenance of ecologically valuable structural components such as down logs, snags, and large trees (p.22).

1.2.1 Location

The proposed treatment area is located about 30 miles southeast of Coos Bay, Oregon and is bisected by State Highway 42. The total analysis area is 72,223 acres in size. The proposed harvest activities are located in T. 29 S., Ranges 12W, 11W, and 10W; and T. 30 S., Ranges 11W and 10W, Willamette Meridian. All of the units are located in the Belieu Creek, Indian Creek, and Rock Creek sub-watersheds.

1.3 Decision Factors

In choosing the alternative that best meets the purpose and need, consideration would be given to the extent to which each alternative would:

1. Reduce competition-based mortality and increase tree vigor and growth specific to the Matrix;

2. Improve Riparian Reserve/Late-successional Reserve stand structure by thinning out excess trees in overstocked stands to enhance the growth and vigor of the residual trees while retaining structural and habitat components, such as large trees, snags, and coarse wood;

3. Provide timber resources and revenue to the government from the sale of those resources;

4. Provide cost effective management that would enable implementation of these management objectives while providing collateral economic benefits to society;

5. Comply with applicable laws and Bureau policies including, but not limited to: the Clean Water Act, the Endangered Species Act, the O&C Act, The Magnuson-Stevens Fishery Conservation and Management Act, and the Special Status Species Program.

1.4 Conformance with Existing Land Use Plans

This EA is tiered to and in conformance with the *Coos Bay District Resource Management Plan/Final Environmental Impact Statement* (USDI 1994) and its *Record of Decision* (USDI 1995) and the *Final Supplemental Environmental Impact Statement* (FSEIS) *on Management of Habitat for Late Successional and Old Growth Forest Related Species Within the Range of the Northern Spotted Owl (Northwest Forest Plan [NFP])* (USDA and USDI 1994a) and its *Record of Decision* (USDA and USDI 1994b) as supplemented and amended by:

- *Management of Port-Orford-cedar in Southwest Oregon Final Supplemental Environmental Impact Statement* (USDA and USDI 2004) and its *Record of Decision* (USDI 2004b).
- *The Final Supplement to The 2004 Environmental Impact Statement to Remove or Modify The Survey and Manage Mitigation Measure Standards and Guidelines* (USDA and USDI 2007) and its *Record of Decision* (USDI 2007d)

This EA is also tiered to and in conformance with the *Final Programmatic Environmental Impact Statement Vegetation Treatments Using Herbicides On Bureau Of Land Management Lands in 17 Western States* (USDI 2007a) and its *Record of Decision* (USDI 2007c) as well as the *Coos Bay Integrated Noxious Weed Program* (EA OR 120-97-11).

All of these documents are available for review at the Coos Bay District Office of the Bureau of Land Management, during regular business hours. Some of the documents are available at the Coos Bay and North Bend Public Libraries, the Coos Bay District's Internet Home Page at http://www.blm.gov/or/districts/coosbay/index.php , and the Oregon State Office of the Bureau of Land Management in Portland, Oregon.

1.4.1 Endangered Species Act

Consultation with the U.S. Fish and Wildlife Service (USFWS) as provided in Section 7 of the Endangered Species Act (ESA) of 1973 (16 U.S.C. 1536 (a)(2) and (a)(4) as amended) is currently in process and a project level Biological Assessment (BA C08-05) will be submitted for activities causing noise disturbance to northern spotted owls and marbled murrelets during nesting periods. It is anticipated that a Biological Opinion will be returned. All of the appropriate Terms and Conditions will be incorporated.

Informal consultation with the National Marine Fisheries Service has been requested for the threatened Oregon Coast coho salmon. A Letter of Concurrence is anticipated. Additionally, project activities would not adversely affect Essential Fish Habitat under the Magnuson-Steven Fishery Conservation and Management Act (16 U.S.C. 1855(b)).

1.5 Decisions to be Made

The Field Manager of the Myrtlewood Field Office, Coos Bay BLM, must decide whether to conduct commercial and density management thinning within the King Myrtle project area. This project is described in detail starting in Section 2.2.

The Field Manager must also determine if the selected alternative would or would not be a major Federal action significantly affecting the quality of the human environment. If the Manager decides it **would not** significantly affect the quality of the human environment, then the Manager can prepare and sign a FONSI (Finding of No Significant Impact).

If the Manager determines that the selected alternative would significantly affect the quality of the human environment, then the project must either be dropped, modified, or have an EIS (Environmental Impact Statement) and a ROD (Record of Decision) prepared and signed before the King Myrtle project could proceed.

1.6 Public Involvement

The primary purpose of scoping is to identify agency and public concerns relating to a proposed project and helps define the environmental impacts of concern to be examined in detail in the EA. The initial scoping process consisted of an ID Team that identified potential issues that may result in the development of additional alternatives. The general public was notified of the proposed project and EA through publication of the District's semi-annual Planning Update. Additional scoping notices were also sent to adjacent landowners, agencies that have requested these documents, and other interested parties on the District NEPA mailing list. The scoping period for the proposed project ran from May 8 to June 7, 2008.

Additionally, two field trips with BLM and Coquille Indian Tribe representatives to the area adjacent to Euphoria Ridge were conducted to resolve potential impacts to the meadow. Don Ivy and Ed Vaughn, representatives of the tribe, and numerous BLM personnel resolved potential issues in the field.

Chapter II Alternatives

This chapter provides a description of each alternative and summarizes the environmental consequences of the alternatives.

This EA analyzes a no action alternative and a proposed action alternative. Analysis of the no action alternative is required under CEQ regulation §1502.14. For an action alternative to be considered it must meet the purpose and need while not violating any minimum environmental standards. The alternatives developed are consistent with the RMP and satisfy the purpose and need of implementing the RMP.

For harvest unit locations refer to Map extents (A)-(H). Appendix D of the RMP ROD describes the Best Management and Conservation practices for harvest related activities while Appendix E describes the silvicultural objectives of commercial thinning and density management thinning. Research by Tappeiner *et al*. (1997), Poage and Tappeiner (2002) and others (Muir *et al.* 2002) also guide density management treatments.

All quantifications (i.e. acreages, mileages, etc.) are based on estimates obtained from geographic information systems (GIS). Final numbers could vary slightly as the plans are translated to the ground. Harvest volumes for the commercial thinning and density management treatments are estimates derived from stand exam information. These volume estimates are variable and actual volume harvested may differ.

2.1 No Action Alternative

The No Action Alternative provides a baseline for the comparison of the alternatives. This alternative describes the existing condition and the continuing trends. Selection of this alternative would not constitute a decision to reallocate these lands to non-commodity uses. Future harvesting in this area would not be precluded and could be analyzed under a subsequent EA. This alternative would not meet the Purpose and Need.

The project area would not receive the treatments described in this document in the foreseeable future. Ongoing activities would continue to occur. These include silvicultural activities in young stands, compliance with Oregon fire control regulations, construction of roads across BLM land under existing right-of-way agreements, routine road maintenance, control of noxious weeds, and projects covered by earlier records of decision. Timber harvest on adjacent private lands would occur and would be guided by Oregon Forest Practices Act.

2.2 Proposed Action Alternative

The proposed action is to implement silvicultural treatments on approximately 700 acres of BLM administered lands. This action would include thinning of conifer stands in the GFMA, Late-successional Reserves (LSR), and Riparian Reserve (RR) land-use allocations. All of the thinning treatments in this action would yield commercial wood products; however, thinning in the GFMA is termed commercial thinning (CT) while thinning in the LSR and RR is termed density management thinning (DMT) because of differing management objectives.

Table II-1 Project Area Acres* and Locations for Each Proposed Sale

Sale Name	No. of Units	Estimated CT Acres (Matrix)	Estimated DMT Acres (LSR)+	Estimated DMT Acres (RR)	Total Treated Acres	Dropped or Buffer Acres**	Location T. R. S.
Belieu Creek CT	11	137	76	83	296	769	29-10-17,31; 30-10-5,6,7; 30-11-12
Jersey Jim CT	6	170	0	55	225	662	29-11-17,24,25,27; 29-12-13
Shark Bait	5	58	0	29	87	372	29-11-29,31,33; 30-11-6
Rock Creek CT	7	52	0	29	81	364	30-10-19; 30-11-23,26
Misc. CT Units	3	24	0	11	35	143	30-10-17
Totals	**32**	**441**	**76**	**207**	**724**	**2310**	

Stand exams conducted on 1916 acres and included every unit.
*Based upon final field review, some minor adjustments in these acreage estimates may be necessary.
+ Includes RR acres in LSR

The timber harvest activities and road work activities are summarized in Table II-2. Road-related activities include new construction, road renovation, improvement, and maintenance, and road decommissioning. Silvicultural activities are described in detail in Section 2.3 while roads are in Section 2.4.

Table II-2 Proposed Action Summary

Activity		Total	
Timber Harvest	Commercial Thinning (GFMA)	441 acres	
	Density Management (LSR)	76 acres	
	Density Management (RR)	207 acres	
Timber yarding	Cable yarding	678 acres	
	Ground based yarding	46 acres	
Timber hauling	All Season / Gravel Roads	48.2 miles	
	All Season / Paved Roads	6.7 miles	
	Dry Season / Dirt Roads	1.7 miles	
	Dry Season / Gravel Roads	8.7 miles	
	Dry Season / Paved Roads	1.8 miles	
Road Activities	Construction	2.5 miles	
	Renovation	6.5 miles	
	Improvement	1.8 miles	
	Decommissioning (Total)	5.9 miles	
	Decommissioning (Net)*	3.4 miles	
	Haul Route Maintenance	57.2 miles	
Open Road Density on BLM (miles/mile^2)	Analysis Area	**No Action**	**Proposed Action**
		5.12	4.90
	Middle Fork Watershed (5th Field)	**No Action**	**Proposed Action**

***Net Decomm** does not include new construction that is to be decommissioned or existing roads currently decommissioned

All proposed units would be harvested using a combination of skyline cable and ground-based equipment (Table II-3). Cutting of trees would either be done manually with chainsaws or with a mechanical harvester. One-end log suspension with full suspension over stream channels would be required during inhaul for the skyline cable system. Specific Project Design Features are located in Section 2.5.

Table II-3 Yarding Systems by Units

Sale Name	EA Unit No. *	Cut-to-length/ forwarder	Skyline cable		Unit Acres
			Downhill yarding	Uphill Yarding	
Belieu Creek CT (357 ac.)	BFS02	0	0	29	29
	BFS03	0	0	18	18
	BFS17	2	0	24	26
	BFS19	0	0	11	11
	BFS20	0	0	5	5
	BFS21	2	2	39	43
	BFS23	3	0	32	35
	BFS24	0	0	38	38
	BFS25	0	0	19	19
	LRC01	0	0	35	35
	LRC25	0	0	37	37
		7	**2**	**287**	**296**
Jersey Jim CT (228 ac.)	BFS08	15	0	11	26
	BFS11	0	0	29	29
	BFS16	0	0	12	12
	IC05	15	8	10	33
	IC06	0	0	92	92
	IC09	0	0	33	33
		30	**8**	**187**	**225**
Shark Bait CT (87 ac.)	IC10	0	0	25	25
	IC11	0	0	7	7
	IC14	0	0	43	43
	IC15	3	0	4	7
	IC18	0	0	5	5
		3	**0**	**84**	**87**
Rock Creek CT (81 ac.)	LRC07	0	0	26	26
	LRC08	0	0	2	2
	LRC09	1	0	16	17
	LRC10	2	0	4	6
	LRC13	0	0	4	4
	LRC17	0	0	23	23
	LRC23	0	0	2	2
		3	**0**	**78**	**81**
Misc. Units (35 ac.)	LRC102	3	0	0	3
	LRC103	0	0	6	6
	LRC21	0	0	26	26
		3	**0**	**32**	**35**
Totals		**46**	**10**	**668**	**724**

This alternative would contribute to the need for forest products by providing an estimated 9 MMbf of timber through a combination of commercial thinning and density management treatments. Commercial thinning of young stands would provide an estimated 4.5 MMbf of timber towards meeting the Districts' ASQ. Density management in Riparian Reserves and LSR would not contribute to the ASQ; however, an additional 4.5 MMbf of timber would be supplied to the local economy.

2.3 Silvicultural Treatments

2.3.1 Commercial Thinning Prescription

The commercial thinning (CT) treatments in the GFMA are designed to:

- increase the proportion of merchantable volume in the stand
- produce larger, more valuable logs over time
- anticipate mortality of small trees as the stand develops
- maintain good crown ratios and stable, wind firm trees
- accelerate development of trees that can later provide large-diameter snags and down logs
- manage species composition

The GFMA stands would be thinned from below by primarily cutting the overtopped, intermediate, and co-dominant conifers (Douglas-fir, western hemlock, and grand fir) and red alder to obtain the desired relative density. Other species of conifer and hardwood may be retained to provide species, spatial, and structural diversity. The residual trees would be distributed across the site to rapidly capture the growing space made available by the thinning and would be the trees with the largest crowns and diameters relative to other trees in the immediate area.

Relative density (RD) "expresses the actual density of trees in a stand relative to the theoretical maximum density (RD100) possible for trees of that size" (Hayes *et al.* 1997). It is a measure used to estimate when a stand reaches a density where diameter growth begins to decline and suppression mortality increases (Table II-4). RD increases for a given number of trees per acre as stem diameters increase. RD decreases for a given stem diameter if the number of trees per acre decrease. At this stage, stands require manipulation in density to maintain a positive growth rate.

Dense young stands in the GFMA would be thinned to a relative density of roughly 35. Thinning to this density is considered a light thinning typical for stands intended for timber production (Hayes *et al.* 1997). For Douglas fir stands, a RD of 55 is at the lower threshold of imminent competition mortality and trees have small live crowns that cover only the upper 35% to 40% of the stem (Drew and Flewelling 1979). A RD of 35 is considered full site occupancy from an operational perspective. A stand with a RD of 35 is producing approximately 75% of the gross volume periodic annual increment of what that stand would produce if it had sufficient stocking to be at the lower limit of self-thinning (Long *et al.* 1981). As depicted in Table II-4, all stands in the project area exceed this density. A Douglas-fir stand with a RD of 25 to 35 is considered less than fully occupied and capable of understory development (Hayes *et al.* 1997). Stands with a RD of 15 are just at the threshold of crown closure – when the entire area of the stand is first covered by crown.

The prescriptions in the GFMA would result in an average of 100 trees per acre being retained with a range between 50 and 150 (variable densities). Post-treatment canopy closure would be greater than 60%. Port-Orford cedar (POC) would be left at a spacing no closer than 25' x 25' or within 50 feet of a road to maintain presence in the stand and reduce likelihood of POC root rot disease spread. Pacific yew, Western redcedar, myrtlewood, and big leaf maple would be reserved to maintain species diversity. Red Alder would be removed except in portions of units (size) where no suitable conifer or other hardwood species occur.

Table II-4 Comparison of current stand conditions using stand exam data and the projected cut and post-thinning results using the SPS model. This is the Commercial Thinning prescription with a RD of 35.

		Current Stand Condition						Cut				Residual Stand		
Sale Name	EA Unit #	TPA	BA/ Acre.	Avg. DBH	RD	Est. Total Age	Vol/Ac. (Mbf)	TPA	BA/ Acre	Avg. DBH	Net Vol/Ac. (Mbf)	TPA	BA/ Acre	Avg. DBH
Belieu Creek CT	BFS02	210	208	13.4	63	39	36.9	120	77	10.8	13.2	93	142	16.7
	BFS03	167	181	14.1	48	41	34.9	78	52	11.0	10.4	92	143	16.8
	BFS17	265	181	11.2	54	32	22.8	146	67	9.2	8.2	124	130	13.8
	BFS19	295	210	11.4	62	31	27.6	184	101	10.0	13.5	119	132	14.2
	BFS20	208	167	12.1	48	40	27.4	93	46	9.5	7.2	117	132	14.4
	BFS24	263	166	10.8	51	35	19.1	161	89	10.1	13.4	93	142	16.7
	BFS25	218	155	11.4	46	34	19.9	88	42	9.3	3.8	132	126	13.2
Jersey Jim CT	BFS08	155	187	14.8	49	37	33.4	63	57	12.9	10.0	94	141	16.5
	BFS11	267	177	11.0	53	33	37.3	146	67	11.0	6.5	124	130	13.8
	BFS16	190	172	12.9	48	38	26.3	87	46	9.8	6.9	105	137	15.5
	IC05	180	193	14.0	52	34	28.4	93	66	11.4	8.8	90	144	17.1
	IC06	181	209	14.5	55	43	43.3	103	72	11.3	12.6	81	150	18.4
	IC09	161	215	55.6	54	47	47.7	103	58	10.1	9.4	59	166	22.6
Shark Bait CT	IC10	366	205	10.1	65	34	34.6	244	93	8.3	15.2	132	127	13.3
	IC11	153	138	12.9	38	31	19.2	40	23	10.3	3.3	155	133	14.6
	IC14	222	187	12.4	53	31	27.6	119	70	10.4	9.9	108	137	15.2
	IC15	217	182	12.4	53	31	25.9	113	62	10.0	8.6	107	135	15.2
	IC18	323	195	10.5	60	32	26.9	198	84	8.8	11.1	132	127	13.3
Rock Creek CT	LRC07	212	190	12.8	53	37	29.3	125	60	9.4	8.9	92	144	16.9
	LRC08	212	190	12.8	53	37	29.3	125	60	9.4	8.9	92	144	16.9
	LRC09	233	183	12.0	53	35	29.4	118	63	9.9	8.9	118	132	14.3
	LRC10	321	183	10.2	57	31	27.0	182	77	8.8	12.0	146	123	12.4
	LRC13	209	176	12.4	50	33	25.5	102	64	10.7	8.9	111	134	14.8
	LRC17	163	308	18.6	71	56	87.4	114	148	15.4	38.9	52	173	24.6
	LRC23	205	180	12.7	51	37	26.6	94	57	10.5	6.6	114	134	14.7
Misc. Units	LRC102	223	340	16.7	83	61	76.2	171	199	14.6	35.2	65	163	21.3
	LRC103	258	320	15.1	82	62	60.9	211	175	12.3	22.7	59	165	22.5
	LRC21	194	236	14.7	61	37	40.6	124	98	12.0	16.9	74	153	19.4

2.3.2 Density Management Thinning Prescription in Riparian Reserve

The density management thinning (DMT) treatments in the RR are designed to:

- promote development of large conifers
- recruit large woody debris
- improve diversity of species composition and stand density
- promote forest health
- promote an understory/shrub layer
- develop within-stand complexity

Density management thinning would occur in Riparian Reserves adjacent to and contiguous with the commercial thinning units where thinning would be beneficial to the development of riparian conditions. Density management thinning prescriptions are applied to accelerate the growth of individual trees within the Riparian Reserves. DMT differs fundamentally from conventional commercial thinning in that the intent of treatment is not to prepare the stand for a final harvest but to redirect the stand development trajectory to provide desired future stand structural conditions. Operationally, DMT is very similar to conventional commercial thinning.

In this Alternative, dense young stands in Riparian Reserves would be treated to a relative density of 25, which is considered a "heavy thinning" by Hayes *et al.*(1997) and would promote understory development and vertical diversity (Table II-5). Spacing would vary throughout the

units based primarily on the distribution of trees in different diameter classes. Stands would be thinned from below by cutting the overtopped, intermediate, and co-dominant conifers (Douglas-fir, western hemlock, and grand fir) to obtain the desired relative density. The Riparian Reserve width of one site potential tree height has been calculated to be 200 feet slope distance in the Middle Fork Coquille Watershed.

Treatments in Riparian Reserves of this age are the beginning of a process designed to accelerate development of late-successional forest characteristics and improve habitat conditions for riparian dependent/associated species.

Table II-5 Comparison of current stand conditions using stand exam data and the projected cut and post-thinning results using the SPS model. This is the Density Management Thinning prescription for Riparian Reserves with an RD of 25.

		Current Stand Condition						Cut				Residual Stand		
Sale Name	EA Unit #	TPA	BA/ Acre.	Avg. DBH	RD	Est. Total Age	Vol/Ac. (Mbf)	TPA	BA/ Acre	Avg. DBH	Net Vol/Ac. (Mbf)	TPA	BA/ Acre	Avg. DBH
Belieu Creek CT	BFS02	210	208	13.4	63	39	36.9	151	115	11.8	20.5	62	104	17.5
	BFS03	167	181	14.1	48	41	34.9	111	88	12.1	17.2	59	106	18.1
	BFS17	265	181	11.2	54	32	22.8	190	101	10.0	12.6	80	96	14.8
	BFS19	295	210	11.4	62	31	27.6	226	136	10.0	18.7	77	97	15.1
	BFS20	208	167	12.1	48	40	27.4	139	78	10.1	12.4	70	100	16.0
	BFS21	228	176	11.9	51	31	25.5	156	96	10.6	13.3	76	97	15.2
	BFS23	242	169	11.3	50	31	23.7	132	127	13.3	7.8	85	93	14.1
	BFS24	263	166	10.8	51	35	19.1	195	125	10.9	18.6	59	106	18.1
	BFS25	218	155	11.4	46	34	19.9	136	74	10.0	8.4	85	94	14.2
	LRC01	178	262	16.4	65	57	67.5	121	146	14.0	33.0	57	116	19.4
	LRC25	178	262	16.4	65	57	67.5	121	146	14.0	33.0	57	116	19.4
Jersey Jim CT	BFS08	155	187	14.8	49	37	33.4	93	95	14.0	17.2	65	103	17.1
	BFS11	267	177	11.0	53	33	37.3	126	82	11.0	12.5	79	96	14.8
	BFS16	190	172	12.9	48	38	26.3	105	137	15.5	6.9	67	102	16.7
	IC05	180	193	14.0	52	34	28.4	124	104	12.0	15.1	59	106	18.0
	IC06	181	209	14.5	55	43	43.3	124	97	12.0	17.5	60	125	19.5
	IC09	161	215	55.6	54	47	47.7	127	101	12.0	19.2	35	122	25.0
Shark Bait CT	IC10	366	205	10.1	65	34	34.6	296	125	9.0	21.7	81	95	14.7
	IC11	153	138	12.9	38	31	19.2	81	58	11.0	8.6	74	99	15.6
	IC14	222	187	12.4	53	31	27.6	158	105	11.0	15.3	69	101	16.4
	IC15	217	182	12.4	53	31	25.9	150	99	11.0	13.9	70	99	16.0
	IC18	323	195	10.5	60	32	26.9	247	117	9.0	15.4	84	94	14.3
Rock Creek CT	LRC07	212	190	12.8	53	37	29.3	159	99	11.0	14.8	57	105	18.3
	LRC08	212	190	12.8	53	37	29.3	159	99	11.0	14.8	57	105	18.3
	LRC09	233	183	12.0	53	35	29.4	159	99	11.0	15.0	77	97	15.1
	LRC10	321	183	10.2	57	31	27.0	238	108	9.0	16.6	90	92	13.7
	LRC13	209	176	12.4	50	33	25.5	139	100	11.0	15.0	75	98	15.4
	LRC17	163	308	18.6	71	56	87.4	131	193	16.0	51.5	34	128	26.0
	LRC23	205	180	12.7	51	37	26.6	129	95	11.6	12.5	78	96	14.9
Misc Units	LRC102	223	340	16.7	83	61	76.2	193	245	15.2	46.0	44	117	22.1
	LRC103	258	320	15.1	82	62	60.9	233	215	13	29.5	37	124	24.5
	LRC21	194	236	14.7	61	37	40.6	145	142	13.4	26.5	53	109	19.3

2.3.3 Density Management Thinning Prescription in Late-Successional Reserve

Density management thinning (DMT) in late-successional reserves (LSRs) is designed to be beneficial to the creation of late-successional habitat (USDI 1995). The South Coast-North Klamath Late-Successional Reserve Assessment (LSRA) (USDA and USDI 1998) offers suggestions, but not management direction, as to stand treatments in the LSR allocations within the Analysis Area. LSR stands in the Analysis Area are part of LSR 260, a small LSR designed to provide late-successional refugia in this physiographic province. The LSRA identifies

improving habitat connections to other LSRs and creating blocks of late-successional habitat where absent in LSR 260 as a medium priority. Within LSR 260, a selection criterion for stand treatment includes stands at the periphery of existing larger patches of late-successional habitat: this describes all proposed LSR treatment units in the Analysis Area. Younger stands (< 30 years old (YO)) are identified as a high priority for treatment; stands > 30 YO are identified as medium-low priorities (USDA and USDI 1998). The LSRA suggests that single-canopied stands with low within-stand diversity < 80 YO should be considered potential treatment units, regardless of age [1]. In general, the LSRA states that DMT should be directed towards accelerating stand development and diversity of canopy structure.

