Environmental Assessment
Camp Grisdale Road Improvements
Grays Harbor County, Washington

Prepared for
U.S. Department of Transportation
Federal Highway Administration
Western Federal Lands Highway Division

Prepared by
Herrera Environmental Consultants

February 24, 2005

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ENVIRONMENTAL ASSESSMENT

Camp Grisdale Road Improvements
Grays Harbor County, Washington

WA PFH 208-1(1)

Prepared for

U.S. Department of Transportation
Federal Highway Administration
Western Federal Lands Highway Division
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Vancouver, Washington 98661-3801

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Environmental Assessment

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Submitted
Pursuant to Public Law 91-190
National Environmental Policy Act

Prepared by
Herrera Environmental Consultants, Inc.

for
U.S. Department of Transportation
Federal Highway Administration
Western Federal Lands Highway Division

Cooperating Agencies
U.S. Department of Agriculture, Forest Service
Grays Harbor County

2/22/2005
Date Approved

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February 24, 2005

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Abbreviations

AASHTO	American Association of State Highway and Transportation Officials
CE	categorical exclusion
COE	U.S. Army Corps of Engineers
CR	county road
WDNR	Washington Department of Natural Resources
EA	environmental assessment
Ecology	Washington Department of Ecology
EIS	environmental impact statement
FDR	forest development road
FHWA	Federal Highway Administration
Forest Service	USDA Forest Service
FR	forest road
HPA	hydraulic project approval
HUC units	hydrologic unit classifications
mph	miles per hour
NEPA	National Environmental Policy Act
NOAA	National Oceanic and Atmospheric Administration
NOI	notice of intent
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRHP	National Register of Historic Places
OAHP	Office of Archaeological and Historic Preservation
ONF	Olympic National Forest
SADT	seasonal average daily traffic
SEE	social, economic, and environmental (SEE Study Team)
SHPO	State Historic Preservation Office
SYU	sustained yield understanding
U.S. EPA	U.S. Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
WDFW	Washington Department of Fish and Wildlife
WFLHD	Western Federal Lands Highway Division of FHWA
WSDOT	Washington State Department of Transportation

Executive Summary

The Western Federal Lands Highway Division (WFLHD) of the Federal Highway Administration (FHWA), in cooperation with the U.S. Department of Agriculture, Forest Service; Washington State Department of Transportation; and Grays Harbor County, is proposing to improve approximately 17.5 miles of Camp Grisdale Road (Forest Road [FR] 22), including approximately 0.8 mile of Forest Development Road (FDR) 2294. For the purposes of this report, the 17.5-mile segment of FR 22 and FDR 2294 proposed for improvement is called Camp Grisdale Road.

The proposed project is located in Grays Harbor County approximately 17 miles north of Montesano, Washington. The project corridor begins at the limit of the paved section of Wynoochee Valley Road (Grays Harbor County Road 51190), follows FR 22 and FDR 2294, and terminates at the Wynoochee River bridge on FDR 2294, immediately below the Wynoochee Lake dam. FDR 2294 connects to FR 22 in the northern portion of the project corridor and serves as the access road to the Wynoochee Lake dam and Coho Campground.

The purpose of this project is to provide a safer and more efficient transportation route for motorists traveling from the Montesano area to Wynoochee Lake and surrounding forest areas. The proposed project would improve the operational safety, efficiency, and drivability of Camp Grisdale Road.

The existing Camp Grisdale Road is extremely rough, with numerous potholes, and requires continual maintenance. Emergency vehicles responding to calls in recreation areas served by Camp Grisdale Road currently must travel at reduced speeds to avoid potholes. Many of the culverts that cross underneath the road are damaged or plugged, and some are barriers to fish passage.

Wynoochee Lake has recreational facilities and an improved campground. The existing road is too narrow for the traffic conditions and the sizes of vehicles using it, and several of the curves along the roadway do not meet current design criteria. Timber harvesting occurs in the area during the summer, when logging trucks share the road with recreational traffic, resulting in a mix of vehicle types that exceed capacity of current road criterium. The narrow driving lanes, absence of a painted centerline, and lack of shoulders make it difficult for vehicles traveling in opposite directions to pass safely.

Two alternatives are analyzed in this document. The no-action alternative would maintain the road in its existing condition, continuing the current maintenance requirements for frequent grading and gravel placement. The action alternative (which is the preferred alternative) would reconstruct the road surface, widen the lanes, and realign some curves. The improved road would largely remain within its existing alignment but would have pavement, shoulders, and drainage, with new or repaired drainage crossings as appropriate.

The design speed would be 40 miles per hour for the FR 22 segment and 25 miles per hour for the FDR 2294 segment. Realignment of substandard curves would occur in the following four areas:

- At the southern terminus of the project corridor
- Near Cougar Smith Road
- Between 3.2 miles and 5.1 miles north of the beginning of the project (two minor realignments)
- Near Neil Creek.

The project corridor (100 feet on either side of the centerline of the proposed alignment) lies within the lower Chehalis River watershed in state water resource inventory area (WRIA) 22. The largest of the drainages within the area include the Wynoochee River, Anderson Creek, Save Creek, Neil Creek, and Schafer Creek. Including these drainages, the Camp Grisdale Road project corridor crosses 24 perennial streams, 19 intermittent drainage courses, and 34 wetlands.

The National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA Fisheries) and the U.S. Fish and Wildlife Service (USFWS) were consulted about federally protected fish species presence within the streams that cross the project corridor or its vicinity. The agencies identified federally listed threatened, endangered, or candidate fish species, including coho salmon (candidate), coastal cutthroat trout (proposed threatened), and bull trout (threatened). Also identified were marbled murrelet, spotted owl, and bald eagle.

Wildlife is abundant in the Camp Grisdale Road project corridor and study area, particularly on Forest Service lands, due to the highly diverse wetland, riparian, and forest wildlife habitats. The project vicinity contains many deciduous forest-dominated riparian and wetland corridors, increasing the diversity of habitat in the study area and vicinity. The riparian areas within the Forest Service lands are managed as 200-foot-wide riparian reserves under the Northwest Forest Plan, minimizing the timber cutting in these areas. Typical wildlife species that use the habitats in this area include mammals such as the Roosevelt elk, black-tailed deer, black bear, bobcat, cougar, coyote, raccoon, beaver, mountain beaver, skunk, porcupine, forest bat, Douglas squirrel, Townsend's chipmunk, and numerous small rodents. Active timber management on Green Diamond Resource Company lands located within the study area has reduced wildlife habitat, and not as many species are expected to be present in these areas.

Terrestrial habitat resources within and adjacent to the project corridor are dominated by second-growth conifer forest with large trees and high tree density. Third-growth regenerating conifer stands are another significant habitat type. Some mature old-growth habitat is located in the northern portion of the study area, and there are several clear-cuts adjacent to Camp Grisdale Road. Wetlands, riparian areas, and the surrounding forest support numerous amphibians (e.g., frogs and salamanders), reptiles (e.g., snakes), and invertebrates (e.g., slugs, snails, and insects).

Potential direct and indirect impacts of the proposed road improvements on the natural and cultural environments are discussed. Direct and indirect construction impacts and post-construction impacts are individually addressed for both the preferred alternative and the no-action alternative. No significant impacts from the project have been identified.

Beneficial (or neutral) long-term effects of the preferred alternative, compared to the no-action alternative, include a reduction in ongoing soil erosion; a reduction in airborne sediment deposited in adjacent areas; major reductions in the amount of sediment delivered to wetlands, streams, their buffers, upland areas, and vegetation; improved hydraulic connectivity through the project corridor; and a minor increase in pollutant loading in receiving waters that would not result in water quality impacts. The preferred alternative would be beneficial to fish because of the installation of fish passage culverts.

The preferred alternative would result in no substantial changes in land use or development patterns; it may have a positive effect on the local economy if recreational use of the area increases; there would be no disproportionate effect on racial or ethnic minorities or low-income people; there would be a decrease in road maintenance needs and costs and a reduction in travel time for emergency vehicles; there would be no effects on any known cultural resource; no substantial visual impact; and there would be improved access to Wynoochee Lake.

Air quality would be improved, and there would be minor changes in noise levels, no effects related to hazardous materials, and minimal effects on natural resources and energy.

Compared to the no-action alternative, the preferred alternative would result in some adverse effects including wider fillslope areas along the existing roadway; a potential increase in volumes of surface runoff entering streams that cross the project corridor; the loss of a small area of disturbed forest edge habitat; and the potential loss or modification of marbeled murrelet, spotted owl, and bald eagle habitat.

A cumulative effects analysis for this project indicates that some cumulative effects on natural resources likely would result from the Camp Grisdale Road improvement project. Past actions considered in the cumulative impact analysis that have contributed to the present environmental conditions in the project area include road development, timber harvesting, and timber production. Present actions considered in the cumulative impact analysis for the project include logging operations. Reasonably foreseeable future actions considered in the cumulative impact analysis include continued logging and forestry-related activities and improved access to and use of recreation facilities.

Mitigation measures are identified that could minimize direct, indirect, construction, post-construction, and cumulative adverse effects of the proposed project.

1.0 Project Description

The Western Federal Lands Highway Division (WFLHD) of the Federal Highway Administration (FHWA), in cooperation with the U.S. Department of Agriculture, Forest Service; Washington State Department of Transportation; and Grays Harbor County, is proposing to improve approximately 17.5 miles of Camp Grisdale Road (Forest Road [FR] 22), including approximately 0.8 mile of Forest Development Road (FDR) 2294. For the purposes of this report, the 17.5-mile segment of FR 22 and FDR 2294 proposed for improvement is called Camp Grisdale Road.

Location of the Proposed Project

The proposed project is located in Grays Harbor County approximately 17 miles north of Montesano, Washington. The project corridor begins at the limit of the paved section of Wynoochee Valley Road (Grays Harbor County Road 51190), follows FR 22 (Camp Grisdale Road) and FDR 2294, and terminates at the Wynoochee River bridge on FDR 2294, immediately below the Wynoochee Lake dam (Figure 1-1). Camp Grisdale Road is oriented primarily north to south, with a few sections that run east and west (USGS 1995, 1990 provisional edition, 1990a, 1990b, 1990c, 1990d). The proposed project is located through private timber lands and through the Olympic National Forest, within the following legal coordinates:

- Sections: 2, 11, 14, and 23, Township 19 North, Range 8 West
- Sections 1, 12, 25, 35, and 36, Township 20 North, Range 8 West
- Sections 6, 7, 17, 18, 19, 30, and 31, Township 20 North, Range 7 West
- Sections 6, 7, 18, 19, 30, and 31, Township 21 North, Range 7 West
- Section 1, Township 21 North, Range 8 West
- Sections 20, 29, 30, and 31, Township 22 North, Range 7 West.

Camp Grisdale Road serves as the primary southern access route to the Olympic National Forest and the Wynoochee Lake recreation area. At the north end of the project corridor, Camp Grisdale Road continues west as FR 22 and connects to United States (US) 101 near Humptulips to the west. Near the southern end of the project terminus, Cougar Smith Road provides a connection between Camp Grisdale Road and US 101 north of Shelton to the east. The Camp Grisdale Road project route is classified as a rural minor collector, which accumulates traffic from local roads, brings developed areas within reasonable distances of collector roads, provides service to smaller communities, and links the locally important traffic generators with their rural hinterland (AASHTO 2003).

Scope and Nature of the Proposed Action

The existing Camp Grisdale Road (FR 22) is an unpaved two-lane road that varies between 16 to 28 feet wide. The proposed improvements to FR 22 are based on a 40-mile per hour (mph)

design speed. (A design speed is the speed for which a facility is designed. Pertinent geometric features, such as horizontal curves and grades, are based on design speed.) The road design includes two 12-foot paved lanes and two 2-foot paved shoulders totaling a width of 28 feet (Figure 1-2). Minor improvements to horizontal and vertical curves are proposed to improve the alignment. A major realignment is proposed at Cougar Smith Road (Figure 1-3).

The proposed action also includes work on a portion of FDR 2294. FDR 2294 connects to FR 22 in the northern portion of the project corridor and serves as the access road to the Wynoochee dam and Coho Campground. Its existing width varies between 16 and 28 feet. The proposed design of FDR 2294 includes two 12-foot travel lanes with 2-foot shoulders, and curve widening based on a reduced design speed of 25 mph. Higher design speeds were considered but rejected for the FDR 2294 segment of the roadway, because design speeds of 30- or 40-mph would generate excessive cut and fill slopes and intrusion into adjacent habitat and old growth forest areas.

The drainage system along Camp Grisdale Road would be improved. Culverts would be repaired or replaced to accommodate stormwater flows and to avoid debris clogging and associated maintenance requirements. Several large culverts would be replaced with fish-passable culverts that meet fish passage design standards of the Forest Service, the U.S. Fish and Wildlife Service (USFWS), and the Washington Department of Fish and Wildlife (WDFW).

It is possible that Camp Grisdale Road would be temporarily closed during culvert installations. In this event, automobiles would be routed along a detour route on existing roads. Logging trucks would use the existing railroad grade that is located on Green Diamond property.

Funding

The project would be funded by FHWA Forest Highway Program funds. The WFLHD administers the Federal Lands Highway Program, serving the needs of Oregon, Washington, Idaho, Montana, Wyoming, and Alaska. The WFLHD actively administers the surveying, design, and construction of forest highway system roads.

Jurisdiction and Land Ownership

The northern portion of the project is located in Olympic National Forest. The Forest Service has a 100-foot easement to cross land owned privately by the Green Diamond Resource Company (formerly Simpson Timber Company). One small parcel owned by another timber company is located at the beginning of the project.

The Forest Service has an easement to cross Green Diamond Resource Company property. The easement was established in 1946 in a written *sustained yield understanding* (SYU). In 1962, the conditions of the SYU were determined through litigation. A 2004 agreement between

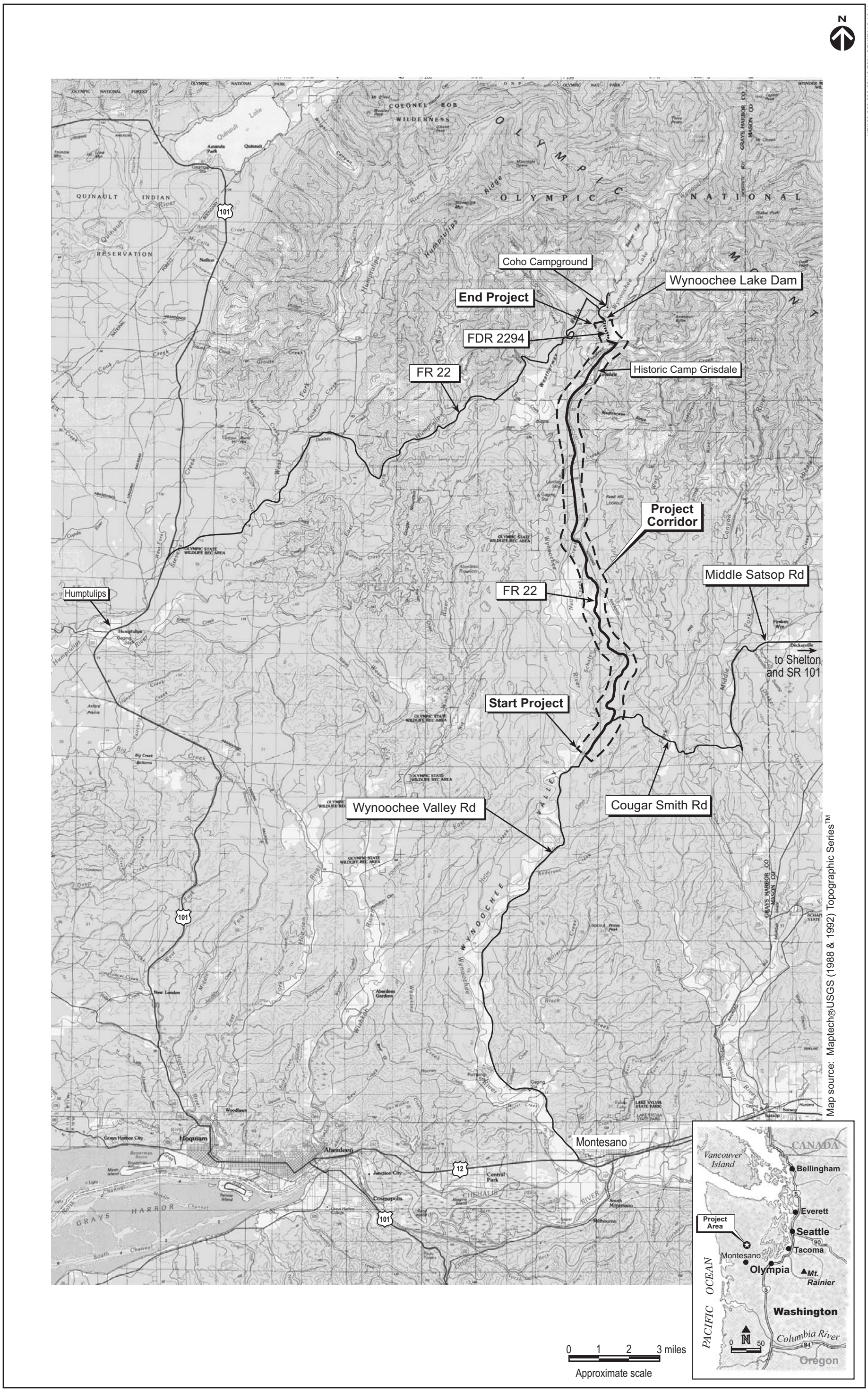

Figure 1-1. Vicinity map of the Camp Grisdale Road improvement project, Grays Harbor County, Washington.

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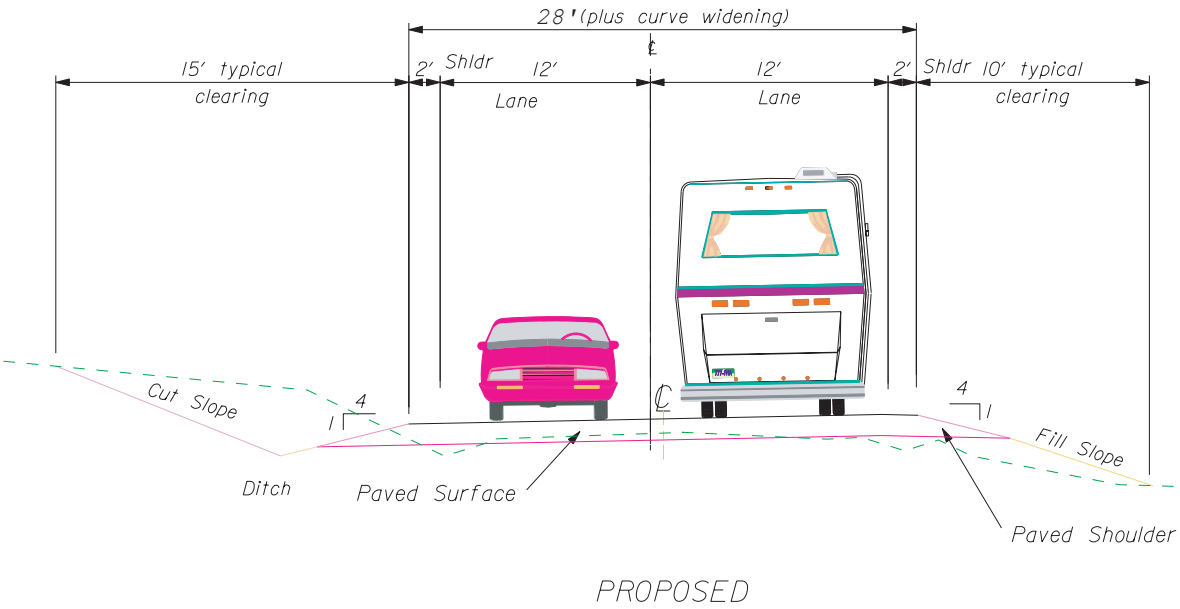

Not to scale

Figure 1-2. Camp Grisdale Road sections for proposed conditions.

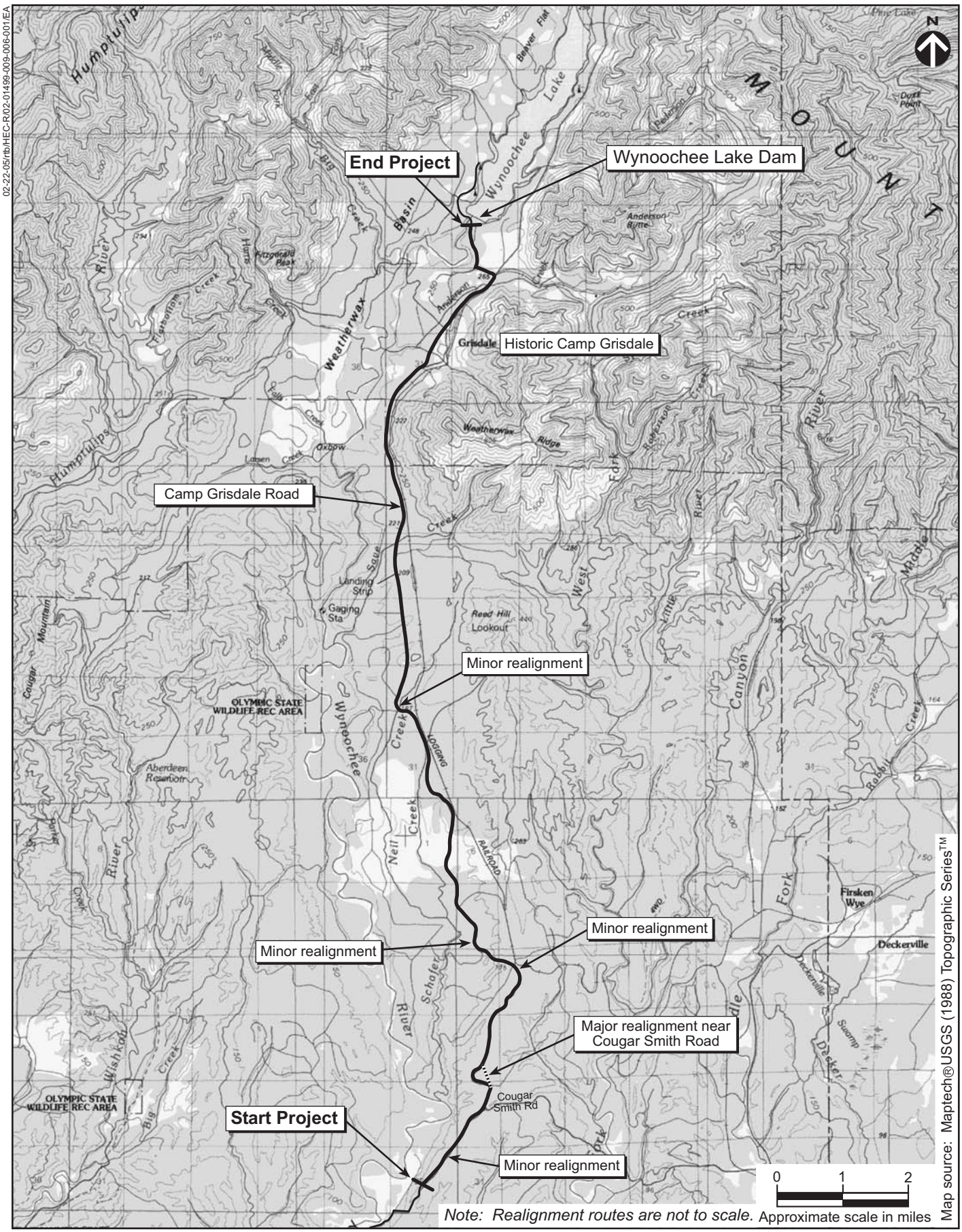

Figure 1-3. Camp Grisdale Road potential realignment areas.

02-22-05/rlb/HEC-R/02-01499-009-006-001/EA

Green Diamond Resources and the Forest Service states that Green Diamond Resource Company has transferred its interest in the corridor to the Forest Service so that the easement can be transferred to Grays Harbor County for maintenance and operation of the road.

2.0 Purpose and Need

Summary

The purpose of this project is to provide a safer and more efficient transportation route for motorists traveling from the Montesano area to Wynoochee Lake and surrounding forest areas. The proposed project would improve the operational safety, efficiency, and drivability of Camp Grisdale Road.

Need for the Project

Road Use

Camp Grisdale Road was constructed during the 1940s for timber harvesting access to the forest. The historic Camp Grisdale, located east of the project corridor and less than 2 miles south of Wynoochee Lake, was a major logging camp for the area (see Figure 1-1).

Camp Grisdale Road provides access to recreational areas and timber acreage. The road is the most direct access to over 100,000 acres of forest land, more than half of which lies within the Wynoochee Lake recreation area. Wynoochee Lake, near the north end of the project corridor, has a campground, boating facilities, and hiking trails. The road allows access to Wynoochee Lake dam, Coho and Chetwood campgrounds, and several trailheads in both the Wynoochee and Satsop drainages.

Traffic Volumes

Much of the traffic in the project corridor is seasonal. The seasonal average daily traffic (i.e., the average number of vehicles that use the route each day between May and September, the recreational season) is about 350, including logging trucks, recreational vehicles, and cars with boats or camp trailers (WFLHD 2004a). This traffic volume is projected to increase to 500 in the year 2019 (WFLHD 2004a). Improvements to the road may increase the seasonal average daily traffic volume, although the extent of increase cannot be accurately projected at this time.

Existing Road Conditions and Safety Deficiencies

The existing Camp Grisdale Road is extremely rough, with numerous potholes, and requires continual maintenance. The road is regularly graded, and gravel is added to maintain the surface. Over time, the gravel migrates to the sides of the road. In the summer when the weather is dry, dusty conditions are generated by roadway traffic, as well as by grading and maintenance activities. The dust impairs visibility. The roughness of the road damages tires, and driving conditions are bumpy and unpleasant.

Emergency vehicles responding to calls in recreation areas served by Camp Grisdale Road currently must travel at reduced speeds to avoid potholes.

Wynoochee Lake has recreational facilities and an improved campground. The campground is used to capacity during the summer season (Mazur 2004a). Although the lake has boating facilities, visitors are reluctant to tow their boats on Camp Grisdale Road because of the potential for boat damage caused by loose gravel and rough road conditions.

The existing road is too narrow for the traffic conditions and the sizes of vehicles using it, and several of the curves along the roadway do not meet current design criteria. Heavy timber harvesting occurs in the area during the summer and large logging trucks must share the road with recreational traffic. The resulting mix of vehicle types creates safety concerns. The narrow driving lanes, absence of a painted centerline, and lack of shoulders make it difficult for vehicles approaching from opposite directions to pass safely.

Many of the culverts that cross underneath the road are damaged or plugged, and some are barriers to fish passage.

Accident History

Traffic accident statistics are limited because Camp Grisdale Road is a remote forest road and collisions may go unreported. Most known accidents are caused by vehicles running off the road (WFLHD 1999).

Project Purpose

The purpose of this project is to provide a safer and more efficient transportation route for motorists traveling from the Montesano area to Wynoochee Lake and surrounding forest areas by:

- Improving the operational safety, efficiency, and drivability of Camp Grisdale Road.
- Improving drainage to alleviate potholes in the road surface.
- Paving the road to eliminate the need to regularly regrade the road and add gravel. Paving would also eliminate dust generation, improving driving safety.
- Widening the curves, adding shoulders, and striping the pavement to define travel lanes would provide more room for large logging trucks to safely pass approaching vehicles. Eliminating sharp curves would also accommodate logging vehicles, as well as passenger vehicles, more safely.

- Striping the pavement with a centerline to provide defined travel lanes, facilitating safer passage for vehicles traveling in opposite directions.

- Improving the road to improve emergency vehicle access.

3.0 Alternatives Considered

Six alternatives for this reconstruction project were jointly developed by the Federal Highway Administration, the Forest Service, and Grays Harbor County**:** a no-action alternative and five potential action alternatives. Due to operational safety, efficiency, drivability, cost, roadway length, or environmental impacts, four action alternatives were eliminated from further consideration. These alternatives are summarized in this chapter. This environmental assessment analyzes the potential effects of the no-action and preferred alternatives in Chapter 5, Impacts and Mitigation.

No-Action Alternative

The no-action alternative would maintain the road in its existing condition, continuing the current maintenance requirements for frequent grading and gravel placement. Air quality would continue to be affected by dust generation in the summer. Safer travel for logging trucks, commercial trucks, passenger cars, and recreational vehicles would not be provided. Tires, vehicles, and towed boats would continue to be subject to gravel damage. The no-action alternative does not meet the project purpose and need.

Preferred Alternative

The action alternative is the preferred alternative, and it meets the project purpose and need. Under the preferred alternative, the road surface would be improved along the existing alignment for the most part, with some realignment of sharp curves. The road would have improved drainage, shoulders, pavement, and several new drainage crossings would be provided. The estimated construction cost for the preferred alternative is $14 million.

The proposed design speed would be 40 mph for the FR 22 segment and 25 mph for the FDR 2294 segment. Design speed is defined as the maximum safe speed that can be maintained over a specified section of highway when conditions are favorable (AASHTO 2003). Designs for realignment of substandard curves were evaluated for the following four areas:

- The southern terminus of the project corridor
- Near Cougar Smith Road
- Between 3.2 miles and 5.1 miles north of the beginning of the project (two minor realignments)
- Near Neil Creek.

Because habitat loss would result from the realignment designs considered above, the degree of realignment was reduced from the original design to minimize impacts on habitat adjacent to the road.

Design speeds of 40 mph and 30 mph were considered for the dam access road, FDR 2294. These design speeds would result in adverse impacts on adjacent old-growth forest. For this reason, the design speed was reduced to 25 mph for FDR 2294.

Existing culverts would be replaced, repaired, or extended as appropriate.

If the road is closed for culvert installation during construction, vehicular traffic would be detoured onto a detour route. The proposed detour route is shown on Figure 3-1. The detour route begins at Montesano and continues west on US 12 to Hoquiam. The route then turns north along US 101 and then turns northeast onto Donkey Creek Road. The route then heads northeast, turns into FR 22, and continues to the southern end of Wynoochee Lake. The existing route from Montesano to the lake is 34.2 miles, and the detour route is 60.4 miles (an additional 26.2 miles).

To access the aquatic resource (AR) 44 culvert for continued maintenance, a 10-foot-wide, gravel-surfaced access road from the Camp Grisdale roadway to the inlet of the culvert at the unnamed tributary to Anderson Creek would be constructed with the road improvements. This access road would generally follow the fill slope edge down to the culvert inlet. The culvert construction detour at the unnamed tributary (AR-22) to Schafer Creek would follow an existing alignment of the construction access road that was used during construction of the existing culvert. The construction access road would be cleared of brush and small trees that have grown up along it and then would be surfaced with gravel. A temporary bridge structure would be used to cross the creek during use of the construction bypass. Upon completion of construction, the temporary bridge would be removed, the surfacing would be removed, and the access road obliterated.

Summer, the season during which road construction would take place, is the dominant season for Green Diamond Resource Company to harvest and transport timber. Traffic controls to minimize impacts on logging truck traffic would be evaluated along with using an existing railroad alignment for use as a detour for Green Diamond Resource Company trucks hauling timber during road construction.

Alternatives Considered but Rejected

Corridor Alternatives

During early project development, three other route corridor alternatives were considered but rejected because of cost or environmental impacts. The alternatives considered but rejected are summarized below. The Project Identification Report (WFLHD 1999) and the Project Checklist (WFLHD 2004a) provide additional discussion and figures for the alternatives considered but rejected.

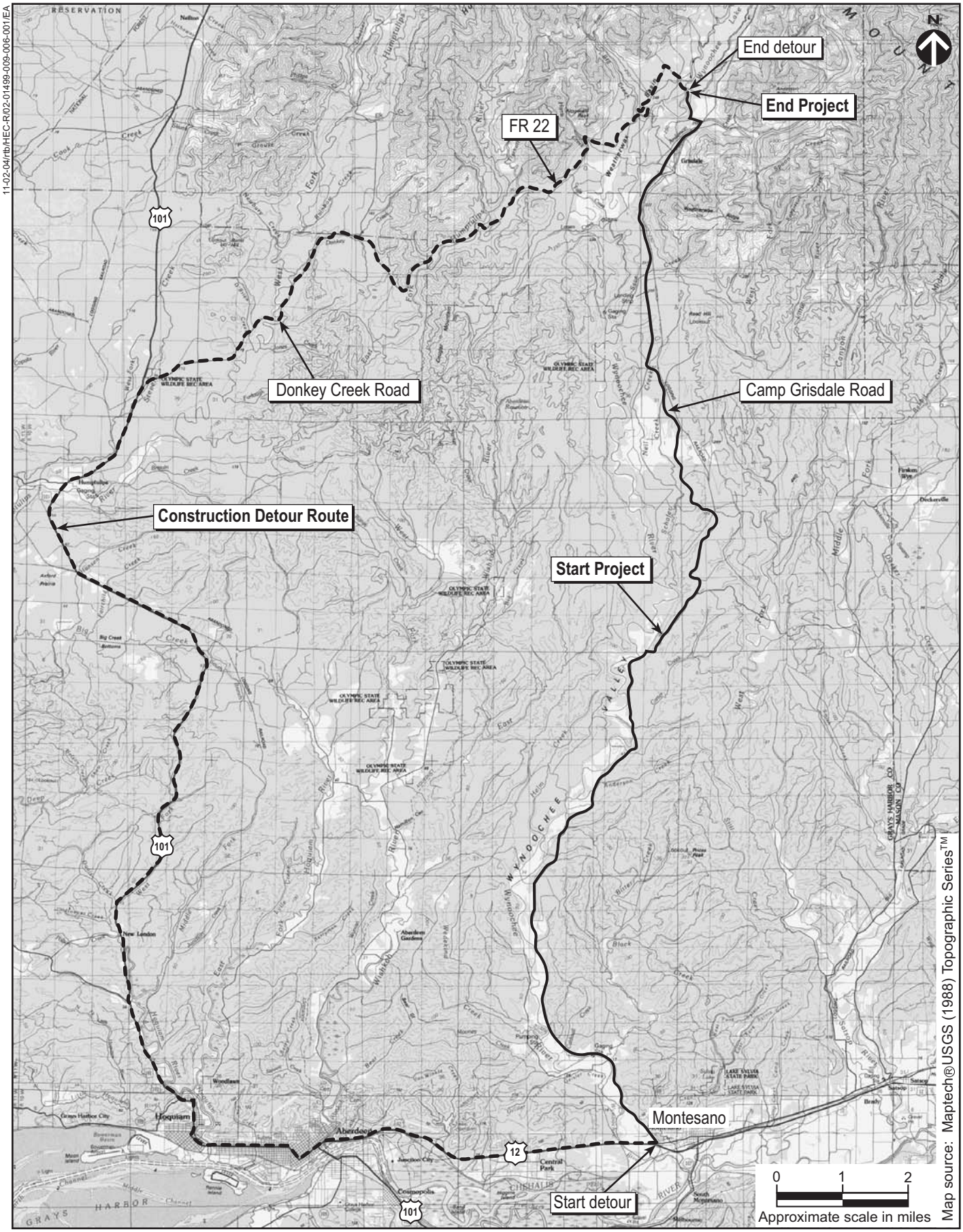

Figure 3-1. Proposed detour route.

- The Matlock route starts at Shelton, travels west to Matlock, continues west on a new alignment, and intersects Camp Grisdale Road 4 miles south of the historic Camp Grisdale. The route is 4.8 miles longer than the preferred alternative and would cost approximately $23 million.

