Yachats Roadwork Project

Environmental Assessment

Siuslaw National Forest
South Zone District
Lincoln and Lane Counties, Oregon

Lead Agency:	**USDA Forest Service**
Responsible Official:	**William Helphinstine, District Ranger** South Zone Ranger District 4480 Hwy 101, Bldg. G Florence, OR 97439
For Information Contact:	**Paul Thomas, South Zone Team Leader** South Zone Ranger District 4480 Hwy. 101, Building G. Florence, Oregon 97439 (541) 902-6985 or (541) 563-8426 pgthomas@fs.fed.us

Contents

Table Titles

Maps

Appendices

Why is the project needed, and what evidence established these needs? CHAPTER 1

Chapter titles are framed as questions intended to focus the writing and to alert readers to judge whether the answers provided are adequate. For readers accustomed to earlier environmental documents, chapter 1 is equivalent to the "Purpose and Need for Action" section.

The Proposed Project

Introduction—District Ranger Bill Helphinstine proposed the Yachats Watershed Roadwork Project (the Project) to reduce the maintenance obligation associated with non-key forest roads and to enhance watershed health in the Yachats 5th-field watershed. To meet these objectives, the Project proposes to close about 34.8 miles and decommission 8.3 miles of non-key forest roads in the Yachats River watershed that are not connected to the Yachats Terrestrial Restoration Project. To decommission roads, about 3,410 cubic yards of fill material from 32 stream crossings would be removed along with four barriers to fish passage. These activities may begin as soon as July 2006, depending on availability of funding. This project proposes no changes to roads administered by other public agencies or to roads managed by private landowners. The Project lies in the Yachats River basin and is about 45 air miles southwest of Corvallis, Oregon (map 1).

The proposed project was designed to address the problems discussed in The Problems To Be Addressed, page 2. Alternative 2 is considered and displayed as the proposed project**.** Descriptions of the proposed project and other alternatives are located in chapter 2, pages 5 to 9.

Relationship to the Siuslaw Forest Plan—The Siuslaw Forest Land and Resource Management Plan (Siuslaw Forest Plan; USDA 1990), as amended by the Northwest Forest Plan (USDA, USDI 1994b), establishes the management direction, desired conditions, and standards and guidelines under which lands administered by the Siuslaw National Forest are managed. These plans are intended to provide for healthy forest ecosystems, including protecting riparian areas and waters as well as providing adequate habitat to maintain viable populations of native vertebrate species. All relevant aspects of the amended Siuslaw Forest Plan—such as management area standards and guidelines—apply to this project. Thus, this assessment is tiered to the Final Environmental Impact Statement for the Siuslaw National Forest Land and Resource Management Plan, as amended by the Northwest Forest Plan (the Plan).

The Planning Area

The planning area for the Project lies in the Yachats River basin, which includes six sub-watersheds and covers about 28,000 acres. The U.S. Forest Service manages about 76 percent of the area, 23 percent is privately owned, 1 percent is managed by the Bureau of Land Management, and about 40 acres are managed by the Oregon Department of Forestry. The project area is located in portions of Township 14 South, Range 10 and 11 West; and Township

15 South, Range 10 and 11 West; Lincoln and Lane Counties, Oregon. All proposed activities are in the riparian and late-successional reserve land allocations as prescribed in the Northwest Forest Plan.

The Problems (Issues) To Be Addressed

Based on available information, including the direction from the Plan, the Forest Roads Analysis, and the Yachats-Blodgett Watershed Analysis, District Ranger Bill Helphinstine identified the following problems in the planning area:

- ✓ The shortage of road maintenance funds limits the ability to maintain forest roads at a level that is suitable for commercial and noncommercial use. Lack of adequate maintenance makes forest roads a higher risk for failure.

- ✓ Sedimentation of streams, resulting from a lack of adequate road maintenance, can reduce watershed health, including the health of aquatic habitat. The shortage of properly functioning aquatic habitat in the Oregon Coast Range limits recovery of cold-water species such as Coho salmon.

In identifying these problems, the District Ranger saw a need to reduce the maintenance obligation associated with managing non-key forest roads and to enhance watershed health.

In response to a request for comments, the public, including other agencies and organizations, identified the following additional problems:

- ✓ Proposed road decommissioning and closure actions could limit access to private lands, reduce emergency access, and reduce the ability to control wildfires.

- ✓ Roads proposed for decommissioning and closure could limit opportunities for commercial timber harvest, special forest products collections (including commercial firewood), and hiking.

- ✓ Road decommissioning is too costly.

The problems identified by the public lead to the development of two alternatives that were considered, as disclosed in chapter 2; helped guide the effects analyses, regarding access issues and cost analysis, as disclosed in chapter 3; and added criteria to the project design (appendix A, page 3).

Evidence Used by the District Ranger in Deciding to Address The Problems He Identified

The record of decision (USDA, USDI 1994b) for the Northwest Forest Plan—based on physical, biological, and societal evidence provided in the Forest Ecosystem Management Assessment Team report (USDA, USDI, et al. 1993) and described in the Plan's environmental impact statement (USDA, USDI 1994a)—is intended to provide for healthy forest ecosystems, including protecting riparian areas and waters.

The Plan identified concern for northern spotted owls, marbled murrelets, and anadromous fish in the Oregon Coast Range Province (which includes the Siuslaw National Forest) because of its isolation and harvest history (chapters 3 and 4; p. 21). The record of decision, which amended the Siuslaw Forest Plan, allocated federal lands in the Yachats watershed into one or more of the following:

- ⇨ Tier 1 key watershed (page C-7);
- ⇨ Late-successional reserve (pages C-9 to C-20);
- ⇨ Riparian reserve (pages C-30 to C-38); or
- ⇨ Matrix (lands not included in the other two allocations; pages C-39 to C-48).

The Plan identified specific environmental conditions and appropriate commodities and amenities to be produced and maintained in each land allocation. It also outlined the rules and limits governing possible activities for achieving desired conditions in each allocation.

The Assessment Report for Federal Lands in and adjacent to the Oregon Coast Province (USDA 1995) describes the in-stream fish habitat on federal lands throughout the Province as being in marginal to poor condition. It recommends specific actions to improve fish habitat on federal land by stabilizing, decommissioning, or obliterating roads.

For needing to reduce the maintenance obligation associated with non-key forest roads

The Forest Roads Analysis identified two broad categories of forest roads: key roads, expected to serve long-term public, administrative, and local community traffic; and non-key roads, expected to be either retained for periodic forest management activities or removed from the forest road system. The Forest Roads Analysis recognized that funding is lacking to maintain all forest roads to required standards. Currently, funding is inadequate to maintain all key roads to standard; consequently, these roads receive the highest priority for funding.

For needing to enhance watershed health

The Plan's Aquatic Conservation Strategy is intended to restore and maintain the health of watersheds and the aquatic ecosystems they contain. The Yachats-Blodgett Watershed Analysis (USDA 1997) identified the following adverse effects on the watershed:

- ⇨ Forest and county roads inhibit large wood and coarse sediment transport, disconnect stream channels, may contribute fine sediment to streams, and may act as barriers to aquatic species migration.
- ⇨ Funding to maintain all forest roads to standard is lacking. Roads not maintained to standard deteriorate more rapidly, increasing adverse effects to fish such as creating migration barriers or contributing fine sedimentation to streams from culvert failure.

Help From Other Agencies and the Public

After considering the identified problem to be addressed with this project and developing a proposal to correct the problem, letters describing the proposed Yachats Roadwork Project were mailed to about 200 individuals, agencies, and organizations identified as potentially interested

in the proposed project and analysis. Public comment on the proposed project was also solicited through the Siuslaw National Forest's quarterly "Project Update" publications, the Corvallis Gazette-Times in Corvallis, Oregon, and the Newport News-Times in Newport, Oregon. Scoping letters were mailed on October 2, 2002. A news release was published in the Gazette-Times on October 4, 2002 and in the News-Times on October 9, 2002. Comments were requested by October 31, 2002.

Eight letters were received in response to these scoping efforts. Public comments contained a wide variety of suggestions to consider. Comments not outside the scope of the project and not covered by previous environmental review or existing regulations were reviewed for substantive content related to the project. Based largely on public comment, some alternatives were considered, but eliminated from detailed study. The alternatives are discussed in chapter 2. Comments, relevant to clarifying how the project would be implemented or disclosing the effects of implementing the project, are addressed in chapters 2 or 3; the project design criteria (appendix A); or the project file. Refer to appendix D for a list of agencies and organizations consulted and for a summary of public comments received, including Forest Service responses.

The notice of availability for the Yachats Roadwork Project Preliminary Analysis (PA) was published as a legal notice in the Eugene Register-Guard on July 31, 2005, informing the public that the PA is available for a 30-day review and comment period. Copies of the PA were made available at the Forest's offices in Corvallis, Waldport, and Florence. Copies of the PA were mailed to those who commented on the proposed project or who requested a copy of the document. The legal notice and PA cover letters indicated the beginning and end of the comment period, the comment process was described, and a Forest Service contact person was identified. The comment period ended at the close-of-business on August 30, 2005. Comments were received from four persons and are summarized in appendix D, along with Forest Service responses to them. The comments were considered in the development of this EA.

Decision Framework

The Responsible Official for this project is the District Ranger for the South Zone District of the Siuslaw National Forest. The environmental assessment for this project provides the alternatives, the environmental effects of implementation, and public comments upon which a decision will be made by the District Ranger. The District Ranger will determine through a Decision Notice:

- To what extent, if any, will activities called for in the proposed project or management alternatives be implemented?

- What management requirements and mitigation measures (project design criteria) will be applied to these activities?

The primary factors that will influence the District Ranger's decision are based on how well the problem on page 2 is addressed. The Decision Notice will document this decision and describe what activities will be implemented to address the problem. The decision will be consistent with the Siuslaw Forest Plan, as amended by the Northwest Forest Plan, and will incorporate the associated project design criteria (appendix A), including the management requirements and mitigation measures

What alternatives were developed to meet the identified needs?

CHAPTER 2

In chapter 2, we considered alternative proposals that were not fully developed for reasons disclosed. We describe fully developed alternative proposals for resolving the problems and meeting the needs identified in chapter 1; it is equivalent to the traditional section, "Alternatives Including the Proposed Action". (The "we" in the previous sentence and throughout the document is our interdisciplinary team).

Alternatives were developed to meet the identified need and associated problems, and to be consistent with the standard and guidelines associated with the Siuslaw Forest Plan, as amended by the Northwest Forest Plan. The range of alternatives, including those that were considered but eliminated from detailed study, reflects comments received during public scoping for this project; public involvement with recent Forest projects, such as the Five Rivers Landscape Management Project (USDA 2002b), the Lower Siuslaw Landscape Management Project (USDA 2002a), and the Yachats Terrestrial Restoration Project (USDA 2005b); the problems identified on page 2; and field observations of past, similar District projects.

Alternatives Considered But Eliminated from Detailed Study

The following alternatives represent those that were considered by the District Ranger, but for various reasons, were eliminated from detailed study. The first two alternatives were considered to address comments raised during public scoping.

Do not remove the six culverts from the Axtel Creek road (road 5455)—One commenter has expressed that some local residents have used road 5455 for recreational hiking for several years. He requests that the six culverts not be removed from the road because it would preclude them from using the decommissioned road as a hiking trail. However, leaving culverts in a road that would be decommissioned would not address the problems identified on page 2. Based on field review of the culvert-removal sites, there is nothing that would preclude use of the decommissioned road as a trail after work is completed. Past experience has shown that hikers tend to form footpaths in a contoured fashion across excavated culvert sites on the uphill side of the road after roads are decommissioned. The project design criteria (appendix A) will include direction to minimize slash on the inlet side of the excavation area to limit obstructions to hikers. Therefore, an alternative that would not remove the six culverts from road 5455 was not fully developed.

Keep road 5872 open—Keeping this non-key forest road open, outside the need for conducting periodic forest management activities, would not contribute towards meeting the project needs identified on page 3: reducing the maintenance obligation associated with non-key forest roads and enhancing watershed health. Because keeping this road open does not meet these needs and funding for maintaining non-key forest roads is inadequate, this alternative was not fully developed.

Extend road 5500-520—For the Yachats Terrestrial Restoration Project EA (USDA 2005b), the decision was made to maintain the upper portion of road 5491, eliminating the need for extending road 5500-520 (USDA 2005a). This decision was based primarily on information gathered for both roads after public notification of the proposed Yachats Roadwork Project. This information raised concerns about the design and location of road 5500-520. Because private timberlands and Forest Service management require truck and trailer access, the road extension would need to be designed and constructed with adverse grades not exceeding 15 percent. To maintain this grade, multiple switchbacks on steep ground would be required, with a limited number of turnouts. The road's steep and high cut-slopes would be prone to ravel, requiring routine maintenance at least the first few years after construction. Based on these expected outcomes, the road would be marginally serviceable. In addition, a stable area would need to be dedicated to accommodate 20,000 cubic yards of excess excavation (USDA 2003d). Thus, the proposal to extend road 5500-520 is no longer included as part of the Yachats Roadwork Project.

Alternatives Considered in Detail

Two alternatives, including No Action (Alternative 1) and the Proposed Project (Alternative 2), were fully developed and are described in this section. The analyses of their effects are described in chapter 3. Actions proposed by Alternative 2 were designed to address the problems identified by the District Ranger and incorporate the standards and guides of the Siuslaw Forest Plan as amended by the Northwest Forest Plan, including the Aquatic Conservation Strategy objectives (USDA, USDI 1994b; ROD, page B-11).

Management requirements, mitigation measures, and monitoring—Design criteria (appendix A) outline the practices to be used and their timing and duration when planned actions under Alternative 2 are implemented. Measures to avoid or minimize impacts associated with implementing these alternatives have been incorporated into the design criteria. Therefore, we believe that management requirements and mitigation measures for all proposed actions are covered by the design criteria. For the proposed actions, appendix A identifies implementation monitoring (determines if actions are implemented as designed) and effectiveness monitoring (determines the effectiveness of the design criteria). Monitoring and observations of past, similar actions indicate that the design criteria are effective in protecting natural resources.

Alternative 1: No action—The no-action alternative is required by Council of Environmental Quality regulations (40 CFR 1502.14(d)). The no-action alternative forms the basis for a comparison between meeting the project needs and **not** meeting the project needs. This alternative provides baseline information for understanding changes associated with the action alternative and expected environmental responses as a result of past management actions. Selecting this alternative would continue the following resource management actions:

- ✓ Forest management would rely on natural processes to restore hydrologic conditions;
- ✓ Primary and secondary key forest roads would be maintained;
- ✓ Other roads would be evaluated and managed by reacting to individual events such as slides, road slippage, or culvert failures that make a road impassable or affect natural resources; and
- ✓ Outside the actions linked to the Yachats Terrestrial Restoration Project (USDA 2005a) and the Yachats Aquatic Restoration Project (USDA 2004), no additional projects are

anticipated for the next 10 years unless a catastrophic event such as a flood or a fire occurs.

Alternative 2: Proposed project—Actions included in this alternative are designed to address the problems identified by the District Ranger. The actions incorporate the standards and guides established by the Siuslaw Forest Plan, as amended by the Northwest Forest Plan; the design criteria; and monitoring protocols outlined in appendix A. Selecting this alternative would result in implementing the following management activities (map 2):

- Decommission (waterbar road surfaces, remove culverts and associated fill material at stream crossings, remove unstable sidecast fill material in road fills, and close road entrances) about 8.3 miles of road, including about 5.5 miles in riparian reserve;
- From roads proposed for decommissioning, remove about 3,410 cubic yards of fill material from 32 stream crossings;
- Remove about four barriers to fish passage from roads proposed for decommissioning; and
- Close (remove any obstruction from culvert inlets, waterbar road surfaces, and close road entrances) about 34.8 miles of road to vehicular traffic, including about 24 miles in riparian reserve.

The roadwork activities of Alternative 2 are summarized by sub-watershed in table 1. Activities would begin in the summer of 2006, with most completed in 5 years. Refer to appendix B for a list of affected roads.