The Analysis Area includes three LSR units considered for DMT: LRC25, BFS23, and BFS21. LRC25 is roughly 60 YO; BFS23 and BFS21 are roughly 30 YO. LRC25 supports some residual overstory tree structure but does not support patches of trees with characteristics of potential marbled murrelet (MAMU) structure as defined in relevant guidance (USDI 2004a). Treatment for this stand has thus been designed to be consistent with Level 2 guidance Option 3 (USDI 2004a), to enhance or buffer any existing or developing marbled murrelet habitat (i.e., tree structures).

Density management treatment in LSR and Matrix portions of LRC01/LRC25

The density management thinning (DMT) developed for this stand has been designed with the following objectives, suggested by the LSRA (USDA and USDI 1998):

- Retain all residual overstory trees (1880's cohort). Facilitate retention of large lower limbs in a subset of these trees (< 50%), and buffer microclimate and minimize potential damage (limb loss) in a different subset (> 50%).
- Maintain or improve growth rates for 1940's-cohort trees by reducing cohort density. Thin from below, retaining all conifers > 18 in. DBH.
- Increase horizontal stand diversity (e.g., create canopy gaps). Maintain or improve vertical diversity by enhancing both residual overstory tree canopy layers and hardwood and tolerant conifer understory layers.
- Maintain hardwood richness and diversity. Retain all minor conifer species (e.g., grand fir, western hemlock) and hardwoods (e.g., tanoak, red alder).
- Create a (modest) density of legacy structures (snags and downed wood) commensurate with this stage (Young) of stand development (Table II-7). Retain pockets of high density in the 1940's cohort to ensure future snag development.

Note that although roughly half of the treated stand would be in the Matrix LUA (i.e., unit LRC01), the same prescription would be applied to both units within the stand.

Above Road in LRC01/LRC25

The Riparian Reserve prescription (RD 25 with retention of hardwoods and minors) would be applied to LSR and Matrix areas above Rd 30-11-12.0. Portions of this area have low conifer stocking, and would not be amenable to a diameter limit thinning. Naturally occurring gaps in this stand would be largely maintained with this thinning, and thinning in dense portions would facilitate continued high rates of overstory tree growth.

LSR portions of BFS23

The density management thinning (DMT) developed for this young stand has been designed with the following objectives, suggested by the LSRA (USDA and USDI 1998):

[1] LRC01 is functionally a single-canopied stand, although it supports a very low density of residual trees.

- Maintain high growth rates for the dominant and co-dominant trees in the stand by reducing stand density. Thinning from below to RD 25 would promote some ground-layer development and facilitate development of large overstory dominant trees.
- Maintain conifer and hardwood richness and diversity. Retain minor conifer species including all western hemlock and western red cedar. Retain hardwoods (e.g., tanoak). Retain red alder in riparian ecotones.
- Retain pockets of high density for shade-tolerant species (western hemlock), to increase horizontal structural diversity and ensure near-term snag development.

LSR portions of BFS21

Because LSR portions of BFS21 cover less than 10 acres, LSR portions of the unit would be treated similarly to matrix portions of the unit. This RD 35 thinning would maintain growth rates in overstory trees for several years, allow options for management in later years, and provide some level of suppression mortality in coming decades.

Table II-6 Comparison of current stand conditions using stand exam data and the projected cut and post-thinning results using the SPS model. This is the thinning prescription for Late-Successional Reserves and associated stands as described above.

Current Stand Condition							Cut				Residual Stand		
EA Unit #	TPA	BA/ Acre.	Avg. DBH	RD	Est. Total Age	Vol/Ac. (Mbf)	TPA	BA/ Acre	Avg. DBH	Net Vol/Ac. (Mbf)	TPA	BA/ Acre	Avg. DBH
BFS21	228	176	11.9	51	31	25.5	115	61	10	7.9	117	132	14.3
BFS23	242	169	11.3	50	31	23.7	132	127	13.3	7.8	85	93	14.1
LRC01	178	262	16.4	65	57	67.5	112	126	14.0	34.6	66	136	18.1
LRC25	178	262	16.4	65	57	67.5	112	126	14.0	34.6	66	136	18.1
LRC 25/01 – Above road	178	262	16.4	65	57	67.5	121	146	14.0	33.0	57	116	19.4

2.3.4 Stand Structure

The following table shows activities, if applicable, which would be implemented to meet the management direction for harvest units within Matrix lands to retain snags sufficient to "support species of cavity-nesting birds at 40 percent of potential population levels." There are also requirements for down wood levels. Table II-7 summarizes the analysis relating to stand structure located in Chapter 3. These activities would occur in both CT and DMT areas. Units that are not listed do not have average tree diameters large enough to meet the ROD requirements.

Table II-7 Snag and/or Down Wood (DW) creation by Units where applicable.

Sale Name	Unit Number	Activity	Sale Name	Unit Number	Activity
Belieu Creek	BFS02	Snags	Jersey Jim	IC09	Snags/DW
	BFS03	Snags	Rock Creek	LRC07	Snags
	LRC01	Snags/DW		LRC08	Snags
Jersey Jim	BFS08	Snags		LRC17	Snags/DW
	BFS16	Snags	Misc. Units	LRC102	Snags/DW
	IC05	Snags		LRC103	DW
	IC06	Snags		LRC21	Snags/DW

2.4 Road Management

Road management for this project consists of developing and maintaining a transportation system that serves the project needs in an environmentally sound manner as directed by the Coos Bay RMP/ROD and the Western Oregon Districts Transportation Management Plan (USDI 2002).

This would involve construction of new roads, renovation and improvement of existing roads, maintenance of roads necessary to facilitate harvest operations, and decommissioning of roads at the completion of the project.

Construction of new roads and use of existing roads in this project have generally been designed to allow yarding and hauling operations to occur at all times during the year. In order for year-round operations to occur, the proposed action includes rocking the surface of most newly constructed roads and existing roads that are dirt or have a rock surface inadequate for winter operations. This would allow harvest operations to occur outside of established timing restrictions pertaining to marbled murrelet and spotted owl nesting periods.

2.4.1 New Road Construction

New road construction would consist of approximately 1.3 miles of rocked surface roads and 1.2 miles of dirt surfaced roads (Table II-8). The type of road to be constructed and the location of the road would generally be governed by the BMPs listed in the Project Design Features in Section 2.2.3. Approximately 0.3 miles of new road construction would occur within the Riparian Reserves with some additional roadside landings constructed along existing roads in the upland portion of the Riparian Reserve. Landing construction would consist of creating wide spots to facilitate safe yarding and loading of logs and are typically about ¼ acre in size, which includes the existing roadbed. As development of each individual timber sale progresses and becomes more refined, some short unplanned spur roads or landings may be required that better facilitate harvest operations.

Table II-8 New Road Construction Estimates by Unit

Sale Name and Number	EA Unit	EA Spur No.	Surface Type	Haul Season	Closure Type	Miles	Totals
Belieu Creek CT 09-01	BFS21	BFS21-1	Rock	All	Decommission	0.03	0.41
	BFS23	BFS23-1	Rock	All	Decommission	0.02	
	BFS02	BFS02-1	Dirt	Summer	Full Decommission	0.03	
		BFS02-2	Dirt	Summer	Full Decommission	0.33	
Jersey Jim CT 09-02	BFS11	BFS11-1	Rock	All	Decommission	0.03	0.95
	BFS16	BFS16-2	Dirt	Summer	Full Decommission	0.20	
		BFS16-3	Dirt	Summer	Full Decommission	0.04	
	IC06	IC06-1	Rock	All	Decommission	0.27	
		IC06-2	Rock	All	Full Decommission	0.01	
		IC06-3	Dirt	Summer	Full Decommission	0.11	
	IC09	IC09-1	Rock	All	Decommission	0.18	
		IC09-3	Rock	All	Decommission	0.11	
Shark Bait CT 09-03	IC10	IC10-1	Dirt	Summer	Full Decommission	0.13	0.32
	IC18	IC18-1	Dirt	Summer	Full Decommission	0.19	
Rock Creek CT 10-01	LRC07	LRC07-1	Rock	All	Decommission	0.20	0.43
	LRC08	LRC08-1	Rock	All	Decommission	0.09	
	LRC21	LRC21-3	Rock	All	Decommission	0.00	
	LRC17	LRC17-1	Dirt	Summer	Full Decommission	0.14	
Misc. Units	LRC103	LRC103-1	Rock	All	Decommission	0.12	0.35
	LRC21	LRC21-2	Rock	All	Decommission	0.06	
		LRC21-3	Rock	All	Decommission	0.02	
		LRC21-4	Rock	All	Decommission	0.15	
						2.5	

Decommission miles	**1.3**
Full Decommission miles	**1.2**

2.4.2 Road Renovation/Improvement

Renovation includes those roads that have generally been neglected, may not have been used in several decades, are closed with vegetation or debris, and/or would require substantial work

within the road prism to return the roads back to their original condition. Activities may include clearing brush and/or trees within the road prism, cleaning or replacing ditch relief /stream crossing culverts restoring proper road surface drainage, grading, or other maintenance.

Road improvement consists of increasing the existing road standard to a higher design standard by adding capital improvements such as additional ditch relief culverts, surfacing existing dirt roads, or adding rock to existing rocked roads. For this project all road improvement involves adding a gravel surface to an existing dirt road.

Rocked surfaced roads would extend cable harvesting and hauling during the winter season to allow work outside of murrelet and owl seasonally-restricted periods and to reduce yarding damage in stands where hemlock would be a major component of the residual stands.

2.4.3 Road Decommissioning

A total of 5.9 miles of road would be decommissioned or fully decommissioned resulting in a net decrease of 3.4 miles of open road in the watershed. This equates to reduction in the open road density on BLM lands in the watershed of 0.06 miles/sq. mile.

Roads to be "Decommissioned" would be closed to vehicles on a long term basis (> 5 years) but may be opened and maintained for future use. They would be left in an erosion–resistant condition by installing waterbars, eliminating diversion potential at stream channels, stabilizing or removing fills on unstable areas, and treating exposed soil areas. All new construction that is to be rocked would be decommissioned.

Roads to be "Fully Decommissioned" would also be left in an erosion–resistant condition; however, additional measures designed to restore hydrological flow such as tilling of the road bed and removing stream crossing fills and culverts may be adopted.

2.4.4 Haul Route Maintenance

There would be a total of 57.2 miles of existing roads that would receive maintenance to facilitate traffic associated with the proposed action. This routine maintenance consists of, but is not limited to, brushing to control vegetation, cleaning of drainage ditches, maintaining the road surface (such as grading), and removal of road debris creating safety hazards (slough material, fallen trees, etc.). These roads are currently open for travel and are maintained on a regular basis thereby only requiring minimal maintenance for this project. For individual road information, see (Table 1 in Appendix B)

Table II-9 Road Work Summary* - Renovation, Improvement, Maintenance, and Closures.

	Road Work miles			Road Closures		
	Renovation	**Improvement**	**Maintenance**	**Full Decomm.**	**Decomm.**	**Temporary**
Belieu Creek	1.66	0.51	13.01	-	1.78	0.20
Jersey Jim	0.91	0.48	13.97	0.40	0.48	-
Shark Bait	1.65	0.18	9.44	-	0.18	1.40
Rock Creek	1.77	0.28	13.38	-	0.58	1.58
Misc. units	0.50	0.51	7.43	-	-	-
Totals	**6.5**	**2.0**	**57.2**	**0.40**	**3.2**	**3.2**

* This is in addition to and separate from the New Construction

2.5 Design Features for the Proposed Action

Design features are site-specific measures, restrictions, requirements, or mitigations included in the design of a project in order to reduce adverse environmental impacts.

2.5.1 Silviculture Operations

- Tree felling would be accomplished by a mechanical harvester or hand-felled with chainsaws.
- Trees would be felled away from all unit boundaries, reserves, and property lines.
- Existing snags would be reserved from cutting except those that must be felled to meet safety standards. Snags felled or accidentally knocked over would be retained on site.
- Existing down logs in decay classes 3, 4, and 5 would be reserved. Existing down logs greater than 20-inches in diameter on the large end would be reserved from cutting and/or removal during logging operations. These down logs would be protected from damage during logging operations to the extent possible.
- Cable yarding, with one-end or full log suspension would be required.

Riparian Reserves

- The prescription in Riparian Reserves would favor leaving minor conifer species and retain hardwoods and Pacific yew.
- A 50-foot no-harvest buffer would be retained adjacent to perennial streams. Buffer distances would be measured starting from a stream bank, an identifiable topographic break near the bank (generally, the top of a steep inner gorge), or from the streamside edge of vegetation, whichever is greater. Trees harvested adjacent to this buffer would be felled away from the streams where feasible.
- Full suspension would be required across all stream channels.
- No harvest would occur within five feet of identifiable intermittent stream channels.
- Trees felled in yarding corridors within the 50-foot no-harvest buffer and within five feet of intermittent streams would be felled toward the channel and left on site.
- Ground based equipment would stay 20 feet back from the channel, as measured from the edge of the inner gorge. Ground-based equipment would not cross stream channels or wetlands.

Ground-Based areas

- Ground-based equipment would be restricted to the dry season when soil moistures are below the 25% threshold. This threshold is defined as when soil moisture content measurements, taken 2 to 4 inches below the organic layer, are below 25%. This is typically May through October. Soil moisture contents above 25% may require the discontinuation or limitation of ground-based operations in order to prevent excessive compaction.
- If tractors are used for log skidding, skid trails would be designated with the objective of having less than 12 percent of a harvest area affected by compaction. Existing skid [trails] would be used to the extent practical (ROD, D-5 #8a).
- Tractors would be restricted to slopes of less than 35 percent and used only during the dry season (ROD, D-5 #8b).
- Forwarder/harvester operations would utilize slash layers created by the harvesting process to limit bare soil exposure.
- A crawler tractor may be used in conjunction with road construction to skid logs within the road construction right-of-way.
- Drainage and erosion control measures, including water-barring of skid trails, would be applied to bare soil areas following use and prior to winter rains (ROD, D-5 #8f).

- Access points for skid trails would be blocked with logging debris to prevent vehicle access after harvest operations are completed.

Cable-Yarding areas

- A skyline cable system with 75-foot lateral yarding capability would be required.
- Full log suspension or seasonal yarding restrictions (dry season only) would be required as operationally feasible on the following fragile soil areas as designated in the TPCC system:
    - FGR2 – All of LRC13 and LRC23; Portions of Units BFS17/19/21/23; LRC01.
- Ground-based equipment would be limited to slopes <35%.
- The location, number, and width of corridors (within no-harvest buffers) would be specified prior to yarding, and natural openings would be used as much as possible (ROD, D-5 #2).
- Skyline corridors would be a maximum of 12 feet wide. Distance between skyline corridors would be a minimum of 150 feet apart at the widest point where feasible.
- Skyline corridors would be perpendicular to streams as much as possible to minimize the total length of openings created by yarding corridors along stream channels.

Fuel Treatments

- Hazardous fuel reduction measures would be conducted within units along those roads that are not identified for closure or decommissioning after harvest operations. These measures would include pulling back all slash greater than two feet in length and up to six inches in diameter to within 20 feet on each side of these roads.
- Heavy concentrations of slash on landings and roads resulting from cable yarding operations would be piled and burned. Piles would be minimal in number and free of soil and rock material. Placement of landing piles closer than 15 feet to reserved trees, snags, or suitable coarse woody debris would be avoided. Piles would be covered with black plastic and burning would generally occur during the late fall and winter months.
- Alternatively, landing piles of slash would be broken up and scattered throughout the harvest unit before equipment vacates the site.
- Applicable Oregon State Fire Laws would be followed. Burning of slash piles would comply with the Oregon Smoke Management Plan (2007 OAR 629-43-043).

2.5.2 Roads

New Construction

New construction would use the applicable "Conservation Practices for Road and Landing Construction" Best Management Practices (p. D3-D4) found in the RMP. These include:

- Road and landing construction activities would be limited to the dry season, generally from [May] to October.
- Roads and landings would be designed and constructed to BLM standards, but be the narrowest and smallest sizes that would meet safety standards, objectives of anticipated uses, and resource protection. For this project, rocked roads would typically have a running surface of 16 feet, while dirt roads may have a running surface between 14 and 16 feet.
- Roads would be located on stable locations, such as ridge tops, stable benches or flats, and gentle-to-moderate side-slopes.
- Stable end-haul (waste) sites would be located prior to end-hauling. These sites would be kept properly shaped, drained, and vegetated.

- Road drainage would be designed to minimize soil erosion and stream sedimentation. Energy dissipators, culvert down pipes, or drainage dips would be used where water is discharged onto loose material and onto erodible or steep slopes.
- Road surface shape (e.g. crowning, insloping, and outsloping) that meets planned use and resource protection needs would be used.

- Road drainage features (such as ditch-relief culverts) would be designed to minimize soil erosion and stream sedimentation. The table below would be used as the guide for drainage spacing. In addition, road drainage features would be installed an appropriate distance upslope of stream crossings in order to route most of the ditch flow away from streams and onto forest soils where it can re-infiltrate. Depending on site conditions, this distance would generally be about 100 feet from the drainage feature outlet to the stream channel.

Table II-10 Guide for Drainage Spacing by Soil Erosion Classes and Road Grade.

Gradients (%)	Erosion Class		
	High	Moderate	Low
3-5	200	300	400
6-10	150	200	300
11-15	100	150	200
16-20	75	100	150
21-35	50	75	100
36+	50	50	50
Spacing is determined by slope distance and is the maximum allowed for the grade. Spacing in feet.			

- In the designing of roads, landings, and yarding corridors, large remnant trees would be avoided. The exception is for landing construction in Unit LRC17, where four 40 in. DBH Douglas-firs and one 30 in. DBH Grand-fir would be removed.
- Bare soil areas created from landing and road construction would be mulched with appropriate weed-free straw, or equivalent, and seeded with a native or BLM-approved mix.

Road Maintenance and Renovation

- Drainage and soil erosion control practices would be applied to renovated or reconstructed roads in the same manner as newly-constructed roads (ROD, D-4 #17). These may include, but are not limited to, dry season grading and ditch-relief culvert replacements, appropriate end-haul and disposal areas, and proper dispersal of water from ditch-relief culverts.
- Road maintenance activities would be planned to minimize soil erosion and subsequent stream sedimentation (ROD, D-4 #18). Maintenance would include, but is not limited to, grading to remove ruts, removal of bank slough, placement of silt trapping straw bales or other sediment control devices, and adding gravel lifts where needed in the road surface. Existing drainage ditches that are functioning and have a protective layer of non-woody vegetation would not be disturbed.
- Dirt roads and landings would receive seasonal preventative maintenance prior to the onset of winter rains. Seasonal preventative maintenance may include, but is not limited to installing water bars, sediment control mats or devices, removing ruts, mulching, and barricades.
- When replacing stream culverts stream flow would be diverted around the work area, sediment would be contained using appropriate filters or barriers and turbid water would be pumped from the excavation site onto a vegetated terrace or hillslope. Stream culvert replacements would follow ODFW in-stream timing guidelines, which is from July 1 – September 15.

Haul

- Hauling on dirt-surfaced roads would be prohibited during the wet season, generally November through April.
- Road conditions would be monitored during winter use to prevent rutting of the rock surface.
- At designated stream crossings during winter haul, sediment control devices would be installed. Such control measures would allow for the free passage of water without detention or plugging and would be strategically placed based on road conditions, ditch-relief culvert locations, and the amount of vegetation in ditches. These control structures and applications would receive frequent maintenance and would be removed at the completion of haul. Also, sediment retained by the filters would be removed and disposed in areas in which the sediment would not be delivered to stream channels.
- An additional lift of rock would be applied to the area of road that can influence the stream if erosion and sediment delivery is evident from the road tread near live stream crossings.
- If the ground is already saturated from winter rains and more than 1 inch of precipitation is predicted in the project area over the next 24 hours, then winter haul would be suspended. Operations would resume after the 24-hour suspension, except when another storm (exceeding 1 inch) is forecasted. Currently, precipitation predictions are based on the Quantitative Precipitation Forecast (QPF) maps from The Hydrometeorological Predication Center internet site: http://www.hpc.ncep.noaa.gov/html/fcst2.html. A similar predictive model internet site may be used if this site should be unavailable in the future.

Road Closure/Decommissioning

- For roads to be closed or less than fully decommissioned, water bars would be installed to route surface runoff to vegetated areas. Newly constructed dirt roads would be water-barred before the onset of the rainy season, if necessary. Water bar spacing would follow the guidelines in Table II-10.
- Where roads are designated for full decommissioning, slash material would be scattered over the decompacted road surface to protect and reintroduce organic material to the soil.
- For roads to be fully decommissioned, the road surface may be decompacted to a depth of at least 8 inches.

2.5.3 Special Status Species - Including T & E Species

- Daily Operating Restrictions limiting harvest activities from two hours after sunrise to two hours before sunset would be implemented on applicable units to minimize disturbance to nesting murrelets. There are ongoing surveys for some units – if these are determined to be vacant, then no timing restrictions would be implemented. The following table lists these units:

Table II-11 Units with Daily Operating Restrictions

Sale Name	Units with Daily Operating Restrictions	Units - if surveyed vacant, then no restriction
Belieu Creek CT	BFS02,03,17,19,20,21,23,24; LRC01	-
Jersey Jim CT	BFS08; IC05	BFS11
Shark Bait CT	IC11,18	IC06
Rock Creek CT	LRC07,08,09,13,17,23	LRC17
Misc. Units	-	-

- All timber sale contracts include a standard provision that includes management guidelines for species that may be found after the contract is awarded. These species include Threatened & Endangered species, occupied marbled murrelet sites, active raptor nests, federal proposed and candidate species, Bureau Sensitive or State listed species protected under BLM Manual 6840.

- All Bureau Sensitive plant species found during pre-disturbance surveys would be buffered to protect the micro-site.

2.5.4 Noxious Weeds

- To prevent the introduction and spread of noxious weeds during the contract period, equipment would be washed prior to entering the project area.
- Vehicles and equipment would be required to stay on road and landing surfaces, except equipment specifically designated to operate off roads and landings (e.g. mechanical harvesters).
- To the extent practical, travel would be avoided or minimized through weed-infested areas.

2.5.5 Cultural Resources

- If cultural resources are encountered during this project, all work in the vicinity would be stopped and the District Archaeologist would be notified.

Chapter III Affected Environment and Chapter VI Environmental Consequences

3.1 Analysis Background

This Chapter combines the affected-environment (typically EA Chapter 3) and effects-analysis discussion (Chapter 4) and has been arranged by specific resource values that may be affected. It identifies the direct, indirect, and cumulative environmental effects that may result from implementation of either of the two alternatives described in Chapter 2. It also addresses the interaction between the effects of the proposed thinning and density management with the current environmental baseline, describing effects that might be expected, how they would occur, and the incremental effects that could result. The description of the current conditions inherently includes and represents the cumulative effects of past and current land management activities undertaken by the BLM and private entities.

3.1.1 Reasonably Foreseeable Actions

Annual recurring activities are likely to occur within the project area. These include, but are not limited to, fire suppression activities, construction of roads across BLM land under existing right-of-way agreements, routine road maintenance, control of noxious weeds, and silvicultural activities in young stands.

The Coos Bay BLM recently completed an Environmental Assessment analyzing thinning activities on 1400 acres within the Middle Fork Coquille watershed. The Slater Rocks EA (USDI 2008b) contained proposed units that are located in adjacent sub-watersheds, but are not included in the King Myrtle analysis area.

Proposed actions by the Coquille Tribe in the watershed include 3 timber sales in areas managed as Matrix, totaling roughly 350 acres. Approximately 170 acres are being harvested currently; the remaining 180 acres are in the layout phase. Coquille Forest Lands are managed under the Northwest Forest Plan.

The U.S. Forest Service (USFS) manages roughly 1,500 acres in the southern portion of the watershed. No USFS proposed actions are considered reasonably foreseeable; it is assumed that USFS Matrix holdings would be managed intensively and that reserved areas would undergo succession.

It is assumed private forests would be intensively managed on a 40-year harvest rotation under the direction of the State of Oregon Forest Practices Act (OAR 527).

3.1.2 Other Actions

The Proposed Resource Management Plan has been published and is undergoing a 60-day Governor's consistency review. However, the Record of Decision is not anticipated until December 2008. This Decision will determine which activities will be implemented and upon which future cumulative analyses can be based. The proposed plan provides insufficient information for meaningful consideration at this time (see *NAEC v. Kempthorne*, 457 F.3d 969, 979-80 (9th Cir. 2006) finding it lawful to consider the cumulative effects in the later broad-scale planning analysis).

It is not the intent of the planning or NEPA processes to recalibrate all analyses of existing plan implementation actions whenever a new planning effort begins consideration of a broad array of management guidelines and alternative allocations at the programmatic scale. Analyzing the outcome of the plan revision process as a "reasonably foreseeable future action" in every implementing project of the current plan would create a circular analysis process, where the effects of revising the plan would be used to determine whether to supplement the current plan's analysis that is already being revisited in the revision effort. Rather, the plan-level EIS itself will factor in the cumulative program effects and reset the stage for analysis of subsequent plan implementation actions.