- The Satsop River route goes north from Brady along the Satsop River, then west on Cougar-Smith Road, joining Camp Grisdale Road 14 miles south of Camp Grisdale. This route is 35 miles in length and would cost approximately $26 million.

- The Matlock/Cougar-Smith route begins at Shelton, proceeds west to Matlock, then south to Cougar-Smith Road, and intersects Camp Grisdale Road 14 miles south of Camp Grisdale, at a cost of approximately $28 million. The route is 12.5 miles longer than the preferred alternative.

All of these routes bypass Wynoochee Valley Road and cross two forks of the Satsop River. At the river crossing locations, the bridges would require extensive repair. Although these alternatives meet the project purpose and need, the costs would be greater than the estimated cost of $14 million in 2002 dollars for the Camp Grisdale route, the preferred alternative.

Railroad Grade Alternative

In addition to the three corridor alternatives, an alternative that would use an existing railroad alignment was evaluated. The railroad access to the historic Camp Grisdale, constructed by Green Diamond Resource Company, has segments that that are no longer used. These segments were analyzed to compare the horizontal and vertical alignments with those of the existing Camp Grisdale Road. After analysis, WFLHD determined that the railroad alignment is not preferable to the existing roadway alignment.

Additionally, the railroad grade is narrower than the existing road, and construction on the railroad alignment would require greater disturbance of soil and vegetation adjacent to the road than would improvement of the existing road.

Cost for construction of the railroad grade alternative would exceed the cost of construction on the existing road with no notable improvement to vertical or horizontal alignments. Construction of the railroad segment alignments would cost approximately $2.975 million, compared to approximately $2.175 million for reconstruction of the existing segment of Camp Grisdale Road.

4.0 Environmental Setting

This section describes the existing conditions for each element of the environment in the Camp Grisdale Road project corridor. A list of resource reports that are relevant to the environmental elements are provided in Appendix C.

The proposed project accesses and is partially located in the Olympic National Forest in western Washington. The Olympic National Forest encompasses 632,300 acres and is divided into two ranger districts that roughly encircle Olympic National Park. The proposed project is located in the southwestern corner of the Hood Canal Ranger District South. The project corridor lies on a plateau that is above the valley in which the Wynoochee River flows. The Wynoochee River originates in the steep southern flanks of the Olympic Mountains. It drains a 218 square mile area and joins the Chehalis River at tide water near the City of Montesano. The terrain is relatively flat with some rolling elevation.

The project is about 25 miles inland from the Pacific Ocean with a commensurate ocean climate. The area receives between 100 and 180 inches of rain per year, and minimal snow that melts quickly. The temperatures are an average high of 60 degrees with an average low of 40 degrees.

Geology and Soils

The geology of the project area is dominated by volcanic bedrock; uplifted marine terraces; and glacial till, outwash, and moraines (USDA 1979). Volcanic bedrock (basalt) is most prominent in the northern portion of the project area. It is derived from underwater basalt floes that were brought above sea level by the subduction of the ocean crust under the continental crust. As the ocean crust slides under the continental crust underwater features, such as basalt floes and marine sediments, are scraped off the ocean crust, leaving substantial deposition above sea level. This was the formative process that created the Olympic Mountains. These sediments also included marine terraces (mostly siltstones and sandstones) that are most prominent in the southern portion of the project area. These marine terraces underlie much of the project area and are exposed by the down-cutting action of streams. These sediments appear to convey substantial ground water, as exposed faces contain perennial seeps. Glacial landforms and sediments are prominent throughout the project area.

Fourteen soils were mapped in and within 500 feet of the project corridor by the Soil Conservation Service (now the Natural Resources Conservation Service, NRCS) (USDA 1979). These soils are: Copalis silt loam, Grismar very gravelly silt loam, Halbert muck, Hapludands and Dystrudepts, Hoquiam silt loam, Le Bar silt loam, Lytell silt loam, Nemah silty clay loam, Norbdby very gravelly loam, O'Brien silt loam, Seastrand variant muck, Willaby silt loam, Wishkah silty clay loam, and Zyzyl gravelly loam. Of these, Halbert muck, Nemah silty clay loam, and Seastrand variant muck are considered hydric soils by the NRCS (NRCS 1995). The

distribution and characteristics of these soils are described in the *Camp Grisdale Road Wetland Delineation Report* (Herrera 2004a).

Soils within the project area are dominated by young soils (inceptisols) that formed in uplifted marine sediments, as well as sediments and landforms created by glacial action. Many of the glacially derived soils have a significant proportion of volcanic parent material. This material weathered from basalt bedrock in the central and northern portions of the project area and was distributed widely by glacial outwash channels.

Water Resources

The project corridor (100 feet on either side of the centerline of the proposed alignment) lies within the Chehalis River watershed in water resource inventory area (WRIA) 22. The Chehalis River watershed covers approximately 2,700 square miles of forest and agricultural land and is the second largest watershed in Washington state. The upper watershed is 77 percent forest land and 23 percent agricultural and urban land. The lower watershed is 91 percent forest land; the remainder of the area is largely agricultural (Ecology 1996). Figure 4-1 outlines the streams and subwatersheds within the vicinity of the project corridor. The subwatersheds are hydrologic unit classifications (HUC units) that are discussed in subsequent sections of this document.

Surface Water

The project corridor lies within the lower Chehalis River watershed. The largest of the drainages within the area include the Wynoochee River, Anderson Creek, Save Creek, Neil Creek, and Schafer Creek (Figure 4-1). Including these drainages, the Camp Grisdale project corridor crosses 24 perennial streams, 19 intermittent drainage courses, and 34 wetlands. Streams and wetlands or the combination of the two are referred to as aquatic resources (ARs) in this report (see fish habitat section for more information). Table 4-1 provides a list of streams, with flow types, that were surveyed within the study area.

Rainfall within the study area varies greatly. In 2002, the northern end of the alignment at Lake Wynoochee dam measured 163 inches per year, while only 9 miles south at the Elk Meadows gauge, rainfall measured 119 inches per year (Cass 2004 personal communication). The general flow pattern for streams along the Camp Grisdale Road is determined by rainfall and moderate snowmelt patterns. Ninety percent of the rainfall occurs from October through May (Smith 2004 personal communication) (USGS 2004a). The streams in the study area therefore generally experience high flows during the winter months and dry up in the summer (Ecology 2004a). Wetlands are present throughout all segments of the project corridor.

Ninety-four culverts cross the roadways in the project corridor according to FHWA (Bowman 2004 personal communication). Some of these culverts have deficient conveyance capacities and poor fish passage characteristics, and also require extensive maintenance (fish passability of culverts is further discussed in the fish habitat section).

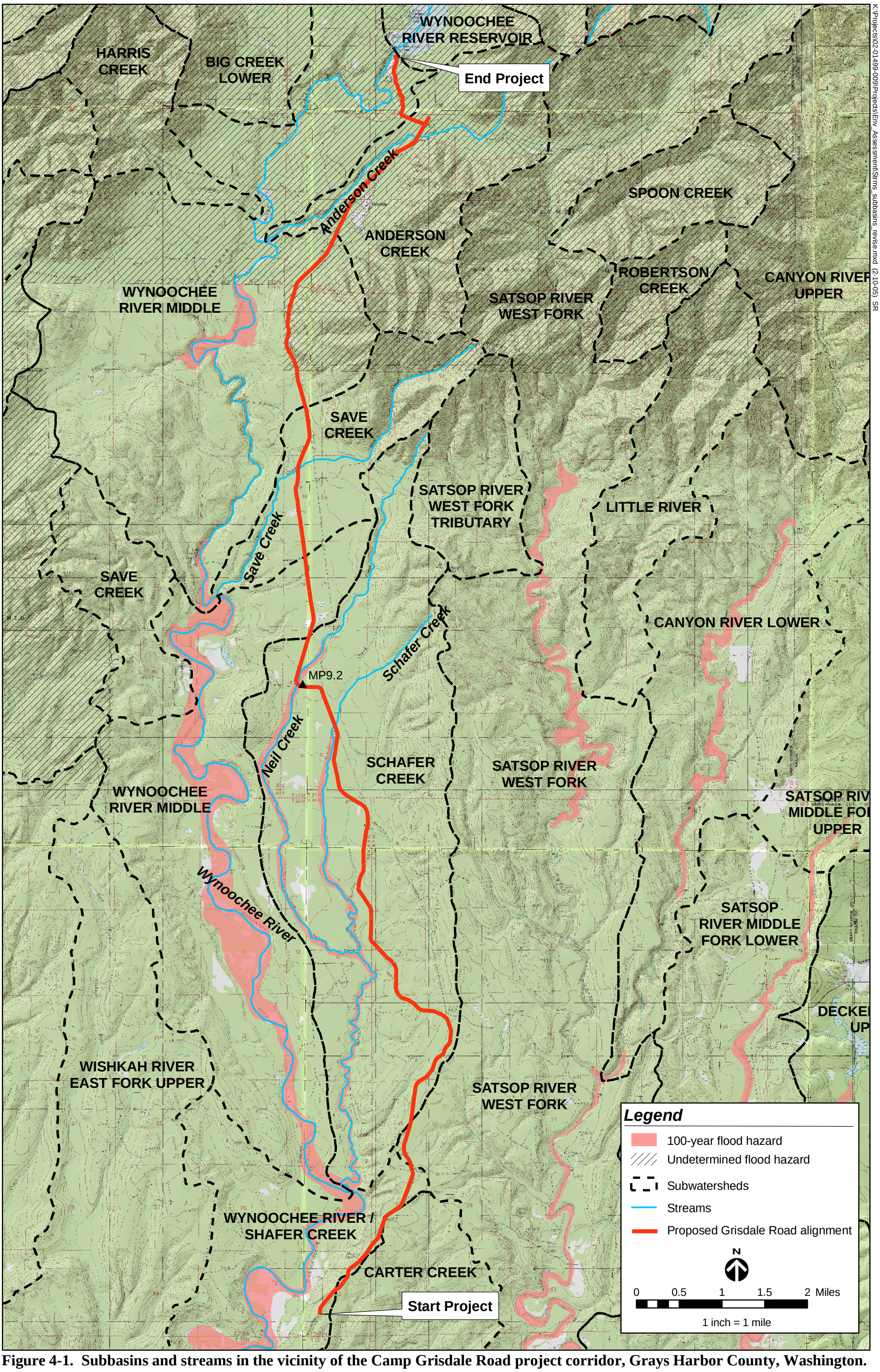

Figure 4-1. Subbasins and streams in the vicinity of the Camp Grisdale Road project corridor, Grays Harbor County, Washington.

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Table 4-1. Streams that cross the Camp Grisdale Road project corridor.

Consecutive Number	Habitat Unit	Stream Name or Identification	Approximate Mileage from Start of Project Corridor	Stream Flow Type
1	AR-5	Tributary to tributary of Schafer Creek (AR-6).	4.36	Intermittent
2	AR-6	Tributary to Schafer Creek (AR-25).	4.4	Perennial
3	AR-8	Tributary to Schafer Creek (AR-25).	4.9	Intermittent
4	AR-9	Tributary to Schafer Creek (AR-25).	5.1	Perennial
5	AR-11	Tributary to Schafer Creek (AR-25).	5.4	Perennial
6	AR-12	Tributary to Schafer Creek (AR-25).	5.5	Perennial
7	AR-13	Tributary to Schafer Creek (AR-25).	5.6	Perennial
8	AR-14	Tributary to Schafer Creek (AR-25).	5.9	Perennial
9	AR-16a	Tributary to Schafer Creek (AR-25).	6.1	Perennial
10	AR-16b	Tributary to Schafer Creek (AR-25).	6.2	Perennial
11	AR-16c	Tributary to Schafer Creek (AR-25).	6.2	Intermittent
12	AR-17	Tributary flows approximately 150 feet to Schafer Creek tributary (AR-22).	6.5	Intermittent
13	AR-18	Riparian corridor of Schafer Creek tributary (AR-22) parallel to west side of road (further than 100 feet from road edge).	6.5	Perennial
14	AR-19	Major tributary to Schafer Creek tributary (AR-22).	6.6	Perennial
15	AR-21	Possible tributary to Major tributary to Schafer Creek (AR-22).	7.3	Perennial/wetland drainage
16	AR-22	Major tributary to Schafer Creek (AR-25).	7.5	Perennial
17	AR-24a and b	Tributary to Schafer Creek (AR-25).	8.0	Intermittent/wetland drainage
18	AR-24c	Tributary to Schafer Creek (AR-25).	8.1	Intermittent
19	AR-25	Riparian corridor of Schafer Creek.	8.4	Perennial
20	AR-27	Riparian corridor of Neil Creek (tributary to Schafer Creek [AR-25]).	9.2	Perennial
21	AR-29	Tributary to Wynoochee River.	9.9	Perennial/wetland drainage
22	AR-30a	Tributary to Wynoochee River.	10.5	Intermittent/wetland drainage
23	AR-30b	Tributary to Wynoochee River.	10.5	Intermittent
24	AR-31	Tributary to Save Creek (AR-35).	11.0	Intermittent
25	AR-35	Riparian corridor of Save Creek.	11.8	Perennial

Table 4-1. Streams that cross the Camp Grisdale Road project corridor (continued).

Consecutive Number	Habitat Unit	Stream Name or Identification	Approximate Mileage from Start of Project Corridor	Stream Flow Type
26	AR-36	Tributary to Save Creek (AR-35).	12.2	Perennial
27	AR-37a	Tributary to Wynoochee River.	13.0	Perennial
28	AR-37b	Tributary to Wynoochee River.	13.0	Perennial
29	AR-39a	Tributary to tributary of the Wynoochee River (AR-39b).	13.4	Perennial
30	AR-39b	Tributary to Wynoochee River.	13.4	Perennial
31	AR-40	Tributary to tributary to Wynoochee River (AR-39b).	13.7	Perennial
32	AR-41	Tributary to tributary to Wynoochee River.	13.8	Intermittent
33	AR-43	Tributary to tributary to Wynoochee River.	14.5	Intermittent
34	AR-44	Major tributary to Anderson Creek (AR-48).	14.9	Intermittent
35	AR-45	Tributary to Anderson Creek (AR-48).	15.1	Intermittent
36	AR-46	Tributary to Anderson Creek (AR-48).	15.8	Intermittent/wetland drainage
37	AR-47	Tributary to Anderson Creek (AR-48).	16.1	Intermittent
38	AR-48	Riparian corridor of Anderson Creek.	16.3	Intermittent
39	AR-49	Tributary to Anderson Creek (AR-48).	16.4	Intermittent
40	AR-50a	Tributary to Wynoochee River.	17.0	Perennial
41	AR-50b	Tributary to Wynoochee River.	17.1	Perennial
42	AR-50c	Tributary to Wynoochee River.	17.2	Intermittent
43	AR-50d	Tributary to Wynoochee River.	17.3	Intermittent

Water quality data are generally unavailable for surface waters within the study area. None of the water bodies within the project corridor (or flowing into waters within the study area) are listed on the 2002/2004 Ecology 303(d) list (Ecology 2004b). The Wynoochee River, south of the study area at the confluence with the Chehalis River near Montesano, is listed for low flows and poor substrate for fish habitat. It is also listed for temperature and fecal coliform exceedance. However, the source of this pollution is likely from the City of Montesano and agricultural areas upstream of Montesano, and not from land within the study area, as the study area lacks residences, agricultural lands, or other likely sources of these pollutants (Ecology 2004b). Air-borne dust from the unpaved road currently settles in and adversely affects surface water adjacent to the road and also washes into surface water during rains.

Ground Water

Ground water data are limited for the study area (Ecology 2004d) (USGS 2004b). A study of the surficial aquifers (ground water 100 feet deep or less) within the Chehalis River watershed attempted to define and explain surficial water quality within the watershed (Ecology 1998). The study revealed that the depth to the ground water near the Wynoochee River approximately 10 miles north of the Chehalis River varied from less than 10 to 20 feet below land surface. This information, in conjunction with the permeable soils in the project vicinity, indicates the relative susceptibility of the aquifers to contamination (USDA 1979).

There are five known ground water wells within 1 mile of the project corridor:

- Wynoochee Lake Project (two wells approximately 400 feet west of the Wynoochee dam)
- Satsop Wells Learning Lodge (one well approximately 4,000 feet [0.75 mile] east of AR-46)
- Bridge Water (one well approximately 3,500 feet [0.7 miles] east of AR-20)
- BRJ Water System (one well approximately 4,000 feet [0.75 mile] east of AR-9).

The two wells near the Wynoochee dam were drilled by the U.S. Army Corps of Engineers in 1969 to supply the dam and Forest Service picnic area; one well is approximately 99 feet deep and the other is approximately 380 feet deep. The deeper of the two wells was drilled as a backup well and has not been used for drinking water purposes. Tacoma Power manages the two wells and conducts water quality sampling. The 2004 inorganic and volatile organic compound tests indicate concentrations of iron and manganese as well as turbidity levels in the deeper well that exceed the maximum tolerances set by the Washington Department of Ecology (Tacoma Public Utilities 2004). While poor water quality in the deeper well is not believed to be a reflection of water quality in the aquifer, the source of the contamination has still not been identified (Hahn 2004 personal communication).

While the other three wells are public systems, no water quality information is currently available.

Floodplains

The evaluation of floodplains in the study area was based on a review of Federal Emergency Management Agency (FEMA) geographic information system (GIS) mapping applicable and available to the proposed project (FEMA 1996). Approximate boundaries of the 100-year floodplain and floodway (called flood hazard) for the drainages within the study area are outlined on Figure 4-1 (boundaries are approximate because the figure is not shown to a precise scale).

The 100-year floodplain is defined as the elevation that has a one percent chance of being equaled or exceeded each year and is estimated from historical streamflow records. The floodway, as defined by FEMA, is the channel of a stream and any adjacent floodplain areas that must be kept free of encroachment so that the 100-year flood flow can be carried without an increase in flood height greater than 0.3 meters (1.0 foot).

Topography within the study area is relatively flat, and most of the floodplains associated with water bodies that cross the Camp Grisdale Road project corridor are contained within the narrow river channels. Therefore, the project corridor does not contain large floodplain areas. Only one floodplain, Neil Creek, is crossed by the proposed road alignment in the project corridor (milepost 9.2) (Figure 4-1) (Ecology 2004c).

Wetlands

Forty-six aquatic resource areas were identified within the Camp Grisdale Road project corridor. These aquatic resource areas may include wetlands, streams, or both. Table 4-2 summarizes the results of field data collection and analysis. Included in this table are the location along the project corridor (by mileage), type of aquatic resource, USFWS and hydrogeomorphic (HGM) wetland classification, Washington state rating, acreage within the road easement, and dominant plant species. The locations and distribution of the aquatic resources are presented in Figure 4-2 (total of 5 sheets).

The following sections describe vegetation, soils, and hydrologic conditions that were observed during field investigations.

Vegetation

Most forested wetlands in the project corridor are dominated by red alder (*Alnus rubra*), with occasional western red-cedar (*Thuja plicata*) and Sitka spruce (*Picea sitchensis*). A typical shrub understory is dominated by salmonberry (*Rubus spectabilis*), with occasional stink currant,

Table 4-2. Aquatic resources observed in the Camp Grisdale Road project area.

Aquatic Resource Number [a]	Mileage from Start of Project Corridor	Type of Aquatic Resource	USFWS Class [b]	HGM Class [c]	WA State Rating for Wetlands [d]	Dominant plant species
AR-2	2.0	Wetland	PSS	Depressional outflow and closed	III	Red alder, Sitka willow, salmonberry, slough sedge, soft rush
AR-3	2.7	Wetland	PFO	Depressional outflow	III	western red cedar, Sitka spruce, vine maple, Dewey's sedge
AR-5	4.36	Stream/Wetland	PFO, R3SB	Depressional outflow and riverine flow-through	III	Red alder, salmonberry, small-fruited bulrush, skunk cabbage
AR-6	4.4	Stream/wetland	PFO	Riverine flow-through	II	Red alder, salmonberry, slough sedge
AR-8	4.9	Stream/Wetland	PFO	Depressional outflow and riverine impounding	II	Red alder, western hemlock, salmonberry, slough sedge, piggy-back plant
AR-9	5.1	Stream/Wetland	PFO	Riverine flow-through	II	Red alder, salmonberry, stream violet
AR-10	5.2	Wetland	PFO	Depressional outflow	III	Red alder, Douglas-fir, cascara, salmonberry, slough sedge
AR-11	5.4	Stream/Wetland	PFO	Riverine flow-through and impounding	II	Red alder, salmonberry, skunk cabbage
AR-12	5.5	Stream/Wetland	PFO	Riverine flow-through and impounding	II	Red alder, salmonberry, lady fern
AR-13	5.6	Stream/Wetland	PFO	Riverine flow-through and impounding	II	black cottonwood, salmonberry, skunk cabbage
AR-14	5.9	Stream/Wetland	PFO	Riverine flow-through and impounding	II	Devil's club, small-fruited bulrush, piggy-back plant
AR-15	6.0	Wetland	PEM	Depressional outflow	III	Pacific willow, Sitka willow, soft rush, small-fruited bulrush
AR-16	6.2	Stream/Wetland	PFO	Depressional outflow and riverine flow-through	III	Western hemlock, salmonberry, stream violet, slough sedge
AR-17	6.5	Stream	PFO	Riverine flow-through	N/A	Red alder, salmonberry, hedgenettle
AR-18	6.5	Stream	PFO	Riverine flow-through	N/A	Red alder, salmonberry, hedgenettle
AR-19	6.6	Stream/Wetland	PFO	Riverine flow-through	II	Red alder, salmonberry, hedgenettle, piggy-back plant, Oregon sorrel
AR-21	7.3	Stream/Wetland	PFO, R3SB	Depressional outflow and riverine flow-through	II	Red alder, salmonberry, small-fruited bulrush, slough sedge
AR-22	7.5	Stream/Wetland	PFO	Riverine flow-through	II	Red alder, salmonberry, vine maple, skunk cabbage
AR-23	7.7	Stream/Wetland	PFO	Depressional outflow	III	Black cottonwood, red alder, red-osier dogwood, hardhack, slough sedge
AR-24	8.0	Stream/Wetland	PFO	Depressional outflow	III	Western red cedar, cascara, salmonberry, stream violet, false lily-of-the-valley
AR-25	8.4	Stream	R3SB	Riverine flow-through	N/A	Red alder, salmonberry, skunk cabbage
AR-26	9.0	Wetland	PFO	Depressional outflow	II	Red alder, salmonberry, slough sedge
AR-27	9.2	Stream/Wetland	PFO	Riverine flow-through	II	Red alder, hardhack, salmonberry, American brooklime, stream violet
AR-28	9.7	Wetland	PFO	Depressional closed	III	Red alder, salmonberry, slough sedge

Table 4-2. Aquatic resources observed in the Camp Grisdale Road project area (continued).

Aquatic Resource Number [a]	Mileage from Start of Project Corridor	Type of Aquatic Resource	USFWS Class [b]	HGM Class [c]	WA State Rating for Wetlands [d]	Dominant plant species
AR-29	9.9	Wetland	PSS (20%) PEM (70%) PFO (10%)	Depressional outflow	II	Western red cedar, red alder, red-osier dogwood, Pacific ninebark, hardhack, vine maple, hedgenettle, Pacific water-parsley
AR-30	10.5	Stream/Wetland	PEM (20%) PFO (80%)	Depressional outflow and riverine flow-through	II	Red alder, Pacific willow, sedge
AR-31	11.0	Wetland	PFO	Depressional outflow	II	Red alder, western redcedar, salmonberry, American brooklime
AR-32	11.2	Wetland	PFO	Depressional outflow	III	Black cottonwood, Pacific willow, lady fern
AR-33	11.4	Wetland	PFO	Depressional outflow	III	Pacific willow, small-fruited bulrush, water sedge
AR-34	11.6	Stream/Wetland	PFO	Riverine flow-through	III	Red alder, salmonberry, trailing blackberry, tall mannagrass
AR-35	11.8	Stream	R3SB	Riverine flow-through	N/A	Red alder, salmonberry
AR-36	12.2	Stream	R3SB	Riverine flow-through	N/A	Red alder, salmonberry
AR-37	13.0	Stream	R3SB	Riverine flow-through	N/A	Red alder, salmonberry
AR-38	13.3	Stream/Wetland	PFO	Depressional outflow	III	Red alder, salmonberry, reed canarygrass
AR-39	13.4	Stream/Wetland	PFO/R3SB	Riverine flow-through	II	Red alder, salmonberry, skunk cabbage
AR-40	13.7	Stream/Wetland	PFO/R3SB	Riverine flow-through	II	Stink currant, western corydalis, piggy-back plant
AR-41	13.8	Stream	R3SB	Riverine flow-through and impounding	N/A	Red alder, salmonberry,
AR-42	13.9	Wetland	PEM	Depressional outflow and sloped	III	Salmonberry, small-fruited bulrush, creeping buttercup
AR-43	14.5	Stream	R3SB	Riverine flow-through	N/A	Red alder, salmonberry,
AR-44	14.9	Stream	R3SB	Riverine flow-through	N/A	Red alder, salmonberry
AR-45	15.1	Stream/Wetland	PFO/ R3SB	Riverine flow-through	II	Red alder, stink currant, lady fern
AR-46	15.8	Stream/Wetland	PFO/ POW	Riverine flow-through and impounding	II	Red alder, stink currant, lady fern, foamflower, miner's lettuce
AR-47	16.1	Stream	R3SB	Riverine flow-through	N/A	Red alder, salmonberry
AR-48	16.3	Stream	R3SB	Riverine flow-through and impounding	N/A	Red alder, salmonberry
AR-49	16.4	Stream	R3SB	Riverine flow-through and impounding	N/A	Red alder, salmonberry
AR-50	17.0	Stream/Wetland	PFO/ R3SB	Riverine flow-through and ground water seeps	II	Red alder, salmonberry, tall manna grass, colonial bentgrass

[a] Since the reconnaissance of the project corridor in 2003 (Herrera 2003), AR-1, 4, 7, and 20 have been found to be upland and are no longer included in the aquatic resource list.
[b] USFWS wetland classification: palustrine forested (PFO), palustrine scrub/shrub (PSS), palustrine emergent (PEM), palustrine open water (POW), and riverine upper perennial streambed (R3SB) (Cowardin et. al. 1979).
[c] Hydrogeomorphic (HGM) class based on Brinson (1993).
[d] Washington Department of Ecology has a four-tiered wetland rating system, Category I (highest quality) through Category IV. Streams are not included in this system and thus are designated N/A (not applicable) (Ecology 1993).

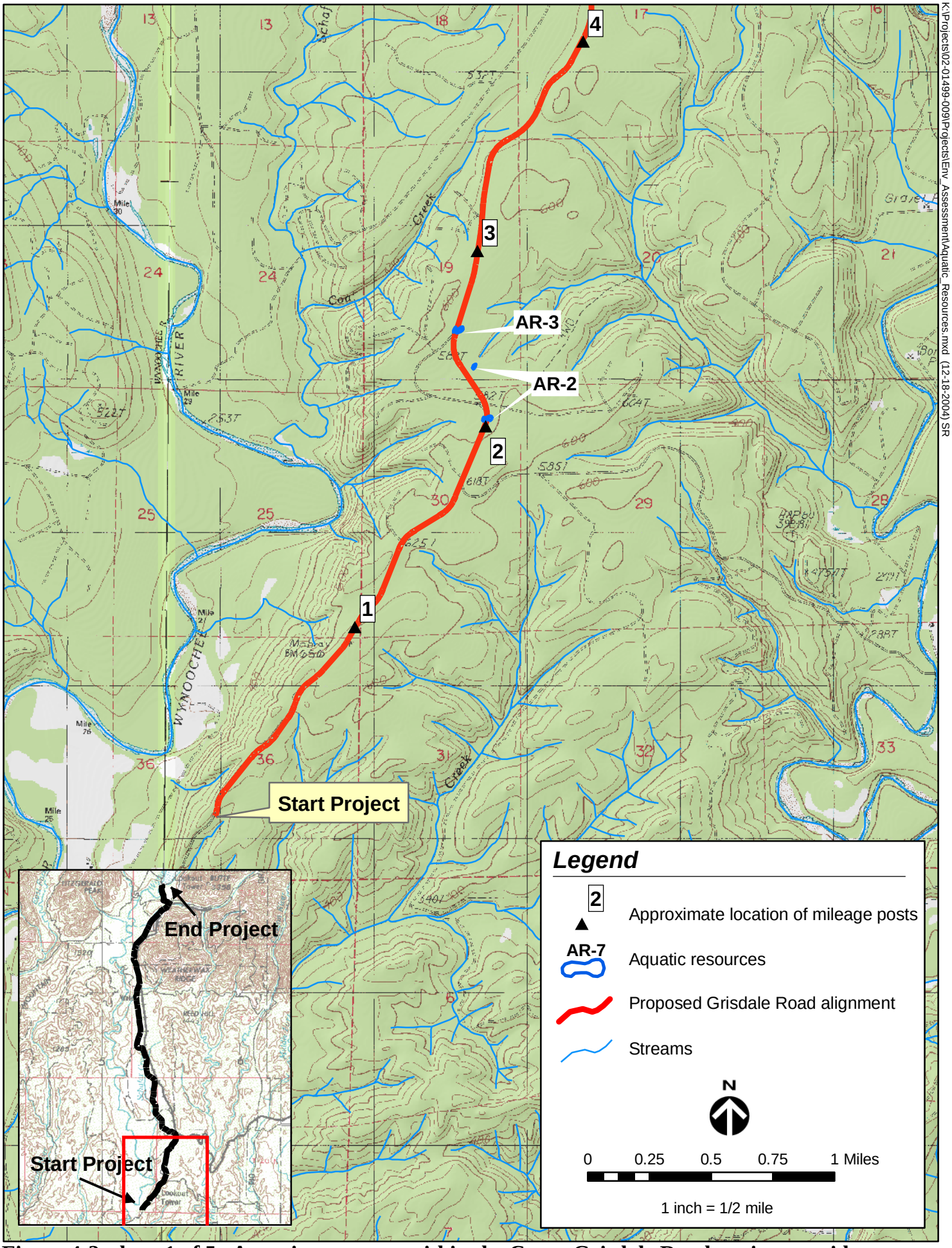

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Figure 4-2, sheet 1 of 5. Aquatic resources within the Camp Grisdale Road project corridor, Grays Harbor County, Washington.

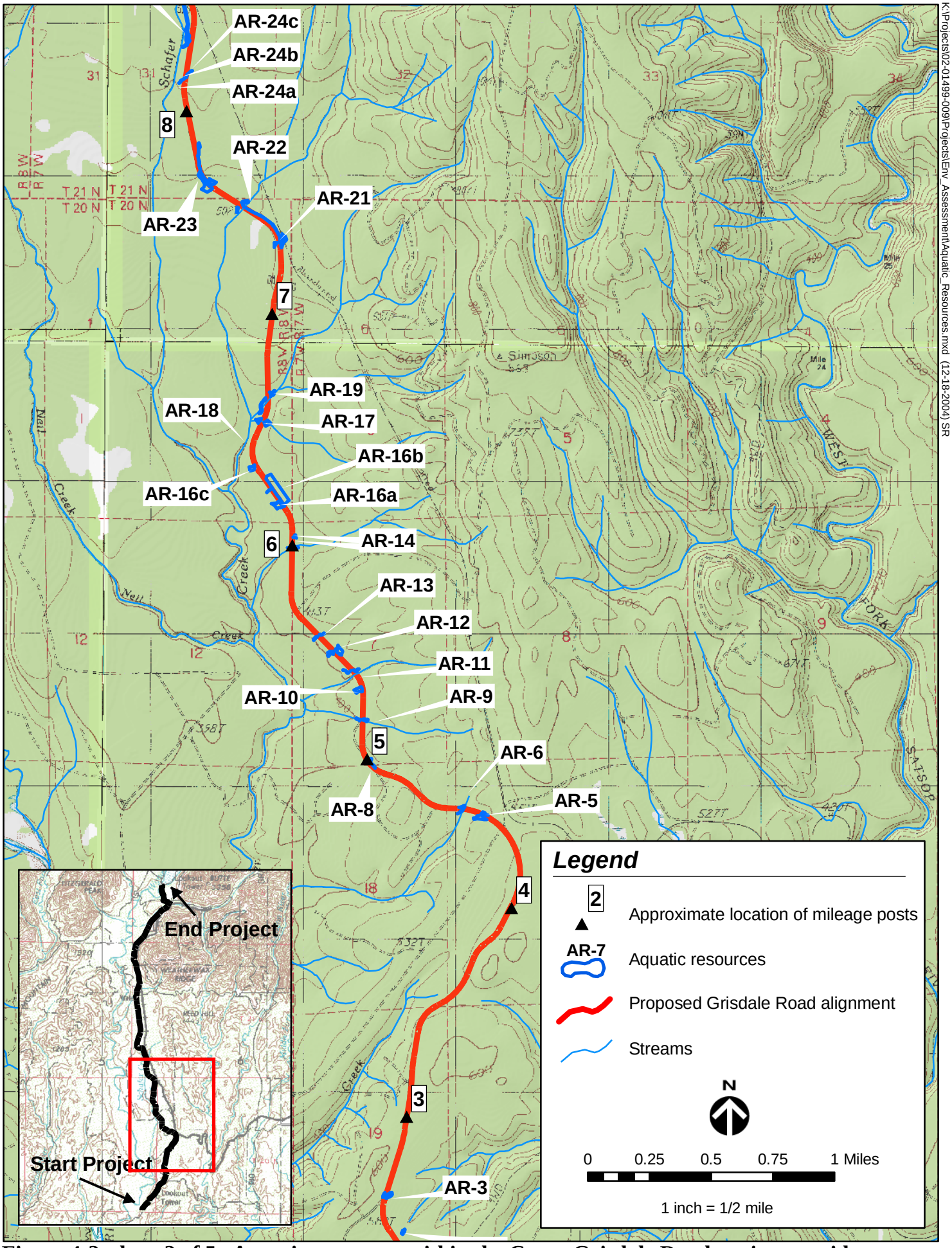

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Figure 4-2, sheet 2 of 5. Aquatic resources within the Camp Grisdale Road project corridor, Grays Harbor County, Washington.