Table 1. Roadwork activity summary for Alternative 2

Roadwork Activities	Road Length (miles)	Estimated fill volume to remove (cubic yards)	Sub-watershed
Road decommissioning			
5360-433	0.5	490	North Yachats
5384 (abandoned section)	1.0	900	North Yachats
5415	2.3	400	Lower Yachats
5415-456	0.12	0	Lower Yachats
5420-410	0.3	150	Yachats
5455	1.8	1,070	Yachats
5591-411	0.3	0	Yachats
5800-416	0.8	0	School
5800-518	0.1	0	Upper Yachats
Un-numbered road near Williamson Creek	1.1	400	North Yachats
Total	**8.32**	**3,410**	
Road closure total	**34.8**	N/A	All sub-watersheds

Comparison of Alternatives—Key quantitative differences—based on our **estimates**—of Alternatives 1 and 2 are compared in table 2.

Table 2. Comparing the key quantitative differences of Alternatives 1 and 2

Objective	Alt. 1 (no action)	Alt. 2 (proposed project)
Reduce the maintenance obligation for non-key forest roads and enhance watershed health:		
Road decommissions (miles)	0	8.3
Fill removed from decommissioned roads (cubic yards)	0	3,410
Remove fish passage barriers (number)	0	4
Road closures (miles)	0	34.8
Open non-key roads (miles)	61.9	18.8
Road decommissioning and closure (cost)	0	$60,020
Annual maintenance reduction (cost)	0	$29,220

Map 2

Map 2

What environmental effects are predicted for each alternative?

CHAPTER 3

In chapter 3, we predict the likely effects of each action under each alternative; it is equivalent to the traditional section "Environmental Consequences". The Northwest Forest Plan, FEMAT report, Late-Successional Reserve Assessment, and the Yachats-Blodgett Watershed Analysis provide evidence for baseline environmental conditions from which direct, indirect, and cumulative effects are analyzed in chapter 3. These broad-based assessments of environmental conditions provide a cumulative view of environmental conditions at different landscape scales and consider past, present, and reasonably foreseeable actions.

One advantage of planning at the 5th-field watershed scale is an improved analysis of cumulative effects. Knowing the site-specific details of all projects in a large geographic area allows us to predict cumulative effects with more certainty than if projects were analyzed individually. The analysis of direct and indirect effects in this chapter inherently includes cumulative effects because all foreseeable future federal actions in the watershed are included in the analysis. Cumulative effects are disclosed under the section titled “Other Predicted Effects” and describe how all actions, including those expected from other landowners, affect each resource.

In this chapter, we predict the likely environmental effects of the proposed alternatives, the outcomes of which are based on the assumption that the Forest standards and guidelines, the project design criteria (appendix A), and terms and conditions of the biological opinions associated with this project, have been followed. The project design criteria are also used during formal consultation with the NOAA Fisheries and the U.S. Fish and Wildlife Service (FWS) to evaluate effects on listed species. The use of these criteria is reflected in the amount of take and in the terms and conditions provided in the biological opinions issued by these agencies.

Based on the science literature and our collective experience, we are confident in the accuracy of our analysis of the **current** conditions discussed in chapter 1. In chapter 3, when we describe the environmental effects of each alternative, we are **predicting** those effects based also on the literature and our collective experience; however, we recognize that predictions are inherently uncertain, some just a little and some highly.

Because of the similarities of environmental conditions and ecological processes found in the planning area, we expect site-specific effects and environmental responses to the proposed actions to be fairly uniform throughout. In the following pages, therefore, we expect our generalized discussions on effects can be applied to any given location in the landscape with a high degree of confidence that the effects described will fit the site.

When the District Ranger chose the members of the interdisciplinary team, he considered possible scenarios for this environmental assessment and determined what disciplines would illuminate decisions about them. Relying on his professional judgment and expertise, he chose the disciplines and formed the team of Forest experts in those disciplines. Team members reviewed areas where actions are proposed, reviewed relevant refereed literature and Forest assessments for this planning area, and consulted disciplinary colleagues in the Forest Service,

other agencies, universities, and elsewhere. Often, literature reviewed by team members was deemed incomplete and, though studies of similar environments and similar scenarios were reviewed, the expert's professional judgment was required to determine what information can be appropriately used here--and how strongly it supports predictions about what the environmental effects of proposed actions will be. Although team members benefit from the array of research information and the insights of colleagues, they are valued most highly for their experience in and knowledge about the project planning area.

Consultation with other experts helps assure that the literature review did not miss a valuable resource, and it provides opportunity to debate and strengthen the team expert's conclusions about how proposed actions are likely to affect the environment. After several team meetings and one-on-one discussions among team members on how each one's predictions might affect or be affected by all of the others, each team member wrote a section of this chapter. Then all of them reviewed the whole chapter to be sure they find the others' predictions clear and supportable.

In this chapter, team members' position titles accompany their written contributions to indicate that they believe the cited references are relevant, the inferences drawn from them are appropriate, and the predictions are supported by the cited literature and their own professional judgment. In this section, when "we" is used, it means one or more other team members concur.

Predicted Effects of Activities to Enhance Watershed Function

Sediment Production—(*District Hydrologist*)

Alternative 1 (No Action)—Depending on slope position and proximity to streams, active roads can be chronic sources of fine sediment (Reid and Dunne 1984; Bilby, et. al. 1989; Foltz 1999). Roads that cross or run adjacent to streams, such as those located on mid-slopes or valley bottoms, are of particular concern due to direct access to streams through the ditch line or short slope distances to adjacent streams. Fine sediment may enter streams and increase turbidity, which affects water quality for water users such as humans or aquatic biota. The Yachats planning area has individual water users in every subwatershed. A municipal water intake system is located in the Lower Yachats subwatershed and a municipal water right exists for the Yachats River (USDA 2003c). When road-stream crossings and, in some cases, side-cast material sites fail, fill material enters stream channels and cause an immediate increase of fine sediment and turbidity. This additional material can also become a chronic source of fine sediment. Road-stream crossings also affect the sediment regime for stream channels, preventing or limiting the distribution of large wood and larger sediments. Alternative 1 would maintain these effects from roads that continue to be open.

Ridge-top roads (5415-456, 5800-416, and 5800-518) do not add fine sediment to stream channels because they do not cross streams and are not in close proximity to streams. Landslides originating from ridge-top roads are uncommon because little surface or subsurface water has an opportunity to collect and saturate soils, initiating movement. Thus, ridge–top roads are not generally sources of fine sediment to stream channels.

Mid-slope roads (5415-000, 5360-433, 5800-416, 5591-411, 5420-410, and 5455-000) are chronic sources of fine sediment that enters perennial and intermittent channels as they are open to vehicle use and frequently cross streams. Additionally, road-stream crossings increase the risk of failures at these sites and becoming immediate and chronic sources of sediment. Sidecast road construction is also common on roads in these locations, though distance between sidecast material and streams can reduce or eliminate the risk of material entering stream channels.

Actively traveled valley-bottom roads (5384-000) are chronic sources of fine sediment. Closed valley-bottom roads (5455-000, and an unnumbered road adjacent to Williamson Creek) do not produce sediment from traffic. All three roads have water running off road surfaces, adding sediment to stream channels. These roads also have the potential for road-stream crossing and sidecast failures. Material from potential failure sites is likely to enter stream channels directly, adversely affecting water quality and water users downstream. Roads 5415-000, 5455-000, and the Williamson Creek road are close to existing water users who would be affected by road failures.

Table 3 summarizes road slope position and length by subwatershed for roads proposed for decommissioning. Mid-slope and valley-bottom roads are considered chronic contributors of sediment. The no-action alternative would allow 8.0 miles of road to continue as a chronic source of sediment.

Table 3. Road slope position and length by subwatershed

Watershed	Road	Slope Position	Road Length (miles)
Lower Yachats 2.5 miles total	5415-000	Mid-slope	2.4
	5415-456	Ridge top	0.1
North Fork Yachats 2.6 miles total	5630-433	Mid-slope	0.5
	5384-000	Valley bottom	1.0
	Williamson Creek	Valley bottom	1.1
School Fork 0.8 miles total	5800-416	Ridge top and mid-slope	0.2/0.6
Stump Creek 0.0 miles total	No roadwork planned	No roadwork planned	0.0
Upper Yachats 0.1 miles total	5800-518	Ridge top	0.1
Yachats 2.4 miles total	5591-411	Mid-slope	0.3
	5420-410	Mid-slope	0.3
	5455-000	Valley bottom and mid-slope	1.8

Alternative 2 (Proposed Action)—Road decommissioning would produce minor amounts of fine sediment during project implementation and up to one year later or until vegetation is established on bare-soil areas adjacent to streams**.** Design criteria are intended to minimize the amount of fine sediment entering stream channels while work is in progress and after the work is completed, including promoting vegetation establishment. Decommissioning roads effectively eliminates them as chronic sources of fine sediment. Fine sediment originates from road

surfaces, road-stream crossings, and side-cast material sites. Thus, under Alternative 2, fine-sediment from decommissioned roads would be eliminated in the long term, protecting downstream water quality and water users. In addition, the sediment regime for 32 stream channels currently affected by the roads would be restored, allowing the distribution of large wood and larger sediments. Stabilizing and closing roads is expected to reduce the potential for sediment for entering stream channels. Under the proposed action, 8.0 miles of potentially sediment-producing roads would be decommissioned, producing a small amount of sediment immediately following the project, but eliminating a long-term source of chronic sediment.

Soil Productivity—(*District Hydrologist*)

Past human activity in the Yachats watershed has resulted in the creation of roads where soil compaction and displacement (removal of topsoil) have altered soil productivity. Effectively, road construction is a long-term commitment of the soil to use as a road. Returning soil to its original productivity after use as a road is a chemical, physical, biologic, and geologic process that can take hundreds of years. Soil productivity begins to return after road closure to vehicle travel, allowing some vegetation to grow within a year.

Typically, soils in this area are surfaced with crushed aggregate to facilitate winter use and compacted by heavy equipment. Soils that were once porous and easily penetrated by water are now susceptible to overland flow and surface erosion. Where topsoil has been removed or excessively compacted, only shrubs, alders, and undersized conifers will grow. Froehlich et al. (1985) and Wert and Thomas (1981) found slow rates of natural recovery of compacted soil restricted primarily to the top 6 inches. Wert and Thomas (1981) observed that heavy compaction persisted at the 8- and 10-inch depths.

Bulk density of soil is often used to characterize compaction. Froelich (1976) has reported that most productive soils in the Pacific Northwest are characterized by relatively low bulk densities, ranging from about 0.5 g/cm^3 to 0.9 g/cm^3, and as a result have high macroporosity, high infiltration rates and low soil strength. Heilman (1981) found that the roots of Douglas-fir seedlings could no longer penetrate soil at about 1.8 g/cm^3. For reference, a road surfaced with igneous rock and then heavily compacted would exceed 2.0 g/cm^3. Pure, igneous rock would be about 2.65 g/cm^3.

Alternative 1 (No Action)—Soil productivity would remain unchanged as long as roads are maintained for vehicle access. The potential for soil displacement from the road continues due to the potential for road-stream crossing and side-cast failures. No additional areas would be compacted.

Alternative 2 (Proposed Action)— Soil productivity would gradually recover on decommissioned roads. Decommissioning roadbeds would not create any additional soil compaction and displacement because excavated soil would be limited to the previously compacted and disturbed roadbed. The potential for soil displacement of the road would be reduced because unstable side-cast material at stream crossings would be moved to a more stable location. Road closure activities are not expected to change current soil compaction and displacement conditions of affected roads.

Table 4 compares the alternatives by how well they reduce road density by sub-watershed. Reducing road density through decommissioning would reduce adverse effects on soil productivity.

Table 4. Comparing alternative effects on road density

Sixth-field Watershed	Alternative	Current Road density (mi/mi^2)	Roadwork project decommissioning (mi)	Projected road density reduction (mi/mi^2)
Lower Yachats	1	2.57	0.0	0
	2		2.4	0.23
North Fork Yachats	1	3.40	0.0	0
	2		2.6	0.23
School Fork	1	1.96	0.0	0
	2		0.8	0.25
Stump Creek	1	3.01	0.0	0
	2		0.0	0
Upper Yachats	1	3.98	0.0	0
	2		0.1	0.36
Yachats	1	2.76	0.0	0
	2		2.4	0.27
Entire Yachats Watershed	1	3.01	0.0	0
	2		8.3	0.23

Water Quality—Temperature (*District Hydrologist*)

Each sixth field sub-watershed in the Yachats Watershed has at least one stream that appears on the DEQ 303(d) List for increased summer stream temperatures. Listed streams include Depew Creek, School Fork Creek, Stump Creek, Williamson Creek, North Fork Yachats River, and the Yachats River. Streams in the analysis area are not listed for any other parameter (DEQ 1998). A water quality restoration plan for the Yachats basin has been completed, detailing plans to improve water quality (USDA 2003c).

Analysis of the effects of the Yachats Roadwork Project on summer stream temperatures focused on effective stream shade, since the principal source of heat for small forest streams is solar energy striking the stream surface (Brown 1969). Conditions where effective shade is greater than 80 percent of complete shading should exhibit no increase in stream temperature (DEQ 1999). Analysis for this planning effort includes modeling the basin for effective shade. The shade model indicates locations with less than 80 percent shade from vegetation within 10 meters of the stream channel (USDA 2003c).

Alternative 1 (No Action)—The no-action alternative does not change the current effective shade during the summer, or the recovery trajectory for the vegetation within ten meters of the stream

center. Perennial-stream crossings on the six mid-slope roads (5415-000, 5360-433, 5800-416, 5591-411, 5420-410, and 5455-000) would remain, preventing growth of shade producing vegetation within 10 meters of stream centers. Shade is provided by culverts and associated fills however, and effects to stream temperature are not measurable. Only road 5360-433 crosses a stream 303(d) listed for summer stream temperature impairment. The three-valley bottom roads (5384-000, 5455-000, and the Williamson Creek road) would remain on the landscape and continue to prevent vegetation from growing tall enough to provide stream shade. All three of these roads are more than 10 meters from the stream and are on the north or east side of the stream channel, so tall vegetation growing in decommissioned road beds would provide minimal shade to the stream. Road 5384-000 and the Williamson Creek road are adjacent to streams 303(d) listed for summer stream temperature impairment. Roads on ridge tops (5415-456, 5800-416, and 5800-518) have no effect on stream temperatures.

Alternative 2 (Proposed Action)—Alternative 2 would not change the current effective shade during the summer, or the recovery trajectory for vegetation within ten meters of the stream center. Perennial-stream crossings on the six mid-slope roads (5415-000, 5360-433, 5800-416, 5591-411, 5420-410, and 5455-000) would be restored and would allow shading vegetation to grow adjacent to the stream. Vegetation would take up to one year to colonize exposed slopes after culverts and associated fill material and sidecast material is removed. Shading vegetation would take at least a few years (up to 20) to reach full shade recovery. In the interim, topography, shrubs (such as salmonberry) and growing trees would provide increasing amounts of shade.

In small streams, 10 feet or less in width, effective summer shade has been measured at greater than 80 percent. These sites comprise a minor amount of the overall stream channel length in the respective 6th-field watersheds and any activities affecting them are not expected to measurably affect stream temperatures. Only road 5360-433 crosses a stream 303(d) listed for summer stream temperature impairment. The three valley-bottom roads (5384-000, 5455-000, and the Williamson Creek road) are more than 10 meters from streams and are located to the north or east side of the streams, providing little to no shade for these streams. Road decommissioning is not expected to affect effective shade on these streams, in the short term. In the long term, road decommissioning allows shading vegetation to grow in the roadbed, though shade from these areas is not expected to measurably affect stream temperatures.

Aquatic Species (*District and Forest Fish Biologists*)

Sedimentation—Sources of sediment in the Yachats Basin include landslides, bank erosion, and roads. Sediment can be either harmful or helpful to the function of streams and species—such as salmonids, amphibians, and invertebrate—that live in them. Large landslides or road-fill failures in small streams lacking large wood can create unstable spawning bars and channel widening with secondary erosion as the sediment moves downstream (ODFW 1997). Fine sediment, however, is necessary habitat for other aquatic species such as the Pacific lamprey (*Lampetra tridentata*). During its larvae stage it burrows into the soft sediment in shallow areas where it lives and feeds from 4 to 6 years (Close et. al. 2002).

Currently in the project area, about 3,410 cubic yards of fill exist over 32 stream-channel crossings. Nineteen crossings are located on potential debris-torrent channels—channels with

greater than 80 percent gradient. These fills could become a large source of fine sediment to streams below culverts if the culverts become obstructed and the fills fail. Currently, some fills are a chronic source of fine sediment and may be degrading aquatic habitat. For example, four failed log culverts exist and where small streams flow over abandoned roads near Williamson Creek and the North Fork Yachats River. About 1,200 cubic yards of fill material is within 0.1 mile of Coho rearing and spawning habitat on the Yachats River. North Fork Yachats and Williamson Creek roads have about 700 cubic yards of fill material that is adjacent to anadromous fish habitat. About three miles of Coho salmon, steelhead trout, and cutthroat trout spawning and rearing habitat could be degraded by the failure of road fill material perched above the stream channels.