This also holds true for the Pacific Connector Gas Pipeline Project. A draft EIS is under development analyzing for a Liquid Natural Gas pipeline route from the proposed Jordan Cove Terminal in Coos Bay to Malin, Or. As no decision has been finalized on this proposal and is one of four routes being proposed, it is speculative to assess for impacts.

3.1.3 Cumulative Effects Considerations

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

The information on individual past actions is merely subjective, and would not be an acceptable scientific method to illuminate or predict the direct or indirect effects of the action alternative. The basis for predicting the direct and indirect effects of the action alternative should be based on generally accepted scientific methods such as empirical research. The cumulative effects of this project upon the environment did not identify any need to exhaustively list individual past actions or analyze, compare, describe the environmental effects of individual past actions in order to complete an analysis which would be useful for illuminating or predicting the effects of the proposed action.

3.2 Resources

3.2.1 Stand Condition

Table B-1 (Appendix B) shows the current conditions of the stands within the proposed units. Included are basal area per acre, relative density, average diameter at breast height, and stand age. This information was derived from stand exam data. Stand density and stand structure was used to describe the current and anticipated stand condition for both alternatives.

3.2.1.1 Stand Density

The BLM manages approximately 13,277 forested acres in the analysis area. The majority (12,537 acres) are dominated by Douglas-fir, similar to the stands proposed for treatment. The remaining 740 acres are a collection of mixed conifers, mixed confers/hardwoods and mixed hardwoods. Of the conifer-dominated stands within the analysis area, approximately 3005 acres

are 30 to 70 years old in the "canopy closure/competitive exclusion" stages of stand development (Franklin *et al.* 2002). These stages are characterized by greatly reduced light levels due to canopy closure, moderated temperatures, increased relative humidity, density-dependent tree mortality, natural pruning of lower branches, and crown class differentiation. As these stages progress from canopy closure, competition intensifies, resulting in tree mortality.

The forest operations inventory (FOI) system and stand exam information are used to describe tree densities within the project area. Prescriptions were developed from these data and included the constraints of windthrow and snow break damage. A detailed analysis is included in Appendix B.

No Action

Approximately 700 acres of overstocked stands would continue to decline in overall stand health and individual tree growth rate if no action is taken. It is expected that stands would continue through a series of suppression mortality stages before eventually developing habitat legacy components of large trees, snags, and course woody debris. A single story canopy with a narrow size and age range would continue to dominate the stand. Height-to-diameter ratios of the standing trees would continue to move towards instability. In the absence of disturbance, vertical stand complexity would remain relatively unchanged over the next several decades. Understory tree recruitment would be unlikely to occur for many decades. The herbaceous/shrub layer would show little development until such time that the stand opens up through competition mortality or disturbance.

Within the Riparian Reserves, retaining the current stocking levels would retard attainment of three functions that are contingent on the presence of large diameter trees: large wood delivery to streams, large wood delivery to riparian areas, and wildlife habitats (FEMAT 1993). Stand projection simulations on the Coos Bay District suggest that it would take un-thinned stands roughly 200 years to produce large diameter forest structure associated with late-seral stands (USDI 2003). Tappeiner *et al*. (1997) found that many Coast Range old-growth stands developed under low stocking densities and developed large diameter trees capable of providing large structure by the time those trees were 50 years old.

Proposed Action

As described in Chapter II, the silvicultural prescription in all LUAs is to reduce the current tree density levels enough to satisfy the objectives of each allocation. Some objectives may be achieved in a short time span of less than a decade while others may require many decades. The effects of thinning will be seen quickly in regards to stemming canopy recession while development of habitat characteristics similar to late-successional stands or maximizing volume growth for timber harvest will take many decades. In Riparian Reserves and LSRs the treatments are designed to allow the leave trees enough growing space to stem canopy recession, increase diameter and height growth rate, and allow enough light to reach the forest floor to spur on understory growth. The wider spacing of these treatments will allow favorable growing conditions to exist for a longer period of time. Growth modeling using SPS shows that 40 years after thinning to a RD of 25, the average stand RD only increases to 47. This density falls within the zone of high competition where trees are growing vigorously but below the zone of imminent mortality (Table B-2, Appendix B). Subsequent treatments at (or before) this time to manipulate densities would be necessary to fully achieve the objectives of the Riparian Reserves and LSRs. Conversely, thinning to a RD 35 in the Matrix at an average age of 40 yields a RD of 59 at age 80.

Residual densities at the stand scale after harvest are expected to range from 50-150 trees per acre in the Matrix and 30-90 trees per acre in the RR and LSR. However, the variation introduced by variability at stand establishment, naturally occurring clustered mortality, windthrow damage, differential growth patterns, and logging-associated mortality would result in within-stand density variation. Densities at the individual ≈0.15-acre plot/patch scale could range from 0 trees per acre in Unit LRC01 with the Maximum Diameter Limit prescription to over 350 trees per acre in the high density leave areas along perennial streams, depending on the unique characteristics at the plot/patch scale. Differing prescriptions applied to individual units and maintenance of untreated areas would maintain density variation at the landscape scale.

Riparian treatments in Units IC09, LRC01, LRC17, LRC25, and LRC103 would take the trees per acre to below 50. Circumstances that may cause these areas to be vulnerable to windthrow include alignment of stream channel with prevailing storm winds, proximity to a "hard edge", topographic position, surrounding vegetation, and height to diameter ratios of leave trees. The Riparian Reserves (where low density marking would occur) have streams that do not align with the prevailing winds, have surrounding stands that are as old or older providing wind protection, are not flanked by hard edges, and have height to diameter ratios of generally wind firm trees (80:1) (Wonn and O'Hara 2001). The only exception to this is Unit IC09 which does have a stream that aligns with the prevailing winds. However this stream is actually outside of the unit by 100 feet so only the outer ½ of the Riparian Reserve would be treated. For these reasons thinning to a density below 50 trees per acre would not increase the vulnerability of the stand to windthrow.

By thinning the proposed units, stand densities would be reduced on 724 acres of the 3005 acres that are 30 to 70 years old in this area; coverage in stands at the highest density class would be expected to decrease from 62% to 49%, coverage in medium density would increase from 32% to 41%, and coverage in poor density would increase from 6% to 10%.

The effects of the proposed action on stand densities would be insignificant at the landscape scale due to the limited scope of the project area and would be evident only at the local stand scale; this is consistent with the intent of creating stands that have variable densities and stand structure important to wildlife, while still maintaining adequate stand-level growth rates for timber production.

Through time, the treated stands would trend back towards the overstocked condition where individual patches would progress at different rates depending on conditions post harvest; however, density independent factors (disease, wind etc.) are expected to play a greater role as the stands develops towards mature forest (Franklin *et al.* 2002). Individual dominant trees would maintain higher growth rates and would be affected less by canopy closure at the stand level.

3.2.1.2 Stand Structure

Forest legacies such as remnant trees, snags, and down logs are valuable individual structural components that contribute to stand complexity and diversity. The following discussion is of the occurrence of these important elements within or near the treatment units.

Units LRC01, LRC07, LRC25, IC05, and IC09 contain remnant trees. Remnants are mature green trees that remain following the previous disturbance and are indicative of the original stand. They are generally greater than 28" in diameter, older than 100 years, singular in nature, and have crowns as much as 100 feet taller than surrounding stand. Remnant trees are not considered part of the marking prescription and would be reserved from cutting. Single trees in Units LRC25 and IC09 have been identified as having some characteristics of potential marbled murrelet nesting

structure such as limbs greater than 6" in diameter with a layer of moss. These trees would have a buffer placed around them to protect them from physical damage.

Snags and down wood can play a major role in the suitability of habitat for wildlife (USDA 2002). Their importance was addressed in the RMP and research continues to show the value of this habitat component for many wildlife species and ecosystem functions. Dead wood (both standing and down) contributes to biological richness as substrate, cavity and forage sites, shelter and cover.

Snags

One hard snag per acre greater than 15 in. DBH and one-half snag per acre greater than 17 in. DBH are required to meet the 40% potential population level[2] of cavity nesting birds as required for harvest operations (USDI 1995). Large size classes are not always available in young stands.

Existing snags found in the proposed units are either small, hard snags resulting from recent mortality or larger snags resulting from past fire or harvest activities. There is an array of snag forms, ranging from soft snags devoid of most bark to hard snags with intact bark. Snag distribution and density are highly variable within units. Table III-1 lists estimated snag densities for units that recorded snags ≥10 in. DBH and ≥10 feet tall during stand exams. Snags were recorded in roughly 27% of the units. EA units IC09, LRC01, LRC25, and LRC103 are the only units where hard snags greater than 15 inches were recorded.

Table III-1 Units with qualifying snag lengths and diameters recorded during stand exams.

Unit No.	Acres	Hard Snags/Acre (Decay Class 1-3)		Soft Snags/Acre (Decay Class 4-5)		Total Snags Per Acre
		10-15" DBH	> 15" DBH	10-15" DBH	> 15" DBH	
BFS08	27	6.0	0	0	0	6.0
IC05	140	1.2	0	0	0	1.2
IC06	98	3.4	0	0	0	3.4
IC09	68	0	0.7	0	0.1	0.8
LRC01/LRC25	84	0	0.4	0	0	0.4
LRC07/LRC08	36	2.6	0	0	0	2.6
LRC17	23	19.3	0	0	0	19.3
LRC103	15	0	1.4	0	1.3	2.7

Down Wood

The Coos Bay District RMP Management Actions/Directions do not require a specific amount of down wood in areas of partial harvest, but the same basic management direction is to be applied with modifications that reflect stand development. Existing large down wood within units is generally remnant from previous harvest, tends to be clumped near old landings, and is typically in soft decay classes (classes 4 and 5).

Down wood was surveyed during stand exams using line transects. Table III-2 lists estimates of the current lineal feet per acre of down wood for logs ≥ 5 inches diameter (at transect crossing) and at least 8 feet long. Data were recorded during stand exams for units or portions of units and are summarized as follows:

- Down wood in all decay classes, ≥ 16" diameter at large end and ≥ 8' long, ranges from 0 to 939 lineal feet per acre, with an average of 285'.

[2] Sheridan, C. 2007. Unpublished data. Forest Ecologist, Coos Bay District BLM, 1300 Airport Lane, North Bend, OR 97459.

- None of the units had ROD compliant down wood (decay classes 1 & 2, ≥ 16” diameter large end, and ≥ 16’ long) tallied in the down wood survey.

Table III-2 Current down wood levels in King Myrtle Units

Unit/Transect No.	Total Hard & Soft Down Wood		Unit/Transect No.	Total Hard & Soft Down Wood	
	5-15” dia. at large end	≥16” dia. at large end		5-15” dia. at large end	≥16” dia. at large end
BFS02	770	513	**IC10**	512	342
BFS03	684	342	**IC11**	2841	105
BFS08	389	292	**IC14**	1026	513
BFS11	1025	427	**IC15**	127	84
BFS16	342	272	**IC18**	682	544
BFS17	1025	85	**LRC01/LRC25**	683	238
BFS19	391	389	**LRC07/LRC08**	682	136
BFS20	342	0	**LRC09**	586	97
BFS21	513	171	**LRC10**	194	97
BFS23	456	684	**LRC13**	570	228
BFS24	854	256	**LRC17**	879	0
BFS25	546	410	**LRC21**	855	341
IC05	250	295	**LRC23**	2394	0
IC06	1477	163	**LRC102**	3079	342
IC09	940	255	**LRC103**	1453	939

No Action

The current trajectory of snag and down wood development would continue throughout the treatment areas where snags and down wood recruitment would primarily originate from the smallest suppressed trees. As suppression mortality continues, there would be an increase in species associated with this habitat as snags and down wood become available. Roughly 60% of the treatment units are immediately adjacent to late-successional habitat. Stand exams and site visits in the units revealed almost no recruitment of large down wood material into the proposed treatment units from these areas. It is expected that recruitment levels would remain and would be the product of sporadic natural events such as wind, snow, and disease.

Pileated woodpeckers and other primary cavity excavators utilize a variety of snag sizes for foraging, but prefer larger snags (≥26 in. DBH) for nesting and roosting. Large snags within the treatment units are uncommon. Recruitment opportunities over the next several decades would improve as tree size increases. Most of the snags and coarse wood in the project area would provide foraging substrate, and would provide nesting and roosting habitat for smaller cavity nesting species. Longevity of the snags and down wood from the smaller diameter classes would be 10 to 20 years due to the rapid rate of decay associated with small wood.

Proposed Action

Thinning the proposed stands would accelerate the development of large trees. Large trees in the Riparian Reserve and Late Successional Reserve provide important structure for a variety of plant and animal species and, ultimately, are recruited into large snags and down wood. Larger trees within the Matrix yield greater wood volume and higher value logs available for meeting the ASQ commitment.

Existing snags and large down wood (> 20 in. diameter large end) would be protected to the greatest extent possible. Some older soft snags and logs would be degraded (cut, knocked over, or smashed) through harvest activities or cut for safety reasons. Trees felled for yarding corridors within the no-harvest buffers of Riparian Reserves would remain on-site as down wood. Overall, there would be an increase in hard snags and down wood (decay classes 1, 2, 3) and a decrease in soft snags and down wood (decay classes 4 and 5) following harvest.

Harvest activities would inadvertently create some immediate hard snags and down wood through injury and breakage. One study found 0.16 snags >20 in. DBH were created following group selection harvest methods (Walter and Maguire 2005). Another study found that after 1-10 years, 13% of the residual trees in a tree-retention harvest of mature forest in the Cascade Range of Oregon had become snags (12" and greater) by natural processes (Busby *et al.* 2006).

3.2.2 Water Resources

The proposed harvest units are located in the 309 square mile, Middle Fork Coquille River Watershed. Watershed is defined as the 5th field hydrologic unit level. Sub-watershed refers to a 6th field hydrologic unit which varies from about 24 - 40 square miles for the affected sub-watersheds. In portions of this analysis, the smaller sub-watershed scale is used to better detect potential effects of the project near the site of proposed actions. The rationale is that adverse (or beneficial) effects to water resources are easier to detect in smaller catchments (Bosch and Hewlett 1982) and as one nears the treatment site. Table III-3 below shows the location and scale of the project by sub-watershed. These three sub-watersheds comprise the analysis area (see Vicinity Map)

Table III-3 Location and area of Harvest Units

Watershed (5th field)	Sub-watershed (6th field)	Area* (mi^2)	Area* (Acres)	Harvest Acres*	Percent of Sub-watershed
Middle Fork Coquille River	Indian Creek	24.1	15,449	248	1.6
	Belieu Creek	17.7	11,357	294	2.6
	Rock Creek	39.9	25,544	175	0.7
	Totals	**81.8**	**52,350**	**717**	**2.3**

*Approximate values based on GIS data

3.2.2.1 Peak Flows and the Transient Snow Zone (TSZ)

Studies have found that higher than normal peak flows can occur as a result of timber harvest in the TSZ (Harr and Coffin 1992). Harvest in the TSZ can provide openings where snow accumulates. Warm winds and/or rain-on-snow events can melt this increased snow pack rapidly and create higher than normal flows. The analysis area is located in the Coastal Region of Western Oregon as delineated by the USGS (Harris *et al.* 1979), and all of the proposed units are located below 2,500 feet in elevation. According to Greenberg and Welch (1998), rain-on-snow events are rare (50 – 100 year events) but have happened in the Coastal Region. However, the authors also state that snowmelt has had little or no effect on the maximum peak flow for these extreme events because snowmelt occurs early in the storm during the rising limb of the hydrograph.

No Action

Other influences within the watershed would continue.

Proposed Action

A change in peak flows due to thinning in the TSZ is not likely. Most rain-on-snow studies have found the greatest effects are from clear-cut areas that create large openings in the forest canopy (Berris and Harr 1987, Harr 1986, Harr and Coffin 1992, Satterlund and Adams 1992). Research suggests that forest thinning treatments maintain patterns of snow accumulation that are similar to mature forests and have little effect on snowmelt rates during rain-on-snow events (Poggi *et al.* 2004)

No measurable effect to stream flow is expected as a result of commercial thinning and density management because the project involves only partial removal of vegetation in three percent or less of each affected sub-watershed. In an overview of several studies, Satterlund and Adams (1992) found that "Lesser or nonsignificant responses occur [to water yield]... where partial cutting systems remove only a small portion of the cover at any one time." Where individual trees or small groups of trees are harvested, the remaining trees will generally use any increased soil moisture that becomes available following timber harvest. Therefore, effects to stream flow from proposed commercial thinning and density management is not likely.

3.2.2.2 Peak Flows and Roads

Roads have the potential to increase peak flows (Beschta 1978, Wemple *et al.* 1996). Mid-slope roads can intercept surface and subsurface water and divert it into the road drainage system. This can effectively extend the stream channel network and speed up delivery of water to streams. Most roads in the analysis area are mid-slope roads and many of these roads have sections where their drainage systems connect directly to stream channels.

A method for assessing the potential risk of the road network to cause an impact on stream flow was developed for the Governors Watershed Enhancement Board (GWEB). The assessment assigns a "threshold of concern" for hydrologic impacts based on the percentage of area covered by roads. The threshold levels are 0-4 % low risk, 4-8 % moderate risk, and above 8 % high risk ((WPN 1999) p IV-15).

Based on GIS data, there are about 375 miles of road in the analysis area. Using an average road width of 30 feet (0.0057 miles), there are approximately 2.1 sq. miles covered by roads (0.0057 miles width x 375 miles length). This equates to about 2.6 % of the total area covered by roads (2.1 sq. miles road area / 81.8 sq. miles total area). According to the GWEB method, the analysis area currently has a low risk (< 4 % road area) of hydrologic impacts due to roads. However, as stated by the authors, the condition of roads and the design of drainage systems may be just as important in determining the impact of roads on stream flow. As noted above, the drainage systems of many roads in the analysis area are directly connected to stream channels.

No Action

It is likely that more roads would be constructed within the watershed by private entities to access their lands. It is unknown whether there would be enough road construction to exceed the GWEB threshold described above to cause impacts to flow regimes. However, new road design and construction practices required by the Oregon Department of Forestry (2007) have been greatly improved since the legacy roads were constructed in the 1960s and 1970s.

Proposed Action

Road effects on streamflow in the analysis area would be slightly reduced. The proposed project would result in a net decrease of approximately 3.4 miles (2.5 miles of new construction – 5.9 miles decommissioned) of the total road network in the analysis area. This mileage would be disconnected from the stream network. Additionally, by improving road drainage, some roads proposed for renovation and improvement would effectively be disconnected from the stream network.

3.2.2.3 Stream Temperature

In the analysis area, the Middle Fork Coquille River and Belieu Creek are listed for exceeding temperature standards. All proposed units are farther than 500 feet from these two streams.

Small streams within or adjacent to the proposed treatment units are currently well shaded by dense stands of conifers and some hardwoods.

No Action

The unthinned stands would continue to have unfavorable height to diameter ratios that increases the risk of blow down (Smith 1962), and subsequent exposure of the stream to solar heating. In addition, the unthinned condition would delay establishment of understory trees and shrubs with their associated multi-canopy layers that could provide shade in the event that some or all of the overstory shade is lost due to a catastrophic event ((Levno and Rothacher 1969); cited in (Adams and Ringer 1994)).

Proposed Action

There would be no effect to stream temperatures in intermittent streams from density management thinning of trees adjacent to these streams. Many of the streams within or adjacent to the proposed units are intermittent in nature, and they have little or no surface flow during the summer when elevated stream temperatures can occur.

Density management near perennial streams would also have no effect on stream temperature. On perennial streams, the 50-foot no-harvest buffers would maintain existing canopy closure directly over stream channels. Additionally, thinned areas outside the buffers would maintain approximately 60% canopy closure, and would provide adequate shade until the canopy re-closes (est. 5-10 years). In units LRC01, LRC17, and LRC25 canopy closure would average between 30% and 45% outside the 50-foot no-harvest buffer. However, the units are located on the north side of perennial stream channels and thinning would not affect stream shade or temperature.

As described above, density management thinning near streams would result in favorable height to diameter ratios of the remaining trees and would decrease the risk of blow down and subsequent exposure of the stream to solar heating. In addition, thinning will accelerate establishment of understory trees and shrubs with their associated multi-canopy layers that could provide shade in the event that some or all of the overstory shade is lost due to a catastrophic event. Growth and vigor would improve in the thinned stands making them less susceptible to wind, insects, disease, and fire disturbances.

3.2.2.4 Sediment

Sediment input to stream channels is a result of both natural and management related processes. Primary sediment sources include; episodic landslides and debris flows usually associated with intense winter storms (Townsend *et al.* 1977), hillslope erosion, stream bank erosion, and roads. Forest management related increases in sedimentation are most often the result of poorly designed and/or poorly maintained forest roads. These roads can be a major contributor of fine sediment to streams (Reid and Dunne 1984).

There are no streams in the analysis area currently listed by ODEQ as impaired by excess fine sediment. However, ODFW surveys found some stream reaches on Slide Creek, Endicott Creek, King Creek, Smith Creek, Salmon Creek, and Rasler Creek with undesirable levels (1992-2005). Field examinations have determined that some roads in the analysis area show evidence of surface erosion, inadequate drainage, inadequate stream crossings, or unstable cut-banks and fill slopes. These roads are likely to provide excess fine sediment to adjacent streams.

No Action

Natural sedimentation levels within the watershed would remain constant over the long term but may vary considerably from year to year. Management related sediment sources, primarily from roads, may decrease in the future. Even while some new roads are constructed, road design and construction practices have been greatly improved since the legacy roads were constructed in the 1960s and 1970s. As compared to these legacy roads, new road construction practices require greater protection of water quality. At the same time, older legacy roads are likely to be improved or decommissioned. However, roads identified in the analysis area as potentially adding sediment to streams would not be renovated or decommissioned at this time. Some roads proposed for renovation or decommissioning would continue to deliver fine sediment to stream channels.

Proposed Action

Overall, the project would result in a net decrease of approximately 6.4 miles (3.4 miles decommissioned + 3.2 miles of temporary closure) of open road after road closures and decommissioning. Proposed road renovation/decommissioning would reduce the volume of fine sediment entering stream channels. The effects of proposed road work and harvest activities are analyzed below by category.

Road Construction

The 2.5 miles of new road construction would have a negligible effect on sediment delivery to stream channels and would not affect water quality. The proposed new roads would be primarily located on or near ridge tops and would incorporate design features that include avoiding fragile or unstable areas, minimizing excavation and height of cuts, endhaul of waste material where appropriate and construction during the dry season (ROD/RMP D-3, D-4).

Approximately 0.3 miles of the new road construction would occur within the Riparian Reserves. This includes a crossing for an intermittent stream on spur BFS16-2, and a temporary stream crossing for an intermittent stream on spur IC06-3. However, road drainage features would be designed so that any sediment-laden surface water would quickly infiltrate into forest soils. With the implementation of the road management Project Design Features, these roads are not expected to increase sediment delivery to stream channels due to their locations, intervening forest buffers, and distances to streams. Therefore, the proposed roads and landings would not measurably affect water quality.

All of the newly constructed roads except spur BFS16-2 (approximately 0.2 miles) would be decommissioned or fully decommissioned when project activities associated with each road are completed. At the request of adjacent right-of-way holders, spur BFS16-2 would not be decommissioned but would be blocked to public access. The new culvert crossing would remain, but the road surface would be put in an erosion-resistant condition.

All new construction of dirt roads and landings would be seasonally maintained prior to winter rains if they would be needed for use the following year. The roads are not expected to increase sediment delivery to stream channels due to their locations, intervening forest buffers, and distances to streams. Therefore, the roads and landings would have little potential to affect water quality.

Road Renovation/Improvement

Road renovation and improvement would reduce sediment delivery to stream channels. Approximately 6.5 miles of the existing, proposed haul route would be renovated. Depending on haul season, some spur roads would be renovated to meet winter haul standards and would be

surfaced with rock. Other spurs for use in the dry season only would not be rocked. Renovation of these roads to standards required for new construction would divert road drainage away from stream channels and toward the forest floor where it could re-infiltrate. In addition, approximately 1.8 miles of road would be improved.

Road renovation and improvement would occur in the dry season for any activities requiring soil displacement. Therefore, renovation or improvement would have a negligible potential for short-term (1-2 year) increased sediment delivery to stream channels. In contrast, road renovation and improvement would provide a long-term (many years) benefit to flow routing and water quality in the affected areas.

Decommissioning

Approximately 5.7 miles of road would be decommissioned. Decommissioning these roads would reduce their potential to deliver sediment to stream channels or alter flow routing in the analysis area.