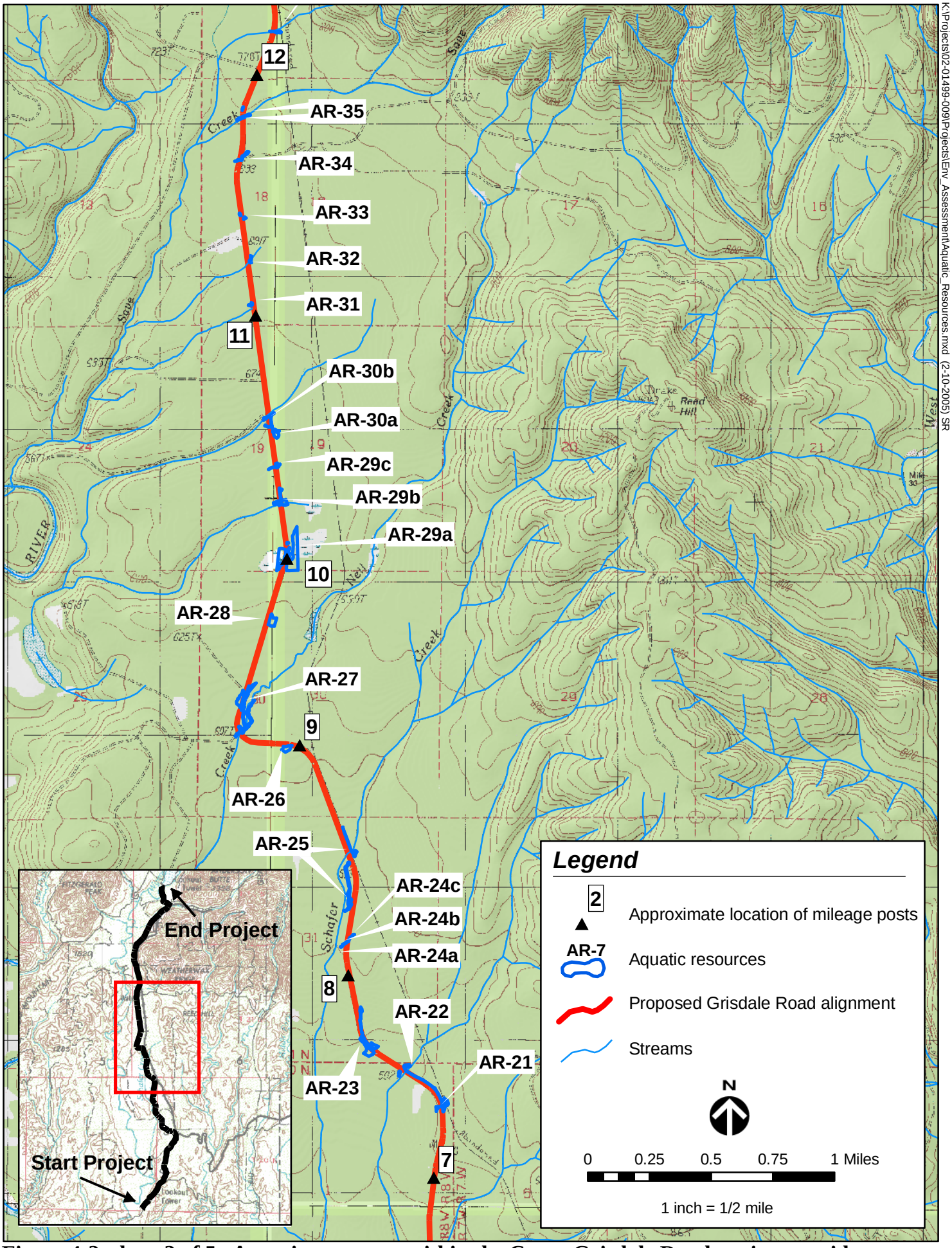

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Figure 4-2, sheet 3 of 5. Aquatic resources within the Camp Grisdale Road project corridor, Grays Harbor County, Washington.

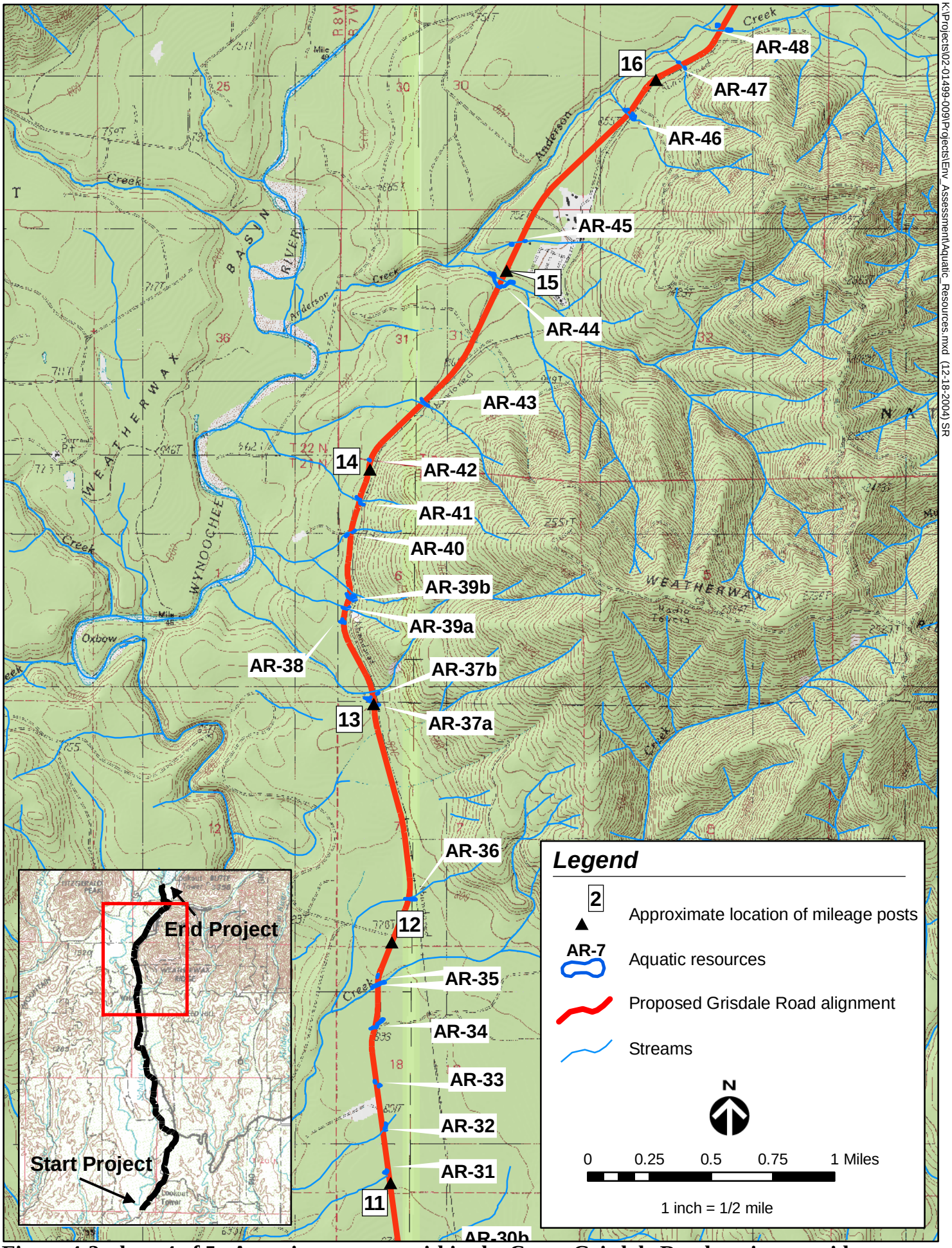

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Figure 4-2, sheet 4 of 5. Aquatic resources within the Camp Grisdale Road project corridor, Grays Harbor County, Washington.

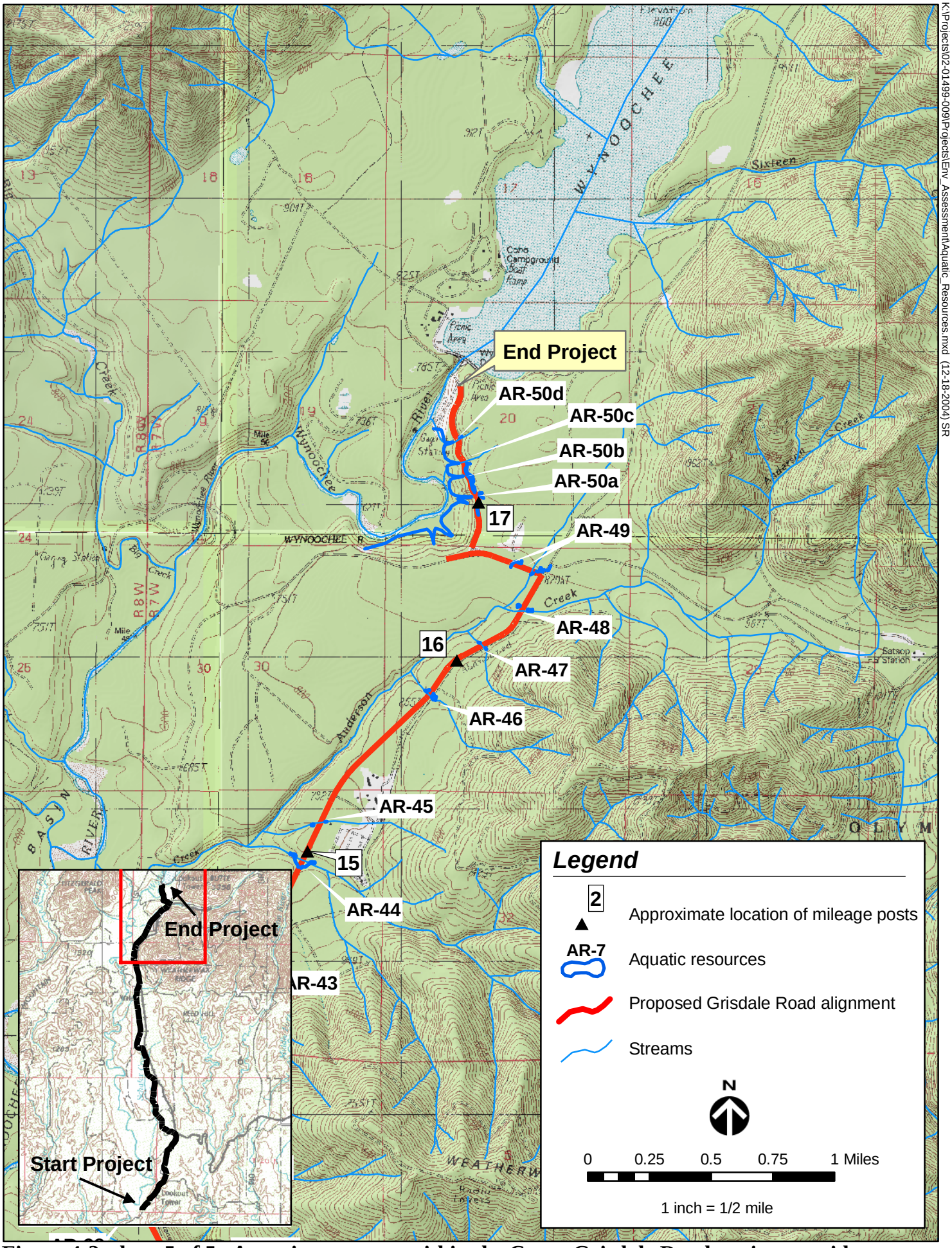

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Figure 4-2, sheet 5 of 5. Aquatic resources within the Camp Grisdale Road project corridor, Grays Harbor County, Washington.

devils club, and Pacific ninebark. The herbaceous understory is often composed of skunk cabbage (*Lysichiton americanum*), lady fern (*Athyrium filix-femina*), hedge nettle (*Stachys ciliata*), and slough sedge (*Carex obnupta*).

Scrub-shrub wetlands within the project corridor are dominated by Pacific willow (*Salix lucida*), Scouler's willow (*Salix scouleriana*), red osier dogwood (*Cornus stolonifera*), and hard hack (*Spirea douglasii*).

Emergent wetlands, although rare in the project corridor, are composed of a distinctive mixture of native species. Slough sedge (*Carex obnupta*), water sedge (*Carex aquatilis*), small fruited bulrush (*Scirpus microcarpus*), American brooklime (*Veronica americana*), and tall manna grass (*Glyceria elata*) dominate these systems.

Common species at the edges of wetlands include western hemlock (*Tsuga heterophylla*), western red-cedar (*Thuja plicata*), Sitka spruce (*Picea sitchensis*), vine maple (*Acer circinatum*), cascara (*Rhamnus purshiana*), devil's club (*Oplopanax horridus*), sweet coltsfoot (*Petasites frigidus*), stream violet (*Viola glabella*), redwood sorrel (*Oxalis oregana*), and Dewey's sedge (*Carex deweyana*).

Common upland species include Douglas-fir (*Pseudotsuga menziesii*), western hemlock (*Tsuga heterophylla*), western red-cedar (*Thuja plicata*), trailing blackberry (*Rubus ursinus*), salal (*Gaultheria shallon*), sword fern (*Polystichum munitum*), false lily-of-the-valley (*Maianthemum dilatatum*), and redwood sorrel (*Oxalis oregana*).

Soils

Most wetland areas contain mineral soils that are mottled in the upper soil layers, indicating a fluctuation in water tables between winter and summer seasons. Some of these wetland soils are underlain with gleyed mineral soils, indicating a high water table, while others are underlain with a dense glacial till or other aquaclude that perches water in the upper soil horizons. Some of the large wetland areas (e.g., AR-29) have deep organic soils, indicating long-term saturated conditions that persist year-round over a long period of time.

Hydrology

Wetland delineations were conducted during June and July of 2004. This is well after the end of the rainiest portion of the year. As a result, few of the wetlands were deeply inundated. However, sediment and vegetation deposits indicate that these areas experience extensive inundation during winter months. Sediment and vegetation deposits also occur in some upland areas that contain hydrophytic vegetation. These sites tend to be in localized depressions or areas where stormwater is impounded against the roadway. They do not contain hydric soils and thus are not considered wetlands.

Other Jurisdictional Waters

Numerous streams occur within the project corridor. The conditions of these streams are described in detail in the streams section of the biological resources report prepared for the project (Herrera 2004c). All of these streams, as well as the extensive network of roadside ditches, cross-road water conveyances, and other features that act as tributaries to the existing stream network, are considered *waters of the United States*, and are under federal jurisdiction.

Vegetation

Several vegetation features were evaluated within the Camp Grisdale project corridor. The location and condition of late successional reserves and riparian reserves were evaluated within the study area on ONF lands only. A list of sensitive, threatened, and endangered plant species was obtained from Forest Service (Appendix B). The presence of Forest Service sensitive species, including vascular plants, mosses, and lichens, was evaluated within the portion of the project corridor that passes through ONF (from milepost 13 north to the end of the project corridor). The presence of vascular plants with a federal or state listing or sensitive status was evaluated for the entire project corridor. The presence of noxious weeds was also evaluated for the entire project corridor.

Terrestrial habitat resources within and adjacent to the project corridor are dominated by second-growth conifer forest with large trees and high tree density. Third-growth regenerating conifer stands are another significant habitat type. Some mature old-growth habitat is located in the northern portion of the study area, and there are several clear-cuts adjacent to Camp Grisdale Road. These habitat types are described in more detail in the following sections.

Analysis of Existing Information

Late Successional Reserves

In a forestry context, the concept of *succession* refers to a series of dynamic changes in ecosystem structure, function, and species composition over time, during which one group of organisms succeeds another through stages over time. *Late successional habitat* is defined as late successional forest that provides habitat to late successionally affiliated species. The forest seral stages (i.e., successional stages) of mature and old-growth age classes comprise late successional habitat.

The Northwest Forest Plan provides a network of late successional reserves on national forest lands to maintain late successional and old-growth habitat within ecosystems on federal lands for the long-term viability of affiliated species. The northern approximately 4 miles of the Camp Grisdale project corridor is located within the Quinault late successional reserve (Quinault North-RW 102 and Quinault South-RW 103) in the Quinault Ranger District, Olympic National Forest. This is part of a larger network of late successional forests, including the adjacent Olympic National Park's Colonel Bob Wilderness, Quinault recreation area, Quinault research natural area, and the Hood Canal South late successional reserve.

The Quinault late successional reserve is documented to contain viable mixtures of silver fir, western hemlock, Sitka spruce, and mountain hemlock. The Quinault North at present is composed of 57 percent late successional forest, and the Quinault South consists of 59 percent late successional forest. The remainder of the late successional reserve has been altered historically by timber harvest, fire, and wind disturbance.

Tree stands within late successional reserves over 80 years of age are generally not available for harvest. Younger plantation or regeneration stands may be harvested through thinning if cuts are designed to enhance late successional characteristics.

Riparian Reserves

Riparian areas located on federal lands are protected under the Northwest Forest Plan. Timber cutting is prohibited in riparian reserves on Olympic National Forest land that includes streams, wetlands, ponds, or reservoirs with buffers between 150 feet (for wetlands, ponds, reservoirs, and non-fish-bearing streams) and 300 feet (for fish-bearing streams). Timber can be cut in riparian reserves to install new roads, but road construction must follow guidelines and standards set forth in the Northwest Forest Plan (see Biological Resources Report [Herrera 2004c]).

The water resources and fish habitat sections provide lists of non-fish-bearing and fish-bearing streams in the study area. The wetland report (Herrera 2004a) provides a list of wetlands within the project corridor.

Sensitive Species

Sensitive plant species potentially occurring within the study area are listed in Table 4-3 (USDA Forest Service 2003). Of the 35 identified sensitive plant species potentially occurring in the region, only 18 species have habitat requirements that could be met in the vicinity of the project corridor: tall Agoseris (*Agoseris elata*), swamp sandwort (*Arenaria paludicola*), yellow-flowered sedge (*Carex anthoxanthea*), few-flowered sedge (*Carex pauciflora*), several-flowered sedge (*Carex pluriflora*), russett sedge (*Carex saxatilis* var. *major*), tall bugbane (*Cimicifuga elata*), spleenwort goldenthread (*Coptis aspleniifolia*), wandering fleabane (*Erigeron peregrinus* var. *thompsonii*), Kamchatka bedstraw (*Gallium kamtschaticum*), branching montia (*Montia diffusa*), northern adder's tongue (*Ophioglossum pusillum*), northern grass-of-Parnassus (*Parnassia palustris* var. *neogaea*), Alaskan plantain (*Plantago macrocarpa*), loose-flowered bluegrass (*Poa laxiflora*), great polemonium (*Polemonium carneum*), Menzies' burnet (*Sanguisorba menziesii*), and great chain-fern (*Woodwardia fimbriata*).

Fungi

The host tree species for the Forest Service sensitive fungi species (*Bridgeoporus nobilissimus* [*Oxyporus nobilissimus*]), are noble and silver firs (*Abies nobilis* and *A. amabilis*), which are absent from the study area. Small patches of a related species, grand fir (*Abies grandis*), occur in the southern portion of the study area, well south of the Forest Service property boundary. The absence of these host tree species was confirmed during vascular and nonvascular plant surveys. No further surveys were conducted for this fungus species.

Table 4-3. Potential presence of listed and sensitive plant species in the vicinity of the Camp Grisdale Road project corridor.

Common Name	Scientific Name	Agency Status [a]			Preferred Habitat Type	Suitable Habitat in Study Area? [b] (*if yes, unit is listed*)
		USFWS	WDFW	Forest Service		
Tall agoseris	*Agoseris elata*	–	–	S	Low-elevation open areas	OF and CC
Swamp sandwort	*Arenaria paludicola*	–	–	S	Low-elevation wet areas	All AR areas
Siberian aster	*Aster sibiricus* var. *meritus*	–	–	S	Subalpine meadows	No
Olympic mountain milk-vetch	*Astragalus australis* var. *olympicus*	SOC	T	D	Subalpine open areas	No
Least bladdery milk-vetch	*Astragalus microcystis*	–	–	D	Subalpine scree	No
Triangular-lobed moonwort	*Botrychium ascendens*	SOC	–	S	Subalpine meadows	No
Yellow-flowered sedge	*Carex anthoxanthea*	–	–	D	Mid-elevation wet areas	All AR areas
Coiling sedge	*Carex circinata*	–	–	D	Subalpine scree	No
Blunt sedge	*Carex obtusata*	–	–	D	Subalpine and alpine meadows	No
Few-flowered sedge	*Carex pauciflora*	–	–	D	Low-elevation bogs	No
Several-flowered sedge	*Carex pluriflora*	–	–	S	Low to alpine elevations, wet areas	All AR areas
Russet sedge	*Carex saxatilis* var. *major*	–	–	S	Mid-elevation wet areas	All AR areas
Long-styled sedge	*Carex stylosa*	–	–	S	Subalpine wet areas	No
Golden chinquapin	*Chrysolepis chysophylla*	–	–	D	Low elevation, east Olympic Mountains; dry, exposed areas	No
Tall bugbane	*Cimicifuga elata*	SOC	T	S	Low-elevation forests	MOGC, SGCL, SGDL, STGD, STGMR, STGM, TGCR, TGCS, and TGDR
Lance-leaved springbeauty	*Claytonia lanceolata* var. *pacifica*	–	–	D	Subalpine rocky areas	No
Spleenwort goldenthread	*Coptis aspleniifolia*	–	–	S	Low-elevation moist areas	All AR areas
Southerly frigid shooting star	*Dodecatheon austrofrigidum*	SOC	T	D	Subalpine rocky areas	No
Hoary draba	*Draba cana*	–	–	D	Subalpine dry areas	No
Long-stalked draba	*Draba longipes*	–	–	D	Alpine moist areas	No
Yellow dryas	*Dryas drummondii*	–	–	S	Alpine rocky areas	No
Wandering fleabane	*Erigeron peregrinus* var. *thompsonii*	–	–	S	Low-elevation bogs	No
Kamchatka bedstraw	*Gallium kamtschaticum*	–	–	D	Low-elevation moist areas	All AR areas
Branching montia	*Montia diffusa*	–	–	S	Low-elevation moist areas	All AR areas
Northern adder's tongue	*Ophioglossum pusillum*	–	T	S	Low-elevation moist areas	All AR areas

Table 4-3. Potential presence of listed and sensitive plant species in the vicinity of the Camp Grisdale Road project corridor (continued).

Common Name	Scientific Name	Agency Status [a]			Preferred Habitat Type	Suitable Habitat in Study Area? [b] (*if yes, unit is listed*)
		USFWS	WDFW	Forest Service		
Northern oxtropis	*Oxytropis borealis* var. *viscida*	–	–	S	Subalpine scree	No
Northern grass-of-Parnassus	*Parnassia palustris* var. *neogaea*	–	–	D	Low-elevation moist areas	All AR areas
Brewer's cliff-brake	*Pellaea breweri*	–	–	D	Subalpine rocky areas	No
Alaskan plantain	*Plantago macrocarpa*	–	–	S	Low-elevation wet areas	All AR areas
Loose-flowered bluegrass	*Poa laxiflora*	–	T	S	Mid-elevation moist areas	All AR areas
Great polemonium	*Polemonium carneum*	–	–	S	Low-elevation open areas	OF and CC
Cooley's kumlienia	*Ranunculus cooleyae*	–	–	D	Subalpine moist areas	No
Menzies' burnet	*Sanguisorba menziesii*	–	–	S	Mid-elevation wet areas	All AR areas
Olympic cut-leaf synthyris	*Synthyris pinnatifida* var. *lanuginose*	–	–	D	Subalpine scree	No
Great chain-fern	*Woodwardia fimbriata*	–	–	S	Low-elevation moist areas	All AR areas

[a] Agency status: E = endangered, T= threatened, SOC= species of concern, D = documented presence, S = suspected presence, SM= state monitor species.
Shading indicates species without suitable habitat in the study area.
[b] See Table 4-2:
AR = aquatic resource
CC = recent clear-cut
MOGC = mature old-growth conifer forest
OF = open field
SGCL = second-growth conifer forest
SGDL = second-growth deciduous forest
STGD = second/third-growth deciduous forest
STGM = second/third-growth mixed forest
STGMR = second/third-growth mixed forest, regeneration size
TGCR = third-growth conifer forest, regeneration size
TGCS = third-growth conifer forest from regeneration size to small-diameter trees
TGDR = third-growth deciduous forest from regeneration size to small-diameter trees. Sources: Eder (2002), Leonard et al. (1993), USDA Forest Service (2003), USFWS (1986, 1997, 2003), WDFW (1991, 2003).

Noxious Weeds

The species included in the noxious weed survey were provided by the Washington State Weed Control Board, Grays Harbor County, and Olympic National Forest. A complete list of these species is located in the Biological Resources Report (Herrera 2004c).

Field Investigation Results

Sensitive Species

Vascular Plants

Vascular plant richness can be attributed to the two vegetation types that dominate upland areas: second-growth conifer forest (often dense western hemlock forest), and clear-cuts. The dense canopy results in a dimly lit understory, in which few vascular species can persist. Oxalis, cut-leaved goldenthread (*Coptis laciniata*), and sword fern are the species most commonly found in these forests. Within clear-cuts, vascular plants such as fireweed (*Epilobium augustifolium*), vine maple, trailing blackberry, cascara, a variety of exotic annual species, and planted timber stock dominate the landscape. Compared to the upland areas, the stream sides and wetlands contain a wider variety of vascular plants. These species include a variety of native shrubs, as well as tall manna grass, stream violet, lady fern (*Athyrum filix-femina*), hedge nettle (*Stachys ciliata*), coltsfoot, and dogbane (*Actea rubra*).

No listed or sensitive plants were observed within the project corridor. With the exception of those species requiring bog habitats (few-flowered sedge and wandering fleabane), the habitats preferred for all listed and sensitive species are found within the project corridor, although no listed or sensitive plant species were observed during the site investigations.

Bryophytes

Moss species dominate the understory in most of the forested areas surveyed. There was often complete coverage of the ground, as well as the boles and branches of trees to a height of 50 feet or more. Twenty eight species of moss and 15 species of liverwort were observed within the project corridor. The sensitive moss species *Tetraphis geniculata* was observed in three locations within the project corridor.

Lichens

The sensitive species *Hypogymnia duplicata* occurred on the recently downed trees examined during the survey, as well as in litter fall collected throughout the Forest Service lands. *Bryoria* species were observed and collected, but none was identified as either of the two sensitive *Bryoria* species, *Bryoria spiralifera* or *Bryoria pseudocapillaris*.

Also observed were *Platismatia lacunosa* and *Usnea longissima*. These two lichens were included on the original 1994 survey-and-manage list and were the focus of concern for riparian habitats.

Noxious Weeds

Of the noxious weed species surveyed, the following species have the greatest overall presence: Canada thistle, bull thistle, Scot's broom, foxglove, St. Johnswort, hairy cat's ear, oxeye daisy, bird's-foot trefoil, narrowleaf plantain, tansy ragwort, and common tansy. These species occur in mixed patches throughout the project corridor. They do not segregate into distinct portions of the study area, but rather occur in varying densities, reflecting differences in disturbance regime, available seed source, and competition for other native and nonnative species. These species are not mapped individually, but rather as a complex of advantageous species that occupy the edges of the existing road, adjacent clear-cuts, and other openings throughout the study area.

Several other species occur in discrete portions of the study area: Himalayan blackberry, evergreen blackberry, orange hawkweed, and reed canarygrass.

Scattered individual occurrences of English holly occur in forested areas just outside the Camp Grisdale Road project corridor. This species has the ability to colonize intact forested habitats, not merely the disturbed habitats favored by the other invasive species discussed in this section.

Native species dominate the landscape in areas outside the margin of the roadway. Even habitats that typically favor invasive species (e.g., emergent wetlands near the roadway) tend to be largely or entirely vegetated with native species.

Wildlife

Review of Existing Information

The WDFW Priority Habitats and Species Program (WDFW 2003), the U.S. Fish and Wildlife Service (USFWS 2003a), and the Forest Service, Olympic Region (USDA Forest Service 2003) were consulted for the presence of sensitive wildlife species within the vicinity of the project corridor (Appendix B contains agency correspondence regarding species). Mollusks that were listed originally under the Forest Service survey-and-manage species program are now protected under the sensitive species program. Northern spotted owl, marbled murrelet, and bald eagle are federally listed species and are discussed in the threatened and endangered species section. Table 4-4 lists the species identified as sensitive species that may inhabit the study area.

Field Investigation Results

Species without Special Status

Wildlife is abundant in the Grisdale Road project corridor and study area, particularly on Forest Service lands, due to the highly diverse wetland, riparian, and forest wildlife habitats. The project vicinity contains many deciduous forest-dominated riparian and wetland corridors, increasing the diversity of habitat in the study area and vicinity. Federally owned riparian areas are managed as 200-foot-wide riparian reserves under the Northwest Forest Plan, minimizing the timber cutting in these areas. The low-elevation forests within the study area are dominated by Douglas-fir and western hemlock. Species richness increases with vegetation height among all

taxa, except for the taxon of reptiles (Johnson and O'Neil 2001). Bird species richness and use, in particular, increases with increased vegetation height, increased canopy layers, and successional stage. The following descriptions use the common names of animals; their scientific names are provided in Appendix E.

Table 4-4. Sensitive wildlife species that may occur within the vicinity of the project corridor.

Species Type	Common Name	Scientific Name	Agency Status [a]		
			USFWS	WDFW	Forest Service
Amphibians	VanDyke's salamander	*Plethodon vandykei*	SOC	SOC	D
	Cope's giant salamander	*Dicamptodon copei*	–	SM	D
	Cascade torrent salamander	*Rhyacotriton cascadae*	–	SOC	D
	Olympic Torrent Salamander	*Rhyacotriton olympicus*			D
Birds	Common loon	*Gavia immer*	–	–	D
	American peregrine falcon	*Falco peregrinus anatum*	SOC	–	S
	Northern spotted owl	*Strix occidentalis*	T	E	D
	Marbled murrelet	*Brachyramphus marmoratus*	T	T	D
	Bald eagle	*Haliaetus leucocephalus*	T	T	D
Mammals	Townsend's big-eared bat	*Corynorhinus townsendii*	SOC	SOC	D
	California wolverine	*Gulo gulo*	SOC	SOC	D
	Fisher	*Martes pennanti*	SOC	E	–
	Western pocket gopher	*Thomomys mazama*	SOC	SOC	S

[a] Agency status: E = endangered, T = threatened, SOC = species of concern, D = documented presence, S = outstanding suitable habitat, SM = state monitor species.

Typical wildlife species that use the habitats in this area include mammals such as the Roosevelt elk, black-tailed deer, black bear, bobcat, cougar, coyote, raccoon, beaver, mountain beaver, skunk, porcupine, forest bat, Douglas squirrel, Townsend's chipmunk, and numerous small rodents. Elk and deer tracks and scat were observed during site visits in the spring and summer of 2003 and 2004. Elk and deer wintering habitat has been identified in the study area by the Forest Service.

The project corridor and study area are used extensively by Roosevelt elk. Some herds remain within the lowlands that surround the project corridor throughout the year, while other herds use mountainous habitats within Olympic National Forest and Olympic National Park from spring through fall, utilizing areas within the study area as wintering habitat. One herd occupies the area near Wynoochee Dam. This herd had utilized the riparian forest upstream of the dam (now inundated by the waters of Lake Wynoochee). As mitigation for the loss of this forest, Tacoma Power purchased the riparian forest that occurs immediately downstream of Wynoochee Dam to provide long-term habitat for this elk herd.

Wintering habitat is also present in patches elsewhere within the study area and crosses the project corridor in five places. The areas of elk and deer wintering habitat are depicted in Figure 4-3 (total of 9 sheets). Wintering habitats provide elk herds with physical protection from rain and wind, winter forage, and access to adjacent habitats.

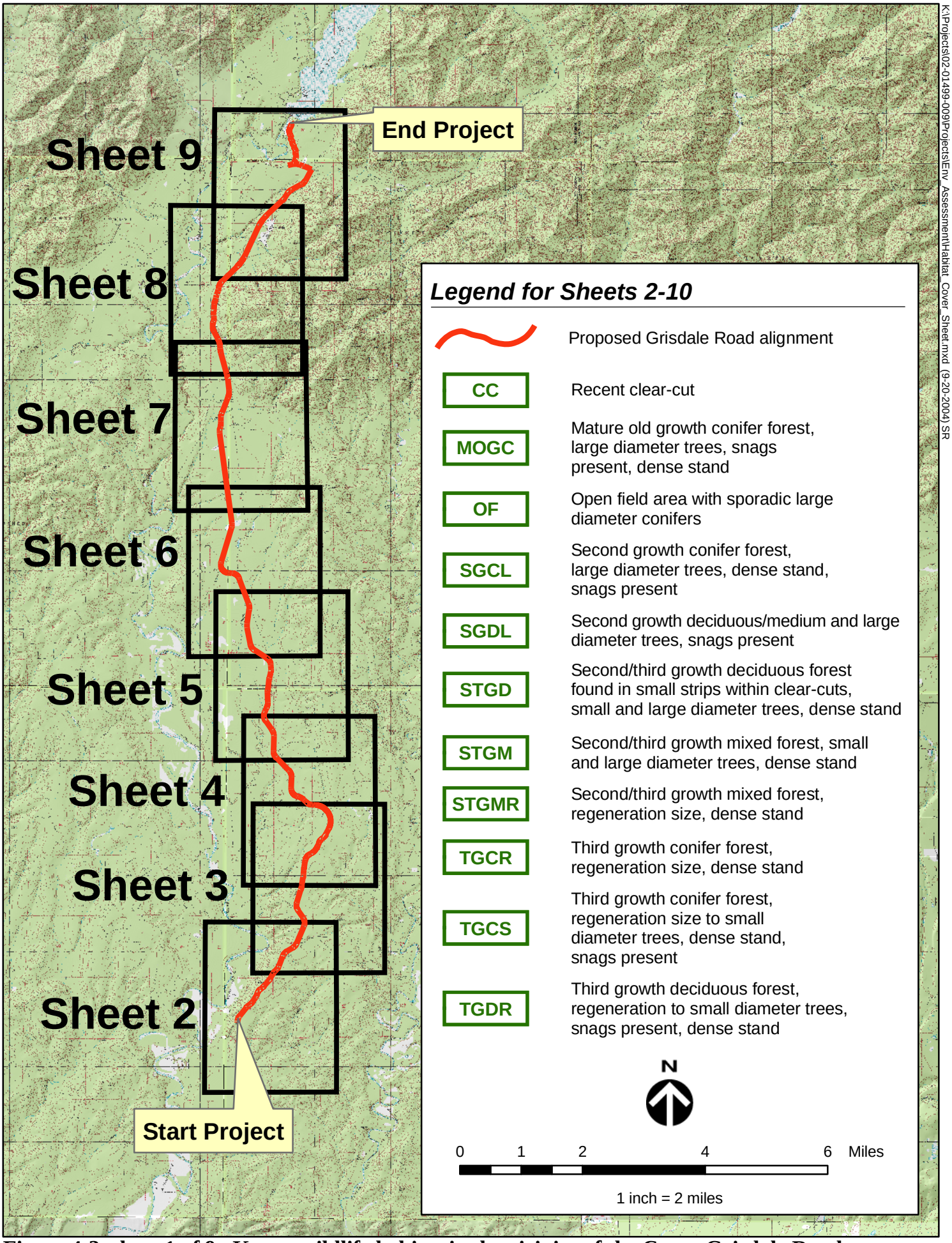

Figure 4-3, sheet 1 of 9. Key to wildlife habitat in the vicinity of the Camp Grisdale Road project, Grays Harbor County, Washington.