The effect the inclusion of large quantities of fine sediment from road fills would have on the aquatic organisms in the stream channel is dependent on the time of year of the event. High turbidity can delay anadromous fish migration. Migrating salmon will avoid waters with high silt loads and can cease moving upstream if the silt load is unavoidable. Salmon and trout migrating to the Yachats River and its tributaries have a short distance to travel to the spawning grounds and would move into the stream from the ocean shortly before spawning. Time in the ocean could be extended as they wait for stream conditions to become favorable.

Chinook found in the Yachats River spawn in the fall, while Oregon Coast Coho salmon spawn in the fall and early winter. Winter steelhead trout and sea-run cutthroat trout typically spawn in the late winter and early spring. Natural levels of sediments entering the stream channel can be high during winter storms. Detrimental effects to spawning habitat can occur when the stream system is overwhelmed by debris torrents containing fine sediment from road fills, with the addition of a few pieces of large wood for structure.

The timing of debris torrents—before or after spawning—can influence the degree of spawning success. Salmon, steelhead, and cutthroat trout spawn when eggs are deposited in a depression in the stream gravels (redd) constructed by the female. The male fish fertilizes the eggs and the female covers the eggs with nearby gravels. The hydraulic action of the female fish digging the redd and covering the eggs creates an environment that is low in fine particles with many gaps and spaces between the rocks of the stream bottom forming the redd**.** The incubating embryos are dependent on inter-gravel stream flow to provide oxygen and carry away waste products from cellular metabolism. Water from the flowing stream is rich in oxygen while ground water is oxygen poor. River water moves into the stream substrate and into the redd egg pocket by down-welling—water moving through the spaces between the rocks of the stream bottom. Fine organic and inorganic particles carried by the stream can plug the spaces between the rocks of the egg pocket or cover the surface of the redd, stopping the movement of oxygen-carrying water to the developing eggs and causing many of them to die.

Eggs that survive to the alevin stage face a new challenge. The young fish with its yolk sac moves up through the gravel to the surface of the streambed. If fine particles plug the spaces between the rocks or cap the redd, the alevin will not be able to escape and die in the streambed. If fine particles do not settle on the redd and the alevin are able to emerge, they will move to the margins of the stream seeking areas of reduced stream flow. The newly emerged fry (juvenile salmon or trout) begin feeding on small aquatic insects and other organisms. The fry are still susceptible to high concentrations of suspended sediment because they are weak swimmers and

are inefficient predators. High turbidity could lead to reduced growth and poor survival of the newly emerged fry.

Alternative 1 (No Action)—Alternative 1 would not decommission any roads. Thus, about 3,410 cubic yards of fill would have the potential for entering streams and adversely affect aquatic species and their habitats. Sedimentation can occur either chronically or through substantial debris torrents, as road fills fail. Sites where water is running over the abandoned Williamson Creek road would continue to add minor, chronic sediment to streams during the wet season.

Alternative 1 would not waterbar and close any non-key forest roads, most of which are located on ridges. However, the roads will continue to close naturally as vegetation grows, trees fall, or other natural barricades occur. Where surface rainwater is not sufficiently managed due to a lack of road maintenance funds, the potential for sedimentation of streams and adverse effects on aquatic species and habitats increases.

Alternative 2 (Proposed Action)—Alternative 2 decommissions about 8.3 miles of roads and reduces the potential for large amounts of fine sediment (about 3,410 cubic yards) to enter streams from road-fill failure. North Fork Yachats sub-watershed is expected to experience the largest increase in suspended fine sediment during culvert and fill removal actions (road decommissioning) because there are 22 culvert- and fill-removal sites that have fill directly over salmonid habitat. The activities are expected to produce minor, short-term increases in turbidity only in perennial streams and near activity sites, with turbidity quickly decreasing as distance from the activity increases. Observations from several recent road-decommissioning projects have found that, on average, an estimated 1 to 3 yds^3 of sediment would enter stream channels from each culvert removal site, up to 3 to 5 years following removal. Most of this sediment would be transported downstream during high flows, as streams reestablish their gradients and banks through removal sites. These observations indicate that about 25 to 75 yds^3 of sediment may enter the North Fork Yachats sub-watershed in the first three years following road-decommissioning activities. It is estimated that less than half of the sediment volume would contribute to suspended load while the other half would become bed load. Only a small portion of the sediment volume is expected to transport out of the stream system during the first year with most fine sediment being stored on floodplains and channel-adjacent terraces (Duncan et al. 1987).

The effects from road decommissioning on sediment are believed to be minimal because monitoring of several road-decommissioning projects on the Siuslaw National Forest found that very little sediment is eroded downstream when design criteria (appendix A) are followed. Covering newly excavated banks adjacent to stream channels with organic debris (e.g., brush and tree limbs) substantially limits erosion and provides roughness for deposition during the first winter. Within one year, about 80 percent of bare-soil areas adjacent to streams become vegetated. Most of the sediment transported downstream following road decommissioning originates from the sediment plain that often forms just upstream from culverts. Where large sediment plains exist, organic debris would be placed into channels to help stabilize the sediment plain. All actions would be implemented during low stream flow, which would limit the geographic extent of the effects.

Lower Yachats and Yachats sub-watersheds are expected to experience similar but substantially less sediment input than outlined for the North Fork Yachats sub-watershed due to the lesser number of culverts that would be removed from streams. None of the other sub-watersheds would experience sediment input because roads proposed for decommissioning do not cross streams.

Alternative 2 would close about 34.8 miles of non-key forest roads, most of which are located on ridges. Closure actions include installing or maintaining water bars and closing road entrances. These actions are not expected to cause fine sediment to enter streams and affect aquatic species and their habitats due to distances between work sites and stream channels. Placement of waterbars on road surfaces disperses surface water in a way that reduces or eliminates the potential for fine sediment to enter streams during the wet season. Closing waterbarred roads serves to protect the investment in the waterbars for several years until the roads are reopened and used periodically to implement forest management activities.

Fish migration—Robison et al. (1999) documented that upstream migration of juvenile salmonids is prevented or restricted at culverts when outlet drops exceed 6 inches, gradients exceed 0.5 percent, velocities exceed 2 feet per second, or the depth of the outlet pool is less than 12 inches. Not only are juvenile salmonids restricted, but other aquatics species may not be able to pass through these culverts. Barriers can alter species diversity by causing the local disappearance of some species, making changes to the abundance of remaining species, causing the local extinction of upstream and downstream migrating species, creating unsuitable living or breeding conditions, causing fish to congregate at a barrier leaving them open to disease and predators, limiting passage of fish to feeding grounds, creating isolated populations and reducing gene flow between populations, and restricting migration of fish for spawning (NSW 2001).

Alternative 1 maintains four culverts identified as barriers to upstream fish migration in the Yachats watershed. A total of 1.7 miles of cutthroat, steelhead, and other aquatic species spawning and rearing habitat upstream of these culverts would remain blocked until these barriers are removed.

Alternative 2 would remove the four culverts identified as fish-passage barriers in the Yachats watershed. A total of about 1.7 miles of cutthroat and steelhead spawning and rearing habitat upstream of these culverts would become fully accessible after road decommissioning. Road closure actions would not affect fish migration because these roads do not cross fish-bearing streams.

Channel barriers—Roads often create channel barriers when fill material or culverts are placed in the stream channel and do not allow large wood and sediment to naturally move downstream. The effects of blocking the migration of large wood and sediment downstream can limit the quality of spawning and rearing habitat for aquatic species. The roads on the floodplain can limit the delivery of large wood and gravels to the stream. The stream reaches of the North Fork Yachats River and Williamson Creek adjacent to the roads proposed for decommissioning lack large wood necessary to trap gravels on the long expanses of exposed bedrock. The smooth bedrock surface is a simple habitat with few hiding places and limited surface area for aquatic insect production. There is little hiding cover and no spawning or rearing habitat for salmon or trout.

Alternative 1 would not remove any of the 224 channel barriers managed by the Siuslaw National Forest in the watershed (USDA 1997). The natural process of sediment and large wood movement in affected streams would continue to be restricted. These channel barriers would remain until they are upgraded or removed.

Through road decommissioning, Alternative 2 would remove 32 of the 224 channel barriers in the watershed. Nineteen of these 32 channel barriers are possible debris-torrent channels. These actions would restore the natural process of sediment and large wood movement in affected streams.

Regional Forester's sensitive species—The Regional Forester's sensitive fish species in the project area—Oregon Coast Coho salmon (*Oncorhynchus kisutch*), Oregon Coast steelhead (*Oncorhynchus mykiss),* fall Chinook (*Oncorhynchus tshawytscha),* chum salmon (*Oncorhynchus keta spp),* and coastal cutthroat trout *(Oncorhynchus clarki clarki),* may be impacted; however, project design criteria should prevent adverse affects. Spring Chinook (*Oncorhynchus tshawytscha), and* Umpqua dace (*Rhinichthys evermanii)* are not known to be present in the project area.

Essential fish habitat—Actions to improve watershed function under Alternative 2 are not expected to adversely affect essential fish habitat for Coho salmon, Chinook salmon, groundfish, or coastal pelagic fish species (USDA 2003a). This conclusion is based on the design criteria to be implemented, the distance between activity sites and habitat, the minor amounts of sediment that may enter stream channels, and no changes in stream temperature.

NOAA Fisheries consultation—NOAA Fisheries has been consulted about effects of proposed actions on federally listed coho salmon through the Northwest Oregon Programmatic Biological Assessment (Programmatic BA) (USDA, USDI 2002). Since the Programmatic BA was completed, the ESA status of the coho listing has changed and coho salmon are currently proposed as a threatened species, with a final rule on their status expected in June 2005. The Programmatic BA and the NOAA Fisheries biological opinion (February 25, 2003) have determined that project activities are likely to adversely affect listed coho salmon in the short term. Project activities are expected to benefit coho salmon and their habitat in the long term. Project activities are not expected to adversely affect designated essential fish habitat.

NOAA Fisheries, on December 14, 2004, proposed the designation of critical habitat for Pacific salmon and steelhead in Washington, Oregon, and Idaho. This proposed rule designated some of the streams within the project area as critical habitat for Oregon Coast coho salmon. Effects to the streams proposed for designation as critical habitat were addressed in detail in the Programmatic BA (USDA, USDI 2002). Consultation with NOAA Fisheries will occur if streams within the project area are formally designated as critical habitat in the final rule, with designations expected in June 2005.

Table 5 summarizes how Alternative 2 quantitatively affects fish habitat.

Table 5. Alternative 2 fish habitat quantitative summary

Sub watershed & (stream name)	Road number	Cubic yards of material to be removed	Number of stream channels to be reopened	Number of debris-torrent channels	Distance to Coho habitat	Type of barrier—fish or channel—to be removed	Miles of fish habitat above barrier to be recovered
Lower Yachats (no name)	5415000	400	1	0	¾ mile	Steelhead Cutthroat	0.3
Lower Yachats (no stream)	5415456	0	0	0	N/A	None	0
N Yachats (Williamson tributary)	5360433	490	2	2	1 mile	Channel	0
N Yachats (North Fork, Glines, Depew)	5384000 (non-system portion)	900	13	4	Adjacent	Channel	0
N Yachats (Williamson tributary)	No number	400	9	8	Adjacent	Steelhead Cutthroat	0.3
School (no stream)	5800416	0	0	0	N/A	None	0
Stump	No roads planned	N/A	N/A	N/A	N/A	N/A	N/A
U Yachats (no stream)	5800518	0	0	0	N/A	None	0
Yachats (no stream)	5591411	0	0	0	N/A	None	0
Yachats (Bend)	5420410	150	1	0	1/10 mile	Juvenile Steelhead Cutthroat	1
Yachats (Axtel)	5455000	1070	6	5	1/10 mile	Juvenile Steelhead Cutthroat	0.1
Total		**3,410**	**32**	**19**			**1.7**

Terrestrial Species *(District Wildlife Biologist; Forest Botanist*)

Federally listed wildlife species—As required by the Endangered Species Act of 1973, as amended, a biological assessment (a project-file document) has been prepared for this project (USDA 2005c). This assessment evaluates and describes the potential effects of proposed actions on species listed—under the Endangered Species Act—that may be found on the Siuslaw National Forest. Because the planning area is outside the range or contains no suitable habitat for the Oregon silverspot butterfly, brown pelican, Nelson's sidalcea, western lily, or western snowy plover, none of the alternatives affect these species. Formal consultation with the U.S. Fish and Wildlife Service (FWS) has been completed for activities that potentially may cause nesting disturbance (FWS reference 1-7-04-F-1113).

Bald eagle, northern spotted owl, or marbled murrelet—Alternative 1 (no action) is not expected to affect habitat or populations of these species.

Bald eagle suitable habitat and disturbance—Under Alternative 2, project activities occur in bald eagle suitable habitat. No known bald eagle nest sites exist within 1 mile of the project. Although suitable habitat along the proposed activity areas have not been surveyed, it is highly likely that, if a nest did exist, it would have been discovered and documented. No removal of suitable bald eagle habitat would occur associated with this project. Since no bald eagle nest sites are known to exist within 1 mile of the project in areas where nests would readily be identified, and since no removal of bald eagle suitable habitat would occur, project activities under Alternative 2 are expected to have no effect on bald eagle suitable habitat.

Project activities under Alternative 2 are proposed in areas considered suitable for bald eagle nesting (within one mile of a major river, or ½ mile of a major tributary). The likelihood of an unknown nest occurring within suitable habitat is low. Because the potential for the presence of nesting bald eagles in proximity to project activities is low, Alternative 2 may affect, but is not likely to adversely affect, nesting bald eagles due to disturbance.

Northern spotted owl suitable and designated critical habitat—Because Alternative 2 would not remove suitable or designated critical habitat, it would have no effect on these habitats.

Northern spotted owl disturbance—All project activities included under Alternative 2 occur within ¼ mile of unsurveyed suitable habitat. Several road segments occur within ¼ mile of occupied or historic spotted owl nest sites. Work associated with all road segments would be conducted outside the critical portion of the breeding season (appendix A, formal and informal consultation section). Project activities that occur during the noncritical portion of the breeding period (July 8 through September 30) may affect, but are not likely to adversely affect nesting spotted owls due to disturbance.

Project activities occurring during the period October 1 through February 28 would have no effect on nesting spotted owls due to disturbance. Table 6 summarizes spotted owl disturbance effects.

Table 6. Alternative 2 disturbance effects on spotted owl nesting

Spotted owl	Project Effects Due to Disturbance*		
	Mar. 1 - July 7	July 8 - Sept. 30	Oct. 1 - Feb. 28
Activity	**MA-LAA**	**MA-NLAA**	**NE**
	Miles		
Road decommissioning	0	8	0
Road closure	0	35	0

* MA-LAA = May affect, likely to adversely affect, MA-NLAA = May affect, not likely to adversely affect, NE = No effect.

Marbled murrelet suitable and designated critical habitat—Because Alternative 2 would not remove suitable or designated critical habitat, it would have no effect on these habitats.

Marbled murrelet disturbance—A total of four road segments scheduled for decommissioning are located within ¼ mile of occupied murrelet sites. Six road segments scheduled for closure are within ¼ mile of occupied sites. Since closure and decommissioning activities would exceed ambient noise levels, treatment of these segments would occur outside the critical portion of the nesting season (appendix A, formal and informal consultation section). All segments proposed for treatment fall within ¼ mile of unsurveyed suitable habitat. Operations occurring during the period July 8 through August 5 may affect and is likely to adversely affect nesting murrelets. Work conducted during the non-critical portion of the nesting season (August 6 through September 15) may affect, but is not likely to adversely affect murrelet nesting. Activities conducted outside the breeding season (September 16 through March 31) would have no effect on murrelet nesting. Project activities that occur during the breeding season (April 1 through September 16) are restricted to daytime hours from 2 hours after sunrise to 2 hours before sunset (appendix A, formal and informal consultation section). Table 7 summarizes marbled murrelet disturbance effects.