Approximately 1.4 miles of the total would be fully decommissioned. Full decommissioning would be designed to restore "natural hydrologic flow" (USDI 2002) and may include but is not limited to sub-soiling or tilling, removal of unstable fills, removal of ditch relief culverts, construction of water bars, eliminating diversion potential at stream crossings, and construction of a suitable barrier to block access.

Decommissioning would result in a net of 3.4 road miles being removed from the hydrologic network with the potential to deliver sediment.

Haul Activities and Road Maintenance

Approximately 8.5 miles of the proposed haul road is paved. Approximately 48.2 miles of gravel road would be used for all season haul. Hauling would be restricted to the dry season where road surfaces have inadequate rock surface for wet season haul. Approximately 8.7 miles of rock surface and 1.7 miles of dirt road would be used for dry season only haul.

The proposed haul route crosses several streams. During the dry season, since there is little or no flowing water on road surfaces, there would be a negligible change in sediment delivery to streams as a result of haul on the proposed main haul routes and spurs. During the winter wet season, there would be no sediment delivery from the paved haul routes because paved roads are not likely to produce sediment (Reid and Dunne 1984).

Wet season haul on gravel roads has the largest potential to deliver sediment to stream channels. However, several design features listed in Chapter 2 would minimize the potential for increased sediment delivery from haul activities and road maintenance. These design features would be in place before winter haul and may include but are not limited to; applying an additional lift of rock to stream crossings if there is a potential for road sediment delivery to a stream, containing any offsite movement of sediment from the road or ditch flow near streams with a suitable sediment filter, monitoring road conditions during winter use to prevent rutting of the rock surface, and suspending haul during very wet conditions. Road maintenance during the life of the project would minimize road drainage problems and reduce the possibility of road failures and increased sediment delivery to streams.

The amount of fine sediment introduced to streams during haul activities would be indiscernible beyond natural erosion processes occurring during winter rains and would have negligible

impacts to downstream resources. The majority of gravel-surface haul routes in the analysis area are used extensively throughout the year by private timber companies. The winter use of roads for the proposed project would be minimal, a few trips per day. The use of these roads is expected to be short term and limited by weather conditions as specified in the site-specific project design features. Though some minor sedimentation may result from the additional proposed haul activities, occurrence should only take place during prolonged rainfall events (until haul is suspended as noted above). Further, due to the steady level of private haul presently on these roads, additional amounts should be negligible and not outside levels that presently occur during such rainfall events.

Density Management in Riparian Reserves

The 50-foot no-harvest buffers along perennial streams are intended to function as protection buffers to maintain shade, protect bank stability, and prevent sediment delivery to streams from adjacent harvest operations. Along smaller intermittent streams, ground-based equipment would not be allowed within 20 feet of the stream channel to maintain an area of non-compacted forest soil.

These protection buffers would provide an adequate filter strip because non-compacted forest soils in the Pacific Northwest have very high infiltration capacities and are not effective in transporting (USDI 1997a) sediment by rain splash or sheet erosion (Dietrich 1982). In the long term, large wood contributed to the stream channel as a result of density management has the potential to create additional capacity for sediment storage.

Yarding Corridors

Yarding corridors would be placed to minimize disturbance of the stream channel and prevent sediment delivery. Due to the inclusion of additional design features and the small area disturbed, there should be no increase in sediment as a result of these yarding corridors.

3.2.3 Aquatic Habitat

Aquatic habitat has been influenced by human activities within the analysis area. Many stream channels in the lower valleys are down-cut and are not connected with their floodplains (USDI 2007b). The Middle Fork Coquille River and portions of many tributary streams are constrained and influenced by roads. Streams within the analysis area are generally lacking in-stream structure, namely large woody debris (LWD) and channel complexity (USDI 2007b).

For a detailed description of aquatic habitat in the analysis area, refer to the Middle Fork Coquille (USDI 2007b), Sandy-Remote (USDI 1996) and Big Creek (USDI 1997a) Watershed Analyses. These documents are hereby incorporated by reference.

Endangered Species Act

The analysis area is located within the Oregon Coast coho (*Oncorhynchus kisutch*) Evolutionarily Significant Unit (ESU). The National Marine Fisheries Service (NMFS) published the listing determination and critical habitat designation for Oregon Coast coho as threatened February 11, 2008 effective May 12, 2008 (73 FR 7816). Streams containing coho or designated as CCH within the analysis area include: Middle Fork Coquille River, McMullen Creek, Salmon Creek, King Creek, Smith Creek, Endicott Creek, Myrtle Creek, Rock Creek, Rasler Creek, Belieu Creek, Slide Creek, an unnamed tributary to the Middle Fork Coquille with the confluence in the SW1/4 of section 36, an unnamed tributary to the Middle Fork Coquille with the confluence in the SE1/4 of section 36, Big Creek, Sandy Creek, and an unnamed tributary to Sandy Creek with the confluence in the NE1/4 of section 15 (Streamnet GIS Data 2003, USDC 2008).

Magnuson-Stevens Act

Streams used by coho and chinook salmon within the analysis area are designated as Essential Fish Habitat (EFH) under the Magnuson-Stevens Fishery Conservation and Management Act. The Magnuson-Stevens Act defines EFH as "...those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (67 FR 2343)." Streams designated as EFH within the analysis area include Middle Fork Coquille River, McMullen Creek, Salmon Creek, King Creek, Smith Creek, Endicott Creek, Myrtle Creek, Rock Creek, Rasler Creek, Belieu Creek, Slide Creek, an unnamed tributary to the Middle Fork Coquille with the confluence in the SW1/4 of section 36, an unnamed tributary to the Middle Fork Coquille with the confluence in the SE1/4 of section 36, Big Creek, Sandy Creek, and an unnamed tributary to Sandy Creek with the confluence in the NE1/4 of section 15 (Streamnet GIS Data 2003).

Special Status Species

Aquatic Special Status Species (SSS) which occur in the analysis area include Oregon Coast coho (federal threatened), Oregon Coast steelhead (Sensitive), and foothill yellow–legged frog (Sensitive). An analysis of yellow-legged frogs is included in the wildlife report. In addition to the coho stream locations listed above, steelhead are also found in Pheasant Creek, an unnamed tributary to Sandy Creek with the confluence in the NW ¼ of section 27, and an unnamed tributary to Rock Creek with the confluence in the NE ¼ of section 4.

3.2.3.1 Riparian Reserve Characteristics including Large Woody Debris

No action

Without treatment these stands would decline in growth and vigor resulting in a stagnant stand more susceptible to wind, fire, insects, and disease. Growth of conifer and hardwoods trees would be delayed until suppression mortality releases trees for growth. Leaving the Riparian Reserves in their presently overstocked condition would increase the time to attain sufficient large conifers to provide an adequate source of large woody debris (LWD) for streams. LWD levels would remain low in most streams for a longer time if left untreated, resulting in lower habitat complexity. Adjacent aquatic habitat conditions would remain simplified until trees in riparian stands grow to larger sizes and eventually fall into stream channels. Untreated stands would produce the highest numbers of dead trees because of competition mortality; however these trees are too small to be suitable for long-lasting large structure (USDI 2007b). LWD is a key component in forming complex stream channels that will contribute to improved aquatic habitat conditions. The trends of aquatic species populations within the analysis area would remain at their current levels if no thinning occurred in Riparian Reserves.

Proposed Action

The proposed treatment inside Riparian Reserves would begin to restore historic landscape-level vegetation patterns. Increasing stand and species diversity as well as placing the stands on a trajectory towards developing late-successional characteristics would be attained through the treatment prescription, the snag and down wood creation, retaining hardwoods and minor conifer species, leaving a 50-foot no-harvest buffer adjacent to perennial streams, and retaining trees within five feet of intermittent streams.

Current and future recruitment of LWD would not be adversely affected by the proposed DMT because of the number of leave trees, the 50-foot no-harvest buffers adjacent to perennial streams, and retaining trees within five feet of intermittent streams. The proposed yarding corridors,

which pass through Riparian Reserves, would not cause a measurable reduction in current or future recruitment of LWD because the corridors would be limited to 12 feet in width and trees felled in the 50-foot no-harvest buffer or within five feet of intermittent streams would be left on site.

Creating snags and down wood in Riparian Reserves would improve the structural diversity in the short- and long-terms and increase late successional characteristics in Riparian Reserves. As snag creation would occur >50 feet from perennial stream channels, they may or may not reach the stream channel depending on their height at the time they fall. The portions of a snag or a down log reaching a stream channel would function as LWD and improve in-stream conditions at the site scale; pieces not reaching stream channels would function as coarse woody debris.

3.2.3.2 Sediment

No Action

The levels of sediment currently in stream channels within the analysis area could increase under this alternative because of current road conditions. Field examinations found some roads in the analysis area with surface erosion, inadequate drainage, inadequate stream crossings, or unstable cut-banks and fill slopes. Those roads contributing sediment to streams would have short- and long-term negative effects to fish habitat[3]. Sediment entering streams could result in a reduction of spawning production, juvenile rearing survival, and insect production (Everest *et al.* 1987, Meehan 1991, Meyer *et al.* 2005, Waters 1995).

Proposed Action

The proposed thinning treatments are not expected to result in sediment reaching fish habitat. Sediment would not be transported to stream channels as a result of harvest activities because 1) the 50-foot no-harvest buffers along perennial streams 2) retaining trees within five feet of intermittent stream channels, 3) requiring full suspension over stream channels and 4) restricting ground based equipment from operating within 20 feet of stream channels.

Yarding corridors could be constructed through Riparian Reserves. A direct route for sediment to enter the channel would not be created because full suspension over the stream channel and banks would be required.

Road renovation, improvement, maintenance, stream culvert replacement, hauling, and decommissioning have the potential to cause sediment to enter stream channels. Best Management Practices and Project Design Features are expected to reduce and in some cases eliminate sediment from entering stream channels. Following the first winter after road activities, sediment entering streams would become negligible.

Winter haul would result in short-term sediment input that could reach fish habitat. This amount of sediment would be indiscernible from background levels and could not be meaningfully measured. However, Project Design Features and BMPs are specifically designed to reduce if not eliminate sediment transport mechanisms to stream channels. Sediment derived from winter hauling would be primarily directed to ditch lines and then out of ditchlines via ditch relief culverts to the forest floor. Sediment directed to hillsides by ditch-relief culverts would filter soil prior to the sediment reaching stream channels. Brake *et al*. (1997) found that on established

[3] The term "Fish Habitat" includes coho Critical Habitat, Special Status Species habitat and Essential Fish Habitat.

logging roads within the Oregon Coast Range, the maximum observed distance sediment traveled below a ditch relief culvert with vegetation filtering or a stream crossing culvert with stream material present (LWD, boulders, debris, etc) was typically not more than 6.21 meters.

Road renovation and maintenance could include stream and cross-drain culvert replacement. Replacing the culverts would result in a short-term input of sediment to stream channels. The amount of sediment reaching fish habitat would be indiscernible from background levels and could not be meaningfully measured because of the distance from the culverts to fish habitat, implementation of Project Design Features for culvert replacements, and the wide dispersal of these culvert locations over the analysis area. Replacing the culverts would reduce the risk of culvert failure.

The proposed road closure activities would result in a short-term immeasurable amount of sediment entering fish habitat. However, there would be an expected long-term reduction of sediment entering stream networks and thus fish habitat. Removing the stream and ditch relief culverts and stabilizing the drainage on roads would reduce the potential of the roads failing producing sediment and affecting fish habitat.

New road construction would involve the installation of two culverts on intermittent stream channels. This has the potential of causing short-term sediment input to the intermittent stream channels. However, the two new culvert installations on intermittent streams would not result in a measurable amount of sediment from reaching fish habitat because of the distance from the crossings (0.15 miles to King Creek and 0.46 miles to Belieu Creek) and the implementation of Project Design Features and Best Management Practices involving new road construction.

Three other roads proposed for new road construction would be located in Riparian Reserves. Sediment would not be transported to streams from these three roads because they are located on the outside edge of Riparian Reserves and have no hydrologic connection to stream networks. Road drainage features would be designed so that any sediment-laden surface water would quickly infiltrate into forest soils.

The sediment generated from the above mentioned road activities would not adversely affect the federally listed coho, its associated Critical Habitat, or Essential Fish Habitat. Nor would the project contribute to the need to list a Special Status Species under the ESA. Implementation of Project Design Features and Best Management Practices, and the proximity of species and habitats in relation to road activities would minimize if not eliminate sediment input to these habitats. Sediment entering stream channels as a result of road activities would not cause measurable changes in fish habitat. Coho and other Special Status Species survival and production would be maintained. The amount of sediment reaching headwater channels would not cause a reduction in macroinvertebrate production, which is a food source for fish. Changes in embeddedness, interstitial spaces, and pool depth would not occur. An overall reduction in sediment entering streams is expected following road renovation, improvement, maintenance, and decommissioning because these road activities would generally reduce erosion and drainage problems, reducing current sediment input to streams.

Cumulative Effects

Cumulative effects of past land management practices on private and BLM lands have contributed to the degraded conditions of fish habitat within the analysis area. On BLM lands the proposed action is expected to have long-term beneficial effects on streams because of improvements in riparian conditions and reductions in road related sediment. This is expected to contribute to improved localized stream channel conditions and benefit fish habitat within the

Middle Fork Coquille River Watershed, although at a site specific scale. Areas of localized sediment input would occur as a result of the proposed road related activities. There would be no cumulative effects to coho Critical Habitat, Special Status Species habitat, or Essential Fish Habitat from harvest or road activities at the 6th or 5th field watersheds. The potential increase of sediment from the proposed road related activities, when added to non-federal actions, would not affect fish habitat at the 6th or 5th field watershed scale. The cumulative effects are within the scope of anticipated effects to aquatic resources including fisheries analyzed in the Coos Bay District RMP EIS.

Essential Fish Habitat Assessment

The proposed action would *not adversely affect* EFH. This assessment fulfills the consultation requirements as described in the Magnuson-Stevens Fishery Conservation Management Act (16 U.S.C 1855((b)). Consultation with NMFS for EFH is not needed because there would be no adverse effects to EFH.

The full analysis resulting in the no adverse effects findings for EFH is located in the biological assessment in the analysis file and is incorporated by reference.

Endangered Species Act

An analysis of the proposed action on Oregon Coast coho and coho Critical Habitat (CCH) resulted in a request for informal consultation with National Marine Fisheries Service. The biological assessment on the proposed action for Oregon Coast coho salmon and CCH is located in the analysis file and hereby incorporated by reference.

Special Status Species

The proposed action would not contribute to the need to list any aquatic Sensitive species under the Endangered Species Act. The habitat for Special Status Species (SSS) would be maintained. There would be no expected increase in stream temperatures or peak flows. Best Management Practices and Project Design Features would eliminate sediment from causing adverse effects to SSS habitat. Finally, the proposed DMT within Riparian Reserves would not cause adverse effects to SSS habitat.

3.2.4 Special Status Species - Botany

There are no known or suspected T & E vascular, nonvascular, or fungal plant species in the project area.

Of the 101 known or suspected special status plant species on the Coos Bay District, there are 38 Bureau Sensitive species suspected of occurring in the King Myrtle project area. Of these there are 24 Special Status Species (SSS) for which surveys are recommended. These include vascular plants, lichens, and bryophytes for which surveys are being conducted and will conclude in December of 2008. None have been found to date. Any special status plant species (including incidental fungi) found would be buffered in order to protect the microsite and ensure that the proposed actions would not contribute to the need to list the species. The other 14 species are fungi in which pre-disturbance surveys are not practical or not necessary (USDA and USDI 2001).

No Action

Young 30 to 70 year old plantations in the stem exclusion stage (Oliver and Larson 1996) would remain densely stocked with very little light reaching the forest floor. As a result, there would be

less shrub cover in the understory than if the stand were thinned (Bailey and Tappeiner 1998, 2002). Thus, the generally sparse nature of understory shrubs and forbs would remain unchanged.

Overall macrolichen diversity would remain low with the greatest diversity occurring in areas with hotspot characteristics. Hotspot characteristics include old remnant trees, large wolf trees, old shrubs, hardwood trees, and rocky outcrops (Muir *et al.* 2002).

In the Coast Range of Oregon, there is no apparent difference in bryophyte species richness between unthinned and thinned stands less than 50 to 80 years old (Rosso 2002). However, bryophyte abundance on older shrubs may actually be greater in unthinned stands because they would not be adversely affected by damage due to logging (Rosso 2002). Thus, bryophyte diversity would likely remain unchanged or even be greater than if the units were thinned.

The present fungal community and the current species association would remain unchanged.

Proposed Action

Thinning these units would initially open up the canopy allowing sunlight to reach the forest floor. This would benefit light-loving vascular and non-vascular species. The open nature of the canopy would last several years, but they would eventually close again restricting the amount of light reaching the forest floor.

Lichen, bryophyte and vascular plant species surveys are on-going and will be completed by December of 2008. To date, none have been found. Any special status plant species (including incidental fungi) found would be buffered in order to protect the microsite and ensure that the proposed actions would not contribute to the need to list the species.

Fungi

To comply with Bureau policy to assess the effects of a proposed action on SSS, the "Conservation Assessment for Fungi Included in Forest Service Regions 5 and 6 Sensitive and BLM California, Oregon and Washington Special Status Species Programs" was consulted. This conservation assessment lists general characteristics of some specific federal management actions that serve as examples of actions that may potentially threaten known fungal sites(Cushman and Huff 2007)

As outlined by this conservation assessment, thinning these proposed units would not cause actions that intensively or extensively remove or consume the woody substrate, forest floor litter, or shrub hosts with which the individual species are associated nor would thinning cause actions that would remove or destroy the fungal organism. In addition, thinning prescriptions for the proposed units would not result in forest canopy covers less than 40%. Identified Special Status fungal sites would be buffered to protect the microsite. Thus, thinning the proposed project area would not result in specific federal management actions that may potentially threaten known Special Status fungal sites (Cushman and Huff 2007)

Vascular Plants

Thinning these young Douglas-fir stands would hasten the development of multistory stands by recruitment of conifer regeneration in the understory as well as by enabling the survival of small overstory trees and growth of advanced understory regeneration (Bailey and Tappeiner 2002). Richness, frequency, and cover of some herbaceous species and most species groups, including exotics, are also greater in thinned stands than in unthinned stands (Bailey *et al.* 1998). Although

thinned stands have a greater number of exotic plants than do unthinned or old-growth stands, exotic plant cover is normally low (Bailey and Tappeiner 2002).

Non-Vascular Plants

Thinned stands support a slightly higher abundance of forage lichens than do unthinned stands less than 50 to 80 years old (Peterson 2002). However, traditional commercial thinning appears to have little effect on the overall epiphytic macrolichen communities in young stands (Peterson and McCune 2001). This is because traditional commercial thinning often reduces the number of tree species present in a stand, removes remnant older trees or small diameter trees, and evens spacing between trees (Peterson and McCune 2001). Leaving with-in stand hotspots such as remnant trees, large wolf trees, old shrubs, and hardwood trees helps to maintain or increase lichen diversity in thinned stands (Peterson 2002).

Within Riparian Reserves, lichen diversity would be expected to increase with the inclusion of stand treatments such as gap creation, hardwood retention, no-harvest buffers which include wolf trees, and retention of remnant trees.

3.2.5 Wildlife Species

This analysis area falls within the Coast Range and the Klamath Mountains Physiographic Provinces and occurs within sub-watersheds of the Middle Fork Coquille River 5th-field watershed. This assessment addresses federal lands in portions of the following 6th-field sub-watersheds: Belieu Creek, Indian Creek, Rock Creek, and Myrtle Creek (Lower Myrtle Creek 7th-field only). This analysis area was chosen to reflect the mobile nature of many wildlife species, and because it closely matches the forest ecosystem and land management patterns of the project area. Analysis will occur at the site level (proposed project units) as well.

3.2.2.1 Marbled Murrelet

Declining population was the primary reason for listing the Marbled Murrelet *(Brachyramphus marmoratus)* as threatened in 1992 under the ESA (57 FR 45328). The Marbled Murrelet Recovery Plan identified the primary threats to the species as: 1) predation; 2) loss of nesting habitat; 3) by-catch in gill-nets; and 4) oil pollution from both chronic and major spills.

At-sea surveys are used to monitor murrelet populations in each of the 5 murrelet conservation zones. The analysis area is within Zone 4, and population densities have declined since 2002, with rising and falling modulations (Huff *et al.* 2006). This is not a statistically valid trend, but the population density in Zone 4 of 3.14 birds per square kilometer for 2005 is below the 2002 density of 4.21 birds per square kilometer.

Murrelet suitable habitat and occupied sites generally contain trees greater than 18 in. DBH (diameter breast height), multi-storied canopies with moderate closure, sufficient limb size and substrate (moss, duff, etc.) to support nest cups, flight accessibility, and protective cover (Burger 2001, Nelson and Wilson 2002).

Suitable habitat within 35 miles of the coast (Zone 1) has a higher likelihood of occupancy because access to the ocean for foraging is easier. All units are located 17 to 24 miles from the Pacific Ocean.

Table III-4 Summary of murrelet habitats within the project area

	Analysis Area	Proposed Units	Adjacent to Proposed Units
Suitable Habitat	5,167 acres – BLM managed (39% of all BLM	None	BFS – 02,03,08,17,19,20,21,23,24 LRC – 01,07,08,09,13,23,25

	acres)		IC – 05,06,11,18
Occupied Sites	~3 acres*	None	None
Critical Habitat	2,295 acres	None	Portions of LRC25,BFS21, and BFS23 for a total of 69 acres

*The occupied site is in an adjacent sub-watershed. The occupied behavior was observed 0.5 miles outside the analysis area.

No Action

Development of larger trees with potential nesting structure would be delayed within Riparian Reserve stands. The stand development trajectory would remain different from that which occurred in most stands that currently provide suitable habitat.

Proposed Action

Effects of potential disturbance to nesting Marbled Murrelets

There is the potential of disturbance to nesting murrelets as commercial thinning and density management thinning on some units would occur during the murrelet breeding season (1 April to 15 September). Noises associated with the proposed actions could disturb nesting murrelets and negatively affect productivity. Noises above ambient levels would occur from chainsaw use; human voices and use of small hand tools are generally not above levels that cause disturbance. Although little detailed information is available concerning the vulnerability of murrelets to disturbance effects, research on a variety of other bird species suggest such effects are possible (Henson and Grant 1991). Studies have shown that disturbance can affect productivity by nest abandonment, egg and hatchling mortality due to exposure and predation, longer periods of incubation, premature fledgling or nest evacuation, depressed feeding rates of adults and offspring, reduced body mass or slower growth of nestlings, and avoidance of otherwise suitable habitat.

The BLM identifies suitable murrelet habitat initially by looking at stands identified in GIS as being over 80 years of age, then reviewing aerial photographs of the stands looking for remnants and habitat structure, and then performing a field review. There have been approximately 536 acres identified as suitable habitat within 100 yards of the proposed units. Twenty-two (69%) of the proposed thinning units have adjacent suitable habitat within the 100-yard disturbance zone for the murrelet (Table III-4). The area of potential disturbance relative to the 22 units ranges from two to 70 acres. Of the 536 acres of suitable habitat potentially affected, 68 acres (8%) will have had two years of protocol surveys completed prior to harvest. If birds are detected, applicable Terms and Conditions of the Biological Opinion would be implemented to lessen noise disturbance.

Inclusion of the Daily Operating Restriction on these units would minimize the potential of noise disturbance to adults when they are visiting the nest to feed their offspring. Research has shown that most feeding visits occur during the dawn and dusk hours, when light levels are low (Ralph *et al.* 1995).

Portions of the action area have previously been surveyed to protocol. From 1994 through 1998 BLM conducted 196 intensive protocol surveys; another 14 surveys were conducted between 2005 and 2006. No murrelets were detected during those surveys. For the 2008 murrelet season contractors working for the BLM conducted 43 surveys at seven sites within the King Myrtle analysis area. On 25 July 2008 surveyors documented two audio detections to the northeast of Unit IC06. A second year of protocol surveys are scheduled for 2009.

Effects to Marbled Murrelet Suitable Habitat

The proposed action would remove five individual trees that are classified as suitable habitat for marbled murrelets. These trees, four 40-in. DBH Douglas-fir and one 30-in. DBH Grand-fir, would be cut to accommodate harvest of Unit LRC17. These trees are located in a 5-acre patch of suitable habitat to the north and are adjacent to this unit. This habitat patch was surveyed during the 2008 breeding season and no murrelets were detected. At the conclusion of the 2009 breeding season it will have had two consecutive years of protocol murrelet survey completed. If no birds are detected, there would be no direct effect to marbled murrelets.

Even if no birds are detected during surveys, removal of these trees is removal of suitable habitat that could be used for nesting marbled murrelets. However, because of the isolated nature and openness of the stand it is highly unlikely that birds would successfully use this stand for nesting purposes. The trees lack large branches and adequate moss for nesting, they are located atop a knoll, and are exposed to windy, dry conditions during the breeding season. The loss of these trees would not have a discernable impact to the marbled murrelet population within the analysis area.