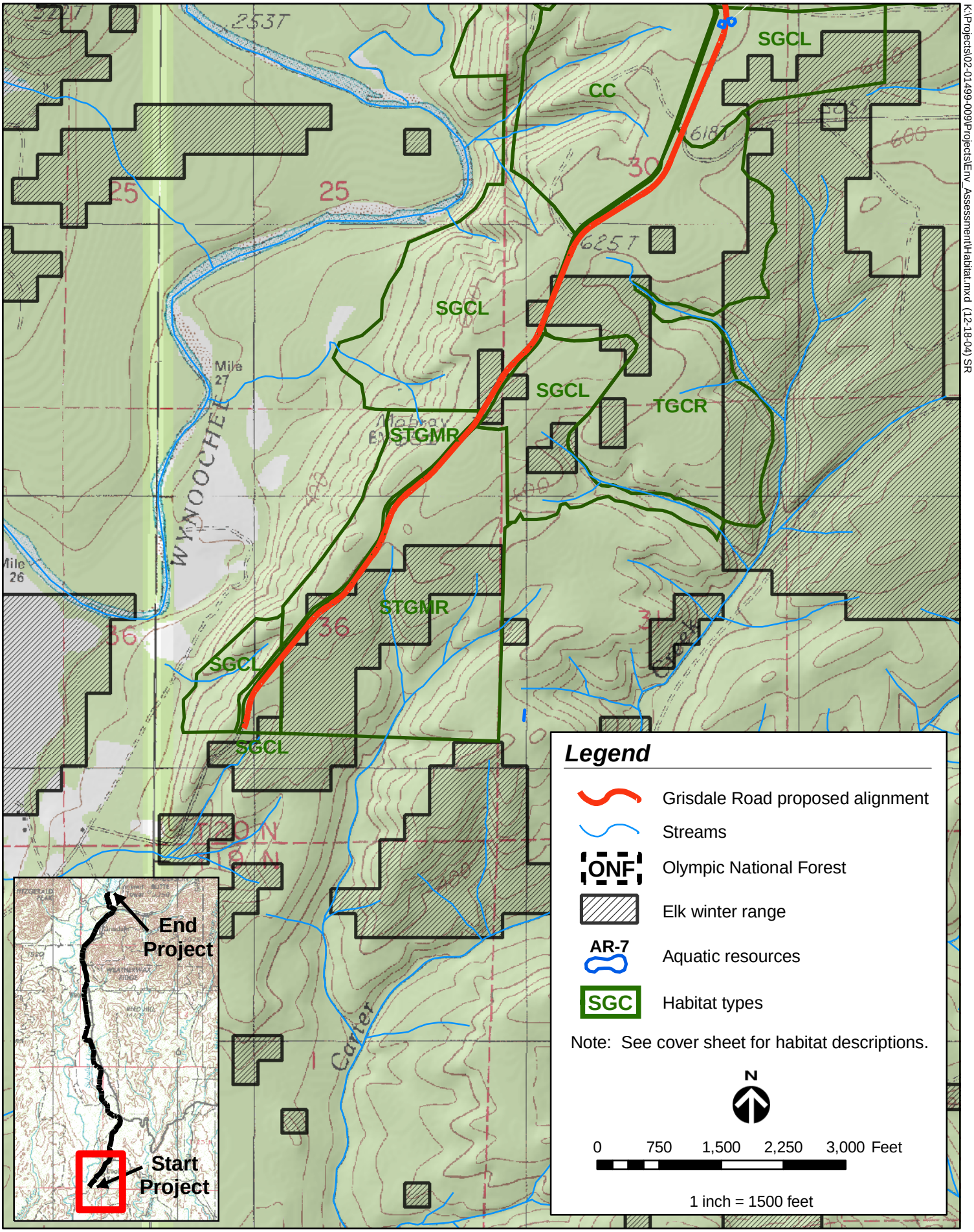

Figure 4-3, sheet 2 of 9. Wildlife habitat in the vicinity of the Camp Grisdale Road project corridor, Grays Harbor County, Washington.

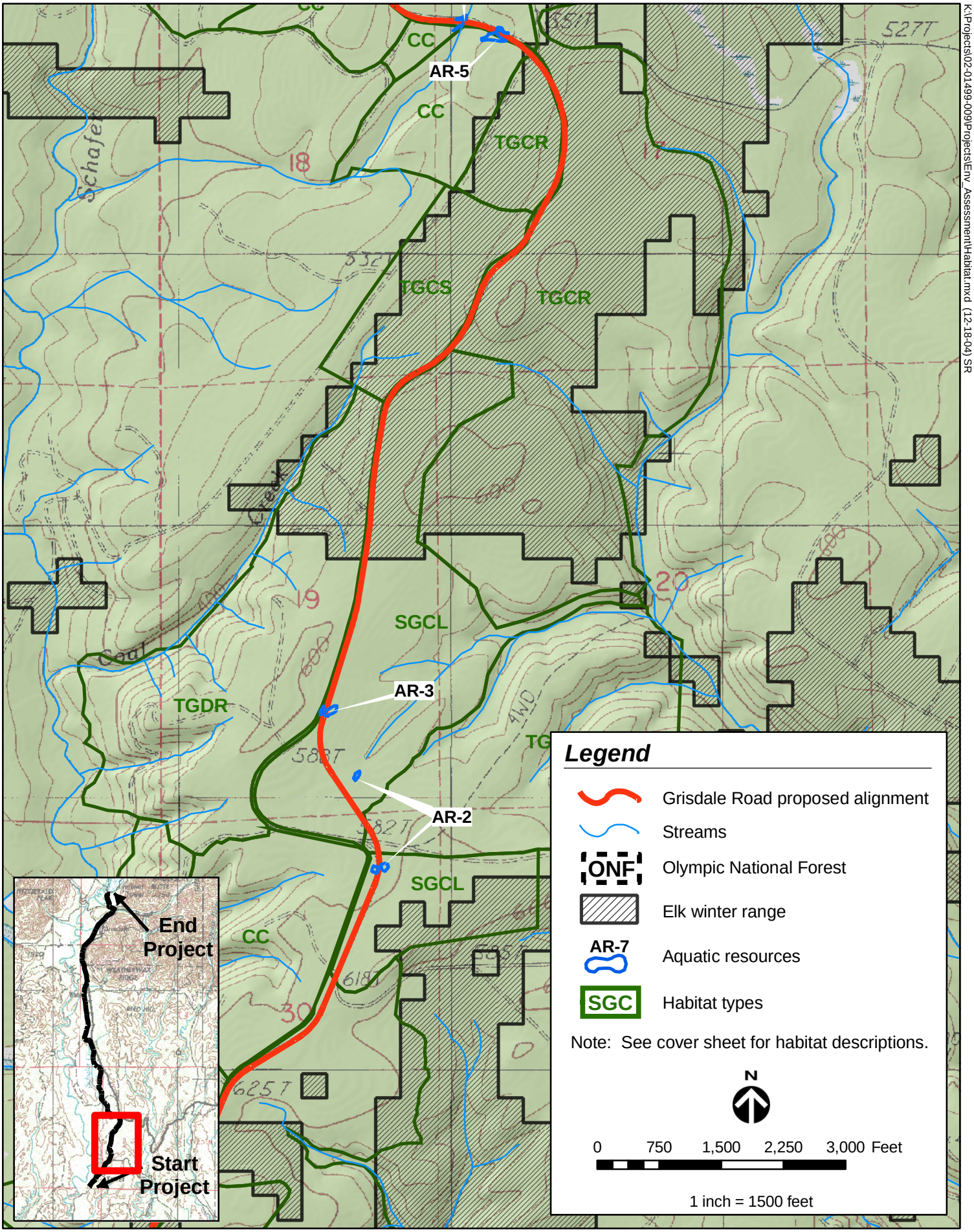

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Figure 4-3, sheet 3 of 9. Wildlife habitat in the vicinity of the Camp Grisdale Road project corridor, Grays Harbor County, Washington.

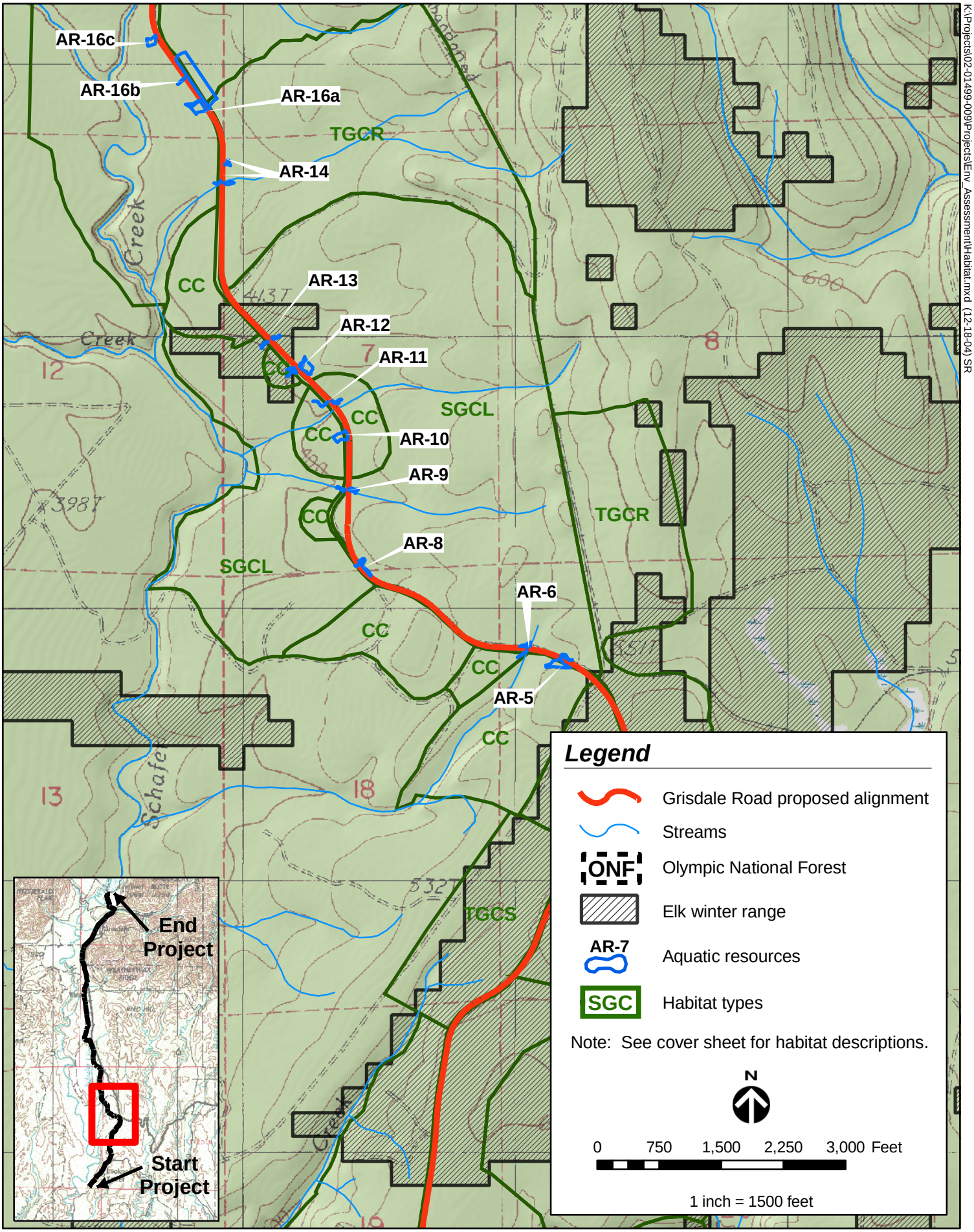

Figure 4-3, sheet 4 of 9. Wildlife habitat in the vicinity of the Camp Grisdale Road project corridor, Grays Harbor County, Washington.

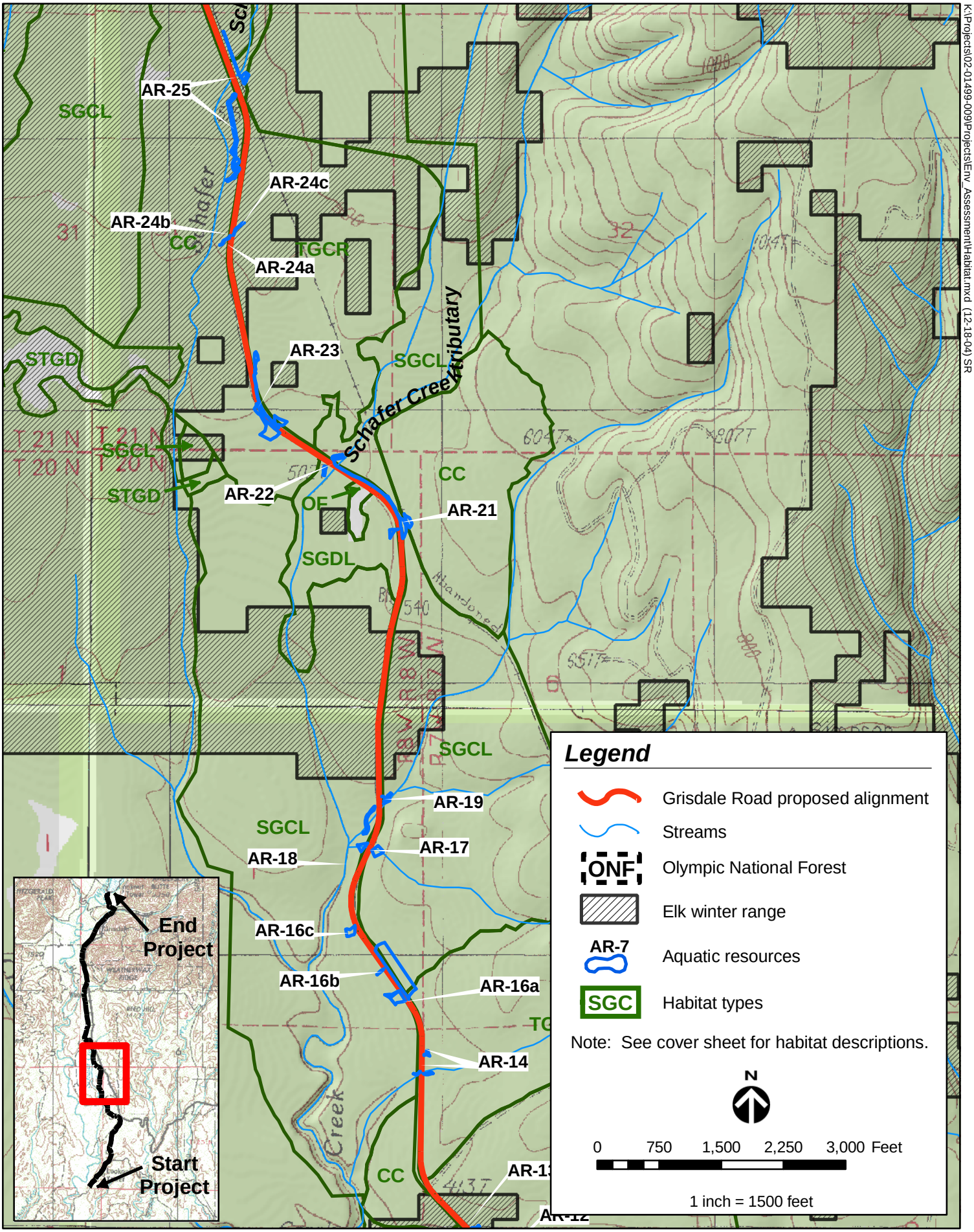

Figure 4-3, sheet 5 of 9. Wildlife habitat in the vicinity of the Camp Grisdale Road project corridor, Grays Harbor County, Washington.

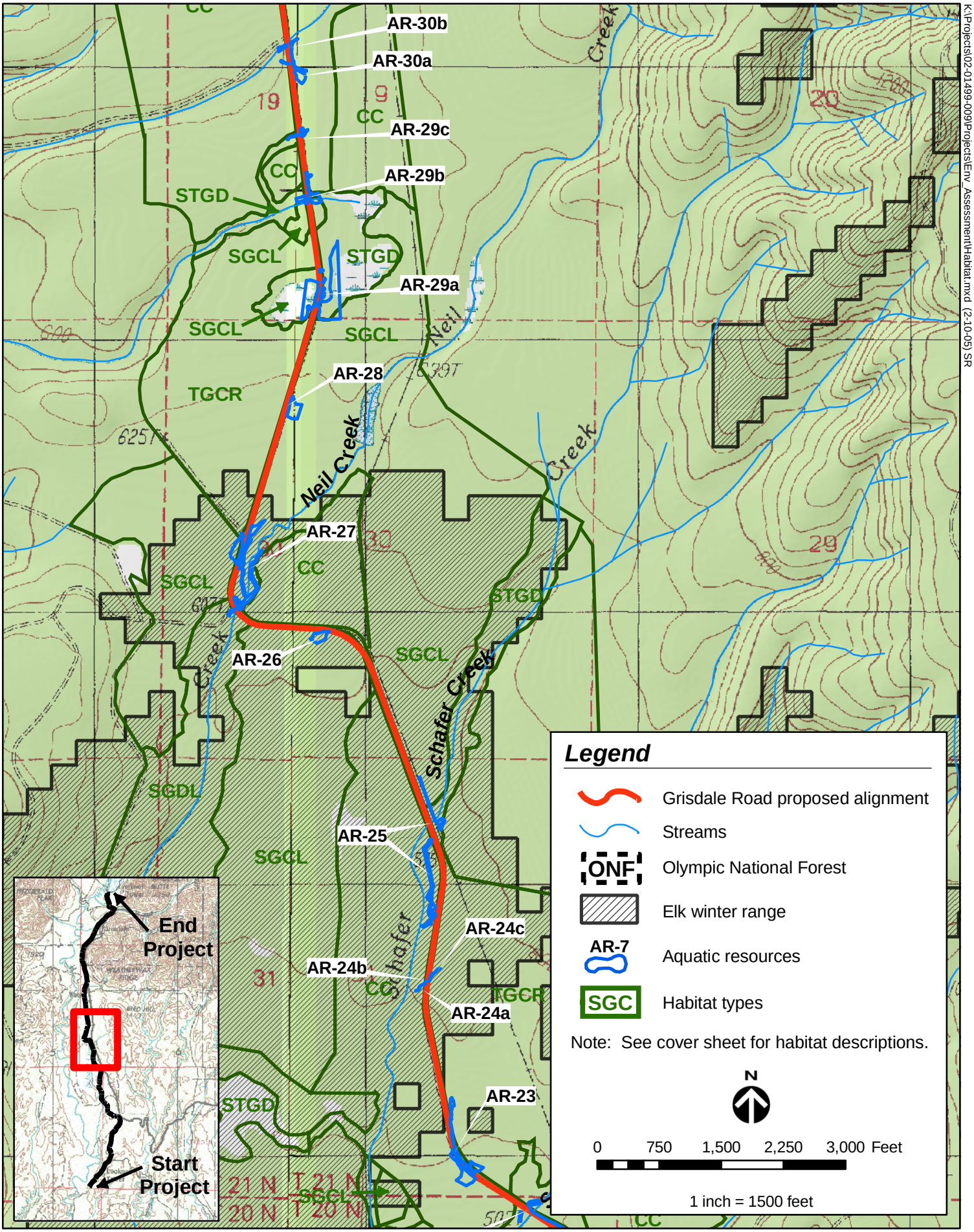

Figure 4-3, sheet 6 of 9. Wildlife habitat in the vicinity of the Camp Grisdale Road project corridor, Grays Harbor County, Washington.

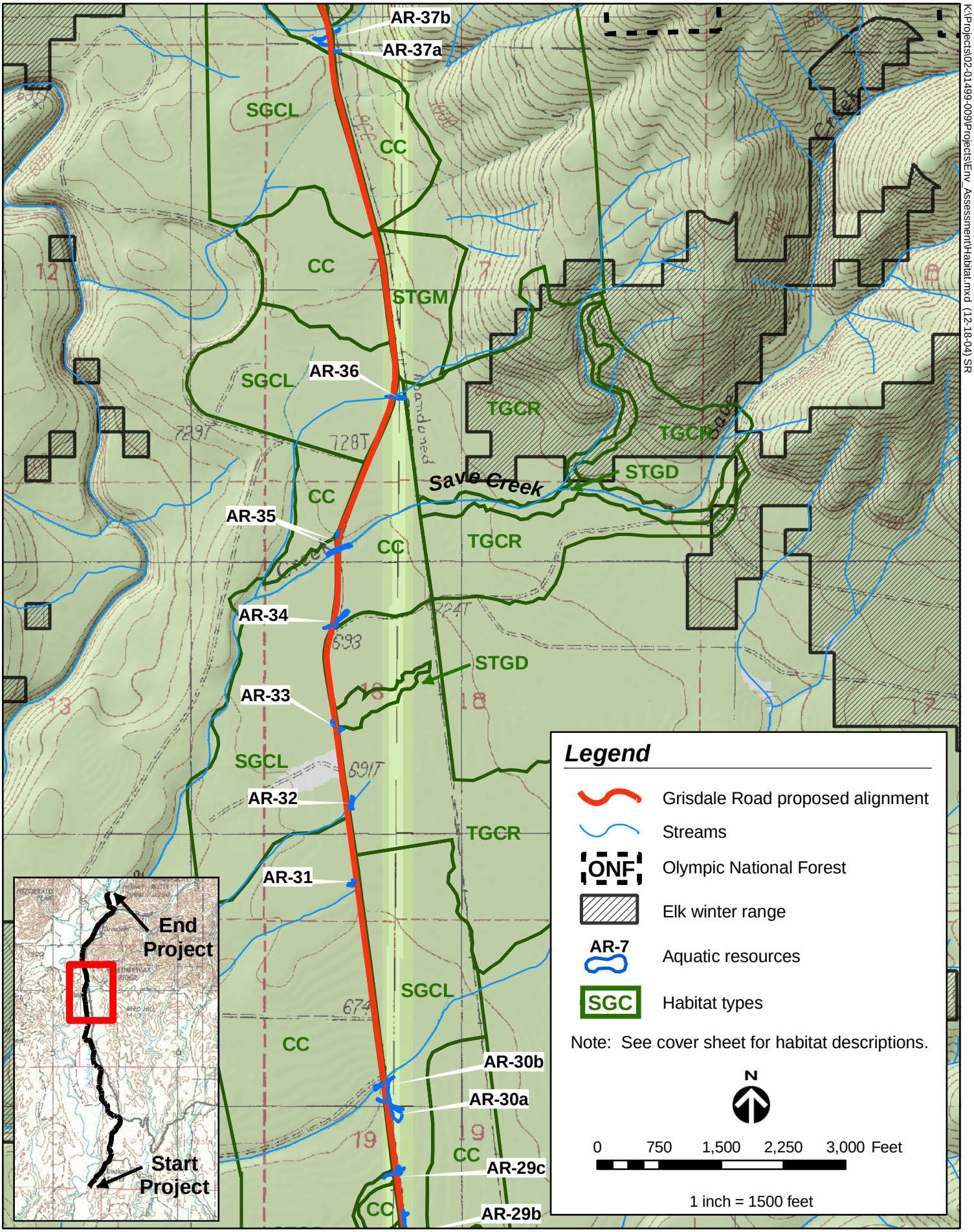

Figure 4-3, sheet 7 of 9. Wildlife habitat in the vicinity of the Camp Grisdale Road project corridor, Grays Harbor County, Washington.

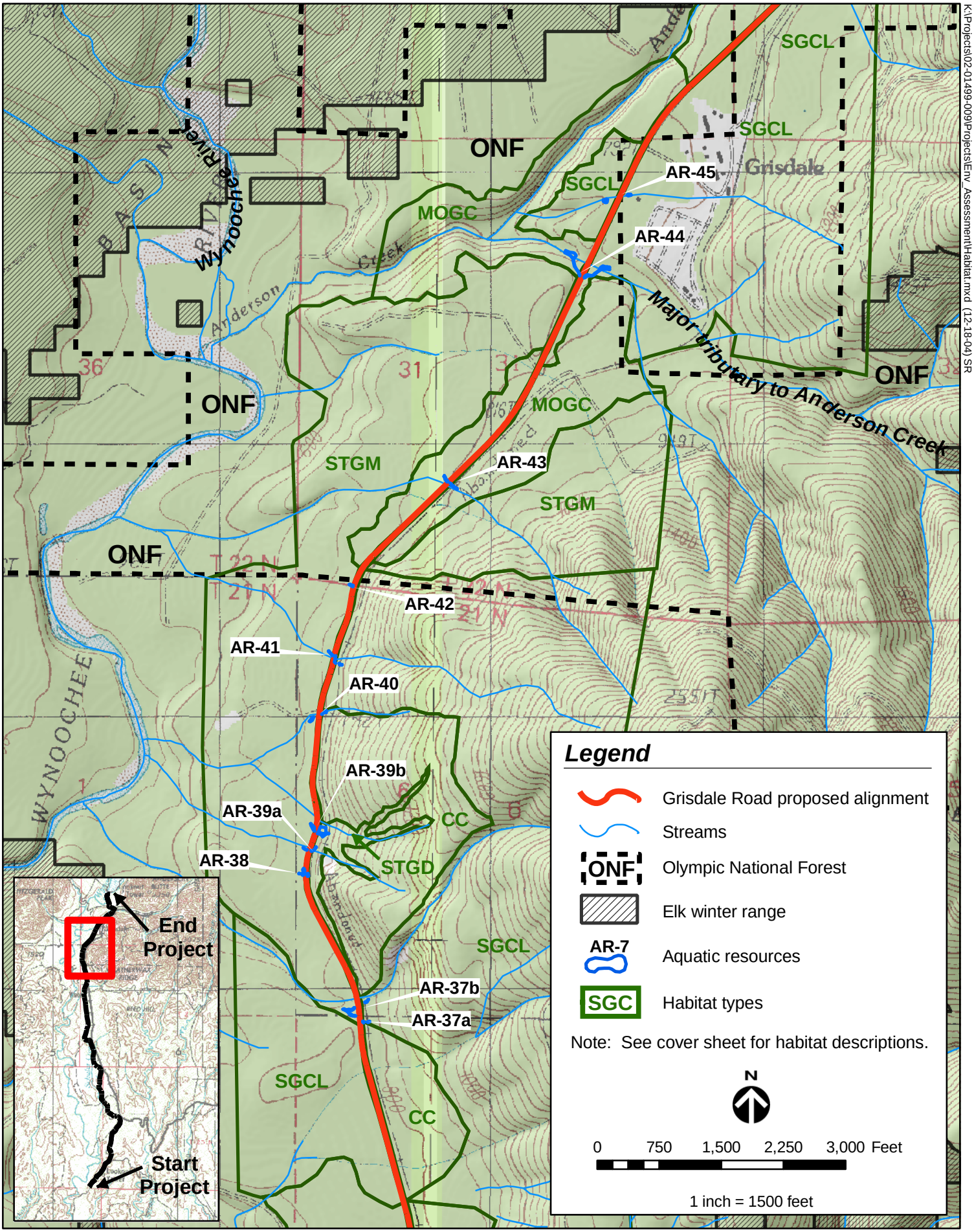

Figure 4-3, sheet 8 of 9. Wildlife habitat in the vicinity of the Camp Grisdale Road project corridor, Grays Harbor County, Washington.

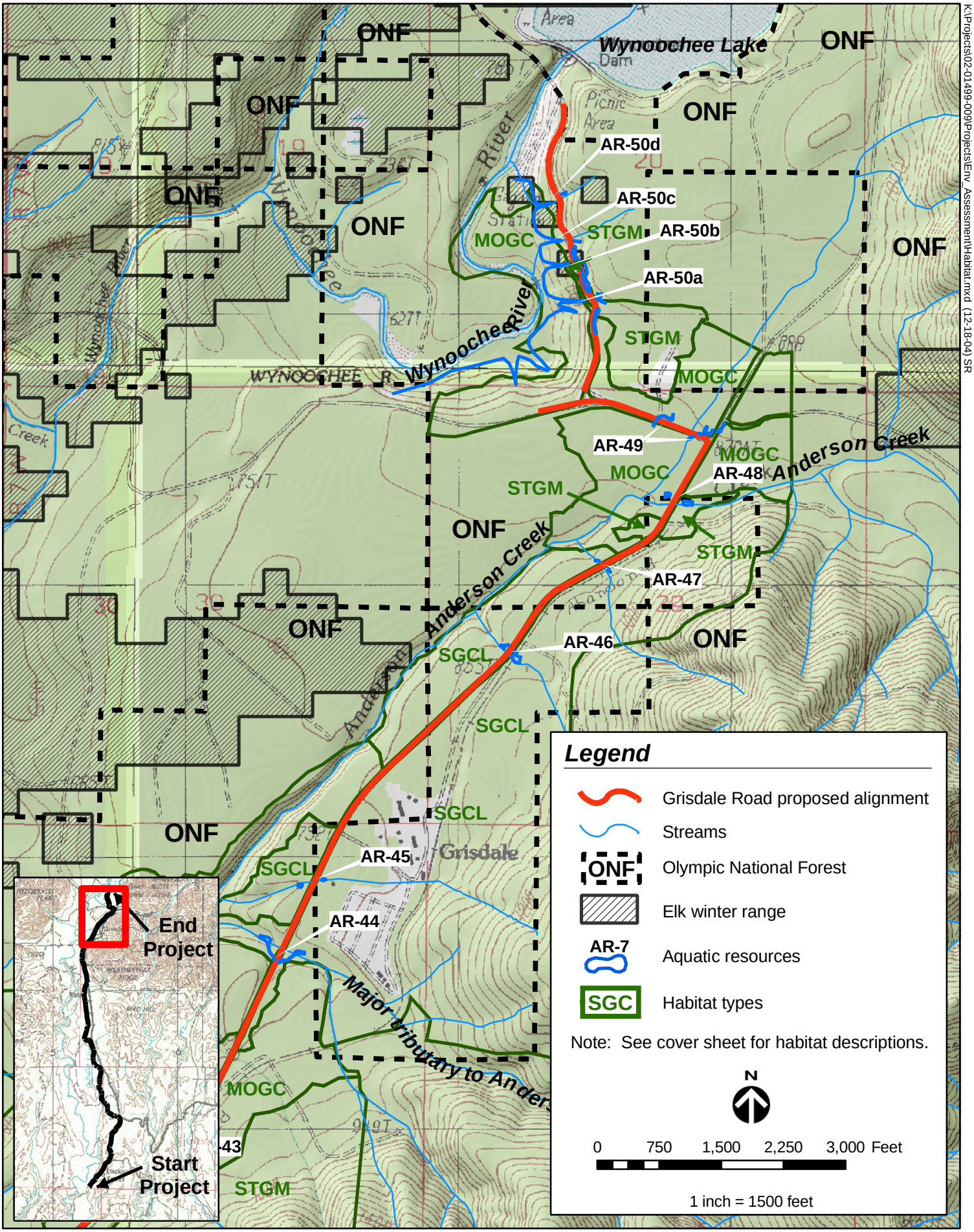

Figure 4-3, sheet 9 of 9. Wildlife habitat in the vicinity of the Camp Grisdale Road project corridor, Grays Harbor County, Washington.

Active timber management on Green Diamond Resource Company lands has reduced wildlife habitat, and not as many species are expected to be present in these areas.

The Forest Service under the Northwest Forest Plan ecosystem management directive has designated the Wynoochee River watershed as a *key watershed*. The key watershed program has the primary goal of protecting at-risk or threatened and endangered salmonid stocks, and includes the protection of forest land within the watershed. The Forest Service has also designated federally owned lands along the project corridor as *late successional reserves*, where old-growth forest habitat is protected (see discussion in vegetation surveys section). These two protective designations have resulted in the presence of large areas of contiguous mature forests, which are especially important to wildlife for cover, breeding, and foraging across the landscape.

Wetlands, riparian areas, and the surrounding forest support numerous amphibians (e.g., frogs and salamanders), reptiles (e.g., snakes), and invertebrates (e.g., slugs, snails, and insects). Wildlife species that have been documented in the vicinity of the project corridor are listed in Appendix E. Amphibians and reptiles that typically use forest habitat in the study area include the northwestern salamander, long-toed salamander, Pacific giant salamander, Del Norte salamander, Cascade torrent salamander, rough-skinned newt, ensatina, clouded salamander, tailed frog, western toad, Pacific chorus (tree) frog, Oregon spotted frog, western skink, rubber boa, western pond turtle, northern alligator lizard, Pacific coast aquatic garter snake, and common garter snake. Red-legged frogs, rough-skinned newts, and northwest salamanders were observed by project biologists in several riparian and wetland areas during the spring and summer 2004 site visits.

Additionally, both migratory and resident waterfowl use the streams, ponds, lakes, and other aquatic habitats in the study area. A great number of bird species are associated with or require riparian and wetland habitats in the Wynoochee River basin. As a subset of this ecological guild, neotropical migrants (e.g., the willow flycatcher, yellow warbler, yellow-breasted chat, red-eyed vireo, and Vaux's swift) continually exhibit declining population trends in this region. Other species that are marsh obligates include the Virginia rail, sora rail, and marsh wren. Harlequin duck, a USFWS species of concern, is discussed in the sensitive species section below.

Sensitive Species

The WDFW Priority Habitats and Species Program (WDFW 2003), the U.S. Fish and Wildlife Service (USFWS 2003), and the Forest Service, Olympic Region (USDA Forest Service 2003) were consulted for the presence of sensitive wildlife within the study area. Table 4-5 lists all of the endangered wildlife species, threatened wildlife species, species of concern, and state monitor species potentially occurring within the study area that are identified by state or federal agencies. The table identifies the preferred habitat type for each species and indicates the presence of suitable habitat (and identification of habitat units) within the study area. Figure 4-3 shows the locations of the terrestrial habitat types associated with the species identified in Tables 4-4 and 4-5.

Table 4-5. Listed and sensitive wildlife species in the vicinity of the Camp Grisdale Road project corridor.

Species Type	Common Name	Scientific Name	Agency Status [a]				Preferred Habitat Type	Suitable Habitat in Study Area? [b] (*if yes, unit is listed*)
			NOAA Fisheries	USFWS	WDFW	Forest Service		
Amphibians	Van Dyke's salamander	*Plethodon vandykei*	–	SOC	SOC	D	Splash zone of streams and waterfalls under rocks and woody debris	All stream ARs
	Cope's giant salamander	*Dicamptodon copei*	–	–	SM	D	Rocky stream bottoms and splash zones on stream banks	All stream ARs
	Cascade torrent salamander	*Rhyacotriton cascadae*	–	–	SOC	D	Near cold, clear streams and waterfalls	All stream ARs
	Olympic torrent salamander	*Rhyacotriton olympicus*	–	–	–	D	Near cold, clear streams and waterfalls	All stream ARs
Birds	Common loon	*Gavia immer*	–	–	–	D	Freshwater lakes and reservoirs near forests	No
	American peregrine falcon	*Falco peregrinus anatum*	–	SOC	–	S	Coastal cliffs and rocks	No
	Northern spotted owl	*Strix occidentalis*	–	T	E	D	Mature coniferous forests	MOGC and SGCL
	Marbled murrelet	*Brachyramphus marmoratus*	–	T	T	D	Mature coniferous forests (nesting in trees with high, large limbs)	MOGC and SGCL
	Bald eagle	*Haliaetus leucocephalus*	–	T	T	D	Near freshwater and saltwater with adequate perching and nesting trees	MOGC, OF, and SGCL
	Harlequin duck	*Histrionicus histrionicus*	–	SOC	–	–	Fast-moving rivers with dense shrubs or timber on banks and absence of human disturbance	ARs 25, 27, 35, 44, 48
	Ferruginous hawk	*Buteo regalis*	–	SOC	T	D	Steppe vegetation, nesting on high cliffs, bluffs, and utility poles	No
Mammals	Townsend's big-eared bat	*Corynorhinus townsendii*	–	SOC	SOC	D	Coastal forests with caves, buildings, and old mines for roosts. Bridges also serve as foraging sites and as protected perches for big-eared bats to consume prey.	MOGC, possibly SGCL, new bridge at AR-35 (Save Creek) for perching and foraging.
	California wolverine	*Gulo gulo*	–	SOC	SOC	D	Large areas of remote wilderness, wooded foothills, and mountains	MOGC
	Fisher	*Martes pennanti*	–	SOC	E	–	Dense coniferous forests	MOGC and SGCL
	Western pocket gopher	*Thomomys mazama*	–	SOC	SOC	S	Flat grasslands to open areas in forests, i.e., meadows	No
Mollusks [c]	Puget oregonian snail	*Cryptomastix devia*	–	–	–	D, A [d]	Found in mature to late successional moist forest and riparian zones, under logs, in leaf litter, around seeps and springs, often associated with hardwood debris and leaf litter and/or talus. Often found under or near big-leaf maple and under sword fern growing under these trees, or on the underside of big-leaf maple logs. Canopy cover is generally high. Low to mid-elevations. Young individuals may be found under mosses on the trunks of big-leaf maple	MOGC, SGDL
	Hoko Vertigo snail	*Vertigo n. sp.*	–	–	–	S, A [d]	Arboreal, considered an old-growth forest and riparian species. May be found on smooth trunks and lower limbs of deciduous trees and shrubs, or in leaf litter under such vegetation within 656 feet of streams, seeps, or springs. This snail typically hangs upside down from limbs and trunks of trees and shrubs with smooth bark, where it may appear to be a small bud.	MOGC, SGCL, STGD, STGMR, STGM

Table 4-5. Listed and sensitive wildlife species in the vicinity of the Camp Grisdale Road project corridor (continued).