Table 7. Alternative 2 disturbance effects on nesting marbled murrelets

Marbled murrelet	Project Effects Due to Disturbance*			
	April 1 to July 7	July 8 to August 5	August 6 to Sept. 15	Sept. 16 to March 30
Activity	**MA-LAA**	**MA-LAA**	**MA-NLAA**	**NE**
	Miles			
Road decommissioning	0	8	0	0
Road closure	0	35	0	0

* MA-LAA = May affect, likely to adversely affect, MA-NLAA = May affect, not likely to adversely affect, NE = No effect.

Sensitive wildlife species—Alternative 1 would not affect local populations of Siuslaw National Forest sensitive species, including the Pacific shrew, the southern torrent salamander, and the Pacific fringe-tailed bat. Because ground disturbance would occur in previously disturbed areas (road prisms, power line corridors), or outside suitable sensitive species habitat, no loss of habitat or impacts to local populations of Siuslaw National Forest sensitive species is expected to occur under Alternative 2.

Land birds—Alternative 1 would not affect land birds or their habitat. Activities under Alternative 2 are not expected to remove suitable land-bird habitat or affect nesting. Alternative 2 would result in a net decrease in open roads, which is expected to benefit a number of species. No intentional take of migratory birds would occur. Therefore, Alternative 2 is not expected to negatively impact local individuals or populations of land birds.

Management-indicator species—Alternatives 1 and 2 would not adversely affect any of the management-indicator species that exist on the Siuslaw National Forest—such as the marten, pileated woodpecker, primary cavity nesters, ruffed grouse, northern spotted owl, and Roosevelt elk—or their habitats because no suitable habitat for these species would be removed (USDA 2005c).

Federally listed botanical species—The planning area contains no suitable habitat for Nelson's checker mallow (Sida*lcea nelsoniana*) or western lily (*Lilium occidentale*), the only federally listed botanical species that is suspected to occur in the Project area. Neither Alternative affects these species.

Forest Service Sensitive plants and fungi—At the time of project initiation, there were no documented Sensitive plant or fungi sites within or adjacent to the proposed project area. A pre-field review of the project area determined that there was potential habitat for twenty-one Forest Service Sensitive plants and fungi.

A field survey, conducted within the project area on May 3, 2005, did not find any Sensitive species. The survey was designed to detect all Sensitive species identified as having potential habitat, with the exception of thirteen Sensitive fungi. These fungi are identified by their fruiting body (mushroom), which may not reliably appear each year. A one-time survey cannot determine presence or absence, so a Sensitive fungi is assumed to be present if the survey finds suitable habitat to be present. Research on fungi similar to the thirteen Sensitive species suggests that areas of compacted or disturbed soil are not as conducive to supporting these species as undisturbed forest soil (Amaranthus et al. 1996). Because most of the project area consists of roads and compacted fill material, there is little likelihood that the thirteen fungi species have potential habitat within the project area or occur there.

Alternative 1 (no action)—The no-action alternative would maintain existing conditions and there would be no impact to Forest Service Sensitive plants and fungi.

Alternative 2—The project area does not contain any habitat for Forest Service Sensitive plant and fungi, therefore implementation of Alternative 2 would have no impact on these species and would not lead to a trend toward federal listing.

Noxious and undesirable weeds—The project area consists primarily of roads and their associated culverts at stream crossings—areas where the soil has been disturbed in the past. The vegetation is dominated by common, widespread non-native species typical of moist, disturbed habitats including creeping buttercup (*Ranunculus repens*), English daisy (*Bellis perennis*), dock (*Rumex acetosella*) and Canada bluegrass (*Poa compressa*). These weeds are considered to be undesirable, but are not classified as Noxious by the Oregon Department of Agriculture. There are no documented occurrences of noxious weeds in the project area and none were detected. Stream-crossing sites are generally shaded by mature red alder and conifer species, such as Sitka spruce, western hemlock, Douglas-fir, and western red cedar.

Alternative 1 (no action)—The no-action alternative would not lead to an increase of noxious and undesirable weeds over what is currently present in the project area.

Alternative 2—This alternative would result in ground-disturbing actions that expose mineral soil. It would also increase sunlight exposure to disturbed areas through the removal of ground vegetation and alder that occupy road fills and adjacent areas. These actions would likely increase the density of undesirable weeds and increase the risk for the introduction of noxious weeds. To mitigate these effects, ground disturbance would be limited to what is needed to accomplish project objectives, and shade would be maintained to the extent possible. To reduce the risk of introducing noxious weed seed or plant parts, all equipment would be cleaned of soil, seeds and plants prior to entering the National Forest.

Public and Management Access (*Forest Transportation Planner*)

A project-level roads analysis, tiered to the Siuslaw National Forest (Forest) Roads Analysis (USDA 2003b), was conducted for the Yachats Roadwork Project. The roads analysis is used as a guide for managing the National Forest transportation system, using key road and non-key road management strategies.

Key roads comprise a network of long-term-use roads, providing connections between communities, vital access for forest management, and connections to state, federal and county roads. Non-key roads are generally not considered vital for community connections and are only needed for periodic forest management. Thus, non-key roads can be maintained in a closure status, when not needed for forest management. The system of key and non-key roads is a management strategy that responds to reductions in funding for maintaining roads on the Siuslaw National Forest. This management strategy helps to prioritize key forest roads for maintenance, based on limited funding and relies primarily on project-level funding to maintain non-key roads, when needed for forest-management.

Most Forest roads not selected as part of the key forest road network (non-key roads) were stabilized with waterbars and either closed with physical barriers, or left to be closed naturally by vegetation encroachment or other naturally caused obstructions. The closures and waterbars were installed in the mid 1990’s as part of an effort to stabilize roads that would not be maintained on a regular basis**.** The non-key roads are typically maintained only when access is needed for specific project activities, such as vegetation management or habitat restoration. The lack of maintenance on the non-key roads has resulted in many roads becoming inaccessible to vehicles or accessible only to high-clearance vehicles, sometimes requiring four-wheel drive.

National Forest System (NFS) road miles in this analysis do not include all miles of roads that would be affected by the proposed project. Because the planning area is based on hydrological boundaries, only those non-key road segments that lie within the planning area are used in determining road density and maintenance costs.

Road maintenance levels in the project area include: Level 0, decommissioned roads that are no longer part of the NFS road network; level 1, roads that are closed to vehicle traffic; level 2, roads that are maintained for high-clearance vehicle use; level 3, roads that are maintained for low-clearance passenger vehicle use; and levels 4 and 5, roads that are maintained for low-clearance passenger vehicles with a moderate or high expectation of user comfort. Alternative 1 represents the existing maintenance strategy. Most of the NFS road changes under Alternative 2

are characterized by moving roads currently in level 2 (maintained for high-clearance vehicles) to level 1 (closed to vehicle use) and decommissioning some level 1 and level 2 roads.

Alternative 1 (No Action)—Alternative 1 would not change the current forest road-maintenance strategy or the miles of road associated with each maintenance level. Thus, no additional road miles would be opened or closed to public use on the National Forest System. Most of the roads not included as part of the key-road system have been waterbarred and not regularly maintained for several years. These roads are becoming less accessible for vehicle use over time due to encroachment of vegetation, wind-thrown trees, or small landslides. Without adequate maintenance, the risk of losing some of the asset value of these forest roads would increase as they become more prone to failure due to obstruction of culvert inlets, collapsing culverts, unstable side-cast material, and other factors.

Alternative 2 (Proposed Action)—Alternative 2 would decommission about 8.3 miles of NFS roads—2.1 of these miles are near North Fork Yachats and Williamson Creek and are currently not accessible by vehicle—and close about 34.8 miles of non-key roads currently open for high-clearance vehicles. Open-road density for NFS roads on Forest Service lands in the project area would be reduced from the current 3.3 miles per square mile to 2.1 miles per square mile, reducing the Forest's overall road maintenance obligation. Road decommissioning is accomplished on roads that are not needed for periodic forest management and present a risk to aquatic resources. Decommissioning actions, such as removing culverts and fill from stream crossings and unstable side-cast material, would reduce the potential for road failure and impacts to aquatic resources. Road-closure actions, such as repairing existing waterbars, adding waterbars, and barricading road entrances, would also reduce the potential for road failure, thereby protecting the asset value of these roads that will be periodically used for forest management.

Roadwork conducted by Alternative 2 would reduce the annual road maintenance costs in the planning area by about $29,000 (table 8). Annual maintenance is work performed to maintain serviceability of roads, or repair road failures during the year in which they occur. As applied on the Siuslaw National Forest, annual maintenance generally includes adding aggregate or asphalt to travel surfaces, cutting brush adjacent to roads, removing obstructions from culvert inlets, and replacing road signs where needed.

Roadwork activities proposed under Alternative 2 do not expand the capacity of a road or otherwise upgrade it to serve needs different from or significantly greater than those originally intended.

Table 8 shows the costs associated with annual maintenance and completing road closure and decommissioning. The wildland-urban interface road (5492) is included in road closure (level 1) costs. Annual maintenance costs for this project include those associated with brushing, blading, and cleaning of ditch-relief culverts, annualized from a three-year entry cycle. Closure and decommissioning figures are one-time costs. The costs shown in the annual maintenance column reflect the amounts needed to annually maintain key and non-key roads to standard in the project area. Currently, the availability of funds to conduct annual maintenance is very limited.

Table 8. Roadwork costs summary

Alternative	Annual maintenance	Road closures	Road decommission	Total cost*
1	$73,466	$0	$0	$0
2	$44,247	$46,065	$13,955	$60,020

*Does not include annual maintenance costs, which are reflected in the second column.

Private landowners, federal agencies, and commercial and community interests have various easements, permits, and access agreements in effect at the time of this project. Alternative 1 would maintain existing agreements for access and project permits. Actions under Alternative 2 are designated to facilitate existing agreements. Additional access needs under all alternatives would be reviewed and authorized case-by-case as requested. Generally, permit holders will be required to perform maintenance items on NFS roads used for activities authorized for permitted uses.

The following summarizes the effects of Alternatives 1 and 2:

Alternative 1

- No changes in the current maintenance strategy of existing National Forest System roads, including key and non-key roads.
- No changes in key or non-key road maintenance costs.
- No changes in road density.
- With limited maintenance funds, roadside vegetation, fallen trees, and other naturally caused obstructions would gradually close maintenance level 2 roads.

Alternative 2:

- Closes about 34.8 miles of Forest-system roads (maintenance level 1) between planned access periods.
- Decommissions about 8.3 miles of Forest non-key system roads, including the removal of about 3,410 cubic yards of fill material.
- Reduces the road maintenance obligation by about $29,220 annually over the next 15 years.
- Keeps county roads and key forest roads open to vehicle traffic.
- Reduces open-road density on National Forest lands from 3.3 miles per square mile to 2.1 miles per square mile.

Fire (*Fuels/Fire Manager*)

As roads degrade under Alternative 1, response times of initial fire-suppression efforts are expected to increase; however, the risk of fire ignitions is expected to decline as public access decreases. Under Alternative 2, decommissioning and closing roads would not change existing fuel conditions in the watershed. Decommissioning and closing roads would reduce public access and the risk of human-caused fires, but would increase the response time of initial fire-suppression efforts. Reduced maintenance on non-key forest roads that would remain open would also increase the response time. Slow response times may allow the size of wildfires to increase. However, since about 95 percent of the wildfires on the Siuslaw National Forest are

human-caused and in areas accessible to vehicles, Alternative 2 is likely to reduce the risk of fire ignitions in the project area as roads are decommissioned or closed.

Human Uses and Influences

Heritage resources (Forest Archaeologist)—Alternative 1 would have no effect on heritage resources. Actions proposed under Alternatives 2 would generally take place on previously disturbed ground and not require field inventories or concurrence from the State Historic Preservation Office (SHPO) before implementation. No known sites would be adversely affected. These actions would be reviewed according to our programmatic agreement with SHPO and would meet the requirements of the National Historic Preservation Act. No treaty resources are in the project planning area.

Recreation (Recreation Planner)—Through time, motorized recreation opportunities would decline under Alternative 1, as road conditions deteriorate from lack of maintenance. The primary consequence of closing and decommissioning roads under Alternative 2 would be changing access from motorized to non-motorized. The highest concentration of vehicle travel on the interior forest would continue to be associated with hunting seasons.

Alternative 1 would adversely affect fish habitat in the long term as roads continue to fail, potentially resulting in adverse effects on recreational fishing. Although some short-term sedimentation of streams is expected under Alternative 2, these effects would be minor and should not adversely affect fish habitat. Proposed actions under Alternative 2 are designed to reduce adverse impacts to fish habitat in the long term, potentially benefiting recreational fishing.

Scenery (Forest Landscape Architect)—Proposed roadwork is expected to retain or may enhance scenic quality in the project area. Where roads proposed for decommissioning or closing intersect with the Yachats River Road, the roads would be blocked at a distance from the intersection so that the blockages would not change scenic quality from the travel corridor. Removing fill and culverts from stream crossings would allow for a more natural appearance, improving scenic quality of the watershed in the long term.

Special forest products (Small Sales Specialist)—Opportunities to gather special forest products through permits and leases would continue under both alternatives. Alternative 2 would reduce vehicle access in the forest, making collecting special forest products more difficult. More difficult access has a lowering effect on the sale values of special forest products such as salal, moss, and evergreen huckleberry.

Forest stand conditions (*District Silviculturist*)—Under Alternative 1, it may take several more decades to recover natural stand structure and process in areas occupied by unneeded roads. Under Alternative 2, road decommissioning would allow vegetation, including conifers and hardwoods, to become reestablished on about 35 acres after several years. Reestablishing conifers or hardwoods on decommissioned roads near streams would recover natural riparian function sooner.

Other Predicted Effects

Cumulative Effects *(The Team)*

The Council on Environmental Quality defines cumulative effects on the environment as those that result from the incremental actions of a proposal added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes them (40 CFR 1508.7).

For purposes of analyzing cumulative effects, the geographic area potentially affected by Alternative 2 is the 28,000-acre planning area in the Yachats River watershed. The Team considered the need to extend the geographic area for each of the affected resources, but we believe that effects were not meaningful or measurable beyond the project planning area.

The analyses provided for the Yachats Aquatic Restoration Project, the Yachats Terrestrial Restoration Project, and this project reflect the sum of most planning actions on federal lands in the near future, including the effects from changes in the transportation system for forest users and adjacent landowners. Under the Yachats Aquatic Restoration Project, major activities include placing about 400 pieces of large wood in 4 streams, including South Fork Yachats, North Fork Yachats, Grass Creek, and Williamson Creek; removing seven culverts from abandoned roads; and removing unstable fill material and thinning and releasing conifer in the Beamer Creek area. Under the Yachats Terrestrial Restoration Project, major activities include decommissioning roads, totaling about 6.1 miles; maintaining and repairing key forest roads 5300, 5360, 5400, 5500, 5590, and 5800, totaling about 38.4 miles; thinning and salvaging about 313 acres of young trees in and adjacent to the original clearing limits of these six key forest roads; and commercial thinning about 2,000 acres of plantations, including temporarily reopening about 9 miles of road and building about 1.8 miles of temporary road. Other likely future actions on federal lands in the project planning area include other activities associated with maintaining and repairing key forest roads, and harvesting of special forest products such as firewood, salal, sword fern, and moss.

On state and county land, actions are expected to be limited to maintaining roads. Lincoln County is planning on maintaining county road surfaces (paving) in the Yachats River watershed within the next year.

On non-federal land, which comprises 23 percent of the project area, the Team expects private landowners to continue current practices and uses of their land and no changes to current county and state land-use regulations. Current uses include industrial timber harvesting, farming, livestock grazing, and limited non-industrial timber harvesting. Most timber harvesting on these lands were accomplished during the 1940’s through the 1970’s. Local industrial timber management objectives and practices indicate that harvest activities on industrial lands will occur before those stands reach 80 years of age. Based on personal communications and observations, industrial timber management, including clear-cut harvesting, has recently begun or been completed on about 530 acres of plantations in the Yachats watershed—about 220 acres in the Lower Yachats, 30 acres in the North Yachats, and 280 acres in the Upper Yachats sub-basins. In less than 10 years, about 920 acres of plantations in the Lower Yachats sub-basin will be clear-cut harvested.