Effects to Marbled Murrelet Critical Habitat

Units LRC25, BFS21, and BFS23 have a combined total of 69 acres located in Marbled Murrelet Critical Habitat Unit (CHU) OR-06c. This CHU totals 2,295 acres and overlaps LSR260. Aside from the short-term negative impact to murrelets as the thinning would take place during the breeding season, the overall long-term effects would be beneficial to murrelets by accelerating tree growth and providing nesting habitat. These are primary constitute elements important to the CHU and recovery of the murrelet.

3.2.2.2 Northern Spotted Owl

The northern spotted owl (*Strix occidentalis caurina*) was listed as federally threatened in 1990 (55 FR 26114) because of declining populations and decreases in suitable nesting habitat.

The forested areas within the project units are classified as spotted owl dispersal habitat, but much of it is poor quality because of small tree size, dense stocking levels, and low levels of snags and down wood. Dispersal habitat is generally described as forests greater than 40 years of age with canopy cover above 40%, which offers cover from predators, some foraging opportunities, and adequate space for flying.

In the Oregon Coast Range and Klamath Provinces, old-growth forest was the only forest type used for roosting and foraging in greater proportion than its availability at the landscape scale (Carey *et al.* 1992). However, at a finer scale, owls used portions of young forests for foraging in greater proportion than its availability, especially where wood rats were present. In the Western Cascades of Oregon, 50 percent of spotted owl nests were in late-seral/old-growth stands and none were found in stands less than 40 years old (Irwin *et al.* 2000). Spotted owls do not generally appear to select stands of intermediate or younger ages (Solis and Gutierrez 1990).

Stand characteristics which spotted owls rely on include: a multi-layered, multi-species canopy dominated by large overstory trees; moderate to high canopy closure; a high incidence of trees with large cavities and other types of deformities; numerous large snags; an abundance of large, dead wood on the ground; and open space within and below the upper canopy for spotted owls to fly (Thomas *et al.* 1990b).

No Action

For those stands within the Riparian Reserve, development of larger trees with potential nesting, roosting, and foraging structures would be delayed. Enhancing structural characteristics within the LSR stands would not occur. This would not result in improving potential habitat for spotted owls by increasing within-stand diversity.

Proposed Action

Disturbance to nesting spotted owls is a concern when noises associated with timber harvest occur during the owl nesting season (March 1 – September 30) within 65 yards of a known spotted owl nest site or activity center. There are no known spotted owl sites within 0.25 miles of any proposed unit; however, there is one predicted owl site within 0.25 miles of IC06.

Effects to Spotted Owl Suitable Habitat

Suitable habitat is described as habitat that supports nesting, roosting, and foraging (NRF) activities of the spotted owl. The proposed action has the potential to affect northern spotted owls because four 40-in. DBH Douglas-firs and one 30-in. DBH Grand-fir would be cut from a patch of suitable habitat to accommodate harvest of Unit LRC17. These trees are located in a 5-acre patch of NRF habitat to the north that is adjacent to Unit LRC17. South and adjacent to the unit is another 12-acre patch of NRF habitat. The five trees are within the 1.3 mile home range but outside the 300-meter nest patch and 0.5 mile core area of three owl sites (one being an alternate). Removal of these trees is removal of habitat that could support nesting, roosting, and foraging activities; however, the loss of these trees is likely indiscernible to owls because of the isolated nature of the stand where these trees are located and the overall lack of quality habitat. It is unlikely that the owls discussed above regularly use this stand.

Over the long-term, thinning of these stands would accelerate the development of suitable nesting, roosting, and foraging habitat for the spotted owl within the project area. Recruitment of large snags and down logs would also be accelerated, which is especially beneficial to the spotted owl and their prey species. Some snags would be intentionally created and as the result of mortality through the thinning process. Some loss or degradation of existing snags and down wood from harvest activities is anticipated, but all wood would be left on-site to continue to provide habitat for owl prey-based species.

Effects to Spotted Owl Dispersal Habitat

The methodology for determining NSO incidental take (USDI and USDA 2008) states that it is likely that the removal of NRF or dispersal-only habitat within a 300-meter radius of a nest patch would cause adverse effects and could, depending upon the extent of the removal, likely constitute a “take” of spotted owls in the form of harm. None of the proposed King Myrtle units are within the 300-meter nest patch of any known or predicted spotted owl site.

Up to 240 acres of spotted owl dispersal-only habitat would be altered within the project area due to commercial and density management thinning. Prescriptions would leave 65-100 trees per acre post-treatment, maintaining an average of 60% canopy cover in all units. Thomas *et al.* (1990a) suggested stands greater than 40% canopy cover could function for spotted owl dispersal. With the implementation of proposed actions current dispersal habitat would be maintained and become enhanced over the long-term.

In time, these stand treatments would cause an indirect beneficial effect by accelerating of the development of late-successional characteristics used by spotted owls, such as large diameter trees, multiple canopy layers, and hunting perches. Creating snags and down wood in applicable units would create a short-term input of these habitat structures for spotted owl prey species that

utilize these features. Thinning the stands would also promote large trees more quickly for future large snag recruitment.

3.2.2.3 Other Special Status Species

Instruction Memorandum No. OR-2008-038 (USDI 2008a), transmitted 2/06/2008, updated the State Director's special status species list for the Oregon/Washington BLM. The new list contains two categories of special status species: Sensitive and Strategic. Strategic Species do not require NEPA analysis. Species listed as threatened or endangered in the ESA are also considered Special Status Species. This analysis describes potential effects based on the current knowledge of the target species, knowledge of similar species, and on habitat correlates. Detailed descriptions of habitats for each species discussed below are located in the analysis file, which is incorporated by reference.

Bald Eagle

The final ruling to remove the bald eagle (*Haliaeetus leucocephalus*) from the Federal List of Endangered and Threatened Wildlife was effective 8 August 2007 (72 FR 37345). Protections remain in place under the Bald and Golden Eagle Protection Act (BGEPA) and the Migratory Bird Treaty Act (MBTA). Population declines at the time of listing were the result of environmental contaminants, habitat destruction, a declining food base, disturbance, electrocution, and intentional killing.

There are no confirmed bald eagle nests in the Middle Fork Coquille Watershed; therefore, there would be no effect to bald eagles from implementation of either alternative.

American Peregrine Falcon

American peregrine falcons *(Falco peregrinus anatum)* were de-listed from threatened status by the USFWS in 1999 (64 FR 46541) in the lower 48 states and removed from the Oregon State threatened and endangered species list in April 2007. Population declines at the time of listing were mainly the result of environmental contaminants.

The proposed units contain no peregrine habitat and there are no documented peregrine falcon eyries (nest sites) in Middle Fork Coquille Watershed, although there are a number of potential cliffs within the Watershed. Neither alternative would cause effects to peregrine falcons because no cliff habitats exist within or directly adjacent to the thinning units.

Fisher

In 2004, the west coast population segment of the fisher *(Martes pennanti)* was found to be warranted for listing under the ESA (69 FR 18769). However, listing was precluded by other listing activities of greater priority, and the species was subsequently placed on the federal list of candidates.

Fisher presence in the analysis area is highly unlikely. The dispersal habitat in the analysis area is low quality based on the overall low number of snags, down wood and fragmented late-successional habitat. Surveys conducted on district lands in 2007-08 were inconclusive. It is possible that fishers are elsewhere on district; however, there is no documentation of fisher presence in the analysis area.

Because of the unlikelihood of fishers being present within the project area, there would be no effect from implementation of either alternative.

Foothill Yellow-legged Frog

Although there are no records for the analysis area this species has been documented elsewhere in the Middle Fork Coquille Watershed. Because perennial streams bisect or are adjacent to units in many areas, the yellow-legged frog *(Rana boylii)* could be present in thinning units.

The yellow-legged frog could be present in streams within thinning units or in streams adjacent to units, but it is highly unlikely because all of these streams are small and have little sun. None of these streams provide egg-laying habitat.

No Action

Current aquatic conditions would continue. Incidental sightings of the yellow-legged frog would be recorded.

Proposed Action

Project design features have been incorporated to ensure the persistence of this species across the landscape. These include no–harvest buffers on streams containing potential yellow-legged frog habitat, sediment barriers and catch basins, and seasonal restrictions. Design features have been incorporated to protect all aquatic species, including fish and macroinvertebrates. Any sediment that may be generated from road associated activities would be mobilized during the first heavy winter rains which does not coincide with the egg-laying and larval stages of this frog. Finally, there would be no changes to peak flows within the watershed through implementation of the proposed project as thinnings of this design have shown no net effect to peak flows.

Northwestern Pond Turtle

This species has been documented in the Middle Fork Coquille Watershed and there is one record for the analysis area. This turtle *(Clemmys marmorata marmorata)* is rare throughout the District.

No Action

Current aquatic conditions would continue. Incidental sightings of the Northwestern pond turtle would be recorded.

Proposed Action

The implementation of Project Design Features and BMPs to arrest sediment delivery to streams would prevent downstream impacts to turtle habitat. Also, because there is no habitat within the treatment areas (no ponds, no basking sites, no non-forested fields nearby for nesting), the proposed action is not expected to have an effect on the Northwestern pond turtle.

Others

There are no known caves, mines, or abandoned bridges or buildings within the project area. They are known bat roosts. No other known sites of any Special Status wildlife species occur within the proposed units.

3.2.2.4 Migratory Birds

Western birds on the U.S. Fish and Wildlife Services' *Bird Species of Conservation Concern* and *Game Birds below Desired Condition* are to be addressed when actions could potentially affect those species. These lists are based primarily on North American breeding bird survey data which can be accessed at http://www.mbr-pwrc.usgs.gov/bbs/ (Sauer *et al.* 2007). The following

species are on one of these lists, could be affected by this project, and have not already been addressed elsewhere in this EA (as T&E or Bureau sensitive species): northern goshawk, olive-sided flycatcher, rufous hummingbird, mourning dove, band-tailed pigeon, and the blue-throated grey warbler.

Northern goshawks are associated with late-seral stands, and at least three sightings have been documented in the Middle Fork Coquille watershed. Because thinned stands in the Riparian Reserve are expected to achieve old-growth structure sooner than unthinned stands (Bailey *et al.* 1998, Bailey and Tappeiner 1998), thinning is likely to benefit this species over the long-term.

The olive-sided flycatcher is associated with conifer forest, especially where burns have left scattered large snags and live trees. It is unclear why this species is declining in an era of increasingly fragmented forests when it prefers edge habitat, but some types of harvested forests could be acting as "ecological traps" where nesting success is poor. However, in one study, this species responded positively to thinning, possibly because thinning creates the uneven canopy needed for foraging (Hagar and Howlin 2001).

Reasons for population declines in the rufous hummingbird are unclear. This species was one of a group of Neotropical birds that did not respond to thinning as a whole (Hagar and Howlin 2001). Because rufous hummingbirds seem to prefer a high canopy and well-developed understory for breeding (Patterson 2003,2006), they would likely benefit from thinning over the long-term, as thinning would increase light to the understory, thus increasing nectar availability.

Both the mourning dove and band-tailed pigeon are currently listed as game birds in the state of Oregon (see: Oregon Game Bird Regulations). Both species are common in western Oregon despite population declines overall. Thinning young forest is likely to benefit both species overall.

In southwest Oregon, black-throated gray warblers are common in mature chaparral which includes a mixture of oak, madrone, and manzanita. Habitat within these stands is not optimal, so the warbler would likely be in low numbers and transient rather than nesting, so direct effects from thinning would be insignificant.

The proposed action represents a net benefit to land birds, at least in the short-term (10 years). Canopy closure in the treated stands is expected to return to pre-project levels within 10-15 years.

3.2.6 Consistency with the Aquatic Conservation Strategy

Components of the Aquatic Conservation Strategy

There are four components to the Aquatic Conservation Strategy (ACS): Riparian Reserves, Key Watersheds, watershed analysis, and watershed restoration. A "fifth" component is the standards and guidelines for management activities located in the Coos Bay District RMP. These standards and guidelines were incorporated into the Draft Coos Bay District Management Plan preferred alternative which was under development (p. A-2). With the signing of the Record of Decision for the RMP in May of 1995, these standards and guidelines were superseded by the RMP management actions/direction.

1) Riparian Reserves:

The Riparian Reserve widths within the analysis area are two site potential tree heights (400 feet) for fish bearing streams and one site potential tree height (200 feet) for perennial and intermittent streams.

Riparian Reserves in the proposed units are in an over-stocked condition primarily as a result of previous harvest. Controlling the stocking in Riparian Reserves through thinning is necessary to meet desired future conditions. The proposed DMT in Riparian Reserves would begin to restore historic landscape level vegetation patterns.

2) Key Watersheds:
The King Myrtle analysis area is not located within a Key Watershed. The Middle Fork Coquille River 5th field watershed is not designated as a Key Watershed in the Coos Bay District RMP.

3) Watershed Analysis:
The proposed action is covered by three watershed analyses: Middle Fork Coquille (USDI 2007b), Sandy-Remote (USDI 1996) and Big Creek (USDI 1997a). Recommendations from these analyses which are incorporated into the King Myrtle project include silvicultural treatments within the Riparian Reserves and management of roads to have positive long-term effects on water quality.

4) Watershed Restoration:
As stated in the Coos Bay RMP, "Th[is] program's most important components are control and prevention of road-related run-off and sediment production, restoration of the condition of riparian vegetation, and restoration of in-stream habitat complexity." Proposed actions which would accomplish management actions/directions for watershed restoration include DMT in Riparian Reserves, road maintenance, road renovation, road improvement, and road closures.

5) Management Actions/Direction:
The following is a list of management actions/directions for timber and road management within Riparian Reserves applicable to the proposed action.

Roads Management:

- Minimizing road and landing locations in Riparian Reserves.
- Preparing road design criteria, elements, and standards that govern construction and reconstruction.
- Preparing operation and maintenance criteria that govern construction and reconstruction.
- Minimizing disruption of natural hydrologic flow paths, including diversion of streamflow and interception of surface and subsurface flow.
- Restricting sidecasting as necessary to prevent the introduction of sediment to streams.
- Reconstructing roads and associated drainage features that pose a substantial risk.
- Closing and stabilizing roads based on ongoing potential effects to the ACS objectives and considering short-term and long-term transportation needs.

Timber Management:

- Apply silvicultural practices for Riparian Reserves to control stocking, re-establish and manage stands, and acquire desired vegetation characteristics needed to maintain ACS objectives.

As stated earlier, the Coos Bay District RMPs Best Management Practices and the Northwest Forest Plan standards and guidelines are also incorporated into the proposed action to maintain water quality and soil productivity.

Existing Watershed Condition

The existing conditions of the Middle Fork Coquille River 5th field watershed are:

- The BLM administers 63,065 out of 197,607 acres within this watershed or 32% of the land within the 5th field watershed.
- Approximately 27,373 acres or 43.4% of BLM land are in Riparian Reserves.
- 36% of the trees within Riparian Reserves are 0-40 years old.
- The BLM controls approximately 385 miles of road or 31% of all road miles within the watershed.
- There are 278 miles of fish-bearing streams within the watershed. Several long standing barriers limit anadromous salmonids to 79.7 miles of this total or 27% of available fish-bearing stream miles.

Aquatic Conservation Strategy Objectives

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.

The landscape-scale features necessary to ensure the protection of the aquatic systems applicable to the King Myrtle EA include the riparian area associated forest stands. These stands provide many functions which include "the maintenance of surface and ground water quality in aquatic systems; … maintenance of streambank and streambed stability; maintenance and protection of habitat structure for fish, wildlife, and vegetation; and maintenance of favorable microclimates for riparian-dependant species" (Everest and Reeves 2006).

Riparian area functions that will be analyzed include microclimate, water quality, streambank stability, sediment regimes, and habitat provided for riparian associated species. Microclimate will be addressed under ACS objective 1. Water quality issues are addressed under objectives 3 and 5; streambank stability and sediment regimes under objectives 4, 6, and 7; and providing habitat for riparian associated species under objectives 2, 8 and 9.

Site Scale Analysis

Short-Term/Long-Term

Microclimates found in riparian areas are important components of watershed and landscape-scale features needed to ensure the protection of the aquatic systems. Because of the 50-foot no-harvest buffers on perennial streams, microclimates adjacent to perennial streams would remain unchanged or within the natural range of variability at the site scale. The 50-foot no-harvest buffers along perennial streams would include the slope break and the retention of riparian vegetation. Anderson *et al.* (2007) found buffer widths determined by either the change in riparian to upland vegetation or by the topographic slope breaks were sufficient in maintaining microclimate post-harvest. These authors also found that microclimate gradients in headwater riparian zones were strongest within 10 meters of the stream center, "a distinct area of stream influence within broader riparian areas." Chan *et al.* (2004) found the greatest change in microclimate occurs between stream center and 15 meters regardless of buffer size or upland treatment.

Because "microclimate is likely influenced by widths of both the riparian area and the stream channel" intermittent streams do not have a wide zone of influence on microclimate (USDI 2007b). Any microclimate change adjacent to intermittent streams would be minimal and short term because 1) all hardwoods and minor conifer species within Riparian Reserves of intermittent streams would be retained, 2) the brush layer would remain, 3) trees within five feet of intermittent stream channels would be retained, and 4) intermittent streams do not have a wide zone of influence on microclimate.

The proposed yarding corridors would not measurably alter the microclimate at the site scale because of the minimal width (12 feet), the locations would be spread out across the landscape, they would be discontinuous, and the majority would be located across intermittent streams.

5th Field Analysis

Short-Term/Long-Term

Because of the small amount of BLM land at the 5th field scale, the overall condition of the watershed and landscape-scale features would remain unchanged at the 5th field scale.

2. *Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependant species.*

Site Scale Analysis

Short-Term/Long-Term

Maintaining the Riparian Reserve network would ensure the effectiveness of the spatial and temporal connectivity within and between watersheds at the site scale.

The DMT prescription designed for Riparian Reserves would retain floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia needed by aquatic and riparian-dependant species for fulfilling life history requirements. Nor would the treatments inhibit spatial or temporal connectivity within and between watersheds. Additionally, the proposed DMT would ensure the long-term health and function of the Riparian Reserves by advancing stands toward developing late-successional characteristics.

The proposed new road construction, including installing culverts over two intermittent streams, would not change the spatial or temporal connectivity within or between watersheds. One culvert would be removed following harvest, while the second culvert would remain. The permanent culvert would not interfere with riparian-dependant vertebrate species movement. Intermittent streams are naturally limited for use as migration corridors by aquatic dependant species because of the limited duration of flow throughout the year and intermittent channels are generally steep.

5th Field Analysis

Short-Term/Long-Term

The spatial and temporal connectivity within and between watersheds at the 5th field would remain unchanged as a result of the proposed action. The small amount of BLM land and the relatively small treatment area would show no effect to these components at this scale.

3. *Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.*

Site Scale Analysis

Short-Term

The physical integrity of the aquatic system including shorelines, banks, and bottom configurations would be maintained at the site scale in the short-term. The proposed action would not adversely modify stream channels or aquatic habitat, nor remove any wood from stream channels. Thinning through intermittent streams would not result in a change to shorelines, banks, or bottom configurations because trees within five feet of the stream channel would be retained and full suspension over streams would be required. The permanent culvert proposed through the intermittent stream would be properly sized.

The proposed yarding corridors through the Riparian Reserves would not cause changes to these features because 1) full suspension would be required when yarding over stream channels and stream banks, 2) the corridors would be limited to 12 feet in width, and 3) trees felled within the no-harvest buffers would be left on site.

Long-Term

Development of late-successional characteristics in Riparian Reserves would increase the potential for LWD recruitment to stream channels at the site scale in the long-term. LWD in stream channels provides channel structure and complexity which improves bank stability.

5th Field Analysis

Short-Term/Long-Term

As there would be no noticeable impact to the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations at the site scale, there would be no change at the 5th field 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.*

Site Scale Analysis

Short-Term/Long-Term

Water quality necessary to support healthy riparian, aquatic, and wetland ecosystems would be maintained at the site scale in the short- and long-terms. Water quality would remain within the range that maintains the biological, physical, and chemical integrity of streams.

As stated in the Water Resources and Aquatic habitat sections of this EA, the proposed action is not expected to result in an increase in stream temperatures at the site scale.

Slight increases in turbidity could occur in the short-term in some localized areas as a result of road activities, but would not measurably alter water quality. Project Design Features would minimize the amount and duration of sediment entering stream channels. Any increase in turbidity would not measurably alter the biological, physical, or chemical integrity of streams. Aquatic and riparian-dependent species' survival, growth, reproduction, and migration would be maintained at the site scale in the short-term. The proposed road renovation, improvement, maintenance, and road closures would result in a net reduction in turbidity in stream channels in the long-term.

The proposed action is not expected to result in any chemical inputs to stream channels.

5th Field Analysis
Short Term/Long Term
As there would be no noticeable impact to water quality at the site scale, there would be no change in water quality at the 5th field scale as a result of the proposed action.

5. *Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.*

Site Scale Analysis
Short-Term
Short-term sediment movement may occur as a result of the proposed action; however, Design Features and BMPs would minimize or eliminate the sediment input to stream channels. The sediment input to streams resulting from road activities would be indiscernible beyond natural erosion processes expected to occur during winter rains. Refer the sediment discussions in the Hydrology and Aquatic Habitat sections for a more detailed discussion of sediment.

Long-Term
The proposed road renovation, improvement, maintenance and road closures would result in a net reduction in sediment delivery to stream channels at the site scale in the long-term. Some existing roads within the analysis area are currently contributing sediment to stream channels from surface erosion, inadequate drainage, inadequate stream crossings or unstable cutbanks and fill slopes. The proposed action would improve these roads by restoring adequate drainage and thus reducing sediment delivery to streams. The proposed action also includes closing roads which would include properly routing water and installing water bars.

The proposed road closures would result in a long-term reduction of sediment entering streams at the site scale. Stabilizing the drainage on these roads would reduce the potential of the roads failing and sediment entering stream channels. Over time, additional large wood recruitment from DMT would create additional capacity for sediment storage.

5th Field Analysis
Short-Term/Long-Term
As there would be no noticeable impact to the sediment regime at the site scale from harvest activities, there would be no change at the 5th field watershed scale in the short or long terms.

The expected sediment to be delivered at the site scale in the short-term from road activities would not be measurable at the 5th field scale. At this scale, taking into consideration the small amount of BLM land compared to privately owned lands and the relatively small size of the project, the proposed action would provide a negligible benefit of reduced sediment delivery to stream channels.

6. *Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetlands habitats to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.*

Site Scale Analysis
Short-Term/Long-Term
In-stream flow sufficient to create and sustain riparian, aquatic, and wetland habitat would be maintained at the site scale. Patterns of sediment, nutrient, and wood routing in addition to the

timing, magnitude, duration, and spatial distribution of peak, high, and low flows would also be maintained at this scale in the short- and long-terms.

Analysis located in the Water Resources section has concluded that there would be no measurable effect to stream flow is expected as a result of the thinning treatments. This analysis also details the methods used for assessing the potential risk of the existing and the proposed road network's ability to cause an impact on stream flow. The results showed the analysis area currently has a low risk of hydrologic impacts due to roads.

5th Field Analysis

Short-Term/Long-Term

Because there would be no impacts to in-stream flows at the site scale, there would be no changes at the 5th field scale.

7. Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.

Site Scale Analysis

Short-Term/Long-Term

The timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands would not be affected by the proposed action at the site scale. The interaction of water with wetlands and meadows would be unaffected; there are no known meadows or wetlands within any proposed units. If meadows or wetlands are discovered during unit layout they would be buffered accordingly. The project does not include water diversions or well drilling, activities usually associated with lowering water tables.

5th Field Analysis

Short-Term/Long-Term

Because there would be no effects at the smaller scale to these components, there would be no change at the 5th field watershed scale in the short or long terms.

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.

Site Scale Analysis

Short-Term/Long-Term

Species composition and structural diversity of plant communities in riparian areas and wetlands would be maintained at the site scale. Density management thinning would occur in Riparian Reserves to promote forest health, promote development of large conifers, enhance large woody debris development, and improve diversity of species composition and stand density. Chan *et al.* (Chan *et al.* 2006) found cover was initially reduced in response to thinning, but had an overall positive effect to understory vegetation and diversity within sample sites in the Oregon Coast Range.

Creating snags and down wood in Riparian Reserves would improve the structural diversity at the site scale and enhance development of late-successional characteristics within the Riparian Reserve over time.

Nutrient availability within Riparian Reserves would increase as a result of the proposed DMT. The proposed treatments would increase brush and deciduous tree growth which would increase nutrient availability in Riparian Reserves. Minor conifer species, alders, and other hardwoods would be retained in the Riparian Reserves, unless cut within yarding corridors.