Species Type	Common Name	Scientific Name	Agency Status [a]				Preferred Habitat Type	Suitable Habitat in Study Area? [b] (*if yes, unit is listed*)
			NOAA Fisheries	USFWS	WDFW	Forest Service		
Mollusks (continued)	Malone's jumping slug	*Hemphillia malonei*	–	–	–	S, C [d]	Found in moist to wet forested habitats, usually with a mixed hardwood component. May be found on or under debris, often on the underside of bark lying on the ground.	MOGC, STGD, STGMR, STGM
	Warty jumping slug	*Hemphillia glandulosa*	–	–	–	D, E [d]	Found in moist to wet forested habitats, usually with a mixed hardwood component. May be found on or under debris, often on the underside of bark lying on the ground.	MOGC, STGD, STGMR, STGM
	Burrington's jumping slug	*Hemphillia* burringtoni	–	–	–	D, E [d]	Found in moist to wet forested habitats, usually with a mixed hardwood component. May be found on or under debris, often on the underside of bark lying on the ground.	MOGC, STGD, STGMR, STGM
	Blue-gray taildropper slug	*Prophysaon coeruleum*	–	–	–	S, A [d]	Found in a wide range of moist and mixed conifer forests. In open or dry areas, usually located in sites with relatively higher shade and moisture levels than those of the general forest habitat. Typically found in moist plant communities such as big-leaf maple and sword fern. This slug is usually associated with leaf and needle litter, wood chips from decomposing logs, mosses, and is known to browse on mycorrhizal fungus species.	MOGC, SGCL, SGDL, STGD, STGMR, STGM, TGCR, TGCS, TGDR

[a] Agency status: E = endangered, T= threatened, SOC= species of concern, D = documented presence, S = suspected presence, SM= state monitor species. A dash (–) means that this agency does not have jurisdiction over this particular species.

[b] See Table 4-2:
CC = recent clear-cut
MOGC = mature old-growth conifer forest
OF = open field
SGCL = second-growth conifer forest
SGDL = second-growth deciduous forest
STGD = second/third-growth deciduous forest
STGM = second/third-growth mixed forest
STGMR = second/third-growth mixed forest, regeneration size
TGCR = third-growth conifer forest, regeneration size
TGCS = third-growth conifer forest from regeneration size to small-diameter trees
TGDR = third-growth deciduous forest from regeneration size to small-diameter trees.
Sources: Eder (2002), Leonard et al. (1993), USDA Forest Service (2003), USFWS (1986, 1997, 2003a), WDFW (1991, 2003).

[c] Former Forest Service survey and manage species.

[d] A = Rare. Manage all known sites. Predisturbance surveys are required. Strategic surveys are required.
B = Rare. Manage all known sites. Strategic survey required.
C = Uncommon. Manage high-priority sites. Predisturbance surveys are required. Strategic surveys are required.
E = Listed as endangered by the state.

Salamanders

Sensitive salamander species identified by WDFW (2003, 2004), USFWS (2004), and USDA Forest Service (2004) are Van Dyke's salamander (*Plethodon vandykei*), Cope's giant salamander (*Dicamptodon copei*), and Olympic torrent salamander (*Rhyacotriton olympicus*). All of these species have known occurrences within the study area, in habitats similar to those found in the project corridor. Although also listed for this area, the Cascade torrent salamander (*Rhyacotriton cascadae*) is restricted in range to the Cascade Mountains (Leonard et al. 1993; Corkan and Thoms 1996). Van Dyke's salamanders and Cope's giant salamanders are known to occur in the Wynoochee River watershed, in streams tributary to the Wynoochee River. Olympic torrent salamanders are known to occur in the Satsop River watershed, directly east of the project corridor, on streams tributary to the Satsop River (WDFW 2003, 2004; USDA Forest Service 2004). All of these species require cold, flowing water, waterfalls, and splash zones of streams. These habitat types are abundant within the project corridor, typically associated with the many Wynoochee River tributaries that are crossed by Camp Grisdale Road. In many areas stream erosion has exposed sandstone and other sedimentary bedrock. These exposed bedrock faces are often the sites of perennial springs and seeps, as the bedrock often confines ground water within the project corridor, releasing it where the bedrock is exposed. This provides favorable habitat for several salamanders species.

There were confirmed detections of two sensitive salamander species during the summer and fall surveys, Cope's giant salamander and Olympic torrent salamander. Both of these species were encountered in AR-50, a ground water spring and wetland complex south of Wynoochee Dam and on benches above the Wynoochee River. Two Cope's giant salamander larvae and one adult male Olympic torrent salamander were observed in cold, flowing water, near ground water springs. In addition, numerous other amphibians were observed, including Pacific chorus frog (*Hyla regilla*), red-legged frog (*Rana aurora*), rough-skinned newt (*Taricha granulosa*), western toad (*Bufo boreas*), and western red-backed salamander (*Plethodon vehiculum*).

Western red-backed salamanders were particularly numerous within the study area, occupying habitats similar to those of the Van Dyke's and Olympic torrent salamander. The western red-backed salamander closely resembles the Van Dyke's salamander, distinguished only by the number of costal grooves (14 in Van Dyke's; generally 16 in western red-backed, but ranging between 14 and 18) and the relative stockiness and shorter tail of the Van Dyke's salamander. These can be difficult field characteristics to verify, when the study subject is maneuvering for evasion or escape. Whenever possible, photographs were taken of species having the characteristics of the sensitive species, to enable a detailed analysis of physical characteristics.

Birds

Sensitive bird species listed by WDFW (2003, 2004) and USDA Forest Service (2004) include common loon, American peregrine falcon, ferruginous hawk, and harlequin duck. No habitat exists for the common loon, American peregrine falcon, or ferruginous hawk within the study area, so these are not addressed further in this report.

Occurrences of harlequin duck breeding pairs and breeding habitat were listed on the state Priority Habitats and Species maps (WDFW 2004) for the area located along the Wynoochee River from the dam to 10 miles south. WDFW reported that surveys of the Wynoochee River completed in 1996 found nesting pairs on Wynoochee Lake and just below the dam where the river gradient is 3 to 5 percent (Shirago 2004 personal communication). Harlequin ducks typically nest near logs and in vegetation within 2 to 3 feet of the shoreline. They also nest in cavities in snags and on rock ledges. They have very high breeding and wintering site fidelity because mating pairs separate after hatching and then rejoin each other at wintering sites in the Strait of Georgia in Alaska.

Mammals

Sensitive mammal species identified by WDFW (2003, 2004), USFWS (2004), and USDA Forest Service (2004) include Townsend's big-eared bat, California wolverine, fisher, and western pocket gopher. Townsend's big-eared bats perch and roost during the day in crevasses in old-growth trees. They hibernate and maternity roost in caves, mine shafts, and old buildings. They also use bridges for cover and perching during foraging on moths over rivers and wetlands. No caves, old mines, or old buildings exist within the study area, so maternity roosting and hibernation do not occur in the area. However, these bats may use the new bridge at Save Creek (AR-35) for perching during foraging, and they likely roost in crevasses in trees in the mature forests along the project corridor.

The California wolverine is a wide-ranging animal that uses wooded foothills and mountains where remote wilderness exists. Historical wolverine sightings in Washington have been very limited. The California wolverine may pass through the foothills and old-growth forests on Forest Service land at the northern extent of the study area but is not expected to den near the project corridor, due to human activity.

Fishers have been observed in the Satsop watershed approximately 5 miles east of the Wynoochee River but have not been reported in the Wynoochee watershed (WDFW 2003). Although they have not yet been observed, it is assumed that fishers may use areas within the Wynoochee watershed because suitable habitat exists.

Western pocket gophers are not likely to occur in the study area because habitat does not exist for them.

Terrestrial Mollusks

Surveys for terrestrial mollusks, including two snails and four slug species, were conducted in the fall of 2004. Habitat requirements and potential habitat occurring within the study area are provided in Table 4-5. Generally, the two snail species (Puget Oregonian (*Cryptomastix devia*) and Hoko vertigo (*Vertigo n.* sp.) are found within leaf litter or woody debris in old-growth or late successional forests. The Burrington's, Malone's, and warty jumping slugs (*Hemphillia burringtoni*, *H. malonei*, and *H. glandulosa)* typically inhabit woody debris in moist forests that have a hardwood component. The blue-gray taildropper slug (*Prophysaon coeruleum*) is found

within leaf litter or organic debris in a more diverse set of habitats, from forests to open grassy areas, compared to the other terrestrial mollusks mentioned above.

Potential habitat for these snails and slugs exists within the old-growth, second-growth, and third-growth forest habitat units identified within the study area (Figure 4-3). Surveys were conducted only within the Olympic National Forest.

Warty jumping slugs were found in numerous locations within the project corridor in Olympic National Forest. They are presumed to be common in this area. No other species of sensitive slug species were identified within the project corridor. Another survey will be conducted in 2005 to verify these results.

Fish and Fish Habitat

Analysis of Existing Information

The National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA Fisheries), the U.S. Fish and Wildlife Service (USFWS), the Washington Department of Fish and Wildlife (WDFW), and the Forest Service were consulted about special status fish species presence within the streams that cross the project corridor or are in the vicinity (Figure 4-4 [total of 7 sheets]). Table 4-6 lists the sensitive species identified as potentially occurring within the streams in the vicinity of the project. The sensitive species include Olympic mudminnow, Salish sucker, chinook salmon, and chum salmon. Other fish species reported in the salmonid stock inventory (WDFW 1998) to potentially occur within the vicinity of the project corridor include steelhead trout (*Oncorynchus mykiss*), brook trout (*Salvenlinus fontinalis*), rainbow trout (*Oncorynchus mykiss*), mountain whitefish (*Prosopium coulteri*), pygmy whitefish (*Prosopium coulteri*), shorthead sculpin (*Cottus confusus*), and sockeye salmon (*Oncorhynchus keta*). The agencies also provided a list of federally listed threatened, endangered, or candidate fish species, including coho salmon (candidate), coastal cutthroat trout (proposed threatened), and bull trout (threatened). The federally listed species are discussed under the threatened and endangered species section.

The locations of the streams are shown in Figure 4-1. The attributes of the stream aquatic resources are summarized in Table 4-7. A discussion of fish passage barriers and criteria for culvert replacement with fish-passable culverts is provided in the fish passage barrier section. Additional information about wetlands is provided in the wetland delineation report prepared for this project (Herrera 2004a).

The WDFW Priority Habitats and Species Program and NOAA Fisheries were consulted for records of fish presence within the vicinity of the project corridor (WDFW 2003, 2004; NOAA Fisheries 2003, 2004). Sensitive and listed fish species potentially occurring in the project vicinity are presented in Table 4-6, along with aquatic habitats identified in the project corridor that may provide suitable conditions for these species. Most of the streams encountered within the project corridor flow toward the Wynoochee River or into major tributaries of the Wynoochee River, including Coal Creek, Schafer Creek, Neil Creek, and Anderson Creek.

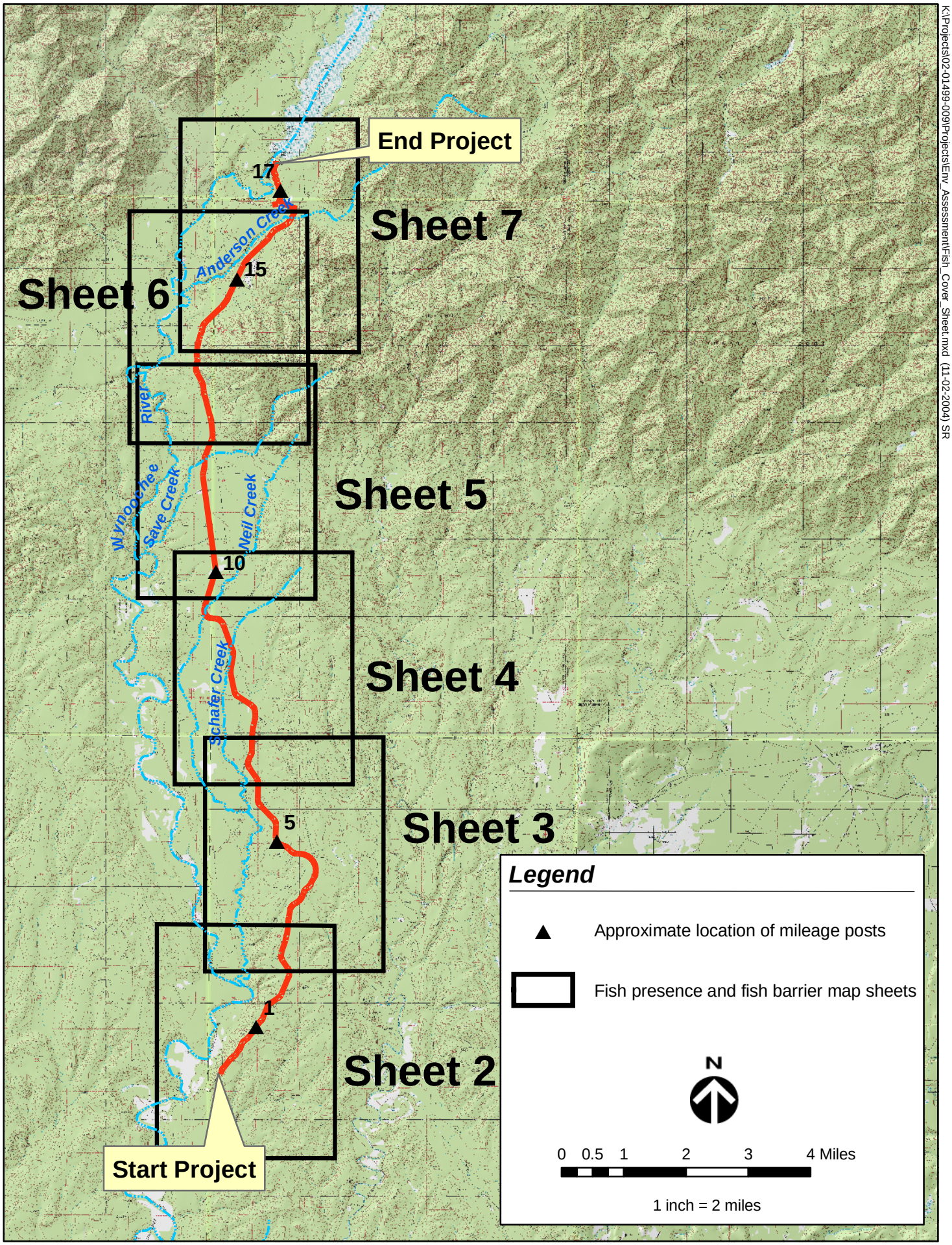

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Figure 4-4, sheet 1 of 7. Key to fish presence and fish barriers in the vicinity of the Camp Grisdale Road project corridor, Grays Harbor County, Washington.

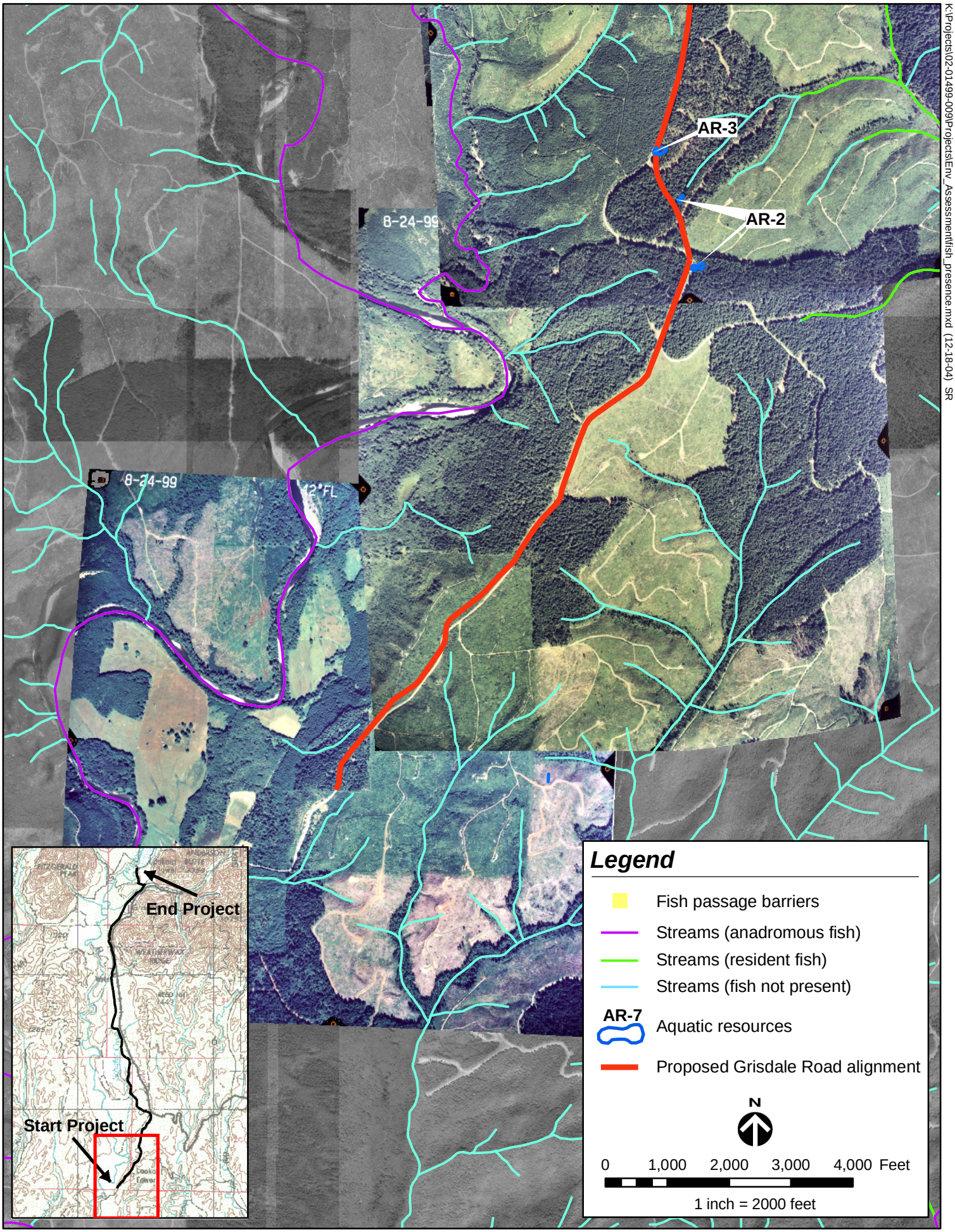

Figure 4-4, sheet 2 of 7. Fish presence and fish barriers in the vicinity of the Camp Grisdale Road project corridor, Grays Harbor County, Washington.

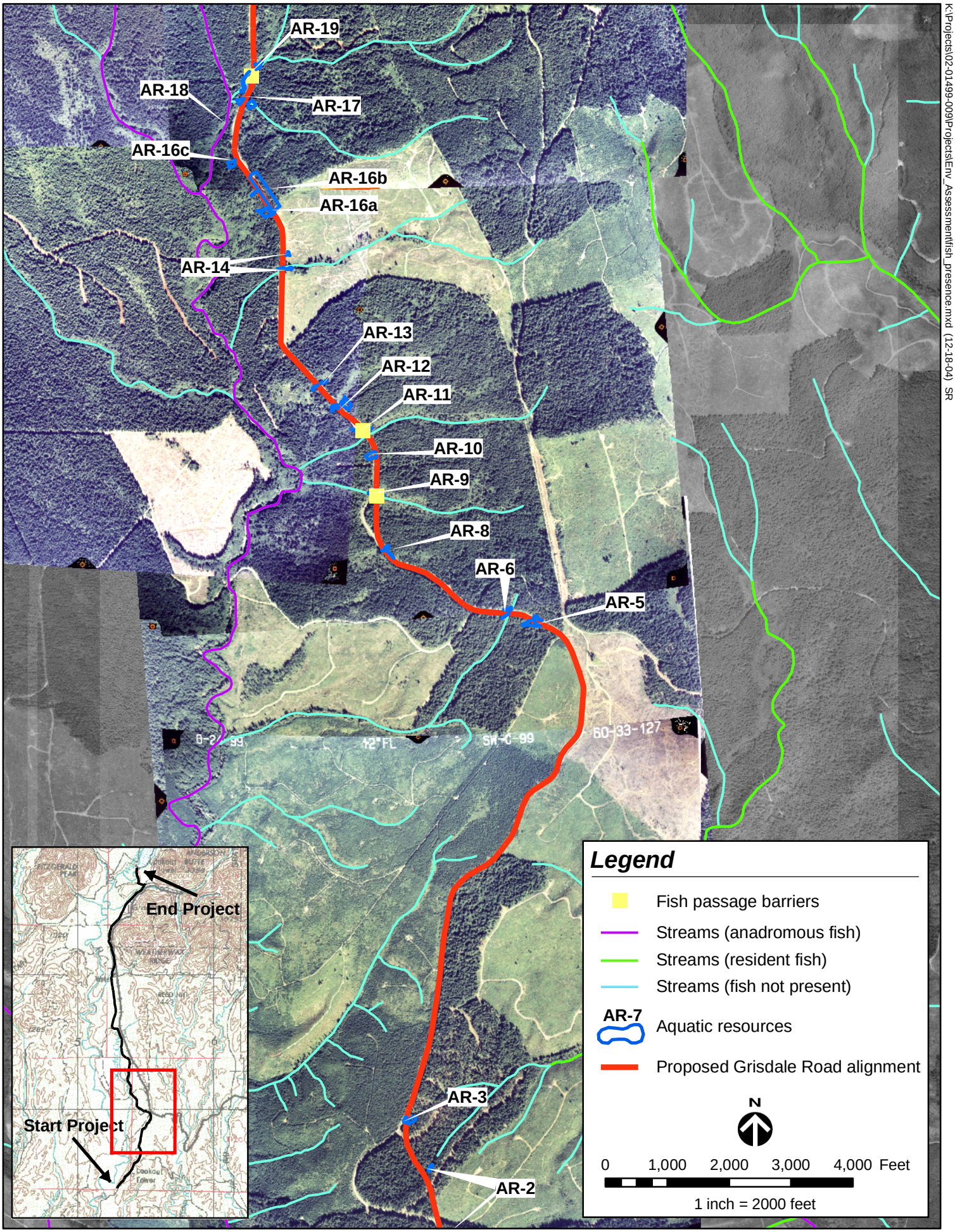

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Figure 4-4, sheet 3 of 7. Fish presence and fish barriers in the vicinity of the Camp Grisdale Road project corridor, Grays Harbor County, Washington.

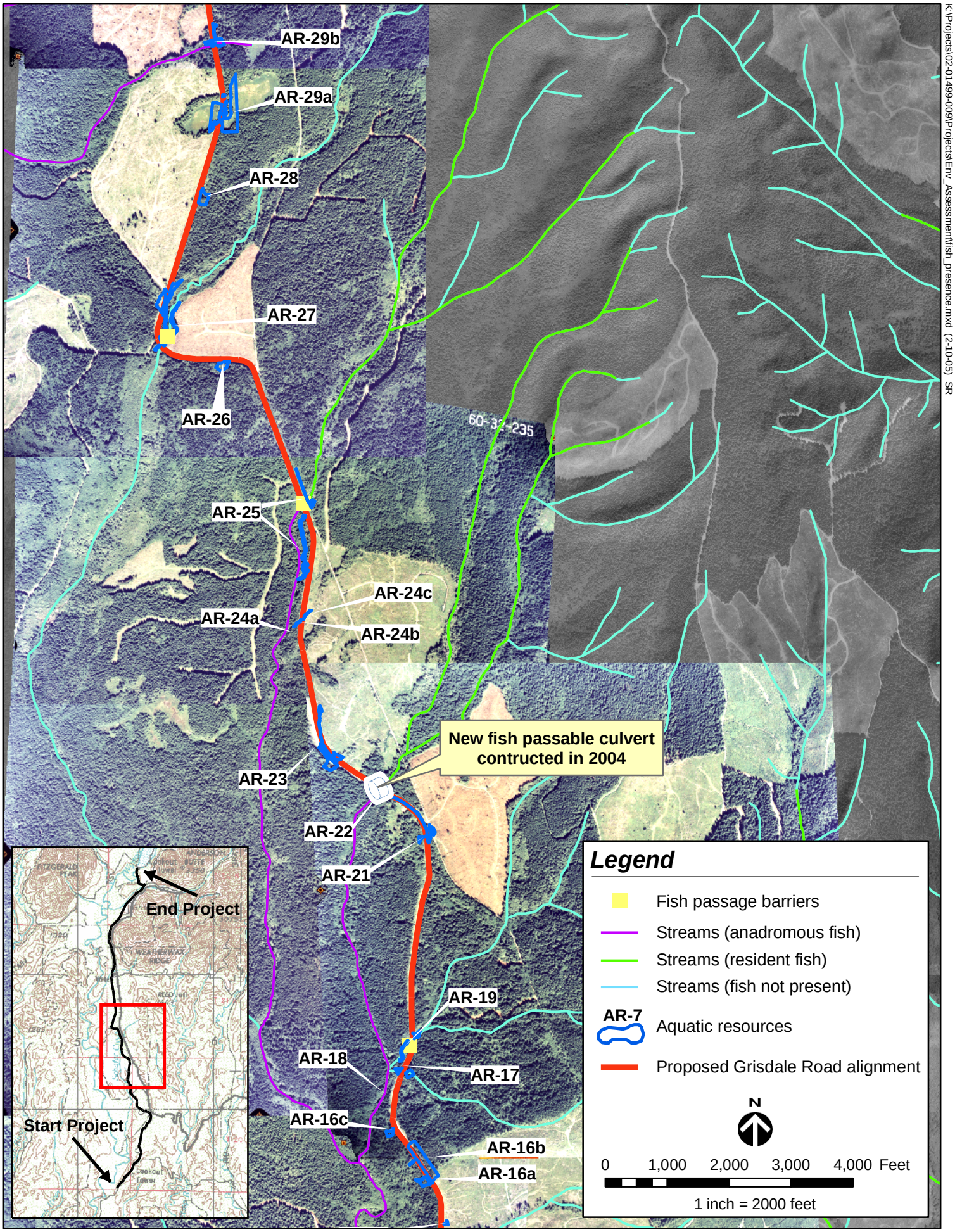

Figure 4-4, sheet 4 of 7. Fish presence and fish barriers in the vicinity of the Camp Grisdale Road project corridor, Grays Harbor County, Washington.

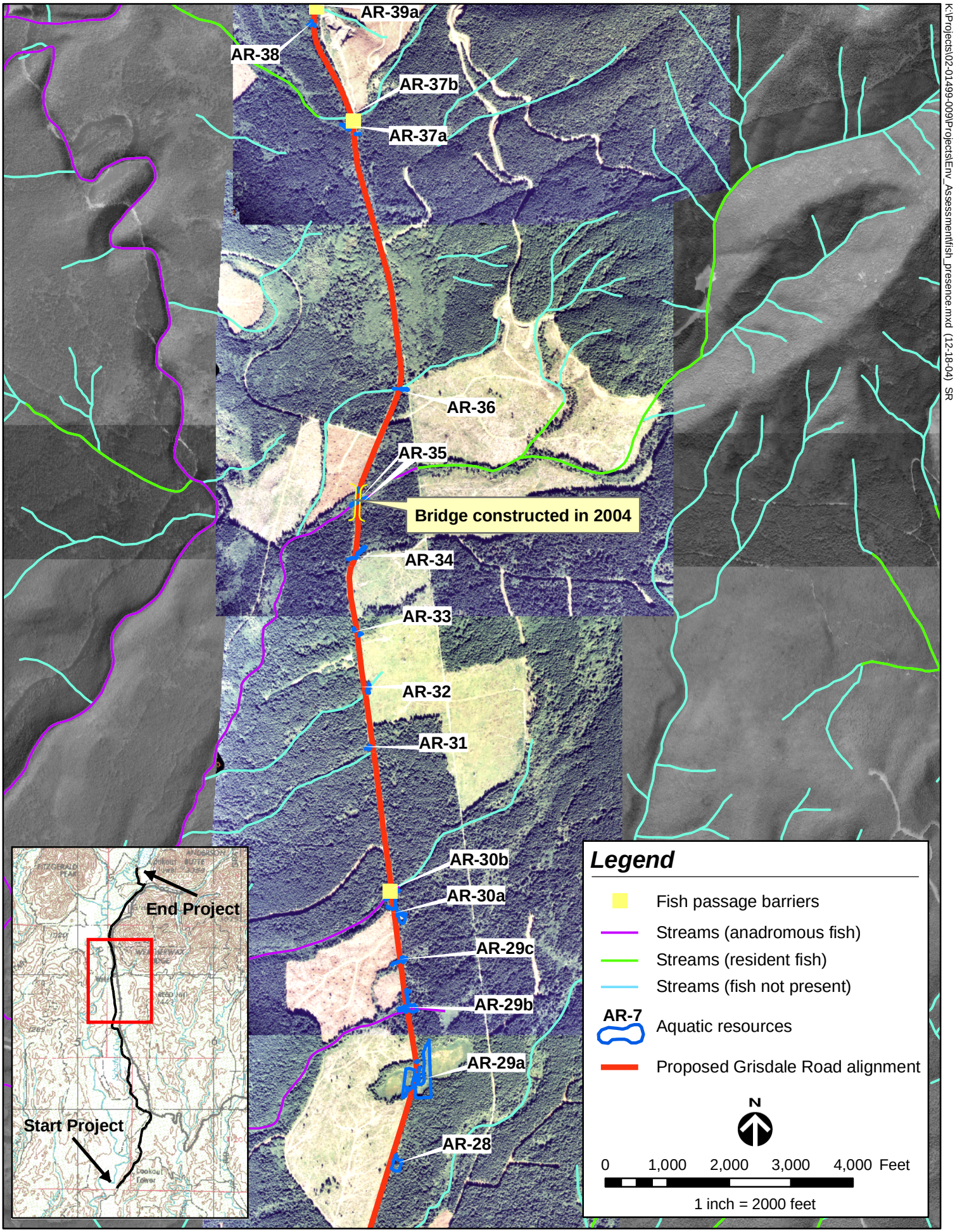

Figure 4-4, sheet 5 of 7. Fish presence and fish barriers in the vicinity of the Camp Grisdale Road project corridor, Grays Harbor County, Washington.

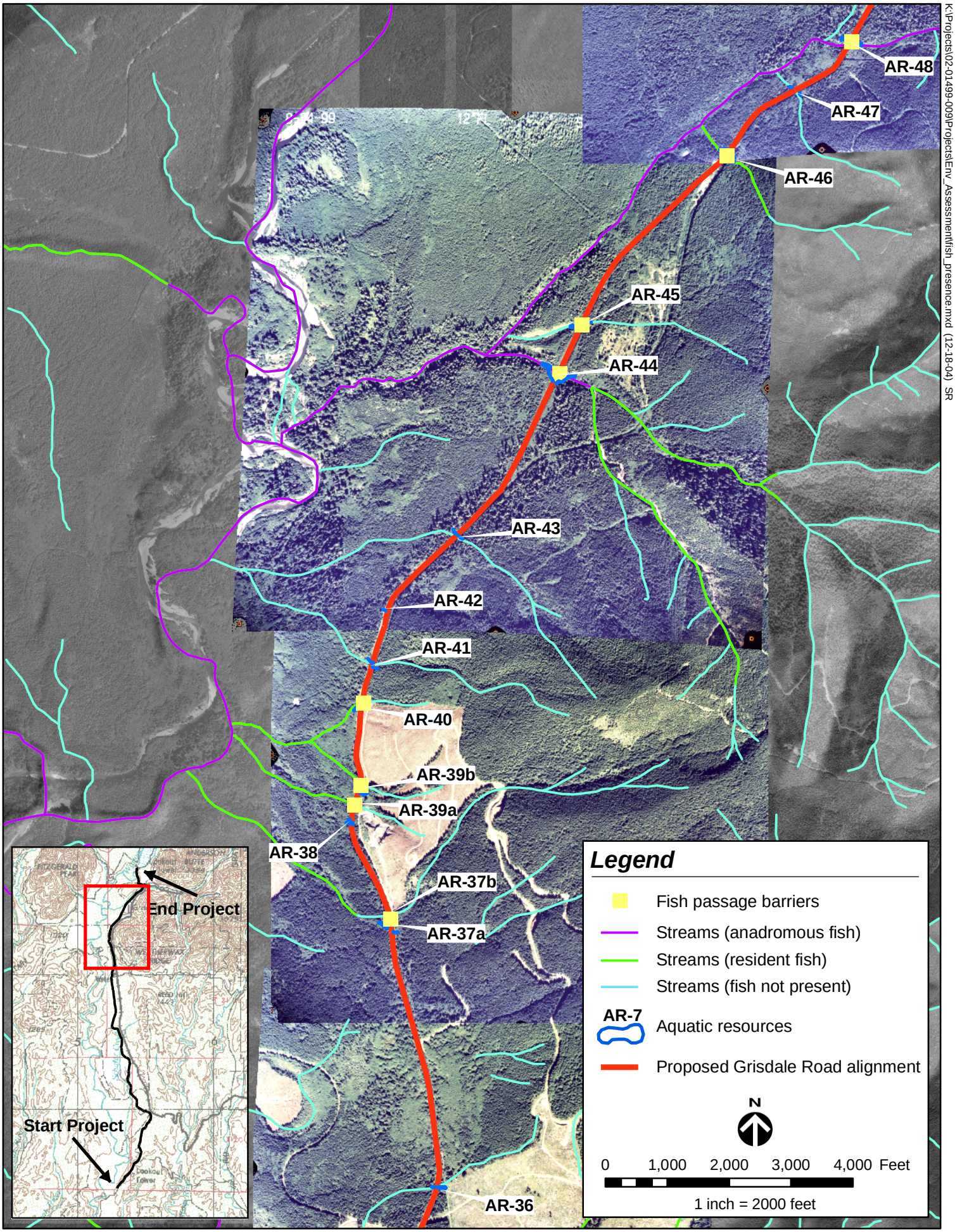

Figure 4-4, sheet 6 of 7. Fish presence and fish barriers in the vicinity of the Camp Grisdale Road project corridor, Grays Harbor County, Washington.