Cumulative effects are measured relative to the baseline conditions described in chapter 1. Where specific effects are not described for a particular resource, cumulative effects are not expected to be measurably different from those under baseline conditions. Alternatives 1 and 2 are expected to have the following cumulative effects:

Alternative 1, no action

- Short-term cumulative effects on forest dwelling species would be limited to noise disturbance from maintaining and repairing key forest roads.
- Aquatic species habitat recovery would depend on natural processes, which may take several decades.
- Sedimentation from non-key forest roads would increase as roads deteriorate from lack of maintenance.
- Watershed function would not be improved because of continued use of nearly the entire road network.
- Fire response time would increase as roads fail or roadside vegetation grows and closes roads naturally.
- Recreation experiences would become more non-motorized as roads close naturally; and public and management access and road maintenance costs would remain unchanged, except where roads fail.

Alternative 2

Terrestrial species (listed, sensitive, survey-and-manage, management-indicator)—In the short term, noise from roadwork activities would likely cause minor disturbance effects on all terrestrial species to some degree. The dispersal in timing and distribution of these actions across the watershed, however, are such that impacts are expected to be localized and not lead to adverse cumulative effects. In the long term, reduction of open-road densities would cumulatively benefit species dependent on late-successional habitat. Habitat for species dependent on early-seral conditions would be reduced as decommissioned roads and other forest openings become forested over time, except for openings that are maintained as early-seral habitat.

Aquatic species—When viewed as a whole, all proposed actions are likely to have minor adverse effects on aquatic species during project implementation and up to 2 years later. In the long term, net improvements to aquatic habitat are expected to accrue, with reduced sedimentation and risk of failure from roads. These actions are expected to substantially benefit aquatic species.

Sediment production—Closing and decommissioning roads would increase sedimentation in the short term, but would reduce sedimentation in the long term. Overall, Alternative 2 is expected to cumulatively reduce sedimentation of streams in the project planning area.

Soil productivity—Road closure and decommissioning activities are not expected to impact soil productivity in the short term. Allowing vegetation to reestablish in road prisms is expected to improve soil productivity in the long term in areas where roads remain

decommissioned. All National Forest System roads proposed for decommissioning would result in a cumulative reduction of the current road density in the watershed (table 9):

Table 9. Cumulative reductions in road density

Sixth-field watershed	Current road density in the Yachats watershed	Density reduction from the Yachats Terrestrial Restoration Project	Density reduction from the Yachats Roadwork Project	Projected cumulative road density
Lower Yachats	2.57	0.09	0.23	2.25
North Fork Yachats	3.40	0.04	0.23	3.13
School Fork	1.96	0	0.25	1.71
Stump	3.01	0.41	0	2.60
Upper Yachats	3.98	0.42	0.36	3.20
Yachats	2.76	0.06	0.27	2.43
Entire Yachats watershed	3.01	0.14	0.23	2.64

Stream-channel barriers—There are a total of 318 channel barriers in the watershed, 224 of which are managed by the Forest Service (USDA 1997). This project, in conjunction with the Yachats Aquatic Restoration Project (removes seven channel barriers) and the Yachats Terrestrial Restoration Project (removes two channel barriers) would cumulatively reduce the channel barriers in the watershed to 277.

Stream flow—Closing and decommissioning roads would reduce peak and storm flows, resulting in a net cumulative decrease over the long term.

Stream temperature—Road decommissioning is not expected to result in a cumulative increase or decrease in stream temperature because changes in stream shading would be imperceptible.

Fire—By reducing public access, road decommissioning and closure would cumulatively reduce the risk of human-caused fire ignition in the long term. Where the wildland-urban interface is an issue, access for fire-emergency equipment would be maintained. Although fire suppression response time would increase where roads are closed or decommissioned, the cumulative effect on wildfire risk would be reduced over time.

Heritage resources—Road actions would be on previously disturbed ground. No adverse cumulative effects are expected.

Recreation—Closing and decommissioning roads would cumulatively shift the recreation experience from motorized to non-motorized.

Scenery—All actions planned for the Yachats 5th-field watershed, including road decommissioning, would be consistent with the scenic quality objectives for the planning area and are expected to improve the scenic quality of the area in the long term.

Public and management access—Closing and decommissioning non-key forest roads across the watershed would reduce public and management vehicle access to public lands for several activities including recreation, hunting, special forest products gathering, and Forest Service monitoring. The maintenance obligation for these roads would be reduced, with the limited maintenance funds shifted to maintaining the key forest road system. The miles of non-key forest roads open to vehicle access on National Forest system land in the watershed would be reduced from 61.9 miles to 18.8 miles. Periodic reopening and use of 34.8 miles of closed roads may occur in the foreseeable future to facilitate forest management.

Listed, sensitive, and survey-and-manage plants—No adverse cumulative effects on listed, sensitive, and survey-and-manage species are expected. Beneficial cumulative effects are expected because human-caused disturbance would be reduced as roads are closed to vehicles and as vegetation recovers on decommissioned roads.

Noxious weeds—Current weed infestation levels would be maintained and infestation levels are expected to decline in the foreseeable future as native vegetation recovers on decommissioned road prisms and plantation trees grow, increasing shade over areas adjacent to roads.

In summary, considering other ongoing and likely actions on federal, state, county, and private lands in the Yachats River watershed, Alternative 2 is expected to reduce the adverse cumulative effects of past actions on the landscape, thereby accruing net beneficial cumulative effects for most resources. The cumulative effects are generally beneficial over time and an improvement over existing conditions.

Aquatic Conservation Strategy *(The Team)*

On March 22, 2004 the USDA Under Secretary for Natural Resources and the Environment signed Record of Decision (ROD) amending the Northwest Forest Plan. The decision clarifies provisions relating to the application of the Aquatic Conservation Strategy (ACS). Specifically, the amendment removes the need for deciding officials to certify that individual projects meet ACS objectives at the site-specific level and short time frames. Instead, the ROD requires individual projects to meet ACS standards and guides, and that ACS objectives be met at watershed or larger scales (5th field hydrologic fields or greater) and over longer time periods of decades or more. Project records must also demonstrate how the decision maker used relevant information from watershed analysis to provide context for project planning.

The Yachats-Blodgett Watershed Analysis describes the existing conditions in the 5th-field watershed, including those that are having adverse effects on watershed health (page 3). The Project is designed to enhance watershed health by improving stream function, reducing the potential for road-fill failure in stream channels, and reducing chronic sedimentation of streams. By improving watershed health, the Project meets ACS objectives, standards, and guidelines in the short term and long term at the watershed scale.

Short-Term Uses and Long-Term Productivity (*The Team*)

The use or protection of natural resources for long-term, sustained yield is the legislated basis of management and direction for the Forest Service (USDA, USDI 1994a, p. 321). Short-term uses include actions such as road decommissioning. The design criteria were developed to incorporate the standards and guides of the Siuslaw Forest Plan as amended by the Northwest Forest Plan. We expect that applying them to the proposed management actions will reduce the potential for long-term loss in productivity of forest soils that may result from short-term uses. They will also allow for the long-term development of late-successional habitat and associated aquatic ecosystems.

Unavoidable Adverse Effects (*The Team*)

Implementing any alternative would result in some adverse environmental effects that cannot be avoided. The design criteria, along with Forest standards and guides, are intended to keep the extent and duration of these effects within acceptable rates, but adverse effects cannot be completely eliminated. The following adverse environmental consequences would be associated to some extent with Alternative 2:

- Short-term, localized reductions in air quality from dust, smoke, and vehicle emissions resulting from management actions and forest users.
- Disturbance to wildlife when their habitat is disturbed by management actions or recreation activities.
- Temporary increase in large vehicle traffic during road decommissioning operations.
- Loss of vehicular access through the forest as roads fail, or are naturally closed by vegetation, are physically closed, or decommissioned.

Irreversible Resource Commitments (*The Team*)

Irreversible commitments of resources are actions that disturb either a non-renewable resource (for example, heritage resources) or other resources to the point that they can only be renewed over 100 years or not at all. The design criteria—along with Forest standards and guides—are intended to reduce these commitments, but adverse effects cannot be completely eliminated. For example, the continued use of existing roads that access the Forest is an irreversible commitment of the soil resource because of the long time needed for a road to revert to natural conditions.

Irretrievable Commitment of Resources (*The Team*)

An irretrievable commitment is the loss of opportunities for producing or using a renewable resource for a period of time. Almost all activities produce varying degrees of irretrievable resource commitments. They parallel the effects for each resource discussed earlier in this chapter. They are not irreversible because they could be reversed by changing management direction. The irretrievable commitment of resources, such as loss of vehicular access through the forest as roads are closed or decommissioned, would be associated to some extent with all alternatives.

Environmental Justice (*Resource Planner*)

Based on local knowledge, small pockets of low-income populations live in the planning area and some augment incomes through actions such as gathering firewood and picking brush to sell. Some farms exist in the planning area and domestic-use water systems include individual wells and spring-fed systems.

Although road decommissioning and closure actions would reduce vehicle access in the watershed, opportunities to gather firewood or commercially harvest shrubs would be maintained. None of the proposed actions are expected to physically affect farms or water quality of domestic-use water systems.

Effects of alternatives on the human environment (including minority and low-income populations) are expected to be similar for all human populations regardless of nationality, gender, race, or income. No disproportionately high and adverse human health or environmental effects on minority populations and low-income populations are expected as a result of implementing actions described for Alternative 2.

Other Disclosures (*The Team*)

Based on the Team's evaluation of the effects, we concluded:

- None of the alternatives would affect minority groups, women, and consumers differently from other groups. These groups may benefit from employment opportunities that proposed activities would provide; the no-action alternative would have neither adverse nor beneficial effects. None of the alternatives adversely affects civil rights. All contracts that may be awarded as a result of implementation would meet equal employment opportunity requirements.
- None of the proposed activities would affect known prehistoric or historic sites because no new disturbance on previously undisturbed ground is expected. As outlined in the American Indian Religious Freedom Act, no effects are anticipated on American Indian social, economic, subsistence rights, or sacred sites.
- No adverse effects on wetlands and flood plains are anticipated. No farmland, parkland, rangeland, wilderness, or wild and scenic rivers would be affected.
- This environmental assessment is tiered to the Siuslaw Forest Plan FEIS, as amended by the Northwest Forest Plan, and is consistent with those plans and their requirements.
- Proposed activities are not in or adjacent to an inventoried roadless area.
- Proposed activities are consistent with the Coastal Zone Management program.
- None of the proposed activities are expected to substantially affect human health and safety.
- Proposed activities are consistent with the Clean Air Act because effects from the use of heavy equipment that can generate dust and exhaust are localized and short-term.
- Because of the design criteria (appendix A) to be applied, this project is expected to be consistent with the Clean Water Act.
- The proposed activities are not expected to measurably affect global warming. The USDA Forest Service will continue an active leadership role in agriculture and forestry regarding the reduction of greenhouse gas emissions.
- These actions do not set a precedent for future actions because they are similar to actions implemented in the past.

References

Bilby, R.E.; Sullivan, K.; and Duncan, D.H. 1989. The generation and fate of road-surface sediment in forested watersheds in southwestern Washington, Forest Science. 35(2): 453-468.

Brown, G.W. 1969. Predicting temperatures on small streams. Water Resources Research. 5(1): 68-75.

Close, D.A.; Fitzpatrick, M.S.; Li, H.W. 2002. The ecological and cultural importance of a species at risk of extinction, Pacific lamprey. Website: www.fisheries.org.

DEQ. 1998. Oregon's final 1998 303(d) database. Website: http://waterquality.deq.state.or.us/wq/303dlist/303dpage.htm. Salem, OR: Department of Environmental Quality.

DEQ. 1999. Water quality management plan, Rogue River basin, Illinois River sub basin. Medford, OR: Department of Environmental Quality.

Duncan, S.H.; Bilby, R.E.; Ward, J.W.; Heffner, J.T. 1987. Transport of road surface sediment through ephemeral stream channels. Water Resources Bulletin. 23 (1):113-119.

Foltz, R.B. 1999. Traffic and no-traffic on an aggregate surfaced road: sediment production differences. Paper presented at seminar on environmentally sound forest roads and wood transport. Rome, Italy: Food and Agriculture Organic.

Froehlich, H.A. 1976. The influence of different thinning systems on damage to soil and trees. In: Proceedings of the 16th IUFRO World Congress, Div. 4. Oslo, Norway. Pages 333-344.

Froehlich, H.A.; Miles, D.W.R.; Robbins R.W. 1985. Soil bulk density recovery on compacted skid trails in central Idaho. Soil Sciences Society American Journal. 49:1015-1017.

Heilman, P. 1981. Root penetration of Douglas-fir seedlings into compacted soil. Forest Sciences. 27(4): 660-666.

NSW. 2001. What is a barrier to fish passage? (DF94)—September 2001. New South Wales Fisheries State Government. Website: http://www.fisheries.nsw.gov.au/conservation/aquahab/barriers_fish_pass.htm.

ODFW. 1997. Yachats River basin fish management plan. Newport, OR: Oregon Department of Fish and Wildlife.

Reid, L.M.; and Dunne, T. 1984. Sediment production from forest road surfaces. Water Resources Research. 20(11): 1753–1761.

Robison, G.E.; Mirati, A.; Allen, M. 1999. Draft Oregon road/stream crossing restoration guide. Drafted Advance Fish Training, Version April 27, 1999. 27 p.

[USDA FS] USDA Forest Service. 1990. Land and resource management plan (as amended by the 1994 Northwest Forest Plan). Corvallis, OR: Siuslaw National Forest.

[USDA FS] USDA Forest Service. 1995. Assessment report: Federal lands in and adjacent to Oregon Coast Province. Two volumes. 200 p. Corvallis, OR: Siuslaw National Forest.

[USDA FS] USDA Forest Service. 1997. Yachats-Blodgett watershed analysis. Corvallis, OR: Siuslaw National Forest. 83 p. plus maps and appendices.

[USDA FS] USDA Forest Service. 2002a. Environmental assessment, Lower Siuslaw landscape management project. Corvallis, OR: Siuslaw National Forest. 89 p. plus appendices.

[USDA FS] USDA Forest Service. 2002b. Final environmental impact statement, Five Rivers landscape management project. Corvallis, OR: Siuslaw National Forest. 113 p. plus appendices.

[USDA FS] USDA Forest Service. 2003a. Biological assessment, 5500-520 road extension project. Corvallis, OR: Siuslaw National Forest. 11 p. plus maps.

[USDA FS] USDA Forest Service. 2003b. Road analysis report. Corvallis, OR: Siuslaw National Forest.

[USDA FS] USDA Forest Service. 2003c. Water quality restoration plan, Yachats River Watershed. Corvallis, OR: Siuslaw National Forest.

[USDA FS] USDA Forest Service. 2003d. Yachats EA road 5500-520 extension/road 5491 evaluation. Corvallis, OR: Siuslaw National Forest.

[USDA FS] USDA Forest Service. 2004. Environmental assessment, Yachats aquatic restoration project. Corvallis, OR: Siuslaw National Forest. 60 p. plus appendices.

[USDA FS] USDA Forest Service. 2005a. Decision notice, Yachats terrestrial restoration project. Corvallis, OR: Siuslaw National Forest. 13 p.

[USDA FS] USDA Forest Service. 2005b. Environmental assessment, Yachats terrestrial restoration project. Corvallis, OR: Siuslaw National Forest. 114 p. plus appendices.

[USDA FS] USDA Forest Service. 2005c. Wildlife specialist report for the Yachats Watershed Roadwork Project. Corvallis, OR: Siuslaw National Forest.

[USDA FS] USDA Forest Service. 2005d. Biological evaluation of proposed, endangered, threatened and sensitive vascular plant, bryophyte, lichen and fungi species for the Yachats Watershed Roadwork Project. Corvallis, OR: Siuslaw National Forest.

[USDA, USDI] USDA Forest Service, USDI Bureau of Land Management. 1994a. Final supplemental environmental impact statement on management of habitat for late-successional and old-growth species within the range of the northern spotted owl. Volume 1. Portland, OR.

[USDA, USDI] USDA Forest Service, USDI Bureau of Land Management. 1994b. Record of decision for amendments to Forest Service and Bureau of Land Management planning documents within the range of the northern spotted owl and standards and guidelines for management of habitat for late-successional and old-growth forest related species within the range of the northern spotted owl. Portland, OR.

[USDA, USDI] USDA Forest Service, USDI Bureau of Land Management. 1997. Late-successional reserve assessment, Oregon Coast Province southern portion--version 1.3. Corvallis, OR: Siuslaw National Forest.