5th Field Analysis

Short-Term/Long-Term

Because there would be no noticeable adverse impact to species composition and structural diversity of plant communities in riparian and wetland areas at the site scale there would be no change at the 5th field watershed scale. Because of the relatively small size of the project, benefits would not be measurable at the 5th field scale.

9. Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.

Site Scale Analysis

Short-Term/Long-Term

Habitat needed to support riparian-dependent species (including plants, invertebrates, and vertebrates) would be maintained at the site scale in the short and long term.

No-harvest buffers would provide areas of undisturbed litter layers, structures, vegetation, and protected microclimates that would provide refugia areas for riparian-dependant plants and animals. Microclimates were discussed under ACS Objective 1.

Following the proposed treatments in the Riparian Reserves, habitat would be maintained and would be expected to improve at the site scale in the short term and long term. The proposed DMT would increase structural and species diversity in Riparian Reserves. The no-harvest buffers would provide areas of undisturbed litter, structure, vegetation, and protected microclimates which would provide refugia areas for riparian-dependant plants and animals. Density management thinning would provide conditions favorable for the development of diversified layers of herbs, shrubs, and pockets of shade tolerant trees.

Creating snags and down wood in Riparian Reserves would improve the structural diversity in the short and long terms at the site scale and increase the late successional characteristics in the Riparian Reserve. Depending on the height of the snags when they eventually fall they may or may not reach a stream channel. If any portion of the snags or trees cut for down logs were to reach a stream channel it would function as LWD and improve instream conditions at that particular site. If the snags or trees fall and do not reach a stream channel they would function as coarse woody debris on upland sites.

The proposed DMT is expected to increase the stand complexity within Riparian Reserves. An increase in stand complexity should increase insect abundance and diversity at the site scale in the short and long terms.

Zobrist and Hinckley (2005) conducted a literature review of thinning and compiled the following discussion of the effects of thinning to understory plant species: "Thinning opens up the stand and allows light to reach the forest floor. This provides for better developed understories with greater richness, diversity, and cover (Bailey et al. 1998, Curtis et al. 1997, Thomas et al. 1999, Thysell and Carey 2000). Studies have found that thinned stands have greater herbaceous cover (Carey and Wilson 2001, Muir et al. 2002), greater understory trees and shrubs (Bailey and Tappeiner 1998, Muir et al. 2002, Tappeiner and Zasada 1993), and greater density, survival, and

growth of conifer seedlings (Bailey and Tappeiner 1998, Brandeis et al. 2001, DeBell et al. 1997, Muir et al. 2002)".

A more diversified array of microclimates, structures, substrates, and habitat would result, which would support well-distributed populations of riparian dependent plant, invertebrate, and vertebrate species.

5th Field Analysis

Short-Term/Long-Term

Because there would be no noticeable adverse impacts to habitat for riparian-dependant species at the site scale, there would be no change at the 5th field watershed scale in the short or long terms. Because of the relatively small size of the project, benefits would not be measurable at the 5th field scale.

3.3 Resources Not Analyzed in Detail

Due to the lack of concern expressed by the Scoping respondents, adequacy of existing best-management practices and policy, and the limited intensity or scope of the effects on the affected resource, the items below are excluded from detailed comparative analysis as directed by CEQ regulation §1500.1(b), 1500.2(b) and other sections.

Air Quality

Landing pile burning (if burning is necessary to reduce potential wild land fire intensity) would adhere to the Oregon Smoke Management Plan for limiting effects of particulate emissions. A post harvest assessment of the treatment areas would occur to determine whether landing piles would be burned.

Forest Fuels/ Fire Regime Condition Class

A fire regime condition class (FRCC) is a classification of the amount of departure from the natural (historical) regime (Hann and Bunnell 2001, Hardy *et al.* 2001, Schmidt *et al.* 2002). The departure is measured in three classes and are based on low (FRCC 1), moderate (FRCC 2), and high (FRCC 3). Within the analysis area, most of the area shows a moderate degree of departure, and is classified as FRCC 2. Mechanical treatments such as thinning and density management in conjunction with activity fuel treatments would assist in maintaining the same FRCC and/or help shift the analysis area towards a FRCC 1 condition.

Reducing the tree density would improve stand vigor, remove portions of the ladder fuels, and greatly decrease the primary source for future ground fuels. Thinning stands would lessen the inherent risk of a stand replacement fire by removing spatial live fuel structure and/or modifying horizontal and vertical arrangements of fuel loadings. This modification occurs during the use of machinery or when using yarding corridors during a cable logging activity. Though thinning would create a short-term increase in fine fuels, the removal of trees would expose the ground to sunlight that would stimulate brush species to grow at more rapid rate and occupy a larger percentage of the site. As the live fuel component builds within the fuel base, the resulting shade reduces surfaces temperatures and increases fuel moistures, therefore promoting decomposition of hazardous fuels. In this condition of decomposition the fuels retain water longer which would strengthen the resistance to fire starts in early to mid-summer.

Port-Orford-cedar

The King Myrtle analysis area is within the range of Port-Orford-cedar; therefore, all management activities would conform to the guidelines specified in the 2004 Final Supplemental

Environmental Impact Statement (FSEIS) for Management of Port-Orford-Cedar in Southwest Oregon where applicable (USDA and USDI 2004).

Areas within 50 feet of streams or roads were determined to be at high risk of infection, and those areas greater than 50 feet away from roads and streams were determined to be at low risk of infection by Port-Orford-cedar root disease (*Phytophthora lateralis*) (p.3&4-42). The answer to all three questions in the Risk Key provided in the 2004 FSEIS (p.2-18) which gives direction for assessing risk and controlling spread of *P. lateralis*, was "no." Risk is therefore deemed to be low and no additional Port-Orford-cedar management practices are required. Although no additional mitigation is required, some measures to reduce the risk of further spread of *P. lateralis* would be implemented as described in Chapter II.

Noxious Weeds

The BLM is required to develop a Noxious Weed Risk Assessment when it is determined that an action may introduce or spread noxious weeds or when known habitat exists (USDI 2007c). This assessment has been completed for the King Myrtle project and is included in the Analysis file. Prevention measures identified as a result of this assessment not already applied on District lands as part of routine activities (USDI 1997b), have been incorporated into the Project Design Features to minimize the potential for introducing weeds to the project area and/or spreading existing weed infestations.

Soil Compaction

A review of historical aerial photos shows that proposed ground-base units, with the exception of BFS23, have a less than 10% compaction area due to legacy logging and skid trails. The area proposed for ground-based harvest in Unit BFS23 has an estimated compaction of 29% from the previous harvest; however, the Unit is approximately 31 years old and most of this compacted area has recovered to a depth of 6 inches. Although some minimum disturbance to the soil layer would occur in all units to be thinned using both ground-based and skyline yarding, mitigation against disturbance using Project Design Features would provide the necessary soil protection. Some of this protection includes: dry season operation for ground-based units, designated main forwarding corridors (skid trails), use of pre-existing skid-trails, minimizing harvester passes (generally 2-3), and yarding vehicles operating on a layer of slash to reduce ground disturbance and the potential for surface runoff. In addition, one-end suspension and the relatively small volume and size of the logs being removed (compared to a regeneration harvest) would minimize increases in soil disturbance and compaction.

Hazardous Materials

Activity resulting from the Action Alternatives would be subject to State of Oregon Administrative Rule No. 340-108, *Oil and Hazardous Materials Spills and Releases.* This specifies the reporting requirements, cleanup standards, and liability that attaches to a spill or release or threatened spill or release involving oil or hazardous substances. Site monitoring for solid and hazardous waste would be performed in conjunction with normal contract administration. In addition, the Coos Bay District Hazardous Materials Contingency Plan and Spill Plan for Riparian Operations would apply when applicable to operations where a release threatens to reach surface waters or is in excess of reportable quantities.

Cultural Resources

Records compiled by the Oregon State Historic Preservation Office (SHPO) and the Coos Bay BLM District do not show archaeological sites within or near the vicinity of project units.

Timber harvest (clear-cutting) was previously accomplished in these units between 1948 and 1974. Subsequently, the units were replanted.

Because of the land-use history of these units, it is not anticipated that this project would impact intact cultural resources. As a Project Design Feature, potential cultural resources are discovered during work associated with this project, work should stop and the District Archaeologist would be contacted to provide clearance for work to resume.

Environmental Justice

The proposed areas of activity in connection with the King Myrtle project are not known to be used by, or disproportionately used by minority or low-income populations for specific cultural activities at greater rates than the general population. This includes their relative geographic location and cultural, religious, employment, subsistence, or recreational activities that may bring them to the proposed areas. Planning discussed above coordinated aspects of this project with the CIT. Agreement was reached concerning access to BLM project units through CIT forest lands. Thus, BLM concludes that no disproportionately high or adverse human health or environmental effects will occur to Native Americans, and minority or low-income populations as a result of the proposed actions.

Native American Concerns

Several of the proposed areas of activity associated with the proposed action are on BLM lands adjacent to Coquille Indian Tribe (CIT) forest parcels. Meetings were held to identify potential CIT concerns and opportunities for cooperation.

New road construction of spur BSF16-2 (approximately 0.2 mi) was proposed to connect existing road 29-11-23.1 to Unit BFS-16 (which is in T. 29 S., R. 11 W., Section 25). As initially proposed, this spur road would traverse Coquille Forest land in T. 29 S., R. 11 W., Section 26, including a portion of Euphoria Ridge meadow. The CIT considers this meadow a cultural resource, and their long-term goals include meadow restoration. Two on-site meetings were held with Tribal representatives to coordinate the new road location. The final road location will both provide access for timber operations in Unit BFS-16 and enhance the restoration of Euphoria Ridge meadow.

Drinking Water Protection Areas

Under the requirements and guidelines of the Federal Safe Drinking Water Act, ODEQ prepares Source Water Assessments for public water supplies in Oregon. One drinking water source for the City of Coquille is the Coquille River. All of the proposed project units are located within the headwaters of the Middle Fork Coquille River and are, therefore, part of the Drinking Water Protection Area (DWPA) for Coquille.

Managed forest lands in the DWPA are listed as one of the potential contaminant sources in the Source Water Assessment (ODEQ 2003). Potentially impacting activities include cutting and yarding of trees, road building and maintenance, and road usage. These activities are analyzed by alternative under Water Quality/Sediment. However, no effect to drinking water is expected as a result of the project.

3.4 Unaffected Resources

None of the following critical elements of the human environment are located within the project area or within a distance to be affected by implementation of either alternative:

- Areas of Critical Environmental Concern
- Farmlands, Prime or Unique
- Flood Plains (as described in Executive Order 11988)
- Wild and Scenic Rivers
- Wilderness values

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Chapter VI List of Agencies and Persons Contacted

The public was notified of the planned EA through the publication of Coos Bay District's Planning Update, Scoping notification on the district web site, and advertisement of Scoping in T*he World* newspaper.

The following public agencies and interested parties were notified directly with scoping letters:

American Forests Resources Council
Association of O&C Counties
Cascadia Wildlands Project
Coast Range Association
Confederated Tribes of Coos, Lower Umpqua and Siuslaw Indians
Coos County Commissioners
Coquille Indian Tribe
Division of State Lands
Douglas Timber Operators
Friends of the Coquille
Governors Natural Resources Office
Klamath-Siskiyou Wildland Center
NOAA National Marine Fisheries Service
NW Environmental Defense Center
Oregon Dept. of Forestry
Oregon Wild
Plum Creek Timberlands
Rogue Forest Protective Association
Umpqua Watersheds
Numerous Private Citizens

The BLM also contacted the Coquille Indian Tribe as an adjacent landowner. A field trip ensued to the area near Euphoria Ridge to resolve potential impacts to the meadow. Don Ivey and Ed Vaughn, representatives of the tribe, and numerous BLM personnel resolved potential issues in the field.

Appendix A Road Work

Table A-1 Proposed Road Renovation, Improvement, and Maintenance Activities. Road closure activities are also listed.

Sale Name and Number	EA Unit No.	EA Spur No.	Road # if known	Haul Season	Current Status	Surface Type	Road Work	Miles	Closure
Belieu Creek	BFS17	BFS17-1R	30-10-5.2	All	Open	Rock	RENO	0.27	Decomm.
		BFS17-2I		All	Open	Rock	IMP	0.03	Decomm.
	BFS19	BFS-19-1I		All	Open	Rock	IMP	0.09	Decomm.
	BFS21	BFS21-2R	30-10-6.1	All	*Gated*	Rock	RENO	0.20	Temp.
		BFS21-1I		All	Open	Rock	IMP	0.06	Decomm.
	BFS23	BFS23-1R	29-10-31.0	All	Open	Rock	RENO	0.33	Decomm.
		BFS23-3R	29-10-33.0	All	Open	Rock	RENO	0.31	Decomm.
					Decommissioned	Rock	RENO	0.11	Decomm.
		BFS23-2I		All	Open	Rock	IMP	0.05	Decomm.
	BFS24	BFS24-1R	30-10-5.1	All	Open	Rock	RENO	0.44	Decomm.
	BFS25	BFS25-2I		All	Open	Rock	IMP	0.09	Decomm.
	LRC25	LRC25-1I		All	Open	Rock	IMP	0.18	Decomm.
	Main-line Haul Roads Accessing Multiple Units		29-10-14.2	Summer	Open		Maint.	0.86	
			29-10-15.0	Summer	Open		Maint.	0.92	
			29-10-17.2	Summer	*Gated*		Maint.	0.08	
			29-10-33.0	All	Open		Maint.	4.94	
			29-10-9.1	Summer	Open		Maint.	0.15	
			29-10-9.2	Summer	Open		Maint.	0.32	
				Summer	*Gated*		Maint.	1.01	
			30-10-5.0	All	Open		Maint.	1.95	
			29-10-17.2	Summer	*Gated*		Maint.	0.12	
			29-10-29.0	Summer	*Gated*		Maint.	0.79	
			29-12-24.0	All	Open		Maint.	0.27	
			30-10-6.0	All	Open		Maint.	0.36	
			30-11-12.0	All	Open		Maint.	0.51	
			Private road	Summer	*Gated*		Maint.	0.94	
Jersey Jim	BFS08	BFS08-1I		All	Open	Rock	IMP	0.16	Decomm.
	BFS11	BFS11-1I		All	Open	Rock	IMP	0.09	Decomm
	BFS16	BFS16-1R	29-11-23.1	All	Open	Rock	RENO	0.14	Decomm
		BFS16-2R		Summer	Open	Dirt	RENO	0.03	Decomm
	IC05	IC05-1R	29-12-13.0	Summer	Open	Dirt	RENO	0.40	Full Decomm.
	IC06	IC06-1R	29-18-11.0	All	Open	Rock	RENO	0.15	
		IC06-2R		All	Open	Rock	RENO	0.06	Decomm
		IC06-2I		All	Open	Rock	IMP	0.23	
	IC09	IC09-2R	29-11-27.0	All	Open	Rock	RENO	0.11	

Sale Name and Number	EA Unit No.	EA Spur No.	Road # if known	Haul Season	Current Status	Surface Type	Road Work	Miles	Closure
	Main-line Haul Roads Accessing Multiple Units		29-11-19.0	All	Open		Maint.	0.26	
			29-11-20.0	All	Open		Maint.	1.67	
				All	*Gated*		Maint.	0.01	
			29-11-23.0	All	Open		Maint.	4.08	
			29-11-23.1	All	Open		Maint.	2.30	
			29-11-26.0	All	Open		Maint.	0.98	
Jersey Jim Cont.			29-11-27.1	All	Open		Maint.	0.12	
			29-11-23.0	All	Open		Maint.	0.54	
			29-12-24.0	All	Open		Maint.	3.01	
			Private Road	All	Open		Maint.	1.00	
Shark Bait	IC10	IC10-1R	29-11-28.1	Summer	*Gated*	Rock	RENO	0.57	Temp-.0.16
		IC10-2R	29-11-29.1	All	*Gated*	Rock	RENO	0.04	Temp
	IC11	IC11-1R	29-11-28.1	All	*Gated*	Rock	RENO	0.59	Temp
	IC14	IC14-1R	29-11-31.0	All	Open	Rock	RENO	0.28	
		IC14-2R	29-11-31.1	All	Open	Rock	RENO	0.17	
	IC15	IC15-1I		All	Open	Rock	IMP	0.18	Decomm.
	Main-line Haul Roads Accessing Multiple Units		29-11-28.1	All	*Gated*	Rock	Maint.	0.61	Temp
			29-12-26.0	All	Open		Maint.	0.66	
			29-12-35.0	All	Open		Maint.	2.16	
			29-12-36.1	All	Open		Maint.	6.01	
Rock Creek	LRC07	LRC07-1R	30-11-14.1	All	Open	Rock	RENO	0.57	
		LRC07-2R	30-11-23.2	All	Open	Rock	RENO	0.17	Decomm.
		LRC07-1I		All	Open	Rock	IMP	0.28	Decomm.
	LRC23	LRC23-1R	30-11-23.0	All	Open	Rock	RENO	0.90	
	LRC17	LRC17-2R		Summer	Open	Dirt	RENO	0.13	Decomm.
	Main-line Haul Roads Accessing Multiple Units		30-10-19.2	Summer	Open		Maint.	1.58	Temp
				All	Open		Maint.	0.68	
			30-11-14.0	Summer	Open		Maint.	3.44	
			30-11-14.1	All	Open		Maint.	1.27	
			County 32	All	Open		Maint.	3.68	
			County 88	All	Open		Maint.	2.73	
Misc. units	LRC102	LRC102-1R	30-10-17.1	Summer	Open		RENO	0.18	
	LRC103	LRC103-1I		All	Open		IMP	0.28	
	LRC21	LRC21-2R	30-10-21.4	All	Open		RENO	0.32	
		LRC21-1I		All	Open		IMP	0.23	
	Main-line Haul Roads Accessing Multiple Units		30-10-14.0	All	*Gated*		Maint.	4.40	
			30-10-21.1	All	Open		Maint.	2.62	
			30-10-21.3	All	Open		Maint.	0.41	

Appendix B Silviculture Tables and Discussion

Table B-1 Summary of current stand conditions at the Unit scale

EA Unit	Stand age	TPA >7"	BA/Ac	DBH	RD	Height/ Diameter	Vol./acre
BFS02	39	210	208	13.4	63	79	36.9
BFS03	41	167	181	14.1	48	77	33.3
BFS08	37	155	187	14.8	49	80	33.4
BFS11	33	267	177	11.0	53	78	31.6
BFS16	38	190	172	12.9	48	80	26.1
BFS17	32	265	181	11.2	54	85	22.2
BFS19	31	295	210	11.4	62	82	27.6
BFS20	40	208	167	12.1	48	63	27.4
BFS21*	31	228	176	11.9	51	87	25.5
BFS23*	31	242	169	11.3	50	87	23.7
BFS24	35	263	166	10.8	51	81	18.0
BFS25	34	218	155	11.4	46	79	19.9
IC05	34	180	193	14.0	52	73	27.2
IC06	43	181	209	14.5	55	90	39.7
IC09	54	161	215	15.6	54	72	42.6
IC10	34	366	205	10.1	65	97	30.7
IC11	31	153	138	12.9	38	74	19.2
IC14	31	222	187	12.4	53	77	27.4
IC15	31	217	182	12.4	53	77	25.9
IC18	32	323	195	10.5	60	90	26.9
LRC01	57	178	262	16.4	65	81	65.3
LRC07	37	212	190	12.8	53	81	27.6
LRC08	37	212	190	12.8	53	81	27.6
LRC09	35	233	183	12.0	53	89	29.4
LRC10	31	321	183	10.2	57	96	24.3
LRC102	61	223	340	16.7	83	81	76.2
LRC103	62	258	320	15.1	82	70	57.3
LRC13	33	209	176	12.4	50	73	15.5
LRC17	56	163	308	18.6	71	77	86.9
LRC21	37	194	236	14.7	61	67	38.6
LRC23	37	205	180	12.7	51	76	26.6
LRC25*	57	178	262	16.4	65	81	65.3
Average	**39**	**222**	**203**	**13.1**	**56**	**80**	**34.6**
Minimum	**31**	**153**	**138**	**10.1**	**38**	**63**	**15.5**
Maximum	**62**	**366**	**340**	**18.6**	**83**	**97**	**86.9**

* Stands or portions of stands within the LSR

Because the forested area is extremely complex, a forest operations inventory (FOI) system is used to facilitate discussion and management decisions. This inventory describes forest cover (vegetation) and land use management attributes within areas greater than 5 acres in size of similar stand characteristics. These characteristics include site class, dominant species, understory species, treatments, age class, and stand condition. The classification system is a subjective interpretation from aerial photography of stand conditions at the landscape scale and ignores small dissimilarities. Using the FOI classification system at the landscape scale, approximately 62% of the 3005 acres of thinning-aged stands are classified as well stocked, 32% as medium stocked, and the remainder (6%) are described as poorly stocked.

Tree densities can also be determined at the plot level using stand exam information. Table B-2 depicts the range of plot level densities in the proposed treatment units. Note that the average across all plots is roughly similar to the classification at the landscape scale. The plots are stratified into "no competition" (relative density less than 20), "low competition" (relative density from 21 to 34), "high competition" (relative density 35 to 55) and high competition transitioning to "imminent mortality" (relative density greater than 55).