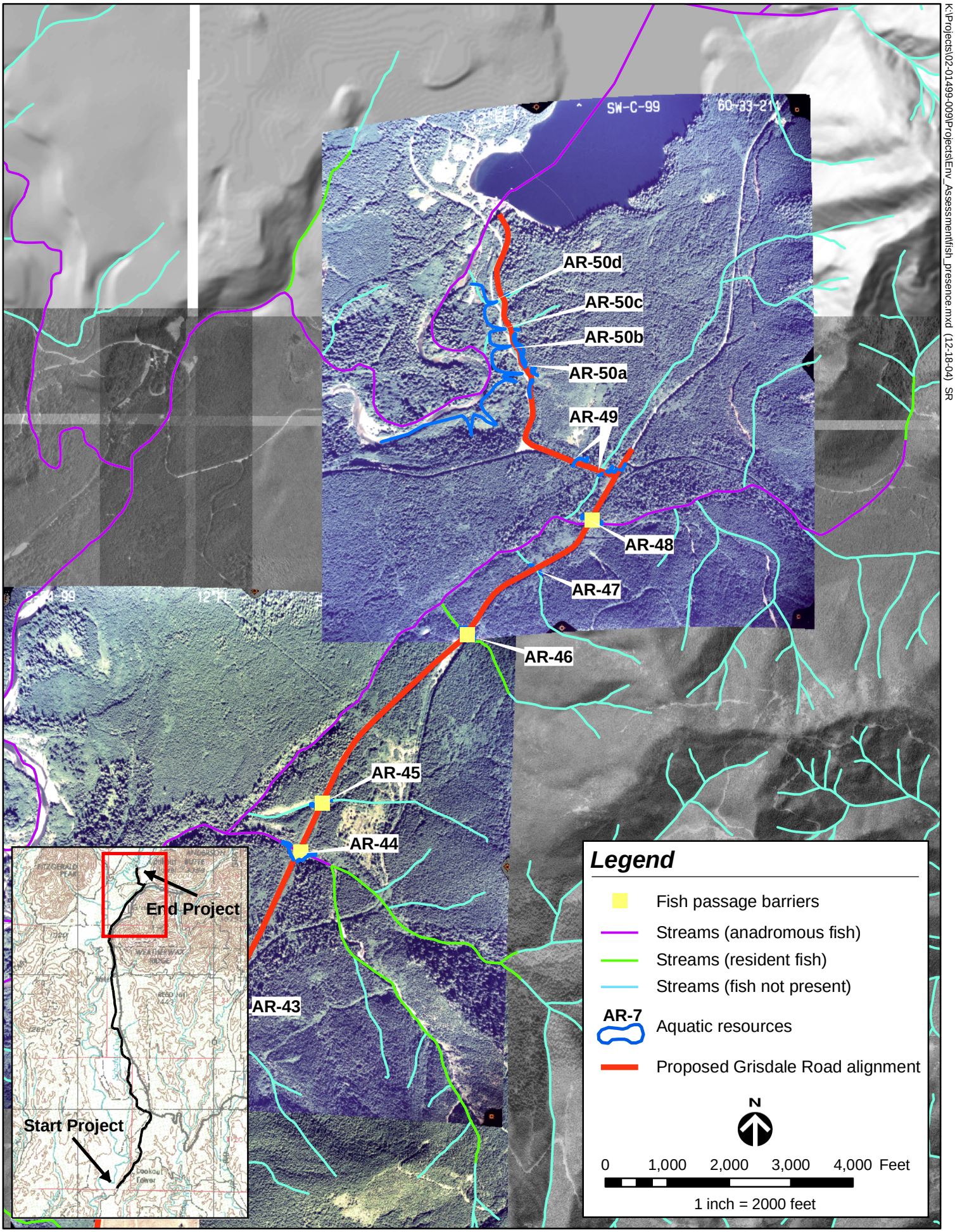

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Figure 4-4, sheet 7 of 7. Fish presence and fish barriers in the vicinity of the Camp Grisdale Road project corridor, Grays Harbor County, Washington.

Table 4-6. Listed and sensitive fish species potentially occurring in the vicinity of the Camp Grisdale Road project corridor.

Common Name	Scientific Name	Agency Status [a]				Preferred Habitat Type	Suitable Habitat in Study Area? [b] (*if yes, unit is listed*)
		NOAA Fisheries	USFWS	WDFW	Forest Service		
Olympic mudminnow	*Novumbra hubbsi*	–	–	Sensitive	D	Lotic, pond, and marsh habitat in coastal lowlands	No
Salish sucker	*Catostomus* sp.	–	–	–	S	Upper reaches of small, slow-moving streams that are clean and cold	ARs 9, 14, 19, 22, 25, 27, 35, 36, 37, 41, 43, 44, 46, 48, and 49
Chinook salmon	*Oncorhynchus tshawytscha*	–	–	–	D	Large rivers and streams for anadromous spawning, due to large body size and relatively poor leaping ability	ARs 25, 27, 35, 44, 48
Chum salmon	*Oncorhynchus keta*	–	–	–	D	Anadromous spawning closer to saltwater than other salmon species (prefers shallower, slow-running streams than other salmonids)	ARs 25, 27, 35, 44, 48
Coho salmon	*Oncorhynchus kisutch*	Candidate	–	–	D	Anadromous species spawns in clean freshwater rivers	ARs 18, 22, 25, 27, 29, 30, 35, 37, 39, 40, 44, 46, 48
Coastal cutthroat trout	*Oncorhynchus clarki clarki*	–	Proposed T	–	D	Gravelly coastal streams and estuaries	ARs 18, 22, 25, 27, 29, 30, 35, 37, 39, 40, 44, 46, 48
Bull trout	*Salvelinus confluentus*	–	T	SOC	–	Spawning habitat restricted to clear, cold, pristine streams	ARs 18, 25, 27, 35, 44, 48

[a] Agency status: E = endangered, T= threatened, SOC= species of concern, D = documented presence, S = suspected presence, SM= state monitor species.
[b] See Table 4-2.
Sources: Eder (2002), Leonard et al. (1993), USFS (2003a), USFWS (1986, 1997, 2003), WDFW (1991, 2003).

Table 4-7. Stream and fish habitat observed in the Camp Grisdale Road study area and project corridor.

Habitat Unit	Stream Name or Identification	Approximate Mileage from Start of Project Corridor	Stream Flow Type	Presence of Priority Anadromous or Resident Fish	Upstream Habitat Description [a]	Upstream Substrate Type	Downstream Habitat Description	Downstream Substrate Type	Hydrologic Condition
AR-5	Tributary to tributary of Schafer Creek (AR-6)	4.36	Intermittent	None documented	NA	NA	Low-gradient riffle and pool complexes	Organic/ gravel	Wetland becomes a stream channel downstream of road.
AR-6	Tributary to Schafer Creek (AR-25)	4.4	Perennial	None documented	Low-gradient riffle and pool complexes	Sand/silt; gravels farther upstream	Low-gradient riffle and pool complexes	Gravel/sand	Stream with associated wetland.
AR-8 [b]	Tributary to Schafer Creek (AR-25)	4.9	Intermittent	None documented	Low-gradient riffle and pool complexes	Gravel/sand	Low-gradient riffle and pool complexes	Gravel/sand	Channelized flow with associated wetland downstream of road.
AR-9	Tributary to Schafer Creek (AR-25)	5.1	Perennial	None documented	Low-gradient riffle and pool complexes	Sand/silt	Low-gradient riffle and pool complexes	Gravel/sand	Stream with associated wetland.
AR-11	Tributary to Schafer Creek (AR-25)	5.4	Perennial	None documented	Low-gradient riffle and pool complexes	Gravel/sand	Low-gradient riffle and pool complexes	Gravel/sand	Stream associated with wetland.
AR-12	Tributary to Schafer Creek (AR-25)	5.5	Perennial	None documented	Low-gradient riffle and glide	Sand/gravel	Pool at culvert outlet, then low-gradient riffle and glide	Sand/silt	Stream associated with wetland.
AR-13	Tributary to Schafer Creek (AR-25)	5.6	Perennial	None documented	Backwater pool at culvert, then low-gradient riffle	Silt/sand	Low-gradient riffle and glide	Sand/gravel	Stream associated with wetland.
AR-14	Tributary to Schafer Creek (AR-25)	5.9	Perennial	None documented	Low-gradient riffle and pool complexes with some glide features	Sand/gravel	Low-gradient riffle and pool complexes	Sand	Stream flows through clear-cut on east side of road.
AR-16a	Tributary to Schafer Creek (AR-25)	6.1	Perennial	None documented	Low-gradient riffle and glide; poorly defined channel	Silt/sand	Low-gradient riffle and glide; poorly defined channel	Silt/sand	Wetlands with two streams flowing through it.
AR-16b	Tributary to Schafer Creek (AR-25)	6.2	Perennial	None documented	Low-gradient riffle and glide; poorly defined channel	Silt/sand	Undefined wetland channel	Sand/cobble	Wetlands with two streams flowing through it.

Table 4-7. Stream and fish habitat observed in the Camp Grisdale Road study area and project corridor (continued).

Habitat Unit	Stream Name or Identification	Approximate Mileage from Start of Project Corridor	Stream Flow Type	Presence of Priority Anadromous or Resident Fish	Upstream Habitat Description [a]	Upstream Substrate Type	Downstream Habitat Description	Downstream Substrate Type	Hydrologic Condition
AR-16c	Tributary to Schafer Creek (AR-25)	6.2	Intermittent	None documented	Low-gradient riffle and glide; poorly defined channel	Silt/sand	Backwater pool at culvert, then low-gradient riffle and pool complexes	Sand/cobble	Wetland drainage and springs
AR-17	Tributary flows approximately 150 feet to Schafer Creek tributary (AR-22)	6.5	Intermittent	None documented	No defined channel; wetland conditions	Organic	Low-gradient riffle	Small gravel	Tributary flows approximately 150 feet to Schafer Creek tributary (aquatic resource [AR] 22).
AR-18	Riparian corridor of Schafer Creek tributary (AR-22) parallel to west side of road (further than 100 feet from road edge)	6.5	Perennial	Yes	Low-gradient riffle and glide; large woody debris (LWD) present	Small gravel/ cobble	Low-gradient riffle and glide; large woody debris (LWD) present	Small gravel/ cobble	Riparian corridor of Schafer Creek tributary (AR-22) parallel to west side of road (further than 100 feet from road edge).
AR-19	Major tributary to Schafer Creek tributary (AR-22)	6.6	Perennial	None documented, fish blockage at culvert	Low gradient riffle and pool complexes; LWD present	Small gravel/ cobble	Plunge pool at culvert, then low-gradient riffle and pool complexes	Small gravel/ cobble	Tributary to Schafer Creek tributary (AR-22).
AR-21[b]	Possible tributary to Major tributary to Schafer Creek (AR-22)	7.3	Perennial/ wetland drainage	None documented, fish blockage at culvert	No defined channel; wetland conditions	Organic	Low-gradient riffle flowing into braided channels in wetland	Sand/small gravel	Wetland becomes a stream channel on downstream side of road.
AR-22	Major tributary to Schafer Creek (AR-25)	7.5	Perennial	Anadromous downstream of culvert, resident above	Low-gradient riffle and pool complexes; LWD present	Small gravel/ cobble	Plunge pool at culvert, then low-gradient riffle and pool complexes	Small gravel/ cobble	Schafer Creek tributary
AR-24a and b	Tributary to Schafer Creek (AR-25)	8.0	Intermittent	NA	No defined channel; wetland conditions	Organic	Low-gradient riffle and glide; small woody debris present	Sand/small gravel	Flow within a poorly defined channel.

Table 4-7. Stream and fish habitat observed in the Camp Grisdale Road study area and project corridor (continued).

Habitat Unit	Stream Name or Identification	Approximate Mileage from Start of Project Corridor	Stream Flow Type	Presence of Priority Anadromous or Resident Fish	Upstream Habitat Description [a]	Upstream Substrate Type	Downstream Habitat Description	Downstream Substrate Type	Hydrologic Condition
AR-24c	Tributary to Schafer Creek (AR-25)	8.1	Intermittent	NA	Low-gradient riffle and pool complexes	Small gravel	Low-gradient riffle and glide; small woody debris present	Sand/small gravel	Flow within a poorly defined channel.
AR-25	Riparian corridor of Schafer Creek	8.4	Perennial	Anadromous fish downstream of culvert, resident upstream	Low-gradient riffle, plunge pool, low-gradient riffle; LWD present	Cobble/gravel	Plunge pool, then low-gradient riffle	Small gravel/ sand	Riparian corridor of Schafer Creek
AR-27	Riparian corridor of Neil Creek (tributary to Schafer Creek [AR-25])	9.2	Perennial	Resident downstream	Dam pool, low-gradient riffle, lateral scour pool, low-gradient riffle; LWD present	Sand/gravel	Plunge pool at culvert, then glide, low-gradient riffle, and pool complexes	Small gravel/ cobble	Riparian corridor of Neil Creek
AR-29	Tributary to Wynoochee River	9.9	Perennial/ wetland	Anadromous	Wetland rearing habitat	Sand/organic	Wetland rearing habitat; potential spawning habitat approximately 0.25 mile from project corridor	Sand/organic to sand/gravel	Headwater wetland provides perennial flow to stream within wetland and flows downstream
AR-30a	Tributary to Save Creek (AR-35)	10.5	Intermittent / wetland drainage	Anadromous fish downstream, none documented above (no habitat exists above)	Defined channel through wetland	Organic/gravel	Plunge pool at culvert, then glide, low-gradient riffle, and pool complexes; LWD present	Small gravel/ cobble	Open water wetland just south of the stream adds hydrology to the stream downstream of the road
AR-30b	Tributary to Save Creek (AR-35)	10.5	Intermittent	Anadromous fish downstream, none documented above	Low-gradient riffle and pools	Gravel/sand	Low-gradient riffle, and pool complexes	Gravel/sand	Unnamed stream
AR-31	Tributary to Save Creek (AR-35)	11.0	Intermittent	None documented	Low-gradient riffle and pools	Gravel/sand	Low-gradient riffle, and pool complexes	Gravel/sand	Contributes hydrology to downgradient streams
AR-35	Riparian corridor of Save Creek	11.8	Perennial	Anadromous upstream and downstream (after bridge constructed)	Low-gradient riffle, lateral scour pool, then low-gradient riffle, and pool complexes	Cobbles/small gravel	Plunge pool then low-gradient riffle, and pool complexes then low-gradient riffle, and pool complexes	Cobbles/small gravel	Riparian corridor of Save Creek.

Table 4-7. Stream and fish habitat observed in the Camp Grisdale Road study area and project corridor (continued).

Habitat Unit	Stream Name or Identification	Approximate Mileage from Start of Project Corridor	Stream Flow Type	Presence of Priority Anadromous or Resident Fish	Upstream Habitat Description [a]	Upstream Substrate Type	Downstream Habitat Description	Downstream Substrate Type	Hydrologic Condition
AR-36	Tributary to Save Creek (AR-35)	12.2	Perennial	None documented	Low-gradient riffle and glide	Silt/sand	Plunge pool then low-gradient riffle, and pool complexes then low-gradient riffle, and pool complexes	Sand/gravel	Upstream channel is poorly defined, braided wetland flow.
AR-37a	Tributary to Wynoochee River	13.0	Perennial	Resident downstream, none documented upstream	Low-gradient riffle, lateral scour pool, then low-gradient riffle, and pool complexes; LWD present	Cobbles/small gravel	Plunge pool then low-gradient riffle and pool complexes; LWD present	Cobbles/small gravel	Southern tributary flow through the wetland. These join approximately 75 feet downstream of the road.
AR-37b	Tributary to Wynoochee River	13.0	Perennial	Resident downstream, none documented upstream	High gradient riffle with small pools; LWD present	Cobbles/boulder	High-gradient riffle, then low-gradient riffle, and pool complexes	Cobbles/ boulder	Northern tributary flow through the wetland. These join approximately 75 feet downstream of the road.
AR-39a	Tributary to tributary of the Wynoochee River (AR-39b)	13.4	Perennial	Resident downstream, none documented upstream	High-gradient riffle, culvert, high-gradient riffle	Cobbles/gravel	Plunge pool, then high-gradient riffle	Cobbles/ boulder	Southern tributary flows through the wetland AR-39a joins AR-39b approximately 100 feet downstream of the road.
AR-39b	Tributary to Wynoochee River	13.4	Perennial	Resident downstream, none documented upstream	High-gradient riffle, culvert, high-gradient riffle	Cobbles/gravel	High-gradient riffle to low-gradient riffle; LWD present	Boulder/ cobbles	Northern tributary flows from springs on east side of road and possibly from west side (east side of culvert not found). Joins other tributary approximately 150 feet downstream of the road.
AR-40	Tributary to tributary to Wynoochee River (AR-39b)	13.7	Perennial	Resident downstream, none documented upstream	High-gradient riffle with small pools; LWD present	Cobbles/gravel	Cascade, then low-gradient riffle; LWD present	Boulder/ cobbles	Stream channel has very high gradient on downstream side of road.
AR-41	Tributary to tributary to Wynoochee River	13.8	Intermittent	None documented	Low-gradient riffle, culvert, low-gradient riffle; LWD present	Sand/gravel	Plunge pool, then low-gradient riffle	Gravel/ cobbles	Stream associated with wetland.

Table 4-7. Stream and fish habitat observed in the Camp Grisdale Road study area and project corridor (continued).

Habitat Unit	Stream Name or Identification	Approximate Mileage from Start of Project Corridor	Stream Flow Type	Presence of Priority Anadromous or Resident Fish	Upstream Habitat Description [a]	Upstream Substrate Type	Downstream Habitat Description	Downstream Substrate Type	Hydrologic Condition
AR-43	Tributary to tributary to Wynoochee River	14.5	Intermittent	NA	Low-gradient riffle, lateral scour pool, then low-gradient riffle, and pool complexes	Cobbles/gravel	Plunge pool, then low-gradient riffle	Sand/gravel	Stream associated with wetland.
AR-44	Major tributary to Anderson Creek (AR-48)	14.9	Intermittent	Anadromous downstream, resident upstream	Low-gradient riffle and pool complexes; LWD present	Cobbles/boulder	Low-gradient riffle, plunge pool, then low-gradient riffle	Bedrock/ gravel	Major tributary to Anderson Creek confluence approximately 150 feet from edge of FR. Asphalt pad located below downstream end of culvert.
AR-45	Tributary to Anderson Creek (AR-48)	15.1	Intermittent	None documented	High gradient riffle and pool complex; LWD present	Cobbles/gravel	High- and low-gradient riffle complex	Cobbles/ gravel	Stream associated with wetland that flows into AR-44.
AR-46	Tributary to Anderson Creek (AR-48)	15.8	Intermittent / wetland drainage	Resident upstream, no fish habitat upstream	Open-water wetland (POW) flowing to downstream channel	Silt/organic	Cascade then low-gradient riffle; LWD present	Cobbles/ gravel	Stream flow cascades on downstream side of road and is eroding hillside.
AR-47	Tributary to Anderson Creek (AR-48)	16.1	Intermittent	None documented	Low-gradient riffle, lateral scour pool, then low-gradient riffle, and plunge pool	Sand/gravel	Plunge pool, low-gradient riffle, and lateral scour pool, low-gradient riffle; LWD present	Gravel/ cobbles	Stream associated with wetland on downstream side of road.
AR-48	Riparian corridor of Anderson Creek	16.3	Intermittent	Anadromous	Low-gradient riffle and glide, poorly defined channel; LWD present	Gravel/cobbles	Plunge pool and low-gradient riffle, pool complexes; LWD present	Cobbles/ gravel	Riparian corridor of Anderson Creek. Two culverts, one appears to be high flow rates and one for low flows.
AR-49	Tributary to Anderson Creek (AR-48)	16.4	Intermittent	None documented	Low-gradient riffle and glide, poorly defined channel; LWD present	Gravel/cobbles	Plunge pool and low-gradient riffle, pool complexes; LWD present	Cobbles/ gravel	Anderson Creek tributary.
AR-50a	Tributary to Wynoochee River	17.0	Perennial	Gradient too steep fish may use lower reach at confluence with Wynoochee	Low-gradient riffle, then cascade	Cobbles/gravel	Plunge pool and high-gradient riffle; LWD present	Boulder in high-gradient riffle	Ground water seeps cascading down both sides of the road feed into stream channel downstream of road. Very steep gradient to Wynoochee River Valley below.

Table 4-7. Stream and fish habitat observed in the Camp Grisdale Road study area and project corridor (continued).

Habitat Unit	Stream Name or Identification	Approximate Mileage from Start of Project Corridor	Stream Flow Type	Presence of Priority Anadromous or Resident Fish	Upstream Habitat Description [a]	Upstream Substrate Type	Downstream Habitat Description	Downstream Substrate Type	Hydrologic Condition
AR-50b	Tributary to Wynoochee River	17.1	Perennial	Gradient too steep fish may use lower reach at confluence with Wynoochee	Roadside ditch	Silt/organic	100 foot drop to high gradient riffle/cascade pool complex	Cobble/gravel	Ground water seeps cascading down both sides of the road feed into stream channel upstream and downstream of road. Very steep gradient to Wynoochee River Valley below. Landslide area and undermined slope at culvert outlet.
AR-50c	Tributary to Wynoochee River	17.2	Intermittent	Gradient too steep fish may use lower reach at confluence with Wynoochee	Cascade/ high gradient riffle/low gradient riffle	Gravel	Culvert extends 50 feet down steep slope/ cascade/plunge pool/high gradient riffle pool complexes	Boulder/ cobble	Ground water seeps cascading down both sides of the road feed into stream channel downstream of road. Stream was dry from east side of road through culvert. Spring emerges at west end of culvert where it drains to a cascade. Flow here was from springs not the culvert. Very steep gradient to Wynoochee River Valley below.
AR-50d	Tributary to Wynoochee River	17.3	Intermittent	Gradient too steep fish may use lower reach at confluence with Wynoochee	High gradient riffle pool complexes	Boulder/cobble	Plunge pool/high gradient riffle pool complexes	Boulder/ cobble	Ground water seeps cascading down both sides of the road feed into stream channel downstream of road. Water appears to flow out of middle of culvert, culvert is broken in center. Very steep gradient to Wynoochee River Valley below. Water flows out of downstream end of culvert and springs provide additional stream flow for perennial stream downstream of culvert.

[a] Habitat descriptions are based on the methodology of McCain et al. (1990).
[b] AR-7 and AR-20 were deleted from list; no wetland or stream was determined to be in these locations.

The WDFW and the Forest Service identified fish present in 13 of the drainages (ARs 18, 22, 25, 27, 29, 30, 35, 37, 39, 40, 44, 46, 48) that cross the project corridor, including priority anadromous and resident fishes (Figure 4-4, Table 4-6). Streams within the vicinity of the project corridor that also contain priority fish include: Wynoochee River and Coal Creek. It is assumed that resident fishes such as cutthroat trout (*Oncorhynchus clarki*) may be present in all of the streams identified in the project corridor, and that some anadromous fishes not documented by WDFW or the Forest Service may occur in some of the identified streams. A discussion of federally listed fish species is provided in the threatened and endangered species section.

Field Investigation Results

Of the 46 aquatic resources, 34 were observed to have one or more surface water channels flowing through them. Several surface water channels were split into 2 to 3 tributaries; therefore, 43 stream channels cross the project corridor within 34 aquatic resources (ARs 5, 6, 8, 9, 11 through 14, 16 through 19, 21, 22, 24, 25, 27, 29, 30, 31, 35 through 37, 39 through 41, and 43 through 50) (Table 4-7). The identified streams range in size from small channels (1 to 3 feet wetted width) to major tributaries of the Wynoochee River such as Schafer Creek and Anderson Creek, which range from 10 to 25 feet in wetted width. Twenty-four of the 43 streams (more than 50 percent) had perennial flow through July 2004.

A quantitative and qualitative assessment of stream habitat character was performed within the project corridor and study area, identifying general aquatic habitat types, dominant substrate, and the presence of large woody debris. The majority of the streams were observed to have low-gradient or high-gradient riffles and alternating pool habitat within the project corridor.

The stream resources between the start of the project corridor and AR-37 (at milepost 13.0) consist of a series of low-gradient riffles and pools or glides. Streams that are north of AR-36 flow down steeper slopes, particularly on the downstream (west) side of the project corridor. These streams generally contain steeper riffle habitat than those to the south, including high-gradient riffles and cascades. The pools observed throughout the project corridor are generally small, consisting of plunge pools, in-channel pools, backwater pools, and lateral scour pools. Additionally, 15 of the 43 streams have large woody debris present in the stream channel (see Biological Resources Report [Herrera 2004c]). Many of the observed pools are small, and though large woody debris is often present, only approximately a third of the observed streams provide fair to good fish habitat.

Stream substrate types were also documented as part of the quantitative and qualitative survey of streams in the project corridor. Twenty-six percent of the streams (11 streams) have sand or silt as the dominant or secondary substrate type within the project corridor. These substrate types do not provide good fish spawning habitat. Although 26 percent of the streams were observed to have poor fish spawning substrates, 49 percent (21 streams) were observed to have potential spawning habitat present. Most of the potential spawning habitat was observed on the downstream side of the project corridor and beyond 100 feet from the centerline of the road

alignment. The qualitative stream data are presented in Table 4-7. Quantitative stream data forms are presented in the Biological Resources Report (Herrera 2004c).

Fish Passage Barriers

Figure 4-4 depicts fish presence and fish barriers in streams within the vicinity of the project corridor. Table 4-8 lists fish presence in streams within the project corridor. As discussed above, the gradients of the culverts and streams are generally less steep from the beginning of the project corridor to approximately AR-37 at milepost 13.0. After that point, the stream and culvert gradients become steeper, in some cases too steep for anadromous fish to pass. Table 4-8 provides a summary of fish habitat presence both up and downstream of culverts under Camp Grisdale Road and the potential for fish passage through them. Culverts were evaluated to determine if they would be recommended for replacement with fish-passable culverts based on the following criteria: 1) fish habitat exists both upstream and downstream of the culvert, 2) no fish passage barriers exist downstream of the culvert, and 3) the slope of the replacement culvert would be less than a 20 percent slope. Table 4-8 summarizes these conditions for each stream and provides a preliminary list of recommended fish-passable culvert replacements. The crossings located at Save Creek (AR-35) and the major tributary to Schafer Creek (AR-22) have a bridge and a fish-passable culvert, respectively.

Seventeen streams containing fish habitat have fish barriers due to perched culverts (ARs 9, 11, 19, 25, 27, 30a, 30b, 37a, 37b, 39a, 39b, 40, 41, 44, 45, 46, and 48). Table 4-8 indicates whether the gradient is too steep to make fish-passable culvert replacement at these streams feasible. There are eight of the 16 culverts being considered for replacement with fish-passable culverts at ARs 9, 11, 19, 25, 27, 30a, 30b, and 48. The other streams that had documented priority resident and/or anadromous fish presence where culverts could be replaced are not considered for replacement because fish habitat above the culvert was poor and generally too steep to warrant it.

Threatened and Endangered Species

This section discusses the federally listed threatened, endangered, candidate, and proposed wildlife and fish species that may use or have been documented within the vicinity of the project corridor. No federally listed threatened or endangered plant species are present within the vicinity of the project corridor. This section differs from the effects section for nonfederally listed species in that it follows a format for a biological assessment. The following topics are discussed for each species: status and distribution, species occurrence within the study area, designated critical habitat, potential project impacts for both the preferred and no-action alternatives, conservation measures (or mitigation measures), and a recommended effect determination.

There are two programmatic biological opinions addressing activities within the Olympic National Forest that are similar to the proposed Camp Grisdale Road reconstruction project. In 2003 the Forest Service prepared a programmatic biological assessment regarding routine Forest

Table 4-8. Fish habitat and culvert conditions observed in the Camp Grisdale Road study area and project corridor.

Habitat Unit	Stream Name or Identification	Approximate Mileage from Start of Project Corridor	Stream Flow Type	Presence of Priority Anadromous or Resident Fish	Type of Upstream Fish Habitat Available	Type of Downstream Fish Habitat Available	Culvert Is a Fish Passage Barrier [a]	Slope of Culvert for Replacement for Those That Are Fish Barriers [b]	Recommended Fish-passable Culvert Replacement [c]
AR-5	Tributary to tributary of Schafer Creek (AR-6)	4.36	Intermittent	None documented	None	Rearing habitat	No	NA	NA
AR-6	Tributary to Schafer Creek (AR-25)	4.4	Perennial	None documented	Rearing habitat	Rearing habitat	No	NA	NA
AR-8	Tributary to Schafer Creek (AR-25)	4.9	Intermittent	None documented	Rearing habitat	Rearing habitat	No	NA	NA
AR-9	Tributary to Schafer Creek (AR-25)	5.1	Perennial	None documented	Rearing and some spawning habitat	Rearing and some spawning habitat	**Yes**	< 10 %	**Yes**
AR-11	Tributary to Schafer Creek (AR-25)	5.4	Perennial	None documented	Rearing and some spawning habitat	Rearing and some spawning habitat	**Yes**	< 10 %	**Yes**
AR-12	Tributary to Schafer Creek (AR-25)	5.5	Perennial	None documented	Primarily rearing with some poor spawning habitat	Rearing habitat	No	NA	NA
AR-13	Tributary to Schafer Creek (AR-25)	5.6	Perennial	None documented	Poor fish habitat	Low-gradient riffle and glide	No	NA	NA
AR-14	Tributary to Schafer Creek (AR-25)	5.9	Perennial	None documented	Rearing habitat	Rearing and some downstream spawning habitat	No	NA	NA
AR-16a	Tributary to Schafer Creek (AR-25)	6.1	Perennial	None documented	Poor fish habitat	Poor fish habitat	No	NA	NA
AR-16b	Tributary to Schafer Creek (AR-25)	6.2	Perennial	None documented	No fish habitat	Possible rearing habitat	No	NA	NA
AR-16c	Tributary to Schafer Creek (AR-25)	6.2	Intermittent	None documented	No fish habitat	Rearing and potential spawning habitat	NA	NA	NA
AR-17	Tributary flows approximately 150 feet to Schafer Creek tributary (AR-22)	6.5	Intermittent	None documented	No fish habitat	Potential rearing habitat	NA	NA	NA
AR-18	Riparian corridor of Schafer Creek tributary (AR-22) parallel to west side of road (farther than 100 feet from road edge)	6.5	Perennial	Yes	Rearing and potential spawning habitat	Rearing and potential spawning habitat	No culvert crossing at FR 22	NA	NA

Table 4-8. Fish habitat and culvert conditions observed in the Camp Grisdale Road study area and project corridor (continued).

Habitat Unit	Stream Name or Identification	Approximate Mileage from Start of Project Corridor	Stream Flow Type	Presence of Priority Anadromous or Resident Fish	Type of Upstream Fish Habitat Available	Type of Downstream Fish Habitat Available	Culvert Is a Fish Passage Barrier [a]	Slope of Culvert for Replacement for Those That Are Fish Barriers [b]	Recommended Fish-passable Culvert Replacement [c]
AR-19	Major tributary to Schafer Creek tributary (AR-22)	6.6	Perennial	None documented, fish blockage at culvert	Rearing and some spawning habitat	Rearing and potential spawning habitat	**Yes**	< 20%	**Yes**
AR-21	Possible tributary to Major tributary to Schafer Creek (AR-22)	7.3	Perennial/ wetland drainage	None documented, fish blockage at culvert	No fish habitat	Potential rearing habitat	NA	NA	NA
AR-22	Major tributary to Schafer Creek (AR-25)	7.5	Perennial	Anadromous downstream of culvert, resident above	Rearing and some spawning habitat	Rearing and some spawning habitat	No	NA	No
AR-24a and b	Tributary to Schafer Creek (AR-25)	8.0	Intermittent	NA	No fish habitat	No fish habitat	NA	NA	NA
AR-24c	Tributary to Schafer Creek (AR-25)	8.1	Intermittent	NA	No fish habitat	Potential rearing habitat	NA	NA	NA
AR-25	Riparian corridor of Schafer Creek	8.4	Perennial	Anadromous fish downstream of culvert, resident upstream	Rearing and some spawning habitat	Rearing and some spawning habitat	**Yes**	< 20 %	**Yes**
AR-27	Riparian corridor of Neil Creek.(tributary to Schafer Creek [AR-25])	9.2	Perennial	Resident fish documented at confluence with Schafer Creek	Rearing and some spawning habitat	Rearing and some spawning habitat	**Yes**	< 20%	**Yes**
AR-29a, b, and c	Tributary to Wynoochee River	9.9	Perennial/ wetland	Anadromous	Wetland rearing habitat	Wetland rearing habitat; potential spawning habitat approximately 0.25 mile from project corridor	No	< 20 %	No
AR-30a	Tributary to Save Creek (AR-35)	10.5	Intermittent/ wetland drainage	Anadromous fish downstream, none documented above (no habitat exists above)	Potential rearing habitat	Rearing and potential spawning habitat	**Yes**	< 20 %	**Yes**
AR-30b	Tributary to Save Creek (AR- 35)	10.5	Intermittent	Anadromous fish downstream, none documented above	Rearing habitat	Rearing habitat	**Yes**	< 20 %	**Yes**
AR-31	Tributary to Save Creek (AR-35)	11.0	Intermittent	None documented	Poor fish habitat	Poor fish habitat	NA	NA	NA
AR-35	Riparian corridor of Save Creek	11.8	Perennial	Anadromous upstream and downstream (after bridge constructed)	Rearing and some spawning habitat	Rearing and some spawning habitat	No	NA	NA

Table 4-8. Fish habitat and culvert conditions observed in the Camp Grisdale Road study area and project corridor (continued).

Habitat Unit	Stream Name or Identification	Approximate Mileage from Start of Project Corridor	Stream Flow Type	Presence of Priority Anadromous or Resident Fish	Type of Upstream Fish Habitat Available	Type of Downstream Fish Habitat Available	Culvert Is a Fish Passage Barrier [a]	Slope of Culvert for Replacement for Those That Are Fish Barriers [b]	Recommended Fish-passable Culvert Replacement [c]
AR-36	Tributary to Save Creek (AR-35)	12.2	Perennial	None documented	Possible rearing habitat, poor fish habitat	Rearing habitat	No	NA	NA
AR-37a	Tributary to Wynoochee River	13.0	Perennial	Resident downstream, none documented upstream	Primarily rearing habitat	Primarily rearing habitat, potential spawning habitat more than 100 feet from project corridor where low gradient riffle is present	**Yes**	> 20 %	No (slope too steep)
AR-37b	Tributary to Wynoochee River	13.0	Perennial	Resident downstream, none documented upstream	Primarily rearing habitat	Primarily rearing habitat, potential spawning habitat more than 100 feet from project corridor where low gradient riffle is present	**Yes**	> 20 %	No (slope too steep)
AR-39a	Tributary to tributary of the Wynoochee River (AR-39b)	13.4	Perennial	Resident downstream, none documented upstream	Primarily rearing habitat	Primarily rearing habitat, potential spawning habitat more than 100 feet from project corridor where low gradient riffle is present	**Yes**	> 20 %	No (slope too steep)
AR-39b	Tributary to Wynoochee River	13.4	Perennial	Resident downstream, none documented upstream	Primarily rearing habitat	Primarily rearing habitat, potential spawning habitat more than 100 feet from project corridor where low gradient riffle is present	**Yes**	> 20 %	No (slope too steep)
AR-40	Tributary to tributary to Wynoochee River (AR-39b)	13.7	Perennial	Resident downstream, none documented upstream	Primarily rearing habitat	Primarily rearing habitat, potential spawning habitat more than 100 feet from project corridor where low gradient riffle is present	**Yes**	> 20 %	No (slope too steep)
AR-41	Tributary to tributary to Wynoochee River	13.8	Intermittent	None documented	Potential rearing habitat	Primarily rearing with some potential spawning habitat	**Yes during low water**	> 20 %	No (slope too steep)
AR-43	Tributary to tributary to Wynoochee River	14.5	Intermittent	NA	Poor fish habitat	Primarily rearing with some potential spawning habitat	NA	NA	NA
AR-44	Major tributary to Anderson Creek (AR-48)	14.9	Intermittent	Anadromous downstream, resident upstream	Primarily rearing with some potential spawning habitat	Primarily rearing with potential spawning habitat	**Yes**	> 20 %	No (slope too steep)
AR-45	Tributary to Anderson Creek (AR-48)	15.1	Intermittent	None documented	Possible rearing habitat	Primarily rearing with some potential spawning habitat	**Yes**	> 20 %	No (slope too steep)

Table 4-8. Fish habitat and culvert conditions observed in the Camp Grisdale Road study area and project corridor (continued).