[USDA, USDI] USDA Forest Service, USDI Bureau of Land Management. 2003. Programmatic biological assessment of fiscal year 2004-2005 activities in the north coast province which might disturb bald eagles, northern spotted owls, or marbled murrelets. Portland OR: USDA Forest Service, USDI Bureau of Land Management.

[USDA, USDI] USDA Forest Service, USDI Bureau of Land Management. 2004. Record of decision to remove or modify the survey and manage mitigation measures standards and guidelines. Portland, OR: USDA Forest Service, USDI Bureau of Land Management. 41 p.

[USDA, USDI, et al.] USDA Forest Service, USDI Bureau of Land Management, USDI Fish and Wildlife Service [and others]. 1993. Forest ecosystem management: An ecological, economic, and social assessment. Portland, OR: USDA Forest Service, USDI Bureau of Land Management, USDI Fish and Wildlife Service, USDI National Park Service, USDC National Marine Fisheries Service, EPA. Irregular pagination.

Wert, S.; Thomas B.R. 1981. Effect of skid roads on diameter, height and volume growth in Douglas-fir. Soil Sciences Society American Journal 45:629-632.

Glossary

Most definitions of the terms in this glossary were taken from, or adapted from, the glossaries of the following documents:

- 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 (USDA, USDI 1994a);
- Forest Ecosystem Management: An Ecological, Economic, and Social Assessment (USDA, USDI et al. 1993);
- Forest Stand Dynamics: Update Edition (Oliver and Larson 1996); and
- Siuslaw National Forest Road Analysis (USDA 2003b).

Access and travel management (ATM) roads--National Forest System roads managed under one of the following categories established by the Siuslaw Access and Travel Management Guide (September 1994):

- Primary forest road, all highway vehicle travel is encouraged;
- Secondary forest road (low clearance), passenger car travel acceptable; or
- Secondary forest road (high clearance), passenger car use is discouraged.

Adaptive management--Changing practices based on management activities that are planned, monitored, and evaluated, with learning considered along with resource objectives. Because learning from forest practices often takes many years, adaptive management must initially focus on providing information for future decisions. Adding aspects of the scientific method to management practices can increase confidence in the interpretation of outcomes.

Aquatic ecosystem--Any body of water, such as a stream, lake, or estuary, and all organisms and nonliving components within it, functioning as a natural system.

Best management practices (BMP)--Methods, measures, or practices designed to prevent or reduce water pollution or other environmental damage.

Biodiversity--The variety of life forms and processes, including a complexity of species, communities, gene pools, and ecological functions.

Biological opinion--The document resulting from formal consultation with the U.S. Fish and Wildlife Service or the National Marine Fisheries Service, stating a finding about whether a federal action is likely to jeopardize the continued existence of listed species or result in destroying or adversely modifying critical habitat.

Classified road--A road wholly or partially in or adjacent to National Forest system lands that are determined to be needed for long-term motor vehicle access, including state, county, and private roads, National Forest system roads, and other roads authorized by the Forest Service.

Closed road--A road on which vehicle traffic has been excluded (year-long or seasonal) by natural blockage, barricade, or by regulation. A closed road is waterbarred and can remain on the National Forest transportation system under a storage strategy for future use. (see "decommissioned road").

Code of Federal Regulations (CFR)--A codification of the general and permanent rules published in the Federal Register by the Executive departments and agencies of the federal government.

Conservation strategy--A management plan for a species, group of species, or ecosystem that prescribes standards and guidelines which, if implemented, provide high likelihood that the species, groups of species, or ecosystem, with its full complement of species and processes, will continue to exist, well-distributed, throughout a planning area.

Critical habitat--For listed species, specific parts of the geographic area occupied by a federally listed species that have physical and biological features essential to conserving the species, and that may require special management consideration or protection; also specific areas outside the geographical area occupied by a species but essential for its conservation. Designated critical habitats are described in 50 CFR 17 and 226.

Debris flow--A rapidly moving mass of rock fragments, soil, and mud, with more than half of the particles larger than sand.

Decommissioned road—An unneeded road that has been closed and removed from the National Forest transportation system. The objective of road decommissioning is to stabilize and restore unneeded roads to a more natural state. Treatments are designed to reduce long-term adverse effects on aquatic resources and typically include removing unstable portions of embankments, partially or completely removing stream-crossing culverts and accompanying fill material, decompacting surfaces of valley-bottom or mid-slope roads, waterbarring roadbeds, seeding to reduce erosion and provide forage, and closing road entrances (see "closed road").

Deferred road maintenance—Maintenance on classified roads that is not routinely performed according to maintenance standards and scheduling, but is deferred to some later date. When allowed to accumulate without limits or consideration of useful life, deferred maintenance leads to deterioration of performance, increased repair costs, and decreased asset value. Deferred maintenance needs can be categorized as critical or non-critical at any point in time. An example of non-critical deferred maintenance is not periodically grading a low-standard, high-clearance road, thus allowing some surface rutting. An example of critical deferred maintenance is not maintaining a culvert in a perennial stream that supplies water to a public water source, thus increasing the risk of culvert obstruction and the potential for sediment entering the public water source. Continued deferral of non-critical maintenance will normally result in an increase in critical deferred maintenance.

Dispersed recreation--Recreation use outside developed recreation sites, including activities like hunting, fishing, scenic driving, hiking, bicycling, horseback riding, and recreation in primitive environments.

Domestic water sources—Streams on National Forest System lands used as sources for providing surface waters to facilities that treat and/or distribute water for domestic purposes. These purposes include normal household uses such as drinking, food preparation, bathing, washing clothes and dishes, watering lawns and gardens, and other similar uses.

Ecosystem management--At the core of ecosystem management is the idea that ecosystems are complex assemblages of organisms interacting with their environment and changing in complex ways over time. Science-based knowledge of how ecosystems work is important to managing forests to maintain their biodiversity and long-term productivity. The first step has often been to reallocate or rezone forests to meet new primary objectives. Concepts of joint production are emerging, however, that attempt to manage for multiple objectives, with no single objective considered primary, and focusing on finding compatible groupings of objectives where possible. An alternative concept to reallocation being proposed and tested is disturbance-ecology-based management. This idea centers on the concept that organisms are more adapted to the historical disturbance patterns than to specific successional states, and that management could more closely emulate natural disturbances and ecosystem responses to disturbance, as a way to maintain diversity and long-term productivity and at the same time continue limited resource extractions.

Fifth-field watershed--The geographical area of a watershed that is generally 50,000 to 100,000 acres in size.

Floodplain—A level lowland bordering a stream or river onto which the stream flow spreads at flood stage.

Forest-development road--A forest road under the jurisdiction of the Forest Service.

Forest ecosystem--The entire assemblage of organisms (trees, shrubs, herbs, bacteria, fungi, and animals, including people) together with their environmental substrate (the surrounding air, water, soil, organic debris, and rocks), interacting inside a defined boundary. Because ecosystem boundaries are arbitrarily set as a research tool, they can be defined at many scales, from a leaf surface to the entire planet. Forest ecosystems are often studied in bounded watersheds draining to a monitored stream.

Heritage resource--The remains of sites, structures, or objects resulting from past human activity that have important socio-cultural value, whether historic, prehistoric, archaeological, or architectural. For this project, “heritage resource” refers only to actual physical things--places, structures, or artifacts that are material evidence of a past way of life--rather than to traditions, customs, or modern life styles. Heritage resources are fragile and nonrenewable; their values, once destroyed, cannot be recreated.

Heritage site--Any definite place of past human activity with important socio-cultural value--historic, prehistoric, archaeological, or architectural--identifiable through field survey, historical documentation, or oral evidence.

Key Forest roads--The Siuslaw National Forest Road Analysis adopted the ATM road management categories (see access and travel management (ATM) roads) in selecting the road system managed for continued access to the Forest:

- Primary forest road, all highway vehicle travel is encouraged;
- Secondary forest road (low clearance), passenger car travel acceptable; or
- Secondary forest road (high clearance), passenger car use is discouraged.

Landscape--A heterogeneous land area with interacting ecosystems repeated in similar form throughout.

Late-successional forest--Forest in the seral stages that include mature and old-growth age-classes.

Late-successional reserve--A mature or old-growth forest reserved under the record of decision for the Northwest Forest Plan.

Listed species--Those plant and animal species listed in the Federal Register as threatened or endangered.

Maintenance Level--Defines the level of service provided by, and maintenance required for, a specific road, consistent with road management objectives and maintenance criteria:

> Maintenance Level 1--Assigned to intermittent-service roads during the time they are closed to vehicular traffic. The closure period is one year or longer. Basic custodial maintenance is performed.
> Maintenance Level 2--Assigned to roads open for use by high-clearance vehicles. Passenger car traffic is not a consideration.
> Maintenance Level 3--Assigned to roads open and maintained for travel by a prudent driver in a standard passenger car. User comfort and convenience are not considered priorities.
> Maintenance Level 4--Assigned to roads that provide a moderate degree of user comfort and convenience at moderate travel speeds.
> Maintenance Level 5--Assigned to roads that provide a high degree of user comfort and convenience. Normally, roads are double-laned and paved, or aggregate surfaced with dust abatement.

Management-indicator species--Species identified in the Siuslaw National Forest Land and Resource Management Plan for special consideration because their population changes are believed to indicate the effects of management activities on the health of mature forests.

Mature conifer stand--A stand of trees where the annual net rate of growth has peaked. Stands are generally older than 80-100 years and younger than 180-200 years. Stand age, diameter of dominant trees, and stand structure at maturity vary by forest cover types and local site conditions. Mature stands generally contain trees with smaller average diameter, less age-class variation, and less structural complexity than do old-growth stands of the same forest type.

Matrix--Federal lands outside reserves, withdrawn areas, and managed late-successional areas and primarily managed for timber harvest.

Mitigation measures--Modifications of actions to avoid adverse effects by not taking a certain action or parts of an action; minimizing adverse effects by limiting the scope or intensity of the action; rectifying adverse effects by repairing, rehabilitating, or restoring the affected environment; reducing or eliminating adverse effects over time by preserving and maintaining operations during the life of the action; or compensating for adverse effects by replacing or providing substitute resources or environments.

Monitoring--A process of collecting information to evaluate whether the objective and anticipated or assumed results of a management plan or project are being realized or whether projects are being implemented as planned.

National Forest System road--A classified forest road under the jurisdiction of the Forest Service. These roads were formerly called Forest-development roads—the two terms are synonymous.

Non-ATM roads--National Forest System roads managed under the Siuslaw Access and Travel Management Guide's designation as "other forest road", including short-term, project, or special-use roads. These roads will receive various degrees of maintenance, depending on their current use or nonuse. Some roads will be closed for safety, some for resource protection.

Non-key roads--National Forest System roads not managed as part of the key Forest road system. These roads are similar to roads formerly called non-ATM roads and include short-term, project, or special-use roads. These roads will receive various degrees of maintenance, depending on their current use or nonuse. Some roads will be closed or decommissioned for safety, some for resource protection.

Noxious weed--A plant specified by law as being especially undesirable, troublesome, and difficult to control.

Overstory--Trees that provide the uppermost layer of foliage in a forest with more than one roughly horizontal layer of foliage.

Peak flow--The highest amount of stream or river flow in a year or from a single storm event.

Quarter-township--An area about 3 miles square containing nine sections of land.

Refereed literature--Scientific literature that has been peer-reviewed prior to publication.

Road analysis--An integrated ecological, social, and economic science-based approach to transportation planning that addresses existing and future road management options.

Road maintenance--The ongoing upkeep of a road necessary to retain or restore the road to its approved road management objective.

Riparian area--A geographic area containing an aquatic ecosystem and adjacent upland areas that directly affect it; it includes floodplain, woodlands, and all areas within a horizontal distance of about 100 feet from the stream channel's normal high-water line or from the shoreline of a standing body of water.

Riparian reserve--Designated riparian areas outside late-successional reserves and reserved under the record of decision for the Northwest Forest Plan.

Ripping--The process of breaking up or loosening compacted soil from temporary roads and landings to better assure penetration of roots of forest vegetation.

Sensitive species--Species mentioned in the Federal Register as proposed for classification or under consideration for official listing as endangered or threatened species, on an official state list, or recognized by the Forest Service or other management agencies as needing special management to prevent their being placed on federal or state lists.

Seral--A biotic community that is in a developmental, transitory stage in an ecological succession.

Silviculture--The art and science of producing and tending a forest, dealing with the principles that underlie the growth and development of single trees and of the forest as a biological unit. Fundamental natural and social sciences guide the various treatments of forest stands to maintain and enhance their utility for any given purpose(s).

Site productivity--The ability of a geographic area to produce biomass (total quantity of living organisms), as determined by conditions (for example, soil type and depth, rainfall, temperature) in that area.

Soil compaction--An increase in bulk density (weight per unit volume) and a decrease in soil porosity resulting from applied loads, vibration, or pressure. The actual physical change is primarily reduction of non-capillary pore space, which in turn reduces infiltration, permeability, and gaseous exchange.

Soil displacement--The removal and horizontal movement of soil from one place to another by mechanical forces such as a bulldozer blade.

Special forest products--Forest products sold for commercial use such as fern, salal, and moss; also others offered for personal use such as shrubs for transplanting, Christmas trees, and firewood.

Standards and guides--The primary instructions for public land managers. Standards address mandatory actions, and guides are recommended actions necessary to a land management decision.

Stream reach--An individual first-order stream or a segment of another stream that has beginning and ending points at a stream confluence. Reach points are normally designated where a tributary confluence changes the channel character or order. Stream reaches are normally 0.5 to 1.5 miles long.

Subsoiling--The process of breaking up or loosening compacted soil from temporary roads and landings to help restore productivity of forest soils.

Subwatershed--A land area (basin) bounded by ridges or similar topographic features, encompassing only part of a watershed.

Survey-and-manage species--Species that are closely associated with late-successional or old-growth forests whose long-term persistence is a concern; in this document, those with ranges in the Lower Siuslaw watershed. Species are listed in the record of decision (table C-3) for the Northwest Forest Plan. Mitigation measures and standards and guidelines for managing survey-and-manage species are amended by the Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and Other Mitigation Measures Standards and Guidelines (USDI, USDA 2001).

System road--A classified road in the National Forest necessary to protect, administer, or use the Forest or its resources.

Temporary roads--Short-term use roads authorized by contract, permit, lease, other written authorization, or emergency operation not intended to be a part of the National Forest transportation system and not necessary for long-term resource management. Temporary roads are reopened or built to accomplish a management objective, such as thinning older plantations or maintaining meadows. After the project is completed, these roads may be decompacted and water barred, stream-crossing culverts and fills removed (if any), and road entrances barricaded (if necessary).

Threatened species--Those plant or animal species likely to become endangered throughout all or a significant portion of their range in the near future. A plant or animal identified and defined in accordance with the 1973 Endangered Species Act and published in the Federal Register.

Unclassified road--A road on National Forest System land that is not managed as part of the National Forest transportation system, such as an unplanned road, abandoned travelway, and off-road vehicle track that has not been designated and managed as a trail; and those roads that were under permit or other authorization and were not decommissioned upon termination of the authorization.

Waterbar--A berm or ditch-and-berm combination that cuts across roads at an angle so that all surface water running on the road and in the road ditch is intercepted and deposited over the outside edge of the road. Water bars normally allow high-clearance vehicles to pass.

Watershed--The drainage basin contributing water, organic matter, dissolved nutrients, and sediments to a stream or lake.

Watershed analysis--A systematic procedure for characterizing watershed and ecological processes to meet specific management and social objectives. Watershed analysis provides a basis for ecosystem management planning to be applied to watersheds of about 20 to 200 square miles.

Wildfire--Any wildland fire that does not meet management objectives, thus requiring a fire-suppression response. Once a fire is declared wild, it is no longer considered a prescribed fire.

Wildland-urban interface (WUI)—The line, area, or zone where structures and other human development meet or intermingle with National Forest System lands that contain undeveloped wildland or vegetative fuels. Because of their location, these structures are vulnerable to fire should an ignition occur in the surrounding area. Actions on National Forest System land (e.g. commercial thinning) in the WUI that increase fire-hazard risks by increasing the fuel loading near residential properties are mitigated through prescribed burning or other fuel-reduction measures.

Appendix A

Yachats Roadwork Project
Design Criteria

These design criteria for the Yachats Watershed Roadwork Project were developed to ensure that standards and guides of the 1990 Siuslaw Forest Plan (SFP) as amended by the 1994 Northwest Forest Plan (NFP) are met. Where applicable, pertinent standards and guides from these Plans are cited. The design criteria apply to all action alternatives, unless otherwise specified. Appropriate specialists will be consulted before any design criteria for proposed activities are changed.