Table B-2 Distribution of plot level (patch) Relative Density

Unit Number	Total plots	Average RD	Percent plots by relative density range			
			No competition: RD of 20 and less	Low competition: RD of 21 to 34	High competition: RD of 35 to 55	Imminent Mortality: RD 56 and greater
BFS02	8	63	0.0	0.0	37.5	62.5
BFS03	8	48	25.0	0.0	37.5	37.5
BFS08	7	49	14.3	0.0	57.1	28.6
BFS11	8	53	0.0	0.0	62.5	37.5
BFS16	10	48	10.0	10.0	40.0	40.0
BFS17	8	54	0.0	0.0	62.5	37.5
BFS19	7	62	0.0	0.0	28.6	71.4
BFS20	2	48	0.0	0.0	50.0	50.0
BFS21	8	51	12.5	0.0	37.5	50.0
BFS23	12	50	8.3	0.0	66.7	25.0
BFS24	7	51	14.3	0.0	28.6	57.1
BFS25	5	46	20.0	0.0	60.0	20.0
IC05	30	52	13.3	0.0	43.3	43.3
IC06	25	55	16.0	0.0	32.0	52.0
IC09	16	54	6.3	6.3	37.5	50.0
IC10	8	65	0.0	0.0	12.5	87.5
IC11	13	38	38.5	0.0	53.8	7.7
IC14	12	53	0.0	0.0	58.3	41.7
IC15	16	53	6.3	0.0	62.5	31.3
IC18	5	60	0.0	0.0	40.0	60.0
LRC01*	40	65	5.0	5.0	10.0	80.0
LRC07**	10	53	10.0	0.0	50.0	40.0
LRC09	7	53	0.0	0.0	57.1	42.9
LRC10	7	57	0.0	0.0	71.4	28.6
LRC102	2	83	0.0	0.0	0.0	100.0
LRC103	8	82	0.0	0.0	0.0	100.0
LRC13	6	50	0.0	0.0	83.3	16.7
LRC17	7	71	0.0	0.0	14.3	85.7
LRC21	8	61	12.5	0.0	25.0	62.5
LRC23	2	51	0.0	0.0	50.0	50.0
Pre-treatment Average	**312**	**55**	**7.1%**	**0.7%**	**42.2%**	**49.9%**

* Same plot information used for Unit LRC25 ** Same plot information used for Unit LRC08

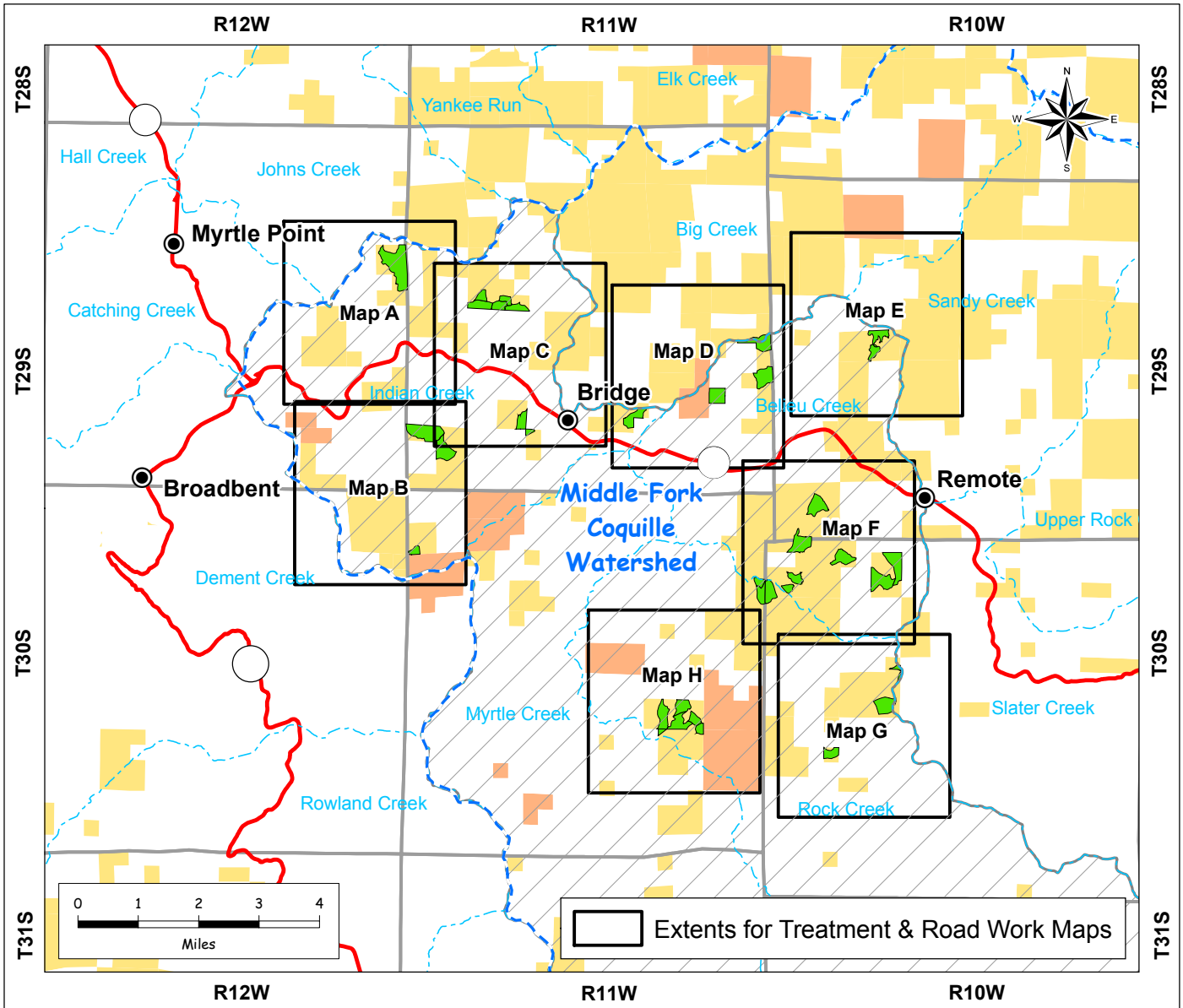
Because of strong winter storm winds and snowfall within the project area, the potential for windthrow and snow break damage acts as a constraint on the lower end of density treatment. Trees suddenly released from dense competition are more susceptible to windthrow and snow break because of the loss of adjacent trees to buffer the wind forces and because of the poor height to diameter ratios trees develop when grown at higher densities. Trees growing under intense competition are forced to grow taller in an effort to overtop adjacent trees and allocate energy towards height growth rather than diameter growth. This results in heights that are greater than open grown trees of the same diameter. This greater height to smaller diameter ratio makes trees more susceptible to bending or breaking under heavy wind or snow loads. Windthrow is

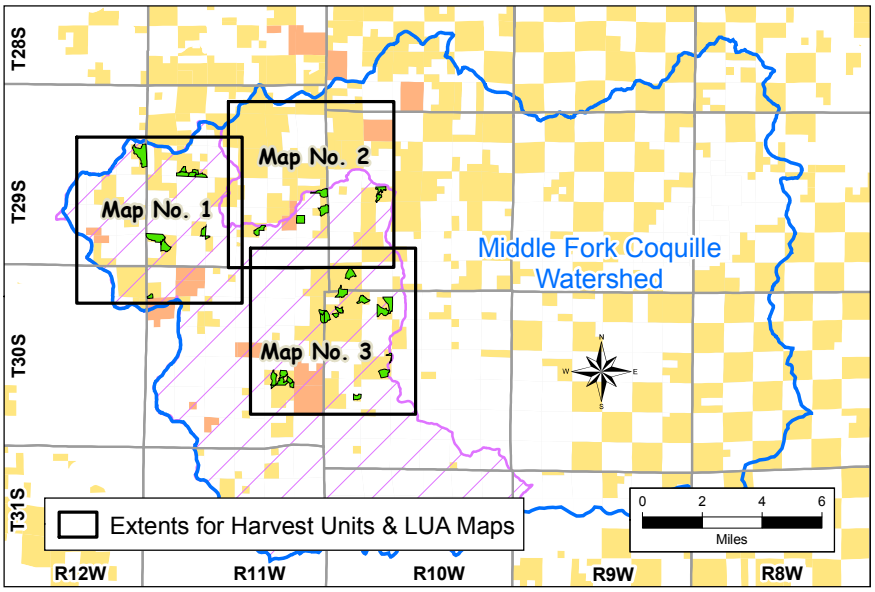
greatest against a hard cut line, such as a change in ownership along a property line where a clear-cut has recently occurred and along topographic features where funneling of wind energy could occur. In an Olympic Peninsula study of wind damage after variable density thinning, Roberts and others (2007) found that wind was responsible for damaging approximately 1.8% of all trees with 80% of the damage being windthrow. A recent unpublished study of windthrow occurrence along steams in the Oregon Coast range found that windthrow did not appear to be a significant source of endemic mortality as only 1% of the live standing basal area was affected over a 4 year period (Drake 2008).

Appendix C MAPS

King Myrtle EA

Vicinity Map





Map Features

- State Highway
- Subwatershed Boundaries
- Middle Fork Coquille Watershed
- Analysis Area
- Unit Boundary
- BLM Administered Land
- Bureau of Indian Affairs
- Private / Other Ownership

US DEPARTMENT OF THE INTERIOR
Bureau of Land Management

Coos Bay District Office
Myrtlewood Resource Area
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North Bend, OR 97459

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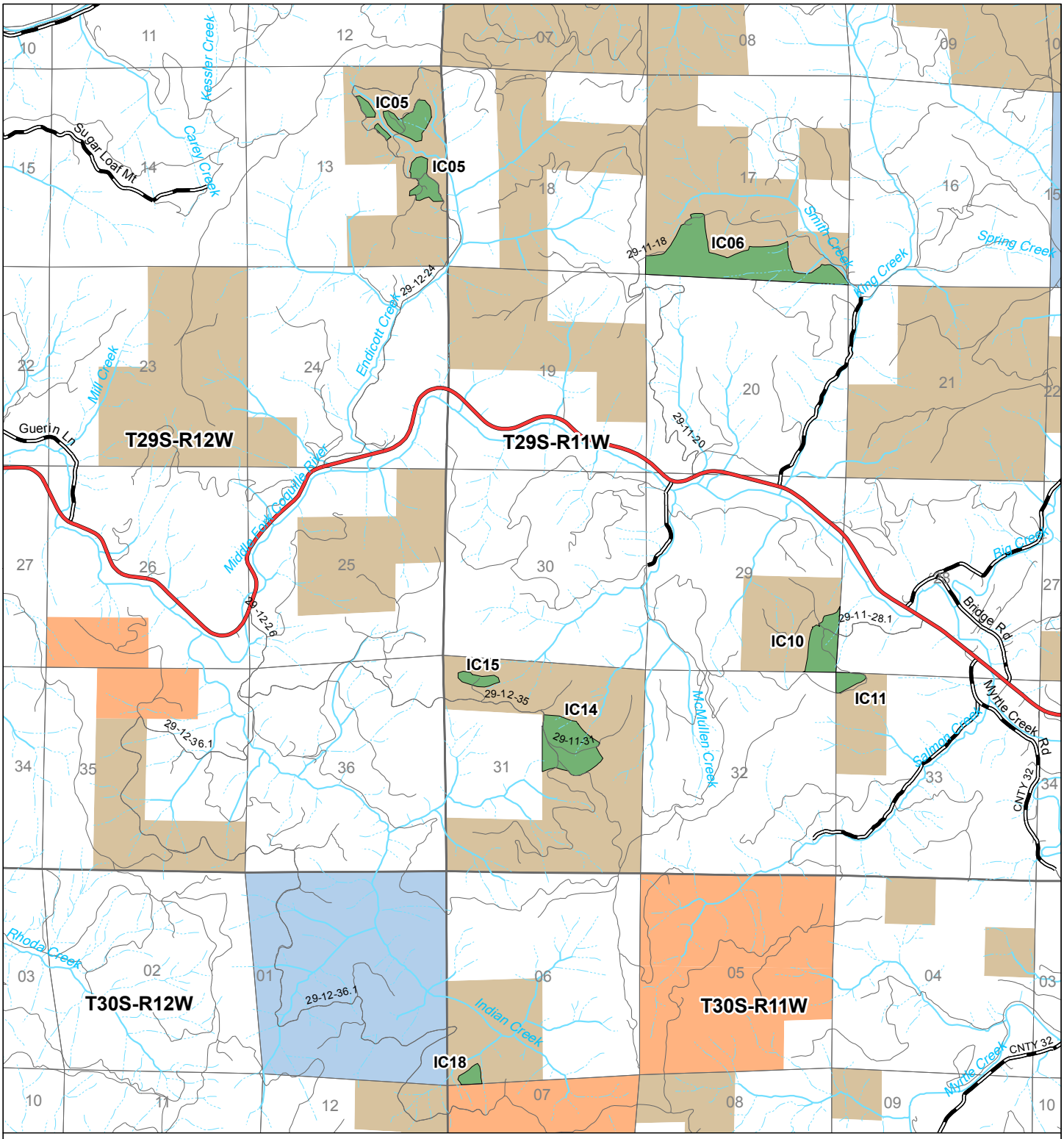
No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data.

King Myrtle Harvest Units and Land Use Allocations



Map Features (Not all map features necessarily occur in the area mapped above.)

- Highway 42
- County Road
- All Other Roads
- Perennial Stream
- Intermittent Stream
- Thinning Units
- Bureau of Indian Affairs
- Private or Other Lands
- General Forest Management Area
- Connectivity Blocks
- Late Successional Reserve

N

US DEPARTMENT OF THE INTERIOR
Bureau of Land Management

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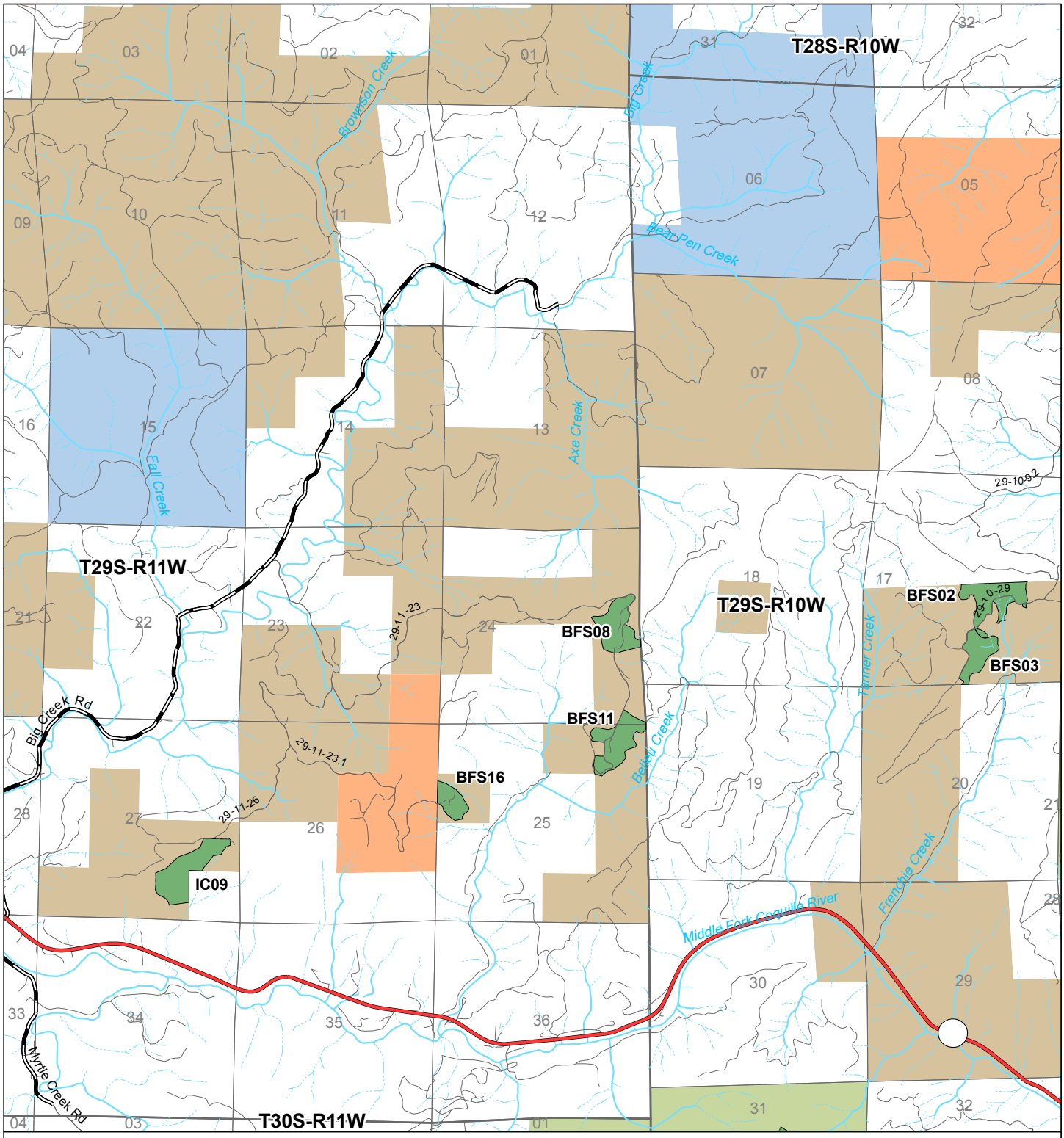
King Myrtle Harvest Units and Land Use Allocations



Map Features (Not all map features necessarily occur in the area mapped above.)

- Highway 42
- County Road
- All Other Roads
- Perennial Stream
- Intermittent Stream
- Thinning Units
- Bureau of Indian Affairs
- Private or Other Lands
- General Forest Management Area
- Connectivity Blocks
- Late Successional Reserve

N

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0 0.5 1
Miles

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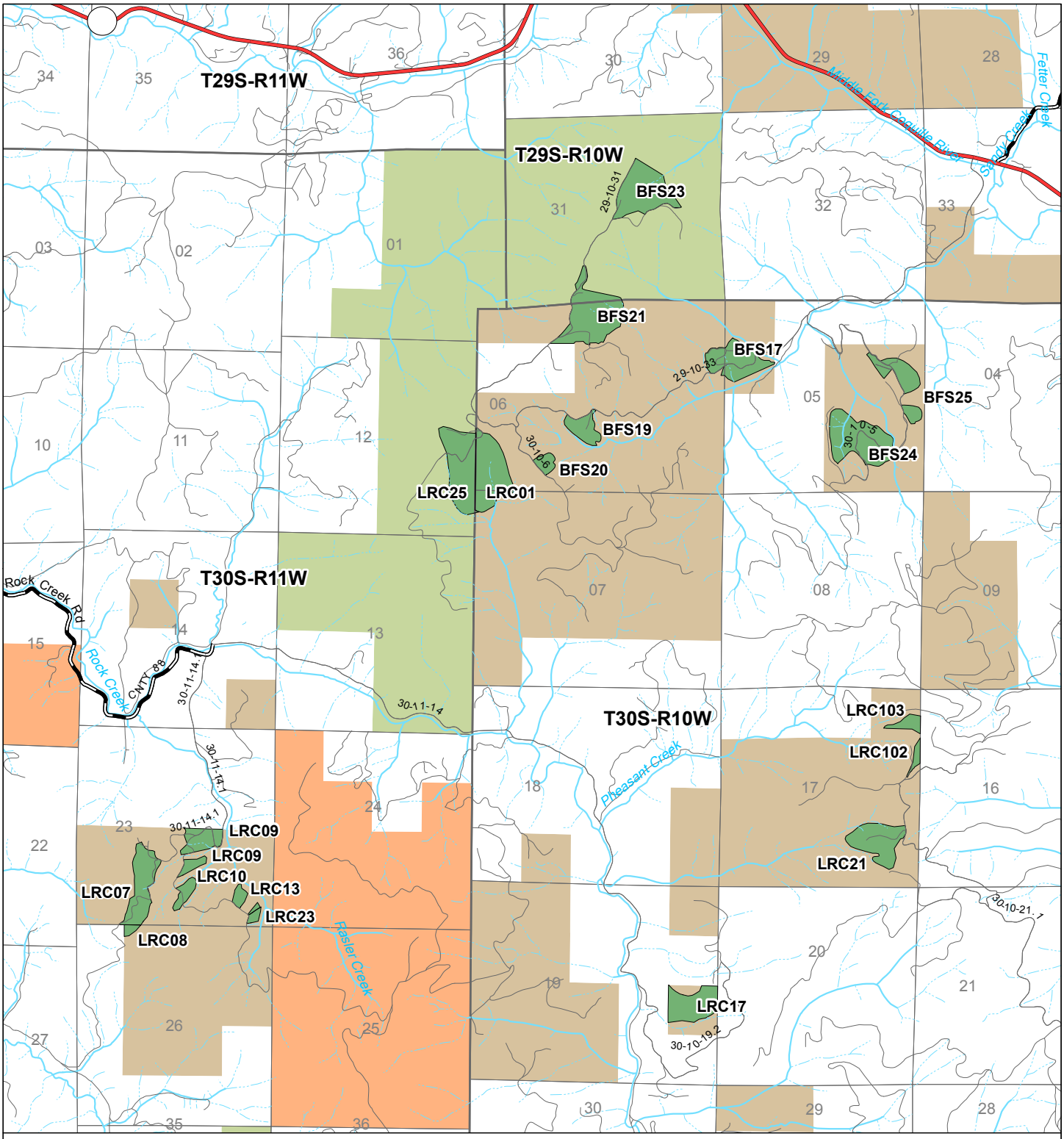
King Myrtle Harvest Units and Land Use Allocations



Map Features (Not all map features necessarily occur in the area mapped above.)

- Highway 42
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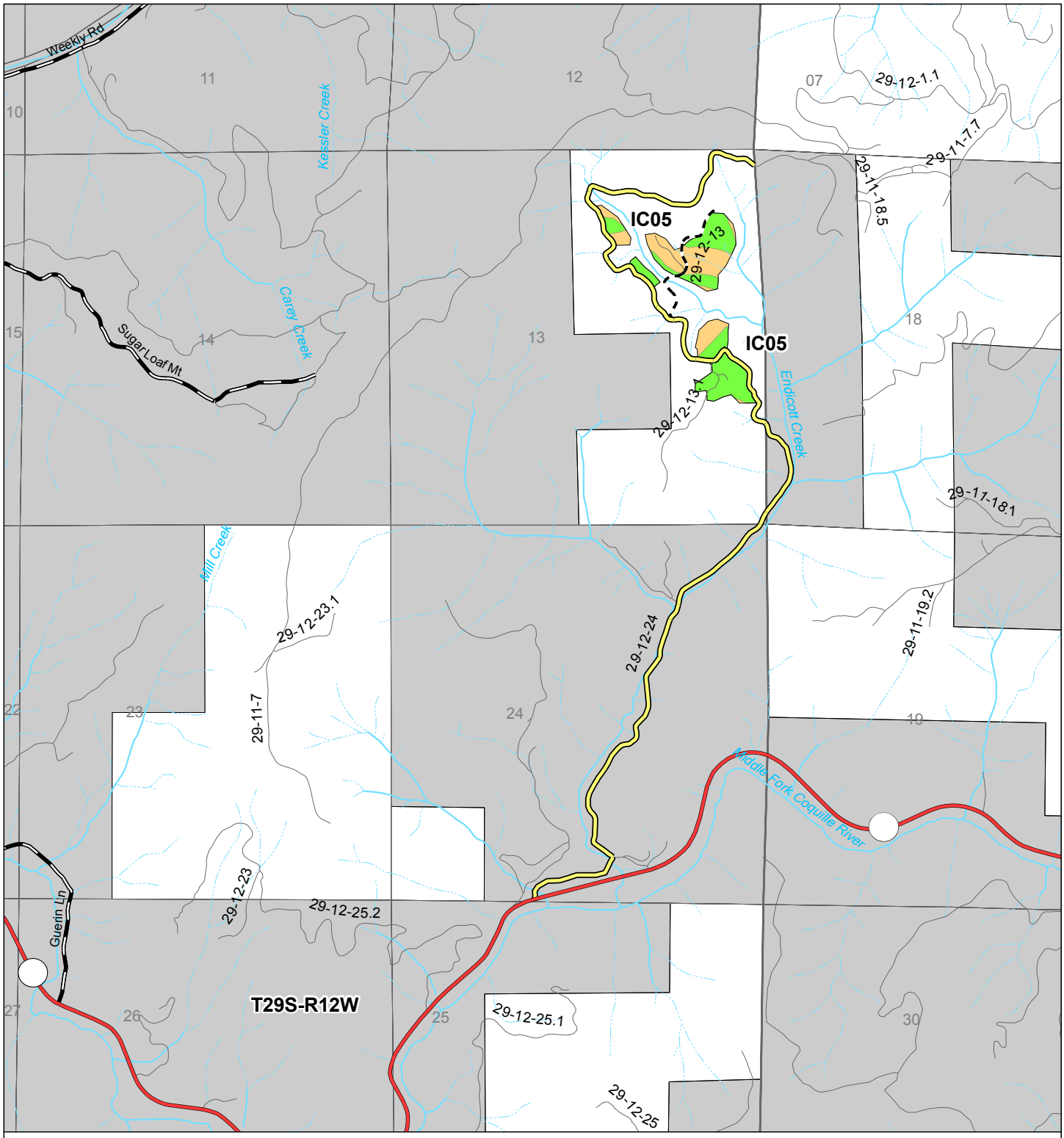
King Myrtle Unit Treatments and Road Work

Map Extents A



Map Features (Not all map features necessarily occur in the area mapped above.)

- Highway 42
- County Road
- New Road Construction
- Road Improvement
- Road Renovation
- Haul Route Maint
- All Other Roads
- Perennial Stream
- Intermittent Stream
- Commercial Thinning
- Density Management Thinning
- BLM Administered Land
- Coquille Forest
- Private / Other Ownership

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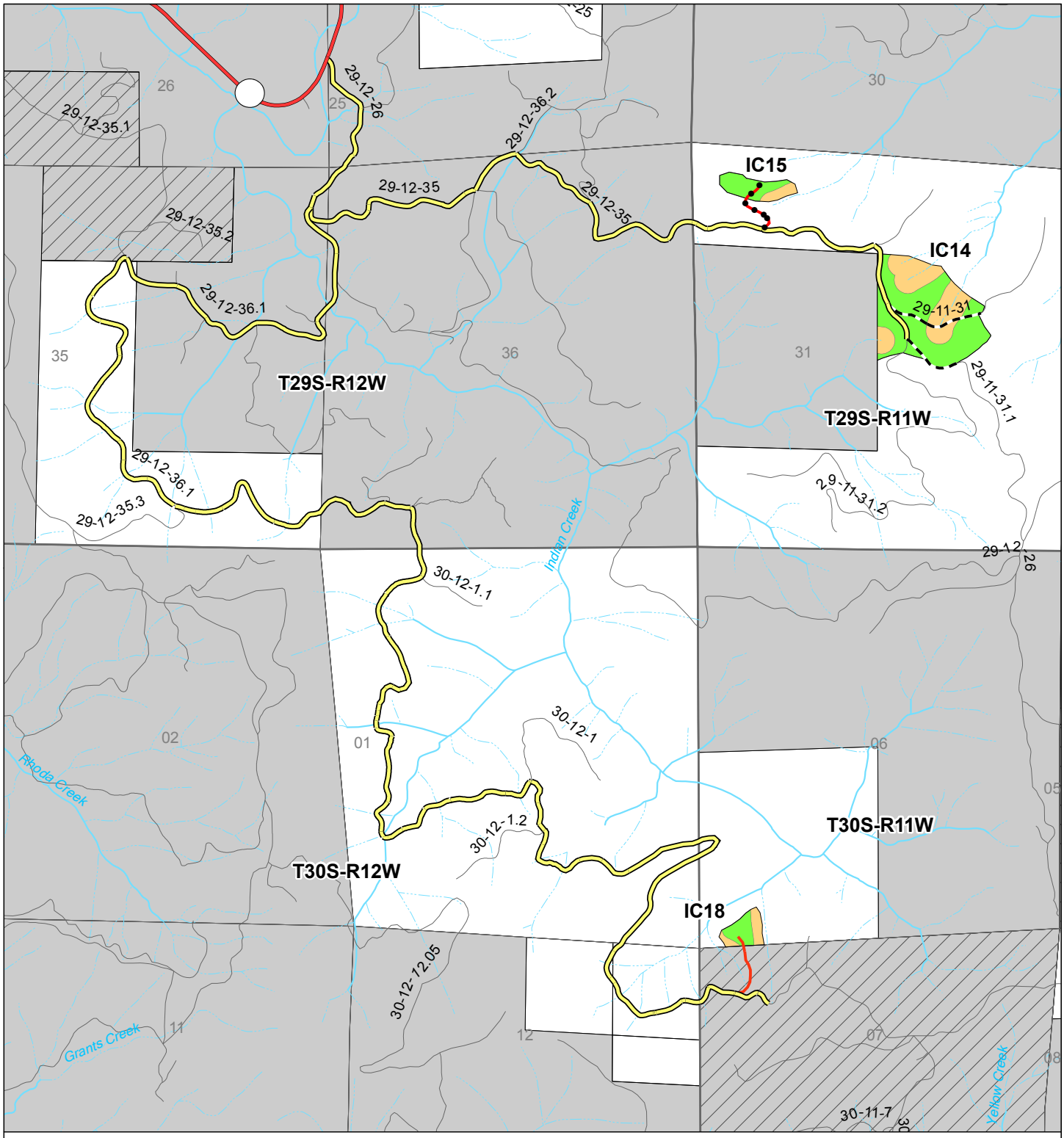
King Myrtle Unit Treatments and Road Work

Map Extents B



Map Features (Not all map features necessarily occur in the area mapped above.)