Habitat Unit	Stream Name or Identification	Approximate Mileage from Start of Project Corridor	Stream Flow Type	Presence of Priority Anadromous or Resident Fish	Type of Upstream Fish Habitat Available	Type of Downstream Fish Habitat Available	Culvert Is a Fish Passage Barrier [a]	Slope of Culvert for Replacement for Those That Are Fish Barriers [b]	Recommended Fish-passable Culvert Replacement [c]
AR-46	Tributary to Anderson Creek (AR-48)	15.8	Intermittent/ wetland drainage	Resident downstream, no fish habitat upstream	No fish habitat	Primarily rearing habitat, potential spawning habitat more than 100 feet from project corridor where low gradient riffle is present	**Yes**	NA	NA
AR-47	Tributary to Anderson Creek (AR-48)	16.1	Intermittent	None documented	Primarily rearing habitat	Primarily rearing habitat, potential spawning habitat more than 100 feet from project corridor where low gradient riffle is present	No	NA	NA
AR-48	Riparian corridor of Anderson Creek	16.3	Intermittent	Anadromous	Rearing and potential spawning habitat	Rearing and potential spawning habitat	**Yes**	<20%	**Yes**
AR-49	Tributary to Anderson Creek (AR-48)	16.4	Intermittent	None documented	Poor fish habitat	Rearing and some potential spawning habitat	NA	NA	NA
AR-50a	Tributary to Wynoochee River	17.0	Perennial	Gradient too steep fish may use lower reach at confluence with Wynoochee	No fish habitat	Potential rearing habitat, no spawning habitat within 0.25 mile of edge of FR 22	NA	NA	NA
AR-50b	Tributary to Wynoochee River	17.1	Perennial	Gradient too steep fish may use lower reach at confluence with Wynoochee	No fish habitat	Potential rearing habitat, no spawning habitat within 0.25 mile of edge of FR 22	NA	NA	NA
AR-50c	Tributary to Wynoochee River	17.2	Intermittent	Gradient too steep fish may use lower reach at confluence with Wynoochee	No fish habitat	Potential rearing habitat, no spawning habitat within 0.25 mile of edge of FR 22	NA	NA	NA
AR-50d	Tributary to Wynoochee River	17.3	Intermittent	Gradient too steep fish may use lower reach at confluence with Wynoochee	No fish habitat	Potential rearing habitat, no spawning habitat within 0.25 mile of edge of FR 22	NA	NA	NA

[a] "No" indicates that culvert was not observed to be a fish passage barrier.
"NA" indicates culvert may be a fish passage barrier, but no fish habitat is available upstream of the culvert.
[b] "NA" indicates that slope of culvert may or may not be too steep for fish passage, but no fish habitat exists up stream of the culvert so it doesn't apply.
[c] "NA" indicates no fish habitat is available above culvert so recommendation for fish passable culvert is not applicable.
"No" indicates fish passage culvert is not feasible to construct.

Service management activities, including road reconstruction. NOAA Fisheries and USFWS each issued a biological opinion regarding the effects of routine land management actions on federally listed species occurring in the Olympic National Forest. These species are marbled murrelet (murrelet) (*Brachyramphus marmoratus*), northern spotted owl (spotted owl) (*Strix occidentalis caurina*), bald eagle (*Haliaeetus leucocephalus*), and bull trout (*Salvelinus confluentus*). The biological opinion also addressed effects on critical habitat for marbled murrelets and northern spotted owl.

In April 2002, the Forest Service invited the USFWS to participate in an interagency effort to develop an aquatic restoration program, with the objective of restoring access to fish habitat through culverts on federal lands in Washington and eastern Oregon where access is currently blocked by existing barriers. The Forest Service then submitted a biological assessment regarding this program in April 2003, which was revised June 12, 2003, to include additional conservation measures (USDA Forest Service 2003). The biological assessment described a proposal to replace culverts and the resulting effects on listed species and designated critical habitat in 11 national forests and one national scenic area in Washington and eastern Oregon. The USFWS and NOAA Fisheries responded with biological opinions regarding the proposed action. Detailed information regarding culvert replacement impacts and federally listed, proposed, and candidate anadromous fish species is provided in these biological opinions (USFWS 2004; NOAA Fisheries 2003) and summarized below where appropriate.

A biological assessment (Herrera 2004d) was prepared and submitted to USFWS and NOAA Fisheries, which are in the process of reviewing the BA.

Fish and Fish Habitat

Bull Trout

Status and Distribution

The Coastal-Puget Sound bull trout distinct population segment (DPS) encompasses all Pacific Coast drainages within Washington, including Puget Sound. The Coastal-Puget Sound bull trout is federally listed as threatened and is a state species of concern. This population segment is discrete because the Pacific Ocean and the crest of the Cascade Mountain range geographically segregate it from subpopulations. The population segment is significant to the species as a whole because it is thought to contain the only anadromous forms of bull trout in the contiguous United States, thus occurring in a unique ecological setting. There is currently no designated critical habitat for bull trout.

Species and Habitat Description

The bull trout occurs in four life history forms: anadromous (associated with marine waters), resident (remaining in headwater areas), adfluvial (associated with lake areas), and fluvial (associated with river areas). Fluvial, anadromous, and resident adults can spawn in the same area (WDFW 1998). After spawning, fluvial adults move throughout the upper river areas and remain in pools throughout the winter, spring, and early summer. Bull trout return to their

spawning staging areas in late summer. After spawning, anadromous adults begin the downstream migration from late fall through the winter. These adults then enter the estuary area in the spring where they remain until late spring/early summer when they begin their upstream spawning run again.

Bull trout have more specific habitat requirements than other salmonids and are most often associated with undisturbed habitat with diverse cover and structure. Spawning and rearing activities are restricted primarily to relatively pristine, cold streams, often within headwater reaches. Water temperature is also a critical factor for bull trout, and areas where water temperatures exceed 15 degrees Celsius (°C) limit their distribution (Rieman and McIntyre 1993). Spawning occurs in upstream areas as water temperature decreases to approximately 8°C (WDFW 1998).

The limiting factors affecting the bull trout include those identified in studies completed by Kerwin (1999) and Haring (2000):

- Degradation of instream and estuarine habitat
- Inadequate wood debris quantities in stream
- Floodplain degradation and development that result in disconnectivity from streambeds
- Water quality impairment due to pollutants and high temperatures
- Increase in peak flow frequency and magnitude
- Migration barriers including tide gates, culverts, and dikes.

Species Occurrence in the Project Corridor

WDFW (1998) documented presence of bull trout in the Satsop River, but not in the Wynoochee River and its tributaries. Although bull trout have not been documented in the study area and its vicinity, potential habitat does exist within the project corridor and study area (Table 4-7). Migratory bull trout may occur in other fifth-field watersheds[1] adjacent to watersheds with bull trout spawning populations. Fifth-field watersheds where migratory bull trout have the potential to occur and which contain at least some Olympic National Forest lands include the East Fork Humptulips, West Fork Humptulips, Stevens Creek, East Fork Satsop, Middle Fork Satsop, West Fork Satsop, Upper Wishkah, Middle Wynoochee, and Lower Wynoochee. With the exception of the Satsop watershed, no bull trout have ever been observed on national forest lands within these watersheds (USFWS 2003b). Focused bull trout surveys within the Satsop watershed have failed to detect bull trout in recent years (USFWS 2003).

[1] 5th field watersheds are those that are approximately 24,700 to 49,400 acres. They are based on a standardized hydrologic unit system, referred to as the Hydrologic Unit Code (HUC) system, that was developed in the mid-1970s by the U.S. Geological Survey (USGS) under the sponsorship of the Water Resources Council.

Critical Habitat

Critical habitat has not been proposed or designated for the Coastal-Puget Sound bull trout distinct population segment. If critical habitat is designated by the service within the action area prior to construction of this proposed action, FHWA will reinitiate consultation with the service to satisfy the ESA Section 7 requirements of the act.

Coastal Cutthroat Trout

Status and Distribution

Coastal cutthroat trout that occur in the Wynoochee are part of the Chehalis watershed that falls within the Southwestern Washington/Lower Columbia River *evolutionarily significant unit* (ESU). The coastal cutthroat trout in this ESU are federally proposed for threatened status. The proposed boundaries of this unit are similar to the Southwestern Washington/Lower Columbia River ESU for coho salmon and extend upstream in the Columbia River to Celilo Falls. Support for this ESU designation comes primarily from ecological and genetic information. Ecological characteristics of this region include the presence of extensive intertidal mud and sandflats, similarities in freshwater and estuarine fish faunas, and substantial differences from estuaries north of Grays Harbor and south of the Columbia River. The coastal cutthroat trout samples from southwestern Washington show a relatively close genetic similarity to samples from the Columbia River.

According to the Washington Department of Fish and Wildlife, the southwestern Washington-lower Columbia River region historically supported healthy and highly productive coastal cutthroat trout populations (Johnson et al. 1999). Coastal cutthroat trout, especially the freshwater forms, may still be widely distributed in most river basins in this region, although probably in numbers lower than historical population sizes. Severe habitat degradation throughout the Lower Columbia River area has contributed to dramatic declines in anadromous coastal cutthroat trout populations and two near extinctions of anadromous runs in the Hood and Sandy rivers. In the southwestern Washington portion of this ESU, trends in anadromous adults and out-migrating smolts are all declining. Returns of both naturally- and hatchery-produced coastal cutthroat trout in almost all Lower Columbia River streams have been declining markedly for the last 10 to 15 years. The status review of the coastal cutthroat trout in the Southwestern Washington/Columbia River ESU concluded that they were likely to become endangered in the foreseeable future (Johnson et al. 1999).

Species and Habitat Description

The diversity of migratory behaviors in coastal cutthroat trout makes identification of fish life-history form particularly challenging. One way to separate coastal cutthroat trout into population groupings is to classify them by the physical locations where they are caught (e.g., Wyatt 1959, Tomasson 1978, June 1981, Moring et al. 1986). These classifications, however, are somewhat arbitrary as fish may move from one area to another (Northcote 1997a). Consequently, the location and timing of sampling *may affect* which life-history category migratory individuals are chosen to represent (Fausch and Young 1995). For instance, coastal cutthroat trout believed to

be freshwater forms one year may migrate to sea another year (e.g., some fish do not make their initial migration to sea until age 6 (Sumner 1962, Giger 1972) and some sea-run cutthroat trout may not enter saltwater every year after their initial smolt migration, but may instead stay in fresh water (Tomasson 1978).

There are three general life-history forms of coastal cutthroat trout:

- **Nonmigratory coastal cutthroat trout—**This life-history form includes fish generally found in small streams and headwater tributaries near spawning and rearing areas. These fish typically undertake only small-scale migrations and maintain relatively small home territories compared to forms that make more extensive migrations. In general, nonmigratory coastal cutthroat trout appear to grow more slowly than other life-history forms of trout (Tomasson 1978; Trotter 1989), are smaller at maturity (seldom larger than 150 to 200 mm in length), and rarely live longer than 2 to 3 years (Wyatt 1959; Nicholas 1978a, June 1981). However, as Nicholas (1981) points out, the lack of older fishes in his study may be due not only to age-dependent mortality, but also to scale aging problems or out-migration of older, larger fishes from the study area.

- **Freshwater-migratory coastal cutthroat trout—**This freshwater or potamodromous life-history form includes fish that migrate entirely within fresh water (e.g., Myers 1949; Tomasson 1978). A variety of distinctive population migrations are frequently recognized within this general classification, including populations that migrate from large tributaries to small tributaries to spawn (fluvial-adfluvial), populations that inhabit lakes and migrate upstream to spawn in the lake inlet (lacustrine-adfluvial), and populations that live in lakes and migrate downstream to spawn in the lake outlet (allucustrine) (Varley and Gresswell 1988; Trotter 1991). These freshwater-migratory populations are best documented in rivers and lakes with physical barriers to anadromous fish. River-migrating coastal cutthroat trout have also been reported as schooling in large streams above migration barriers in southwest Oregon.

- **Saltwater-migratory coastal cutthroat trout—**The juvenile fish migrate from freshwater natal areas in the late winter and spring to feed in marine environments (estuarine or nearshore) during the summer. They then enter fresh water in the winter to feed, seek refuge, or spawn, typically returning to sea water in the spring.

Anadromous cutthroat trout spawning typically starts in December and continues through June, with peak spawning in February (reviewed in Pauley et al. 1989; Trotter 1989). Redds are primarily built in the tailouts of pools in streams with low stream gradient and low flows, usually less than 11 ft^3/s during the summer (Johnston 1982). Generally, spawning occurs upstream of coho salmon and steelhead spawning zones, although some overlap may occur (Lowry 1965;

Edie 1975; Johnston 1982). It is believed that the spawning of coastal cutthroat trout in small tributaries at the upper limit of spawning and rearing sites of coho salmon and steelhead has evolved to reduce competition for suitable spawning sites and reduce competitive interactions between young-of-the-year coastal cutthroat trout and other salmonids.

Eggs begin to hatch within 6 to 7 weeks of spawning, depending on temperature; alevins emerge as fry between March and June, with peak emergence in mid-April (Giger 1972; Scott and Crossman 1973). At emergence, fry quickly migrate to channel margins and backwaters, where they remain throughout the summer (Glova and Mason 1976; Moore and Gregory 1988). Coastal cutthroat trout are found in streams with channel gradients that vary from low (<2 percent) to moderate (2–3 percent) or steep (>4 percent), with narrow widths (2 – 10 feet) (Hartman and Gill 1968; Edie 1975; Glova 1978; Moore and Gregory 1988; Jones and Seifert 1997), and often in small watersheds with drainage areas under 5 square miles (Hartman and Gill 1968).

Species Occurrence in the Project Corridor

Streams that have documented occurrences of coastal cutthroat trout (USDA Forest Service 2004a) include the following (see Tables 4-1, 4-6, and 4-8):

- Wynoochee River
- Schafer Creek (AR-48 and AR-25) downstream of the project corridor
- Schafer Creek tributary (AR-22) downstream of the project corridor
- Neil Creek (AR-27) near confluence with Schafer Creek, but not at project corridor
- Save Creek (AR-35)
- Wynoochee River tributaries (AR-29, AR-30a and 30b, AR-37a and 37b, and AR-39a and 39b) downstream of project corridor
- Tributary to AR-39b tributary to Wynoochee River (AR-40) downstream of project corridor
- Anderson Creek (AR-44)
- Anderson Creek tributary (AR-46) downstream of project corridor
- Anderson Creek (AR-48).

The Wynoochee River is located 2 to 4 miles to the west of the project corridor. The other streams listed above cross the project corridor and eventually drain to the Wynoochee River. Table 4-8 shows presence of priority anadromous fishes.

Critical Habitat

There is no critical habitat designated for coastal cutthroat trout, because its status is proposed.

Coho Salmon

Status and Distribution

On July 25, 1995, the National Marine Fisheries Service determined that listing coho salmon was not warranted for the Puget Sound/Strait of Georgia ESU. However, the Puget Sound/Strait of Georgia coho is currently designated as a candidate for listing because of concerns over specific risk factors. The NOAA Fisheries is the lead regulatory agency for this candidacy under the Endangered Species Act.

The Puget Sound/Strait of Georgia ESU includes all naturally spawned populations of coho salmon from drainages of Puget Sound and Hood Canal, the eastern Olympic Peninsula (east of Salt Creek), and the Strait of Georgia from the eastern side of Vancouver Island and the British Columbia mainland (north to and including the Campbell and Powell rivers), excluding the upper Fraser River above Hope, British Columbia. The following Washington state counties lie partially or wholly within basins containing coho: Clallam, Grays Harbor, Island, Jefferson, King, Kitsap, Kittitas, Lewis, Mason, Pierce, San Juan, Skagit, Snohomish, Thurston, and Whatcom.

Coho salmon support an important commercial and recreational fishery. Coho population declines are attributed to environmental degradation and habitat changes. Logging, agriculture, urban development, and dams cause severe chemical and physical changes to the stream environment, resulting in a high mortality of coho salmon from egg to 1-year smolt.

The limiting factors affecting the Puget Sound/Strait of Georgia coho salmon are the same as those described for bull trout. Because bull trout is the most sensitive of the salmonids addressed here, it is assumed that limiting factors for bull trout are less limiting for more tolerant salmonid species such as coho salmon.

The 1992 Washington state salmon and steelhead stock inventory (SASSI) identifies the presence of 46 coho stocks within the Puget Sound/Strait of Georgia ESU. Twenty of those stocks are classified as healthy, 16 are depressed, one is critical (Discovery Bay coho), and the status of nine is currently unknown.

Species and Habitat Description

The coho salmon is an anadromous species found in many coastal streams. In general, river entry and spawn timing show considerable spatial and temporal variability. Despite this high variability, some regional patterns have been observed. Most Pacific coast coho salmon enter rivers in October and spawn from November through December and occasionally into January (Weitkamp et al. 1995). Coho typically spawn in relatively shallow water (0.59 feet deep), in small streams that are fast-flowing (0.98 to 1.6 feet per second) (Laufle et al. 1986; Emmet et al.

1991). Spawning occurs in riffles with stable gravel substrates ranging in size from 0.4 to 7.9 inches, with less than 30 percent fine-grained sediment (Reeves et al. 1989).

Early rearing habitat consists of shallow areas associated with backwater pools, beaver ponds, or side channels (Reeves et al. 1989). Beaver ponds and pools of all types are preferred for summer rearing (Laufle et al. 1986; Reeves et al. 1989). Overwinter habitat includes streams having mean temperatures below 44.6°F and abundant cover, mainly large woody debris (Reeves et al. 1989). Optimal rearing habitat contains a mixture of riffles and pools, abundant instream and streamside vegetation, and water temperatures that average 50°F to 59°F in summer (Laufle et al. 1986). Summer streamflows are an important factor in the survival of coho salmon (Emmet et al. 1991).

Species Occurrence in the Study Area

Streams in the study area that have documented occurrences of coho (USDA Forest Service 2004a) include the following (see Table 4-6):

- Wynoochee River
- Schafer Creek (AR-18 and AR-25) downstream of the project corridor
- Schafer Creek tributary (AR-22) downstream of the project corridor
- Neil Creek (AR-27) near confluence with Schafer Creek, but not at project corridor
- Save Creek tributaries (AR-29 and AR-30a and 30b) downstream of project corridor
- Save Creek (AR-35)
- Anderson Creek (AR-44)
- Anderson Creek tributary (AR-46) downstream of project corridor
- Anderson Creek (AR-48).

The Wynoochee River is located 2 to 4 miles to the west of the project corridor. The other streams listed above cross the project corridor and eventually drain to the Wynoochee River.

Critical Habitat

No coho salmon critical habitat is designated or proposed at this time.

Essential Fish Habitat

The Pacific Fishery Management Council, with the concurrence of the secretary of commerce, defines *essential fish habitat* for freshwater salmon as "the aquatic component of streams, lakes, ponds, wetlands, and other water bodies currently or historically accessible to chinook, coho, or Puget Sound pink salmon (*O. gorbuscha*) (except above certain impassable barriers) in Washington, Oregon, Idaho, and California identified by USGS hydrologic units" (PFMC 1999). This includes the waters and benthos necessary to a species' spawning, breeding, feeding, or growth to maturity.

The Magnuson-Stevens Fishery Conservation and Management Act (as amended through October 11, 1996) includes a mandate that the National Marine Fisheries Service identify essential fish habitat for federally managed marine fishes. The mandate also requires federal agencies to consult with the National Marine Fisheries Service regarding all activities or proposed activities that are authorized, funded, or undertaken by the agency that may adversely affect essential fish habitat.

There are 83 marine species managed by the National Marine Fisheries Service for which essential fish habitat is considered, including chinook, coho, and chum salmon stocks in Washington, Oregon, Idaho, and California, as well as pink salmon stocks of Puget Sound (PFMC 1999).

Wildlife

Marbled Murrelet

Status and Distribution

On October 1, 1992, USFWS published a Federal Register listing the murrelet as a threatened species in Washington, Oregon, and northern California, effective September 28, 1992 (57 FR 45328) (USDI 1992). Excessive harvest of late-successional and old-growth forests, the habitat preferred for nesting by murrelets, was the primary reason for the listing. Other factors include high predation rates, mortality in gillnets, and oil-spill mortality. The recovery team that developed the Marbled Murrelet Recovery Plan (USDI 1997) estimated that the population was declining at annual rates of between 4 and 12 percent. The recovery team believes that possible reasons for the decline in numbers of murrelets include the species' low reproductive rate, its dependence on older forests (that are now scarce and heavily fragmented) for nesting, and adult mortality due to entanglement in gill nets and encounters with oil spills.

The murrelet ranges from the Aleutian archipelago to central California. The distribution of murrelets becomes more disjunct at the southern extreme of their range. Murrelets are generally found in near-shore ocean waters but come inland to nest in forests. Murrelet nests are not evenly distributed between the coast and the inland extremes of their range (up to 55 miles from marine waters in Washington state), but are observed most often within about 19 miles of the ocean. In marine environments, there are distinct gaps between breeding populations that are thought to relate to availability of onshore nesting habitat. The total population of the subspecies

was recently estimated at 300,000 individuals, with about 85 percent of this estimate concentrated along the Gulf of Alaska and Prince William Sound (WDNR 1997). The population size of the murrelets in Washington, Oregon, and California has been estimated at 18,550 to 32,000 (Ralph et al. 1995).

Species and Habitat Description

The murrelet is a small seabird of the family Alcidae in the order Charadriiformes. The marbled murrelet species was recently split so that there is now the marbled murrelet in North America (*B. marmoratus*) and the long-billed murrelet in Asia (*B. perdix*). Murrelet nesting habitat is generally considered to be old growth or mature trees within about 55 miles of marine environments. In an analysis of Pacific Northwest nest sites, the mean elevation was 1,089 feet and the mean distance to the coast was 10 miles (Nelson and Hamer 1995). All nests found were below 3,600 feet in elevation. Most nest stands were within 19 miles of marine waters and all were within 25 miles. However, occupied behaviors have been documented much further inland. In Washington, 36 percent of occupied stands are more than 29 miles from marine water, with the farthest being 52.2 miles inland.

The marbled murrelet prefers to nest in mature to old-growth coniferous stands, or those younger stands with interspersed large trees which may provide nesting opportunities. Mated pairs typically lay a single egg on a naturally occurring platform formed by the wide (typically 7 inches in diameter or greater), mossy limbs of an old-growth tree, usually 100 feet or more above ground and that have canopy cover above. The single egg hatches within 28 days, and chicks fledge at 35 to 40 days. Upon fledging, the chicks immediately fly to marine waters to begin feeding on small fishes and other aquatic animals. The breeding period in Washington is estimated to last from April 1 to September 15. The early and late breeding seasons are from April 1 to August 5, and August 6 to September 15, respectively (USFWS 2003b). Almost all chicks in Washington are hatched by August 6. Nest success appears to be quite low and predation on eggs and chicks is the major reason (USFWS 2003b). Nests located near forest edges appear to be much more susceptible to predation, especially by corvids.

Adults fly to marine waters to obtain food for the chicks and return to the inland nest. Feedings of the young occurs most frequently at dawn or dusk. Adult marbled murrelets approach and leave their nests at high speed, primarily at dusk and dawn or at night, making nest detection difficult.

Species Occurrence in the Project Corridor

Historically, marbled murrelets have been observed occupying old growth conifer stands on Olympic National Forest land from 0.5 miles and greater distances to the east and west of the project corridor (USDA Forest Service 2004b; WDFW 2004). Occupancy is determined by visually observing murrelets below the tallest canopy within a site.

Two additional marbled murrelet occupied sites, Sites MM-C and MM-D, were found to occur along the project corridor in addition to Site MM-F. The forest habitat within these sites starts

within 30 feet of the edge of the existing Camp Grisdale Road (see detailed maps of occupied marbled murrelet sites in the Biological Resources Report (Herrera 2004c). Sites MM-C and MM-D were surveyed this year (spring 2004) and were determined to be occupied. Site MM-F was historically determined to be occupied through Forest Service surveys. Marbled murrelets were also detected above the canopy at Site MM-A, located in the southern 1.5 miles of the project corridor. Additional surveying in 2005 will be required to determine if this site is occupied.

Critical Habitat

Critical habitat for marbled murrelet was designated in 1996. Critical habitat is defined in section 3(5)(A) of the Endangered Species Act as "(i) the specific areas within the geological area occupied by the species, at the time it is listed … on which are found those physical and biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and (ii) specific areas outside the geological area occupied by a species at the time it is listed…upon a determination…that such areas are essential for the conservation of the species."

The Olympic National Forest contains 411,900 acres of designated marbled murrelet habitat within four units (WA-01, WA-02, WA-03, and WA-06). The amount of suitable habitat within these critical habitat units is 262,074 acres. A portion of the unit WA-03 is located within the project corridor in the northern portion. Critical habitat unit WA-03 is entirely in federal ownership, comprising two LSRs—Quinault South LSR 103 and South Hood Canal LSR 104. Approximately 40 acres of critical habitat is located within the project corridor.

All marbled murrelet critical habitat units are expected to provide suitable habitat for population support; some are designated primarily for connectivity, and many are expected to provide both functions. USFWS (2003b) has determined that the physical and biological habitat features associated with the terrestrial environment that support nesting, roosting, and other normal behaviors (referred to as primary constituent elements of critical habitat) are essential to the conservation of the murrelet and require special management considerations.

The specific primary constituent elements identified for the murrelet are individual trees with potential nesting platforms, including forested areas within 0.5 mile of individual trees with potential nesting platforms, and a canopy height of at least one-half the site-potential tree height. These primary constituent elements are deemed essential for providing suitable nesting habitat for successful reproduction of the marbled murrelet.

Spotted Owl

Status and Distribution

The northern spotted owl was listed by the USFWS as a threatened species in 1990 (Fed. Reg. Vol. 55) and has been listed as endangered by Washington state since 1999 (WAC 2323-12-014). The survival of spotted owl throughout its range is dependent upon adequate, well-distributed

nesting, roosting and foraging habitat (described below). Because of this species' dependence upon old-growth and late-successional forests, the historic and continued loss of these habitats throughout its range as a result of timber harvest and development has contributed to its decline.

The northern spotted owl inhabits conifer and mixed conifer-hardwood forests over a range extending from British Columbia through Washington and Oregon, south to San Francisco Bay. Spotted owl inhabits forest dominated by Douglas-fir (*Pseudotsuga menziesii*) and western hemlock (*Tsuga heterophylla*) in coastal areas of Washington and Oregon. At higher altitudes on the west slope of the Cascade mountain range, owls commonly use forests stands containing Pacific silver fir (*Abies amabilis*) (FR Vol. 57, No. 10). On the east side of the Cascades, typical owl-occupied stands may include grand fir (*Abies grandis*) or ponderosa pine (*Pinus ponderosa*).

Species and Habitat Description

The spotted owl is a medium sized, round-headed nocturnal owl with dark eyes and dark brown plumage with white spots on the head, neck, and back, and white mottling on the breast and abdomen (USFWS 2004c). The adult female is typically larger than the male (FR Vol. 53 No. 123). Spotted owls reach maturity during their third winter and live an average of eight years (Thomas et al. 1990).

Long-term pair bonds are usually formed at the end of winter. Approximately half of spotted owl pairs initiate nesting in a given year, and nesting success depends on availability of prey, the male's hunting effectiveness, and the physiological condition of the female. The sensitive breeding season for spotted owl is for the period March 1 through September 30, and the early breeding season is from March 1 through July 15. Successful pairs typically lay one or two eggs in March or April. Owlets hatch in approximately 30 days, remain as nestlings for 3 to 5 weeks, and depend on their parents for food until they fledge and disperse in September or October (Thomas et al. 1990). Juveniles usually disperse 62 miles or less from the nest site. When spotted owl juveniles cross open or fragmented habitats, they are more vulnerable to their primary predator, the great horned owl. The adults separate for the winter. Spotted owls typically hunt by perching on low branches and locating prey by sight or sound. They then pounce on their prey item, capturing it with their talons. Their diet is primarily composed of flying squirrels and other small mammals, though it can include small birds and insects.

Northern spotted owls have large home ranges and utilize large tracts of forest containing suitable habitat (described below) to meet their biological needs. Median annual pair home range sizes vary from 9,000 acres on the Olympic Peninsula to 3,000 acres in the Oregon Cascades.

Spotted owl habitat consists of four components: 1) nesting, 2) roosting, 3) foraging, and 4) dispersal. However, suitable habitat usually refers to the nesting, roosting, and occasionally the foraging portion of the habitat used by spotted owls. Nesting and roosting habitat typically exhibits the following characteristics: high canopy closure (60 to 80 percent); multi-layered, multi-species canopy; large overstory trees (30 inches or more diameter at breast height); high incidence of large trees with cavities and deformities; snags; large accumulations of woody

debris; and sufficient open space below the canopy for owls to fly (Thomas et al. 1990). These habitat characteristics are usually present in old growth habitats, but in Washington and Oregon conifer forests may start developing these characteristics 80-120 years after clear cutting (Natureserve 2004). Owls use a broader array of forest types for foraging and dispersal, including fragments and more open habitats, although less is known about these habitats. Foraging habitat is highly variable across the range of the owl depending upon forest structure and prey availability (FR Vol. 57 No. 10). Dispersal habitats provide linkage and connectivity between owl subpopulations and consist of stands with adequate tree size and canopy closure to provide protection from avian predators and some foraging potential (FR Vol. 57, No. 10).

Species Occurrence in the Project Corridor

Based on Priority Habitats and Species database information (WDFW 2004), historically there were spotted owls present in the vicinity of the proposed corridor. Historic spotted owl nests and habitat were identified both on Olympic National Forest and Green Diamond Resource Company property.

Though suitable habitat is present in several stands along the road corridor, findings from the first year of surveys that were completed in 2004 identified no spotted owls in the vicinity of the project corridor. Numerous barred owls were identified in the vicinity of the proposed project. Barred owls were observed at the following spotted owl sites along the project corridor: SO-C, SO-D, SO-E, and SO-F. When barred owls and spotted owls come into contact, it is believed that barred owls, a more aggressive species, will out-compete spotted owls for habitat (Smith et al. 1997). Barred and spotted owls have been found to interbreed, but more often barred owls prey on spotted owls.

Critical Habitat

In order to protect remaining critical late-successional and old-growth forest habitat for the spotted owl, and to reduce fragmentation, the USFWS designated several critical habitat units in 1991 (FR Vol. 57, No. 10). There are eleven critical habitat areas located on the Olympic Peninsula, but no critical habitat lies within one mile of the proposed project.

In 1996, via a proposed special 4(D) rule under the Endangered Species Act, the USFWS sought to establish six northern *special emphasis areas* (SEA) in Washington state in which incidental *take* prohibitions would continue to apply. The areas proposed by USFWS were designed to protect spotted owl habitat on nonfederal lands and were similar to the 10 *spotted owl special emphasis areas* (SOSEA) proposed by the Washington Forest Practices Board (FR Vol. 61, No. 92). The closest of these special emphasis areas are the Hoh-Clearwater coastal link and the Mineral Block link, which lie over 20 miles to the north and east of the project corridor, respectively. No designated special emphasis areas or spotted owl special emphasis areas lie within one mile of the proposed project.

Bald Eagle

Status and Distribution

The bald eagle is currently listed as a threatened species under the Endangered Species Act. Historically, bald eagles inhabited most of the continental United States. However, by the mid-twentieth century, they were limited to a few isolated areas such as the Pacific Northwest, the Great Lakes states, and Florida.

Species and Habitat Description

In the Pacific Northwest, bald eagle populations include local nesting birds and wintering birds. Bald eagles typically breed between January 1 and August 15 in Washington state (Anthony et al. 1982). Wintering bald eagles congregate along Washington rivers between October 31 and March 15 to feed on stranded, spawned-out salmon. Wide, braided river reaches with numerous gravel bars are the optimal areas for feeding because the gravel bars catch and retain salmon carcasses and provide the eagles with unrestricted flight paths. Diurnal feeding perches selected by eagles tend to be the highest perch site overlooking a good food source. Nocturnal communal perches, on the other hand, tend to be in mature conifer stands that offer protection from cold and inclement weather.

Species Occurrence in the Project Corridor

Bald eagle nests have not been documented in the project corridor. The closest documented nest is located on the west side of Wynoochee Lake north of the project corridor. Although there are a few large stream valleys along the corridor (Anderson, Save, and Schafer Creeks), they are within relatively steep ravines within 0.25 mile of the project corridor and they provide only marginal habitat for bald eagle compared to the floodplains of the Wynoochee River, where open foraging habitat in the river is available. Therefore, while bald eagles may perch or fly over the project corridor, they are unlikely to use the habitat for nesting, foraging, and roosting. According to the Olympic National Forest wildlife biologist for the Hood River District, no sites for wintering bald eagles may be present in the vicinity of the project corridor (Marable 2004 personal communication).

Critical Habitat

There is no designated critical habitat for bald eagle.

Land Use

The Camp Grisdale project corridor is located in an area used primarily for timber production and recreation. Land cover within the project corridor is primarily coniferous forest land (69 percent), with areas of recent clearcuts (within the last 5 years) (15 percent), mixed coniferous (11 percent), and deciduous forest (5 percent).

The corridor has no adjacent residences or active permanent commercial operations. There is an abandoned logging facility, Camp Grisdale, for which the road is named. It is located adjacent to the road right-of-way, on the east side of the road, from milepost 15 to 15.8. The abandoned camp site extends from the Camp Grisdale road right-of-way to the toe of the slopes located to the east, for a distance of approximately 2,000 feet. There is one privately owned rural property located approximately 0.25 to 0.5 mile west of the very southern tip of the project corridor (on the Wynoochee floodplain). Access to this property is from the Wynoochee Valley Road. Approximately 90 percent of the project corridor is owned by Diamond Green Resource Company, and the remaining 10 percent belongs to the Forest Service.

The Forest Service owns the easement for Camp Grisdale Road where it passes through Green Diamond Resource Company holdings as well as in the ONF. The easement is 100 feet wide, of which 32 feet is road, road prism fill, and ditch, leaving approximately 68 feet of vegetation distributed on either side.

Land Use Plans

There are two land use plans affecting the Camp Grisdale Project Corridor. Private lands are currently regulated by Title 17 Zoning of the Grays Harbor County Comprehensive Zoning Ordinance (Grays Harbor 2003). The Grays Harbor County Comprehensive Plan was written in 1962 and is currently being updated and is not yet available for public review (Shea 2004 personal communication). Areas of the project corridor located in the ONF are managed under the Northwest Forest Plan.

Grays Harbor County Comprehensive Zoning Ordinance

All non-federal lands in the project corridor are located in the General 2 (G2) zoning district, which is a general development zone classification that permits a wide range of uses. The minimum lot size is 5 acres, or 1/128th of a section, and one dwelling unit per lot is allowed in the G2 district.

The following other uses or activities are permitted within the G2 District:

- Agricultural uses and associated uses of a rural nature including road-side stands for the sale of agricultural products, the majority of which are locally grown
- Public and semi-public uses, including schools, churches, museums and cemeteries
- The growing and harvesting of forest products, silviculture uses and associated uses of a rural nature
- Surface excavations regulated under GHCC Sections 17.60.090 through 17.60.180

- Dams, electric power plants, flowage areas, transmission lines and stations together with necessary accessory buildings
- Game and fish rearing and management
- Riding academies
- Parking, repairing, maintaining one heavy truck as an accessory use to a residence where the person operating the truck resides on the property where the truck is to be parked
- Temporary fireworks stands regulated under Chapter 70.77 RCW and WAC 122-17
- Home day cares
- Public and semi-public parks, including sports fields.