I. Design Criteria Common to All Activities

1. Consultation with Other Agencies

NOAA Fisheries has been consulted about effects of proposed actions on federally listed coho salmon through the Northwest Oregon Programmatic Biological Assessment (Programmatic BA) (USDA, USDI 2002). Since the Programmatic BA was completed, the ESA status of the coho listing has changed and coho salmon are currently proposed as a threatened species, with a final rule on their status expected in June 2005. The Programmatic BA and the NOAA Fisheries biological opinion (February 25, 2003) have determined that project activities are likely to adversely affect listed coho salmon in the short term. Project activities are expected to benefit coho salmon and their habitat in the long term. Project activities are not expected to adversely affect designated essential fish habitat.

NOAA Fisheries, on December 14, 2004, proposed the designation of critical habitat for Pacific salmon and steelhead in Washington, Oregon, and Idaho. This proposed rule designated some of the streams within the project area as critical habitat for Oregon Coast coho salmon. Effects to the streams proposed for designation as critical habitat were addressed in detail in the Programmatic BA (USDA, USDI 2002). Consultation with NOAA Fisheries will occur if streams within the project area are formally designated as critical habitat in the final rule, with designations expected in June 2005.

In their biological opinions of the following Siuslaw National Forest biological assessments, the U.S. Fish and Wildlife Service (FWS) has concurred with our findings that the project will not jeopardize the existence of bald eagles, northern spotted owls, and marbled murrelets. The FWS terms and conditions will be applied to the project design criteria:

- Programmatic Biological Assessment of Fiscal Year 2004-2005 Activities in the North Coast Province Which Might Disturb Bald Eagles, Northern Spotted Owls, or Marbled Murrelets. (FWS biological opinion reference #: 1-7-04-F-1113).

Coho salmon

a. No new permanent roads will be built. The density or adverse effects of existing classified (permanent) or unclassified (permanent) roads in the Yachats Watershed will be reduced.

Bald eagle, marbled murrelet, and northern spotted owl habitat

Bald eagle, marbled murrelet, and northern spotted owl

a. Involve a wildlife biologist for any activity that proposes to remove mature conifer hazard trees.

b. Except for hazard trees, do not remove individual known nest trees or trees with nesting structure from areas where, in the opinion of the unit biologist, the loss of such a tree would limit nesting. A known nest tree may be removed only when it is a hazard tree **and** when the tree is unoccupied by nesting birds or young (e.g., after the young have fledged).

Marbled murrelet

a. Comply with the standards of the 13 May 1997 biological opinion addressing the effects of implementing the Northwest Plan standards and guides on designated murrelet critical habitat (USDI 1996) for all individual hazard-tree removals that may affect critical habitat or suitable habitat of the marbled murrelet.

Bald eagle, northern spotted owl, and marbled murrelet disturbance

Bald eagle, marbled murrelet, and northern spotted owl

a. If a new nest site is discovered in the project area, evaluate any activity within 0.25 mile of the nest site (0.5 mile line-of-site for bald eagle nests) for potential effects. Restrict activities to prevent disturbances where necessary.

b. Do not use blasting for part of any proposed action from March 1 through September 30.

Marbled murrelet and northern spotted owl

a. To minimize risk of attracting predators to activity areas, contain or remove all garbage (especially food products) in the vicinity of any activity.

Bald eagle

a. Do not implement any activity within 0.25 mile (0.5 mile for aircraft operations) or a 0.5-mile sight distance of a known bald eagle nest site between January 1 and August 31, unless a wildlife biologist has determined that the nest site is unoccupied.

Marbled murrelet

a. Do not implement activities within 0.25 mile of a known occupied marbled murrelet site during the critical nesting period of April 1 through August 5. The unit wildlife biologist may modify the distance and timing of activities based on site-specific information. Document all changes and notify the US Fish and Wildlife Service before actions are implemented.

b. Do not begin activities associated with projects within 0.25 mile of occupied or unsurveyed suitable or potential marbled murrelet habitat between April 1 and September 15 until two hours after sunrise; end activities two hours before sunset.

Northern spotted owl

a. Do not implement activities within 0.25 mile of a spotted owl nest site or the activity center of any known pair (unless known to be unoccupied, as defined by protocol) during the critical nesting period of March 1 through July 7. The unit wildlife biologist may modify the distance and timing of activities based on site-specific information. Document all changes and notify the US Fish and Wildlife Service before actions are implemented.

2. Public-Generated Design Criteria

Road 5455 (Axtel Creek Road):

a. Place excavated fill material against the road cutbank and leave the outside 5 feet of the road surface open to maintain the opportunity for hiking.

b. Minimize slash on the inlet side of the excavation area to minimize obstacles to hiking.

3. Wildland-Urban Interface

a. Maintain roads that access stands in the wildland-urban interface (WUI). Road 5492 is one of two roads that currently provide access to stands in the WUI. Because this road provides access to BPA towers, it will be maintained as an open road. Road 5500-518 also accesses a stand in the WUI, but it parallels 5492 and is not needed to address WUI concerns.

b. Assess other roads in the planning area boundary that provide primary access to private land case-by-case to determine maintenance levels. The district hydrologist, fire management officer, and transportation planner will make these assessments.

4. Other requirements

a. Follow Siuslaw Plan standards and guides (FW-114 through FW-118) to meet water-quality standards outlined in the Clean Water Act for protecting Oregon waters, and apply practices as described in General Water Quality Best Management Practices, Pacific Northwest Region, November 1988. Design criteria, including these practices, are incorporated throughout the project, such as in project location, design, contract language, implementation, and monitoring. The State has agreed that compliance with these practices will ensure compliance with State Water Quality Standards (Forest Service Manual 1561.5, R-6 Supplement 1500-90-12).

b. Prepare and implement a Spill Prevention Control and Countermeasures (SPCC) Plan. The SPCC plan will meet applicable EPA requirements (40 CFR 112), including certification by a registered professional engineer. (SFP: FW-119, 120, 122).

c. The literature was searched for possible heritage resources (historical or archaeological sites) in the project planning area. No known sites were identified that could be affected by this project. All actions will all be on previously disturbed ground and will not require field inventories. Should heritage resources be discovered as a result of any project activities, cease work in that area and consult with the Forest Archaeologist. Protect, preserve, and treat sites in accordance with the National Historic Preservation Act.

d. The literature was searched for possible heritage resources (historical or archaeological sites) in the project planning area. No known sites were identified that could be affected by this project. All actions will be on previously disturbed ground and will not require field inventories. Should any heritage resources be discovered as a result of any project activities, the site will be preserved or treated in accordance with the National Historic Preservation Act.

e. Required survey-and-manage protocols will follow the Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines (USDA, USDI 2001).

Noxious Weed Prevention and Mitigation:

a. The existing canopy cover, coupled with natural seeding from adjacent vegetation, will ameliorate the spread of noxious and undesirable weeds at culvert-removal and other ground-disturbing sites. Due to the existing canopy cover, artificially seeding disturbed sites is not recommended because it would be ineffective.

b. To prevent spread of noxious weeds, include provision C6.35 (Equipment Cleaning) in contracts for all heavy equipment.

II. Road Decommissioning and Closure

1. Road Decommissioning (NFP: RF-3c, 5, & 6; p. C-32, 33):

Road decommissioning definition—Activities that result in the stabilization and restoration of unneeded roads to a more natural state (Federal Register, January 12, 2001).

a. Review, using a team of planners and engineers, the road project sites before preparing design plans for road-decommissioning contracts. Planners and engineers will review any changes in design plans before they are incorporated into contracts.

b. Involve a fish biologist or hydrologist in the design and implementation of each project that is likely to adversely affect coho salmon.

c. Design fill-removal activities to minimize sediment entering stream channels. The objective is to restore stream processes and floodplain access by removing all fill material on the valley floor. Excavate slopes to approximate 1.5:1, where practical; do not encroach on natural slopes. Allow disturbed slopes to revegetate naturally or use erosion control measures (such as tree limbs and tops, native seed mixtures or plants), where a moderate to high potential for surface erosion exists. Because it can impede the establishment of natural vegetation and deplete soil of nitrogen, use straw as a last resort. Where feasible, restore the natural flood plain. Minimize disturbance of existing vegetation in ditches and at stream crossings adjacent to the road prism. Maximize activities during dry conditions (late summer and early fall). Consult with watershed and/or fisheries staff where technical feasibility or economics limit meeting fill removal objectives (SFP: FW-123).

d. Follow ODFW Guidelines for Timing of In-Water Work (programmatic BA, appendix C) where relevant, except where the potential for greater damage to water quality and fish habitat exists. Request exceptions to ODFW guidelines for timing of in-water work from NOAA Fisheries. Requests must be granted before work can begin.

e. Place material excavated from stream crossings and unstable side-cast road fills on stable areas at least 100 feet away from stream channels or active flood plains. Suitable areas—to be determined by a geotechnical engineer or other qualified personnel—include roadbeds adjacent to cutbanks, or on previously designated waste areas (if locally available). Remove any alder or conifer from the cut bank before placing excavated material, to enhance soil-to-soil contact and long-term soil stability. Contour waste piles to approximate 1.5:1 to 2:1 slopes and allow them to revegetate naturally. Seed piles with a mixture of native, certified weed-free species where a moderate to high potential exists for surface erosion, or where noxious weed infestation is likely. (SFP: FW-117, 171).

f. Use an interdisciplinary process to determine new sites for waste material before contracts are advertised, and to review existing waste sites to determine need for redesign or relocation. Where feasible, avoid placing waste material in areas that would impact access to future projects.

g. Level and seed long-term (multiyear use) waste areas after each season of use. Short-term (one-time use) waste areas should be contoured to blend with the surrounding topography wherever possible, seeded, and—where other resource objectives are not compromised—planted with appropriate tree species.

h. Place woody debris, if locally available, in stream channels where sediment is expected to erode from channels at amounts that equal or exceed three (3) cubic yards. This strategy will help reduce sediment rates as streams adjust to gradients during the next year's high flows.

i. Install water bars on both sides of excavated stream banks to route surface water away from newly excavated slopes (SFP: FW-123).

j. Stabilize unstable areas (such as road side-cast material) before a road is decommissioned, to prevent fine sediment from entering stream channels. Excavate side-cast fill material adjacent to stream crossings, where fill material could fail, enter streams, or both. Focus on areas where downhill slopes adjacent to roads are greater than 60%, and road fills are within 200 feet slope-distance of streams (SFP: FW-108, 117).

k. Design water bars to facilitate proper drainage of surface water and to prevent ponding. Place water bars in areas where drainage will not destabilize road fills. To keep streams within their channels when culverts are obstructed, build water bars immediately above existing culverts to become the overflow point. Use the Siuslaw National Forest Water Bar Construction Guide to determine water-bar spacing and design (SFP: FW-123).

l. Decompact surfaces of decommissioned roads where necessary, to allow water to percolate through the soil and accelerate the recovery of woody vegetation. Although subsoiling is the preferred method, use ripping if subsoiling is not feasible or economical. Consult a geotechnical specialist to determine feasibility of subsoiling (SFP: FW-162).

m. Transport off-site culverts removed from stream crossings and ditches to be recycled, reused, or disposed of at a landfill.

n. Do not apply specified reconstruction to roads that will be decommissioned.

o. Refuel power equipment or use absorbent pads for immobile equipment at least 150 feet from water bodies to prevent direct delivery of contaminants into streams, or as far as possible from streams where local site conditions do not allow a 150-foot setback.

Road 5455 (Axtel Creek Road)—see page 3

2. Road Closure (ML1):

Definition--A road on which vehicle traffic has been excluded (year-long or seasonal) by natural blockage, barricade, or by regulation. A closed road can still operate and remains under the jurisdiction of the Forest Service as a classified road.

a. Close roads placed in ML1 status by one of three methods: growing roadside vegetation, placing an earthen mound or other natural material at or near the road entrance, or installing a guardrail. Closure type will be determined case by case.

b. Stabilize closed roads by reopening culvert inlets where necessary, repairing water bars, or building additional water bars. Build drain dips immediately above stream crossings, to ensure water is kept within stream channels when culvert inlets are obstructed. Harden drain dips with rock to minimize sedimentation of streams when culverts fail.

c. Design and place water bars based on specifications for decommissioned roads.

d. Excavate failing side-cast fill material at stream crossings and at other areas where material could enter streams. Focus on areas where downhill slopes adjacent to roads are greater than 60% and road fills are within 200 feet slope-distance of streams.

VII. Monitoring Objectives

Monitoring items include those required for implementation and effectiveness monitoring. Implementation monitoring determines if the project design criteria and Siuslaw Forest Plan standards and guides, as amended by the Northwest Forest Plan, were followed. Effectiveness monitoring evaluates whether applying the management activities achieved the desired goals, and if the objectives of the standards and guides were met. Findings resulting from project observations and monitoring are expected to help influence designing future projects and developing future monitoring plans.

1. Implementation Monitoring

Forest Plan Standards and Guides

Before the contract is advertised, review project contracts for consistency with the standards and guides of both the Northwest and Siuslaw Plans and project design criteria.

Contract and Operations

Involve appropriate specialists when developing road decommissioning and other project contracts or conducting District operations work to ensure activities are implemented as designed. The appropriate specialists will also participate periodically during contract work, especially when unusual circumstances arise that may require a contract modification.

Key checkpoints include a plan-in-hand review, and a contract review of specifications before the next phase of work begins (to ensure key problem situations are addressed in the specifications).

2. Effectiveness Monitoring

Monitoring will be tiered to the Siuslaw Forest Plan.

Road Treatments

a. Field-review excavated slopes from road stabilization activities and note areas where eroded materials enter stream channels. Make observations after the first major rainfall and seasonally thereafter until vegetation reoccupies disturbed sites (about 2 to 5 years). If the surface is eroding and could adversely affect fish habitat, take steps to eliminate or reduce erosion.

b. Observe road surface treatments such as water bars to determine effectiveness and effects on the stability of the outer portion of the road prism.

c. Review the effectiveness of road closures to determine whether another form or location of closure will be required at or near road entrances.

d. Use Oregon Department of Fish and Wildlife and U.S. Forest Service stream surveys to assess changes from measured baseline data in fish habitat characteristics of streams where fish-passage barriers were removed.

3. Project Tracking

Forest Service direction, regulations, and standards and guides for resource protection may change over time. Should changes occur prior to completion of any actions under this project, an addendum will be done for the EA and contract specifications will be modified, if necessary.