- Highway 42
- County Road
- New Road Construction
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- Road Renovation
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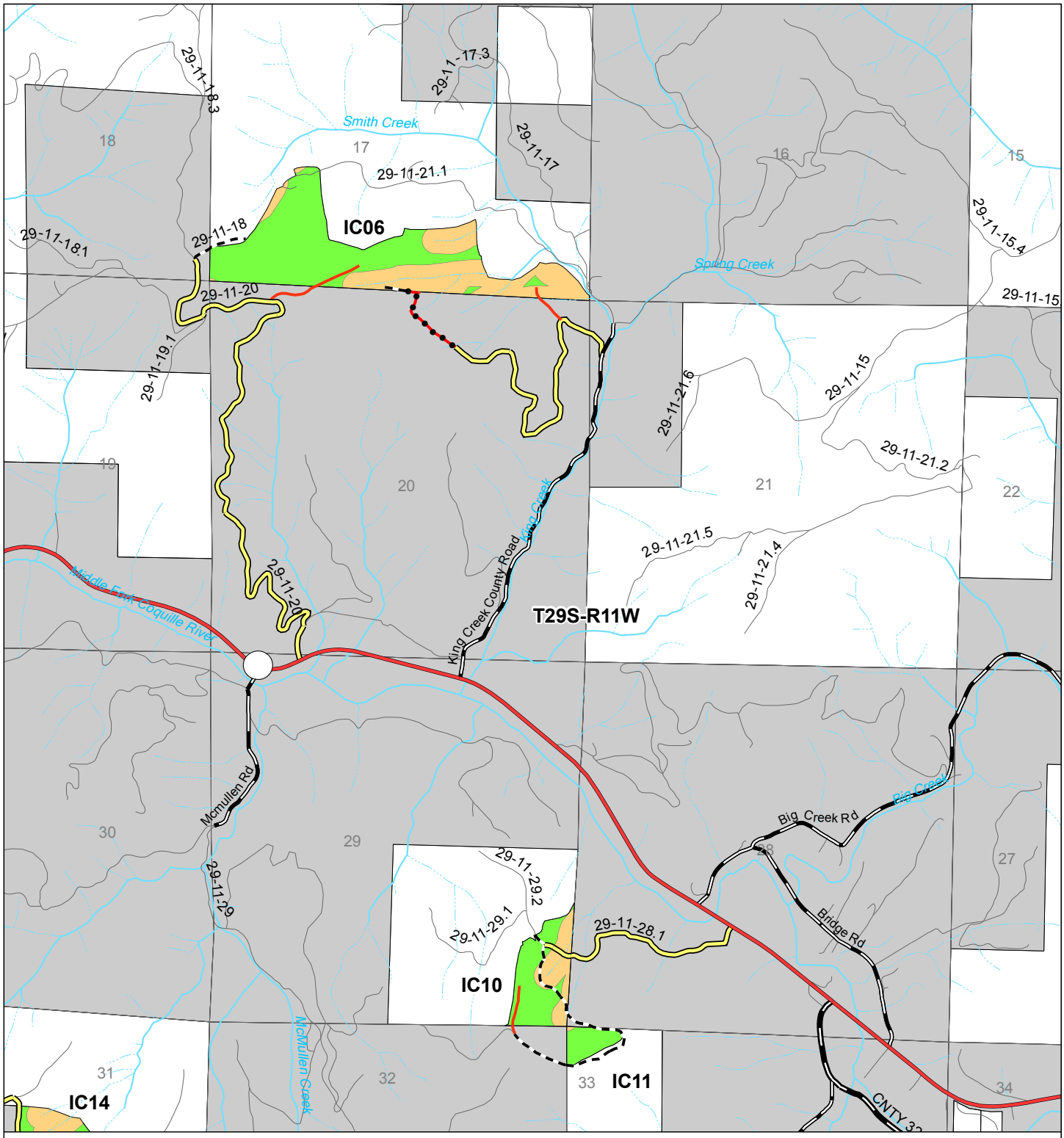
King Myrtle Unit Treatments and Road Work

Map Extents C



Map Features (Not all map features necessarily occur in the area mapped above.)

- Highway 42
- County Road
- New Road Construction
- Road Improvement
- Road Renovation
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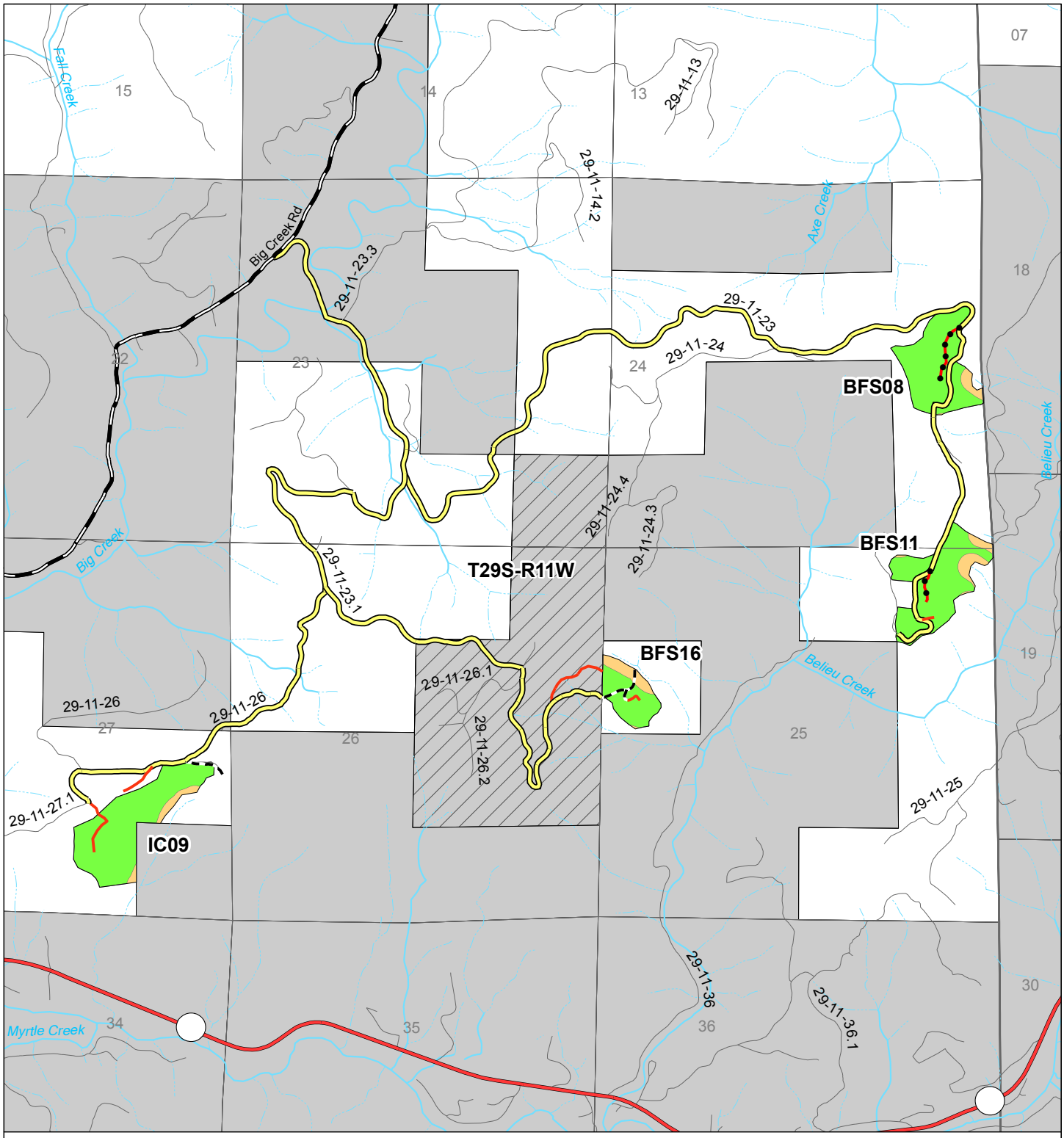
King Myrtle Unit Treatments and Road Work

Map Extents D



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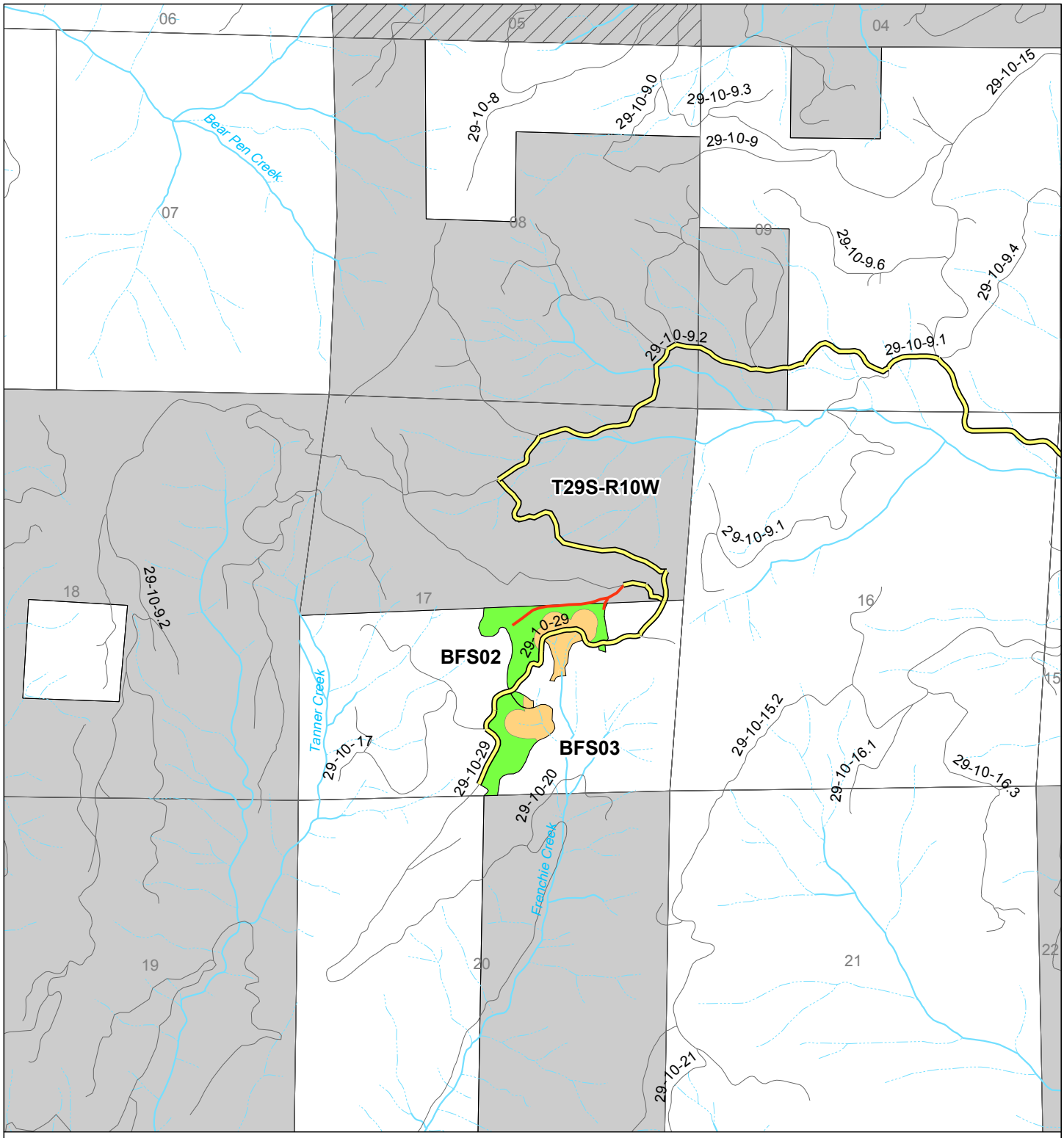
Map Extents E



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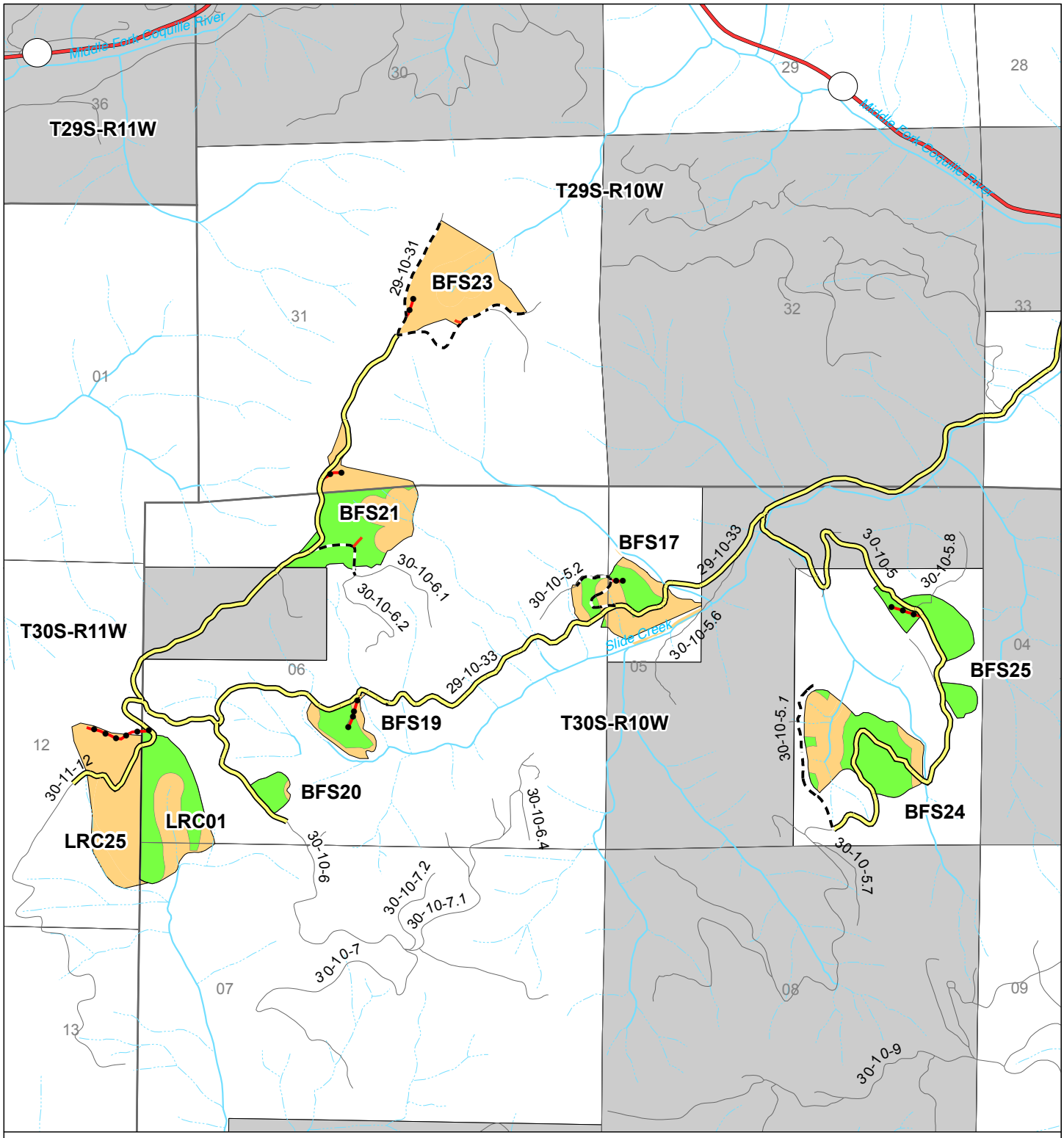
King Myrtle Unit Treatments and Road Work

Map Extents F



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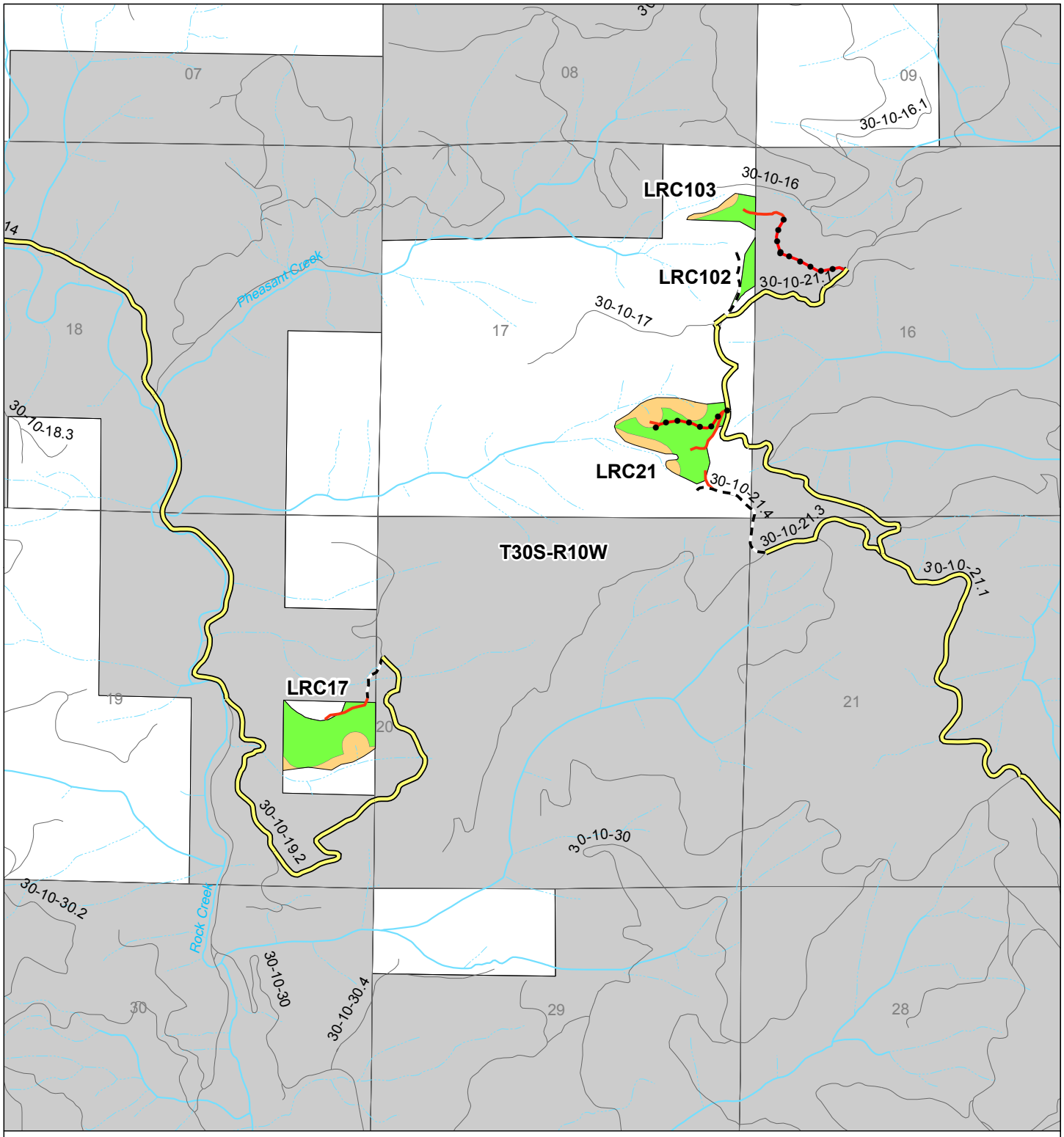
King Myrtle Unit Treatments and Road Work

Map Extents G



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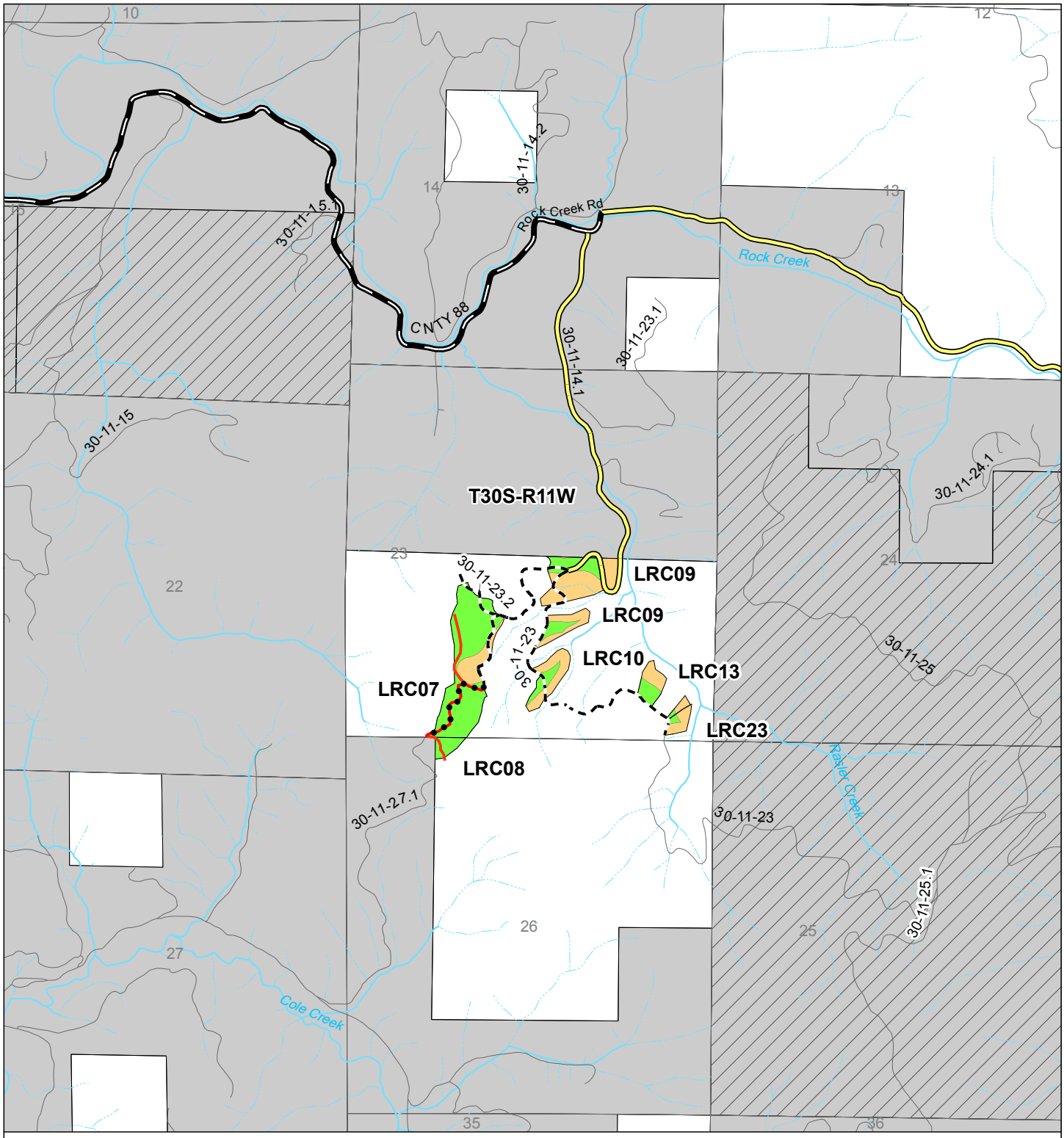
King Myrtle Unit Treatments and Road Work

Map Extents H



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