Yachats Roadwork Project Proposed Road Decommissions

Road #	Beginning Milepost	Ending Milepost	Segment Length	Estimated Fill Volume	Sub Basin	Legal Description	Current Maintenance Level	Proposed Maintenance Level
5591411	0	0.3	0.3	0	Stump	T.15S R.11W S.10	2	0
5360433	0	0.5	0.5	490	Yachats	T.14S R.11W S.21	2	0
5384000	1.4	2.4	1	900	North Yachats	T.14S R.11W S.10	1	0
5415000	0	0.3	0.3	0	Lower Yachats	T.14S R.11W S.32	2	0
5415000	0.3	2.3	2.0	400	Lower Yachats	T.14S R.11W S.32	1	0
5415456	0	0.12	0.12	0	Lower Yachats	T.14S R.11W S.29	1	0
5420410	0	0.3	0.3	150	Yachats	T.15S R.11W S.4	1	0
5455000	0	1.8	1.8	1070	Yachats	T.14S R.11W S.34	1	0
5800416	0	0.8	0.8	0	School	T.14S R.10W S.32	2	0
5800518	0	0.1	0.1	0	Upper Yachats	T.15S R.10W S.8	2	0
Williamson Creek *			1.1	400	Yachats	T.14S R.11W S.26	1	0
Total			**8.32**	**3,410**				

*Abandoned road adjacent to Williamson Creek

Yachats Roadwork Project Proposed Road Closures					
Road #	Segment Length (miles)	Sub basin	Legal Description	Current Maintenance Level	Proposed Maintenance Level
5300415	0.1	North Yachats	T.14S R.11W S.11	2	1
5300416	0.7	North Yachats	T.14S R.11W S.11	2	1
5300418	1.3	North Yachats	T.14S R.11W S.11	2	1
5300421	0.3	North Yachats	T.14S R.11W S.13	2	1
5300425	0.6	North Yachats	T.14S R.11W S.24	2	1
5300427	0.6	School	T.14S R.11W S.36	2	1
5300430	0.1	North Yachats	T.14S R.11W S.25	2	1
5300431	0.3	North Yachats	T.14S R.11W S.25	2	1
5300435	0.4	Yachats	T.15S R.11W S.2	2	1
5305411	0.37	North Yachats	T.14S R.11W S.23	2	1
5306415	0.2	Yachats	T.15S R.11W S.1	2	1
5306418	0.2	Yachats	T.15S R.11W S.2	2	1
5347000	1.2	North Yachats	T.14S R.11W S.24	2	1
5359411	0.7	North Yachats	T.14S R.11W S.9	2	1
5360422	0.7	North Yachats	T.14S R.11W S.16	2	1
5360430	0.3	North Yachats	T.14S R.11W S.21	2	1
5360431	1.3	North Yachats	T.14S R.11W S.21	2	1
5360441	1.3	Lower Yachats	T.14S R.11W S.33	1	1
5360448	0.3	Lower Yachats	T.14S R.11W S.28	2	1
5361413	0.2	North Yachats	T.14S R.11W S.16	2	1
5362000	4.9	Lower Yachats	T.14S R.11W S.21	2	1
5362465	0.6	Lower Yachats	T.14S R.11W S.24	2	1
5384000	0.5	North Yachats	T.14S R.11W S.10	2	1
5420000	0.6	Yachats	T.14S R.11W S.33	1	1
5421000	2.82	Yachats	T.14S R.11W S.33	2	1
5421413	0.4	Yachats	T.14S R.11W S.34	2	1
5455000	1.1	Yachats	T.14S R.11W S.34	2	1
5455412	0.6	North Yachats	T.14S R.11W S.27	2	1
5455413	0.1	North Yachats	T.14S R.11W S.27	2	1
5455425	0.08	Yachats	T.14S R.11W S.27	2	1
5491520	0.4	Upper Yachats	T.15S R.11W S.24	2	1
5492414	0.4	Stump	T.15S R.11W S.13	2	1
5500512	0.2	Lower Yachats	T.15S R.11W S.8	2	1

Yachats Roadwork Project Proposed Road Closures (cont.)					
Road #	Segment Length (miles)	Sub basin	Legal Description	Current Maintenance Level	Proposed Maintenance Level
5500514	0.7	Lower Yachats	T.15S R.11W S.8	2	1
5500515	0.13	Stump	T.15S R.11W S.22	2	1
5500516	0.36	Stump	T.15S R.11W S.22	2	1
5500517	0.14	Stump	T.15S R.11W S.23	2	1
5500518	1.74	Stump	T.15S R.11W S.23	2	1
5500521	0.7	Upper Yachats	T.15S R.11W S.24	2	1
5500522	0.2	Upper Yachats	T.15S R.11W S.24	2	1
5506000	0.8	Lower Yachats	T.15S R.11W S.6	2	1
5590412	0.1	Yachats	T.15S R.11W S.15	2	1
5591000	0.85	Yachats	T.15S R.11W S.10	2	1
5800413	0.2	School	T.14S R.10W S.29	2	1
5800414	0.9	School	T.14S R.10W S.32	2	1
5800517	0.2	Upper Yachats	T.15S R.10W S.5	2	1
5800519	0.3	Upper Yachats	T.15S R.10W S.8	2	1
5800520	0.3	Upper Yachats	T.15S R.10W S.9	2	1
5872000	1.9	Upper Yachats	T.15S R.10W S.21	2	1
5874000	1.4	Upper Yachats	T.15S R.10W S.20	2	1
Total	**34.79**				

Appendix C

Yachats Roadwork Project
List of Preparers

The Team

Name	Position Title	Primary Responsibilities
Bruce Buckley	Resource Planner	Project coordinator, EA, NEPA process
Jessica Dole	Forest Landscape Architect	Scenery effects
Barbara Ellis	GIS Technician	GIS mapping
Edward Garza	Forest Fuels/Fire Planner	Fire hazard effects
Russell Volke	District Silviculturist	Forest stand conditions
Ken McCall	Forest Transportation Planner	Forest transportation system effects, roads analysis
Doug Middlebrook	District Wildlife Biologist	Wildlife effects; wildlife specialist report, including the biological evaluation
Karla Reeves	District Fish Biologist	Fisheries effects, fisheries biological assessment
Jan Robbins	District Hydrologist	Hydrologic and soils effects, system roads stability assessment, water quality restoration plan
Marty Stein	Forest Botanist	Listed, sensitive, and survey-and-manage plant effects, effects on noxious and undesirable weeds
Phyllis Steeves	Forest Archaeologist	Heritage resource effects
Paul Thomas	Planning Manager	Team leader
Jennifer Wade	Recreation Planner	Recreation effects

Other Contributors

Name	Position Title	Primary Responsibilities
Frank Davis	Forest Environmental Coordinator	NEPA guide
Bill Helphinstine	District Ranger	Process guide, public-involvement coordinator

Appendix D

Contributions From Others

1. List of Agencies and Organizations Consulted

Agencies

Lincoln County Road Department
Lincoln Soil and Water Conservation District
NOAA Fisheries, Portland, OR
Oregon Department of Fish and Wildlife, Newport, OR
US Fish and Wildlife Service, Portland, OR

Organizations

Confederated Tribes of Siletz
Confederated Tribes of Coos, Lower Umpqua, and Siuslaw
Local Steelheaders Group
Mid-Coast Anglers
Mid-Coast Watershed Council
Oregon Watershed Enhancement Board

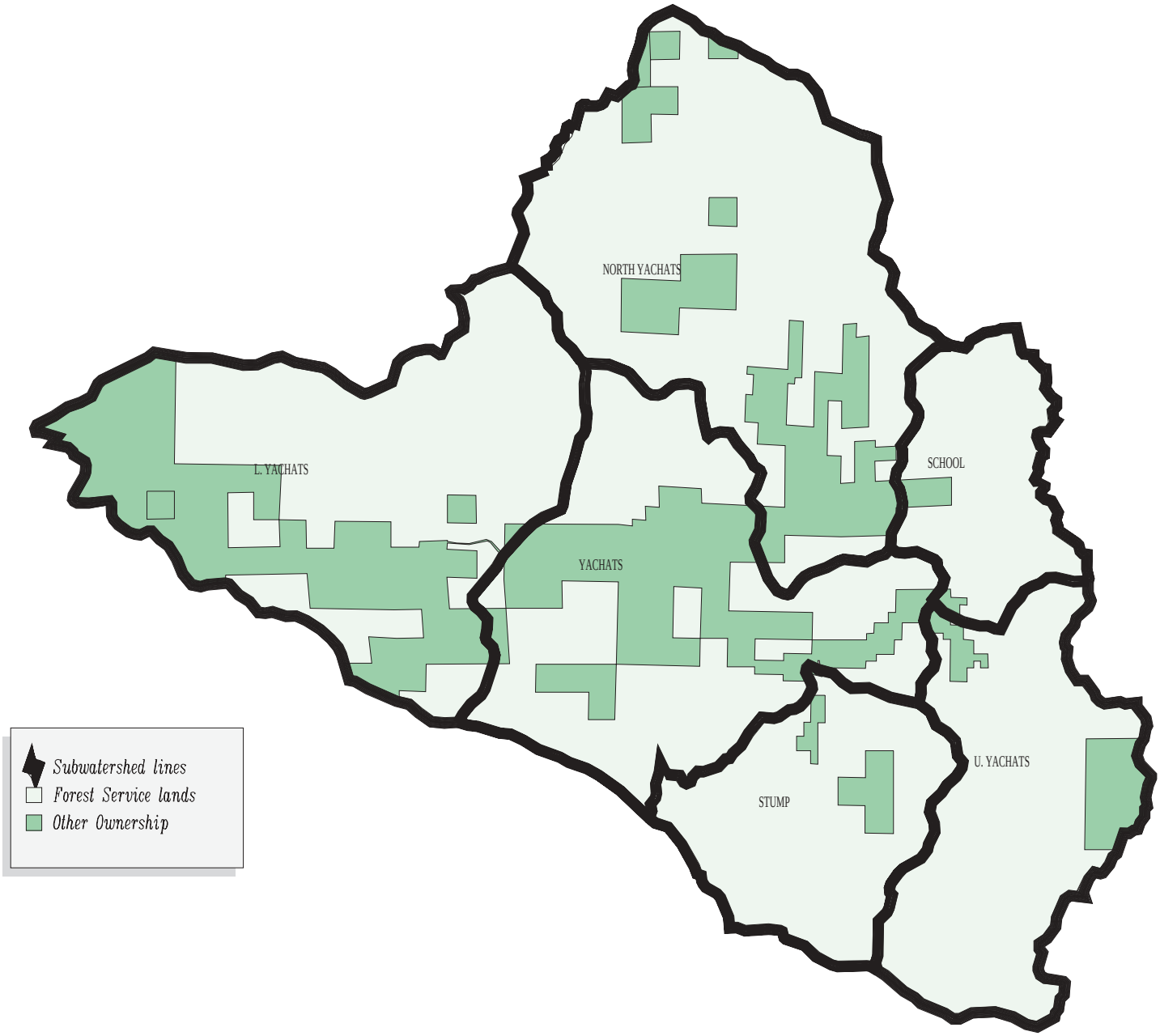
2. Public Comments on the Proposed Yachats Roadwork Project and Forest Service Responses

Table 1 summarizes public comments received on the proposed Yachats Roadwork Project during the 30-day public comment period. Where applicable, sources are referenced in the comment resolution column that clarify or discuss topics raised by the commenters.

Table 1. Proposed Project Comment and Resolution Summary

Person or Organization	Comment Summary	Comment Resolution
David Schlesinger	Supportive of Alternative 2 actions.	
Chandra LeGue ONRC	Supportive of the goals for this project. Treat plantations before roads are decommissioned. More permanent decommissioning of roads in the watershed should be done.	Treating plantations is not part of this project (EA, page 7). The Yachats Terrestrial Restoration Project also decommissions roads in the watershed (USDA 2005).

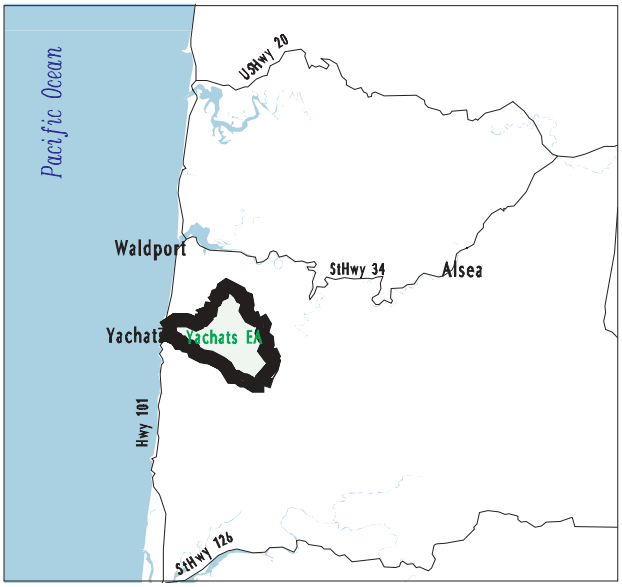
Helen Field	Just allow the roads to grow in with brush and close the roads naturally. Use the road decommissioning money to fix up the main roads.	Alternative 1 does not address the problems identified in the EA, page 2. The Yachats Terrestrial Restoration Project (USDA 2005) will repair and maintain key forest roads in the watershed.
Larry Field	Do not decommission or close roads because they are needed for commercial firewood gathering, logging, fire control, hunting, and recreation. Use the money to fix the roads we use and keep the unused roads for future use.	Alternative 1 does not address the problems identified in the EA, page 2. Refer to the EA, pages 27 and 28 for effects on fire and special forest products. Closing roads does not preclude their use for future forest management actions. The Yachats Terrestrial Restoration Project (USDA 2005) will repair and maintain key forest roads in the watershed.



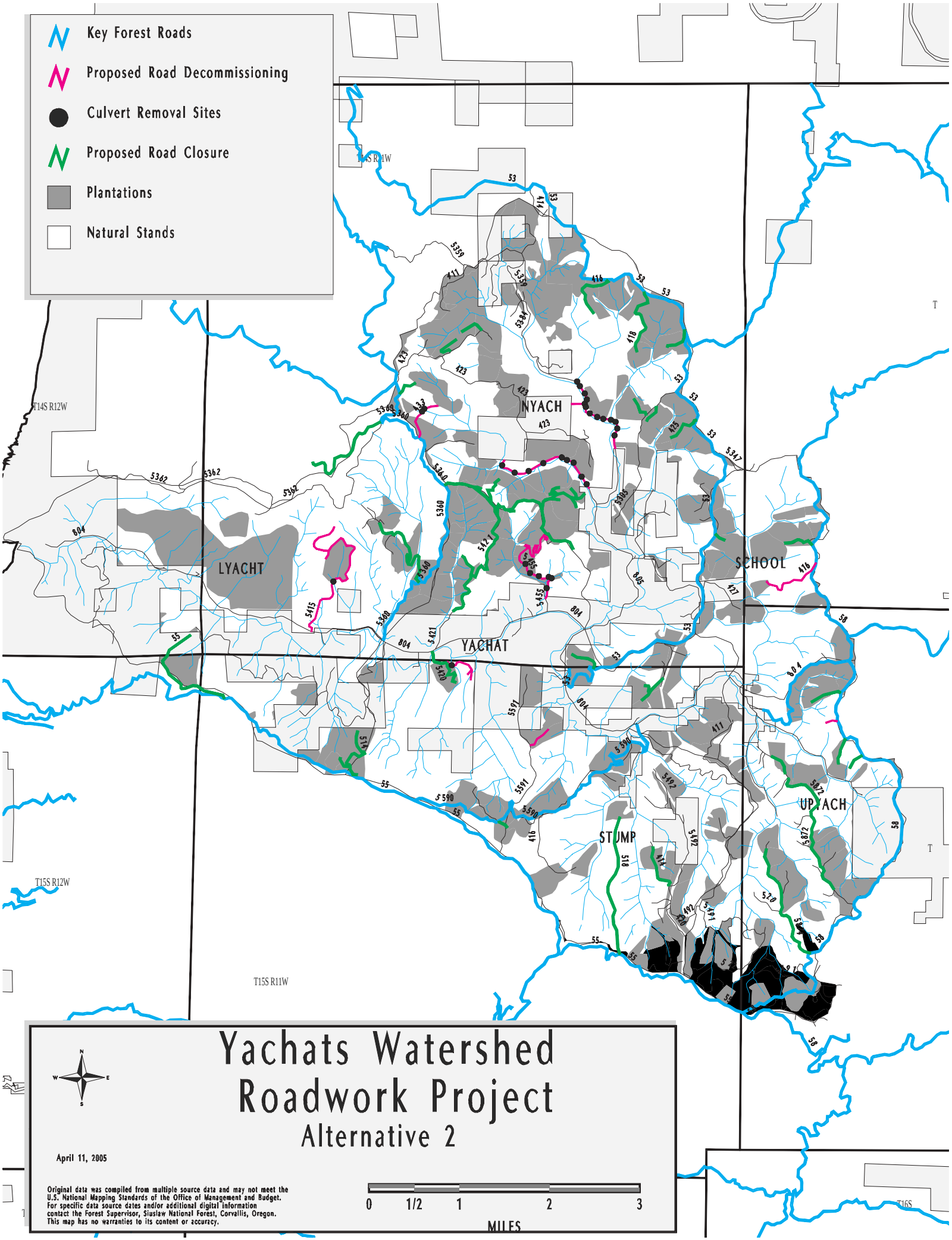
Map 1

Yachats Roadwork Project

Vicinity Map



August 11, 2005


Key Forest Roads
Proposed Road Decommissioning
Culvert Removal Sites
Proposed Road Closure
Plantations
Natural Stands
T14S R11W
T14S R12W
T15S R12W
T15S R11W
T16S
NYACH
LYACHT
YACHAT
SCHOOL
STUMP
UPYACH
Yachats Watershed
Roadwork Project
Alternative 2
April 11, 2005
Original data was compiled from multiple source data and may not meet the U.S. National Mapping Standards of the Office of Management and Budget. For specific data source dates and/or additional digital information contact the Forest Supervisor, Siuslaw National Forest, Corvallis, Oregon. This map has no warranties to its content or accuracy.
0 1/2 1 2 3
MILES