Northwest Forest Plan

Olympic National Forest has an area of approximately 632,300 acres. Under the Northwest Forest Plan, federal land that is in the project area falls into three principal categories. These are described below.

1. Congressionally Withdrawn Areas include the Forest's five wildernesses and the Quinault Research Natural Area, with a total area of about 89,900 acres.

2. Late-Successional Reserves. The Northwest Forest Plan provides a network of late successional reserves to maintain late successional and old-growth species habitat within ecosystems on federal lands for the long-term viability of affiliated species. Portions of the Camp Grisdale Road study area are located within the Quinault late successional reserve (Quinault North-RW 102 and Quinault South-RW 103) in the Quinault Ranger District, Olympic National Forest. This is part of a larger network of late successional forest, including the adjacent Olympic National Park Colonel Bob Wilderness, Quinault Recreation Area, Quinault Research Natural Area, and Hood Canal South late successional reserve).

3. The Adaptive Management Area (AMA): The remainder of the Forest is included in the Olympic Adaptive Management Area, which is used to develop and test management approaches which meet ecological, economic, and social objectives. The AMA totals about 125,000 acres. Approximately 51,000 acres of the Olympic AMA is available for conducting these ecosystem management experiments. The probable timber sale quantity (PSQ) is estimated to be between 8 to 10 million board feet annually.

Approximately 65,000 acres are designated riparian reserves to maintain suitable habitat for fish. Forest Plan administrative withdrawals (2,000 acres) and areas unsuitable for timber production (7,000 acres) make up the balance.

Consistency with Northwest Forest Plan

The Northwest Forest Plan provides guidelines for the Forest Highway Program, which requires data collection and impact analysis of plants and animals protected by the plan. As part of the Northwest Forest Plan guidelines for natural area protection, compliance with the following Aquatic Conservation Strategy Objectives (ACSOs) is required.

1. Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted.

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

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

4. Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.

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

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

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

8. Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.

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

Mitigation measures proposed under the water resources, floodplains, wetlands, vegetation, wildlife, fish and fish habitat, and threatened and endangered species section of this Environmental Assessment address some or all of these ACSOs. Each of these objectives are expected, in the long term, to be maintained or improved after project completion, indicating compliance with the ACSOs.

Socioeconomics

The project setting is rural and contains very limited business or service activities. Camp Grisdale Road is an unpaved road bordered by public and private forest lands. The existing road provides access to over 100,000 acres of forest, including extensive timber acreage, recreational areas, Wynoochee Lake, and the Wynoochee River Project (operated by Tacoma Power). The road primarily serves logging trucks and recreational vehicles during the months of May to September. The only commercial business established along the project corridor is the Green Diamond Resource Company, a Seattle-based timber company, formerly the Simpson Timber Company. Other businesses and services are located outside the project corridor in the nearby incorporated communities.

The cities of Cosmopolis, Aberdeen, and Hoquiam form the commercial and industrial core of Grays Harbor County. Although the timber industry has declined, logging and lumber product manufacturing remain an important economic factor in this area. In the vicinity of Montesano, resource-based industries such as forestry, agriculture, and gravel mining are important to the local economy. Montesano, the Grays Harbor County seat, is surrounded by small farming communities. Montesano residents also have employment in government, transportation, construction, manufacturing, trade, and services.

The population in Grays Harbor County in the vicinity of the Camp Grisdale Road project (census tract 4, census block 5) is 2,721 (consisting of 2,031 rural residents and 690 residents in urban clusters) (US Census 2000). The nearest town is Montesano (population 3,312), located approximately 17 miles south of the project corridor. Aberdeen, which is approximately 15 miles southwest of Montesano, has a population of 16,461. Almost half of Grays Harbor County residents live in the contiguous cities of Cosmopolis, Aberdeen, and Hoquiam (US Census 2000).

The project corridor is unpopulated. Three residences are located just beyond the north terminus of the project at Wynoochee Lake. These dwellings provide housing for Tacoma Power employees at the Wynoochee River Project. South of the Camp Grisdale Road project terminus, farms and residences border Wynoochee Valley Road (Grays Harbor County Road 51190). Many of these residents are employed in the Aberdeen/Hoquiam area or other small urban areas nearby. Housing vacancy rates in Grays Harbor County range from 8.2 percent for seasonal, recreational, and occasional-use housing units to 12.5 percent for rental housing units (US Census 2000).

Environmental Justice

Environmental justice addresses issues related to potential disproportionate impacts of a project on low-income or minority populations. Published data are consulted to determine the presence of low-income residents and racial and ethnic minorities in the study area, and efforts are made to determine whether the proposed project would have a disproportionate impact on members of these groups.

Federal projects and projects that require federal action must comply with Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority and Low-Income Populations), Title VI of the Civil Rights Act of 1964, and many other laws, regulations, and policies regarding equal rights, equal protection, and nondiscrimination.

The socioeconomics study area for the Camp Grisdale Road project is defined as Grays Harbor County, census tract 4, census block 5. Based on data from the 2000 US Census, this area has a population of 2,748. Of this total, 2,617 residents (95.2 percent) are white, and 131 residents (4.8 percent) belong to racial minorities. American Indian and Alaska natives comprise the largest racial minority within the study area, with a population of 99; and 11 native Hawaiian or Pacific Islanders also reside within the study area. In the 2000 census, 21 people in the study area identified themselves as belonging to two or more races. No African American persons resided within the study area at the time of the most recent census.

According to the US Census Bureau, a linguistically isolated household is one in which all members 14 years old or more have at least some difficulty with English. Of the 2,748 residents within the study area, none identify themselves as Hispanic or Latino. However, 31 households (2.9 percent) use Spanish as their primary language within the home, and 12 of these households (1.1 percent) are linguistically isolated. Eleven households speak primarily an Asian or Pacific Island language within the home, but none are linguistically isolated.

The poverty rate within the study area is 8.3 percent, lower than the 10.1 percent poverty rate for Grays Harbor County. Of the 2,737 responses to this question in the 2000 census, a total of 228 people stated that their income was below the federal poverty threshold. In contrast, 2,186 residents of the study area (79.9 percent) listed their income as greater than twice the federal poverty level. The remaining 11.8 percent of the population listed incomes above the poverty line, but less than twice the threshold amount.

These statistics indicate that the population of the study area includes members of racial and ethnic minority groups, as well as people living below the poverty threshold, but that there are few residents of the study area within these groups.

There are no residents within the project area, except personnel who operate the Wynoochee River Dam.

Public Services and Utilities

Public services provided in the study area include fire suppression, emergency medical services, police protection, parks, recreational facilities, and maintenance of public infrastructure, including roads. There are no schools, airports, or religious facilities in the study area, and no health care or mail delivery services are provided. Each of the public services provided in the study area is discussed below.

Three Tacoma Power vaults associated with the Wynoochee River Project are located adjacent to the road near the northern terminus of the project corridor. No utilities are located along the remainder of the project corridor, and none are proposed.

Police services in the project corridor are provided by the Washington State Patrol detachment in Hoquiam or the Grays Harbor County Sheriff's Department headquartered in Montesano.

Snow is removed on Camp Grisdale Road by Tacoma Power, to enable staff members to transport juvenile salmon around the dam during snow events. Green Diamond Resource Company provides road maintenance services during the remainder of the year.

Most parks and recreational facilities in the project vicinity are owned and maintained by the Olympic National Forest. The most popular facilities in the area are the Tacoma Power day use area at the Wynoochee River Project, and the Forest Service's Coho Campground.

Archaeological and Cultural Resources

Historic properties eligible for or included on the National Register of Historic Places are protected under Section 106 of the Historic Preservation Act and Section 4(f) of the 1966 Department of Transportation Act. Tribal cultural resources and Section 106 properties are protected through the Native American Graves Protection and Repatriation Act and the Archaeological Resources Protection Act.

Historic resource is a property or cultural resource listed in or eligible for listing in the National Register of Historic Places and may include buildings, structures, objects, sites, archaeological resources (greater than 50 years old) or traditional cultural properties. A *traditional cultural property* is a property that is eligible for inclusion in the National Register of Historic Places

because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community. A *cultural resource* is an all-inclusive term referring to objects, sites, places, institutions, values, beliefs, customs, traditions, symbols, and social structures that have cultural value to some sociocultural group.

Study Methods

A cultural resources investigation was performed in August 2004 and is presented in *Cultural Resources Investigations for the Camp Grisdale Road Project, Grays Harbor County, Short Report 817* (AHS 2004). Information from that report is summarized below. The objective of this study is to comply with Section 106 of the National Historic Preservation Act of 1966, as amended, through the location and preliminary characterization of both previously identified and as yet unidentified cultural resources within the area of potential effect. Cultural resource tasks performed included: a site file search at the Washington State Office of Archaeology and Historic Preservation (OAHP) in Olympia; inspection of General Land Office (GLO) records maintained at the Spokane Office of the Bureau of Land Management; a visit to the Olympic USFS office in Olympia; a visit to the Mason County Historical Museum, Sheldon; inspection of maps from the Kroll Map Company; a cultural resources survey (including shovel testing) of the area of potential effect; consultation with the Skokomish Tribal Historic Preservation Officer; and a literature review. The Cultural Resources Report (AHS 2004) was provided to the State Historic Preservation Office (SHPO) in late 2004 for its review.

The project area is within the Olympic physiographic province, which consists of the Olympic peninsula bounded by Puget Sound to the east, the Straits of Juan de Fuca to the north, the Pacific Ocean to the west, and the Chehalis River to the east (Thornbury 1965). The project area of potential effect consists of the 17.5 mile long and 100 foot wide road and right-of-way, plus the two major curve realignment areas. The entire area of potential effect totals approximately 214 acres.

Ethnographic and Historic Background

In the early nineteenth century, the people occupying the Wynoochee Valley referred to themselves in reference to politically independent village names (e.g., Wynoochee) and grouped themselves and neighbors in more distant villages together under generic names (Hajda 1990). Wynoochee Valley inhabitants centered on a major salmon stream, and fishing, hunting, and gathering activities provided all subsistence requirements.

Early development and settlement of the project area is documented in a series of General Land Office township surveys from 1884 to 1905. The logging industry of the Wynoochee Valley dates to the late 1880s when teams of oxen skidded immense logs from the forests (Van Syckle 1980). The introduction of steam donkeys and logging railroads quickly followed late in the nineteenth century (Van Syckel 1980). A section of logging railroad last owned and operated by the Simpson Timber Company (formerly the Simpson Logging Company) is present in proximity

to portions of the Camp Grisdale Road. This line is discussed in greater detail in the Study Results section below. Since the 1880s, approximately 300 logging companies have operated in Grays Harbor County (Van Syckle 1980).

In 1946, the Simpson Logging Company signed a contract entering into the 100-year Shelton Cooperative Sustained Yield Unit (CSYU) agreement with the Forest Service (Rooney 1997). The Camp Grisdale Road project was within the 270,000 acre CSYU; however, the 100-year agreement between Simpson Timber Company and the Forest Service was terminated in 2002, 44 years short of its originally conceived end date.

The timber that the CSYU guaranteed to the Simpson Logging Company prompted it to construct the Camp Grisdale residential logging camp in 1946 adjacent to its logging railroad tracks (James 1986). Camp Grisdale closed in 1985 and the shortly thereafter the northern section of the Simpson logging railroad was abandoned at a point in the NW ¼ Section 17 T20N, R7W about 10.25 miles south of Camp Grisdale.

From the time of the first commercial logging, timber harvest in the Wynoochee has followed the typical pattern of building transient camps and facilities that are dismantled or abandoned as soon as the timber is cut. Logging facilities such as camps and railroads therefore have life spans coeval with the available timber resources and land use policy conducive to its exploitation.

Camp Grisdale is over 400 feet from the road and is not within the area of potential effect (APE).

Study Results

One historic archaeological site was recorded as a result of the survey and shovel testing. Fragments of automobile windshield glass and plastic sheeting, all modern debris, were the only cultural materials recovered from two of the 12 shovel tests.

The archaeological site is the abandoned Simpson Timber Company logging railroad roadbed. Five segments of the railroad roadbed were recorded during the survey. Segments 2 through 5 of this railroad roadbed are adjacent to the project APE. Segment 1, which is at the northern end of the FR 22 portion of the project corridor, extends slightly into the APE.

By 1928 the railroad had been constructed to Section 30, T21N, R7W (Kroll Map Company 1928:16). Between 1928 and 1955 (USGS 1955) the railroad was extended approximately 10 miles to its northern terminus in Section 27, T22N, R7W. By 1987 the entire railroad segment north of Simpson Timber's transfer point in the NW ¼ Section 17 T20N, R7W was abandoned. The rails, ties, and any associated features in those segments adjacent to the Camp Grisdale Road APE have been removed.

Today portions of the railroad roadbed are still used by logging and gravel trucks. Other segments are overgrown with shrubs and trees and at least one segment adjacent to the Camp Grisdale Road APE is used as a waste rock dump. Dump truck loads of gravel have been dumped on this section of the roadbed.

Cultural Resources in Project Area of Potential Effect Eligible for National Register of Historic Places

None of the identified cultural resources within the APE are eligible for listing in the National Register of Historic Places (NRHP). The abandoned and demolished Simpson logging railroad roadbed is one of dozens of logging railroads in the southern Olympic Peninsula river valleys. The Simpson railroad lacks distinctive architectural design characteristics and physical integrity. As an historic archaeological site, the Simpson railroad does not have the potential to yield information important to history. The Simpson railroad roadbed does not appear to be eligible for listing in the NRHP.

The Shelton CYSU is not a cultural resource, no longer exists, and is not eligible for listing in the NRHP.

No NRHP-eligible cultural resources are present in the project APE.

Cultural Resources in Project Area Eligible for National Register of Historic Places

There are no other cultural resources immediately adjacent to the APE that are potentially eligible for the NRHP, and the APE is in areas of low to moderate prehistoric site probability.

Traditional Cultural Properties

No information concerning traditional cultural properties in or near the project area of potential impact was located during a search of records at OAHP, Olympia. The Skokomish Tribe did not express any cultural resources concerns with the project (Miller 2004 personal communication).

Previously Documented Sites

Within the Project Area

In 1974 the Shelton Cooperative Sustained Yield Unit (CYSU) was inventoried as the Simpson Sustained Yield Unit (Ficken 1974) and was issued cultural site designation 14-01492 by the Office of Archaeology and Historic Preservation (OAHP). The Camp Grisdale Road area of potential effect is entirely within the 270,000 CYSU boundaries. The CYSU existed by virtue of a contract between Simpson Logging Company and the Forest Service. The contract authorizing the CYSU has been terminated and as a result the CYSU no longer exists either as a legal agreement or as a timber harvest and management program. The CYSU is not a cultural resource.

Near the Project Area

Recorded in 1983, site FS 9 consists of the completely deteriorated remains of two and possibly three wooden structures and associated domestic artifacts (Notenboom and Willits 1983). The site is west of the Wynoochee River about two miles from the Camp Grisdale Road area of potential effect. While the form was forwarded to the State Historic Preservation Office (SHPO)

with the recommendation that the site was eligible for listing in the NRHP, SHPO did not agree and the site is not NRHP eligible (Notenboom and Willits 1983).

In 1982 a segment of a trail dating to ca. 1917 was recorded as site FS 13, the Old Wynoochee Trail. Mr. Joe Kestner, the first Wynoochee Forest Service guard, built parts of the trail in 1917 for fire prevention and recreation purposes (Willits 1982). Timber harvest and road construction had truncated the trail and only a short segment was documented. The site lies about 21.5 miles west of the Camp Grisdale Road APE. SHPO concurred with the recommendation that the site was not eligible for listing in the NRHP (Willits 1982).

Scenery and Aesthetics

The project corridor lies on a plateau above the Wynoochee River, in the Chehalis River basin of central Grays Harbor County in a forested landscape. The study area includes scenic views of the forest as Camp Grisdale Road climbs in elevation from 490 feet at the southern terminus of the project corridor to 720 feet at its northern terminus. Camp Grisdale Road lies in a mixed coniferous forest where Douglas-fir is the dominant tree species.

The visual character of the project vicinity is determined by the relatively flat nature of the landscape, with some rolling hills, generally dense vegetation, and a generally low level of human activity and associated structures. The corridor consists of two broad visual environments: a distant environment away from the roadway, and a roadside environment. The distant environment is characterized by the absence of manmade structures and a lack of corresponding geometric visual elements. Evidence of past logging is visible at a distance in a patchwork pattern of cut areas of varying ages.

The environment adjacent to the roadway shares most of the visual characteristics of the distant environment, having very few structures or other geometric elements that contrast with the vegetated surroundings. The existing roadway is flat, with several sharp curves. The structures and geometric elements in the roadside environment include the roadway surface itself (two traffic lanes with an unpaved gravel surface), culverts, signs, and bridges. Views from points along and adjacent to the roadway are dominated by the condition of the nearby forest. Evidence of current and past logging adjacent to the roadway is visible in a patchwork of cut areas of varying ages. Openings in the tree canopy and varying ages of tree stands in the surrounding forest allow for occasional views of surrounding hillsides. Green and brown are the dominant colors, and the remaining forest patches and logged areas create a complex, strongly contrasting visual interplay of light and shadow. The existing roadway forms a grayish, horizontal, planar visual element that contrasts with its varied surroundings.

Recreation

The northern segment of the project corridor lies within the Olympic National Forest, which covers 632,300 acres of land in western Washington. The Olympic National Forest provides a

variety of recreational opportunities, including camping, picnicking, hiking, swimming, horseback riding, fishing, hunting, auto touring, backpacking, boating, and watching wildlife.

Camp Grisdale Road is the most direct access to over 100,000 acres of forest, including 50,480 acres in the Wynoochee Lake recreation area.

The primary recreational setting in the project vicinity is the Wynoochee Lake area, which includes the Coho and Chetwood campgrounds and Tacoma Power's Wynoochee River Project. Camp Grisdale Road provides access to Coho and Chetwood campgrounds. No commercial services are available in the Wynoochee Lake area.

Coho and Chetwood Campgrounds

Coho Campground, operated by the Forest Service, is located approximately 0.5 mile north of the northern end of the project corridor on FDR 2294. Located on the western shore of Wynoochee Lake, the campground is shaded by large conifers and other evergreen trees. The road through the campground is paved, and visitor use of the campground is heavy during the summer months. Facilities at the campground include trailer and tent camping, drinking water, flush toilets, picnic areas, hiking trails, and fishing. The campground includes 58 campsites (46 drive-in, single-family campsites, 10 walk-in campsites, and two overflow campsites).

One of the walk-in campsites accommodates a group of 12 persons. A public telephone is available at the entrance to the Tacoma Power day use area. A waste dump station for recreational vehicles is located just outside the campground on FDR 2294. There is a public boat ramp and access to hiking trails.

Coho Campground is open from spring through fall. The campground is used to capacity on summer weekends beginning in mid-July (Moswser 2004a personal communication). Tacoma Power's Wynoochee River Project day use area receives illegal overflow parking from the campground on summer weekends (Mazur 2004a personal communication). During the week, an average of approximately 18 campsites are occupied. Campground hosts report that visitors are mostly local residents.

Day use of the boat ramp is heavy on weekends during the summer. According to campground hosts, the day use parking area fills, and visitors park along the side of the road, disregarding the no-parking signs.

The Forest Service also operates the secluded Chetwood Campground, located one mile north of the Tacoma Power administration building on the western shore of Wynoochee Lake. Chetwood Campground, which can be reached only on foot or by boat, has 10 primitive campsites. No fees are charged for camping, but a trail park pass is required for parking at the trailhead. The nearest parking area is 0.5 mile north of Coho Campground. Visitor use information is not available for the Chetwood Campground.

Tacoma Power's Wynoochee River Project

The Wynoochee River Project area offers recreational opportunities for visitors. Tacoma Power developed the Wynoochee River Dam Project by refitting the U.S. Army Corps of Engineers' Wynoochee River. The COE built the dam in 1972 to provide flood control, industrial water storage for the City of Aberdeen, water for irrigation, and water to support the river's fishery. The dam is owned by the City of Aberdeen.

Tacoma Power built a powerhouse about 0.25 mile downstream of the dam. The powerhouse began generating electricity in 1994 and produces about 30 million kilowatt-hours of electricity each year, enough to serve 2,100 homes.

Wynoochee Lake, the 1,140-acre reservoir Wynoochee Lake dam, offers swimming, fishing, and boating opportunities.

Downstream of the dam on the west bank of the Wynoochee River there is a viewing area with interpretive exhibits where visitors can see the dam structure and the river gorge. An area on the western shore of the lake near the project administration building is available for picnicking and swimming.

Approximately 7,825 persons visited the day use area in 2001, and approximately 10,783 visited in 2003 (Tacoma Power 2004). Through July 2004 approximately half as many visitors used the day use area than through July 2003. This could be due to factors such as higher gasoline prices, road construction on Wynoochee Valley Road, high fire danger, and low lake levels (Mazur 2004b). There have been no large group activities this year, such as company picnics, that increase the visitor load (Mazur 2004b).

Hiking Opportunities

Two trails are accessible to visitors to the campgrounds and the Wynoochee River Project area. The Wynoochee Lake Shore Trail is a 16-mile hiking and mountain biking trail that winds through the forest around the lake. The Forest Service rebuilt the trail and added a one-mile extension in 2000. The trail around the lake is not maintained, and bicyclists must carry their bicycles over approximately 50 downed trees. The 0.25 mile Working Forest Nature Trail, which educates visitors about the forest environment, begins at Coho Campground, loop B.

Air Quality

The U.S. Environmental Protection Agency (U.S. EPA), the Washington Department of Ecology (Ecology), and the Olympic Region Clean Air Agency (ORCAA) regulate the concentration of pollutants in the outdoor air and contaminant emissions from air pollution sources. The U.S. EPA standards are generally used to determine limits for pollutant concentration levels unless local standards are more stringent. The project will comply with EPA standards. There are

several areas where ORCAA regulations are more stringent than the corresponding federal and state regulations (Goodin 2004 personal communication; ORCAA 2003):

- ORCAA regulations under Article 5 require smaller stationary sources of air emissions to register annually. For example, Ecology exempts stationary internal combustion engines less than 500 horsepower from registration [WAC 173-400-100(2)(i)], while ORCAA exempts those below 50 horsepower from registration [Section 5.01(b)(26)].

- ORCAA regulations under Article 7 offer fewer exemptions from preconstruction review and approval through a notice of construction (NOC) application.

- ORCAA regulations under Section 7.02 require submittal of a notice of intent to operate (NOI) at least 15 days prior to starting operation of a temporary or portable source of emissions.

ORCAA regulations are otherwise consistent with corresponding state regulations, although not all state and federal air quality regulations are represented by corresponding ORCAA regulations. ORCAA enforces both state and national ambient air quality standards, as well as federal performance standards for asphalt and rock crushers. In general, ORCAA enforces all local, state, and federal regulations and standards applying to stationary sources of air emissions.

When the wind is from the west, southwest, or northwest, which is typical onshore flow for Grays Harbor area, the air quality forecast and conditions would be expected to be in the good air quality range. Air quality is expected to be in the good range most of the time with a few moderate days during the late fall and winter months during times when offshore flow and a temperature inversion is present with high woodstove use and outdoor burning (from forestry, residential, and land clearing activities). Within the project corridor, the unpaved road generates dust that increases with traffic levels, particularly in the dryer summer months.

ORCAA currently monitors only in Aberdeen for inhalable particulate matter (PM_{10} and $PM_{2.5}$, particulates no larger than 10 microns and 2.5 microns, respectively). The ORCAA (2004a) air quality index summary of $PM_{2.5}$ for 2003 reports 351 days with good air quality and 14 days with moderate air quality. In a 1997–1998 study of PM_{10} and sulfur dioxide levels in Aberdeen, Hoquiam, and Cosmopolis, no exceedances of the national ambient air quality standards for these pollutants were reported (ORCAA 2004b).

Key elements of the 1990 Clean Air Act Amendments include defining nonattainment areas, controlling hazardous pollutants at the source, reducing acid rain, requiring air quality permits and annual reporting for industrial polluters, and instituting automobile emission standards. *Nonattainment* is the term applied to areas where concentrations of pollutants exceed public health and environmental safety standards. The Camp Grisdale Road study area is not listed among the U.S. EPA nonattainment areas for criteria pollutants (U.S. EPA 2004).

Noise

The Camp Grisdale study area is predominantly actively harvested forest land. The primary source of noise within the study area is automobile and truck traffic from Grisdale Road or from timber harvesting activities on the adjacent forest lands. Washington Department of Transportation (WSDOT) traffic noise analysis and abatement policy and procedures provide guidance for the analysis and abatement of highway traffic noise and fulfill requirements stemming from the following state and federal environmental statutes and regulations:

- FHWA regulations found at 23 CFR Part 771, which prescribe procedures for implementing the National Environmental Policy Act (NEPA)
- 23 CFR 772, which prescribes procedures for abatement of highway traffic noise and construction noise
- Ch. 173–58 WAC - Sound level measurement procedures
- Ch. 173–60 WAC - Maximum environmental noise levels
- Ch. 173–62 WAC - Motor vehicle noise performance standards.

Traffic noise levels within the rural project area are currently low to moderate. The greatest noise levels are associated with vehicle traffic and timber harvest activities when heavy machinery and trucks are in use.

Grisdale Road would remain a two-lane roadway in substantially the same location. Potential noise-sensitive receptors in the project area include recreational users of the ONF and visitors to Wynoochee Lake. Potential noise receiving sites are the Wynoochee Lake picnic area located approximately 1,200 feet from the project corridor, the boat ramp located at Wynoochee Lake (2,500 feet) and the south end campground (1,600 feet). Implementation of the proposed road alignments would not move traffic closer to any receivers. The bird and mammal species that are noise-sensitive species are discussed in the Wildlife section.

Hazardous Materials

Facilities or properties that have released hazardous materials to the environment, or that manage hazardous materials in significant quantities, are required to report these activities to both federal and state regulatory agencies. The potential for hazardous materials impacts was evaluated by first reviewing current regulatory databases maintained by these oversight agencies. Sites identified by the U.S. Environmental Protection Agency (U.S. EPA) or the Washington Department of Ecology (Ecology) located within the study area were documented and classified according to the activity indicated. Regulatory databases were searched for facilities located along the project corridor with documented releases or that manage hazardous materials in

significant quantities to determine if a potential to affect public health and safety in relation to the Camp Grisdale Road project improvements was of concern.

Historical information also was reviewed for the project area to identify activities that may have impacts on soil and ground water. Historical records were reviewed from the following standard sources:

- Historical photographs and books covering logging camps
- Historical parcel maps
- County directories
- County files.

A site reconnaissance provided verification of the project corridor conditions and firsthand knowledge of site settings, including the surrounding environs. A more detailed discussion of the hazardous materials investigation, relevant laws and regulations, site categories, and methodology is provided in Appendix F.

Known and Potential Hazardous Materials Sites

This section summarizes the sites located within 500 feet of the project corridor identified as either reportedly having, or with a potential for, a release of hazardous materials to the environment.

Tacoma Public Utilities Wynoochee Dam Facility

The Tacoma Public Utilities Wynoochee Dam facility, located approximately 500 feet north of the northern limit of the project corridor (Figure 4-5), is listed in Ecology's leaking underground storage tank (LUST) and registered underground storage tank (UST) databases, as well as EPA's Resource Conservation and Recovery Act (RCRA) database as a conditionally exempt small quantity generator (SQG) of hazardous waste. Because of the distance relative to the study area, the reported release associated with leaking UST(s) was limited to soil and has been cleaned up, and no release or violations have been reported associated with the hazardous waste generator designation, this facility is not considered an environmental concern for the project corridor.

Former Simpson Timber Company Lumber Processing Plant

The former Simpson Timber Company (currently the Green Diamond Resource Company) lumber processing plant, located along the project corridor at the south end of Camp Grisdale (Figure 4-5), is listed in the RCRA database as a hazardous waste generator. No information is available whether this facility is a large quantity or small quantity generator; however, no release or violations were reported and it is not considered an environmental concern for the project corridor.

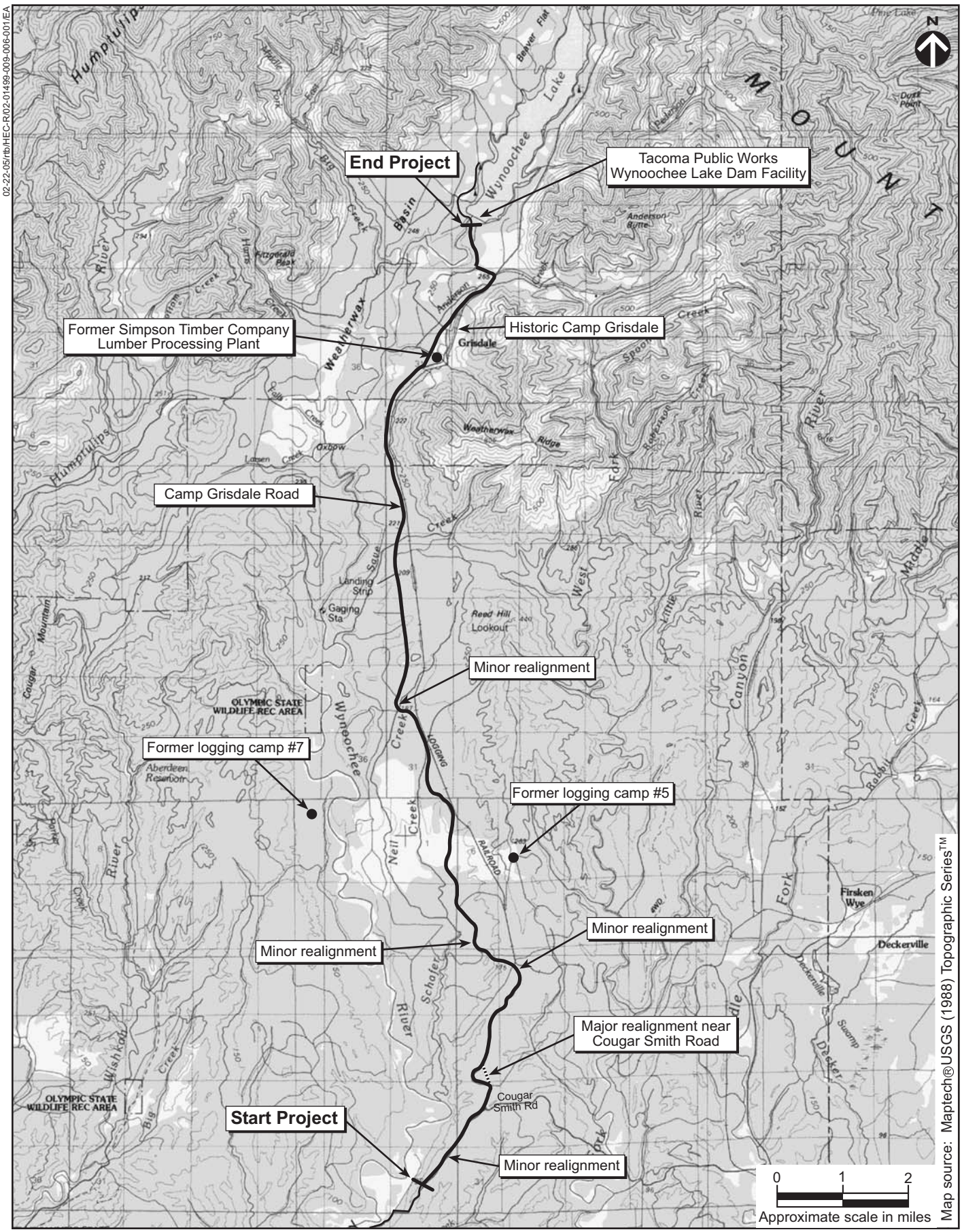

Figure 4-5. Former logging camps and hazardous materials sites in the Camp Grisdale Road study area.

Camp Grisdale

A review of historical information indicated that heating oil was used throughout the former company town, indicating a potential that underground storage tanks were used to store the oil. Tanks associated with a gasoline station connected to the former mercantile store also may have existed. No site assessments were conducted or records exist as to whether a release of petroleum products has occurred and/or whether the tanks were removed. Residual petroleum hydrocarbon contamination in soil and ground water as a result of spills and/or leaks from underground storage tanks may potentially affect soil and ground water quality adjacent to the project corridor.

5.0 Impacts and Mitigation

This chapter discusses potential long-term operational impacts and mitigation for each environmental element. Construction-related impacts and mitigation measures are discussed separately at the end of this chapter. No significant impacts from the project have been identified. The roadway design avoids disturbance to steep, unstable cut slopes on FR 2294.

Geology and Soils

This section describes the potential direct and indirect impacts of the proposed road improvements on soils. Proposed mitigation for the Preferred Alternative is discussed. Effects of the no-action alternative are also addressed.

No-Action Alternative

Soil loss in airborne dust plumes will continue under the no-action alternative. New soils and gravel, and regrading will continue to be needed to maintain the existing roadway. This will continue to increase the road width in some areas. Sediment and gravel loss from the roadway could clog some culverts and cause flooding or drainage problems during heavy winter rains.

There are a few areas where slopes adjacent to the existing roadway are unstable and landslides have occurred. Erosion of road fill slopes is expected to continue under the no-action alternative.

Preferred Alternative

Reconstruction and paving of Camp Grisdale Road would result in wider fillslope areas along the existing roadway. Roadway slopes disturbed during construction would be recontoured to meet FHWA road construction criteria. All disturbed soils would be revegetated to prevent erosion.

The paved road would have less airborne sediment deposits to adjacent areas. Soil erosion of the existing roadway would be prevented after construction has been completed, although road shoulders would still be prone to erosion until revegetation stabilizes the soils.

Mitigation Measures

The following mitigation measures are proposed to minimize the potential impacts on geology and soils:

- Appropriate Best Management Practices (BMPs) would be implemented following construction.
- A borrow source development plan and a reclamation plan would be prepared by the contractor and approved by WFLHD for each of the

proposed material source sites and waste disposal sites if the sites are not commercial.

Water Resources

This section describes the potential direct and indirect impacts of the proposed road improvements on hydrology, water quality, as well as related mitigation for those impacts. Direct and indirect construction impacts and post-construction impacts are individually addressed for the action alternative, which is the preferred alternative. Effects of the no-action alternative are also addressed.

No-Action Alternative

Continued sedimentation and gravel input to streams would occur under the no-action alternative. Continued sedimentation of streams and wetlands would continue to affect water quality.

Preferred Alternative

Gravel roads are considered impervious because of their compacted surfaces. Widening Camp Grisdale Road and paving would increase the existing impervious surface of the road by 17 percent. The improved roadway would decrease the sediment loading in adjacent streams due to the elimination of dust and there would be substantial reductions in surface erosion after the existing gravel surface is paved.

Many of the existing culverts are too small to convey flows. The proposed project would replace undersized culverts.

Long term operational impacts are expected to result from the paving of Camp Grisdale Road. Currently, seasonal average daily traffic (SADT) is approximately 350 vehicles (including logging trucks, recreational vehicles, and cars towing boats or camp trailers), and the projected SADT in 2019 is 500 vehicles (see project description). Any increase in runoff pollutant load produced by the increase would be minor and would result in minor water quality impacts in streams crossed by Camp Grisdale Road. The increase would be offset by reduction of sediment deposited in streams by settlementof air-born dust.

Mitigation Measures

The following mitigation measures would minimize adverse water quality impacts after construction of the improved road:

- Stabilization of the inlets and outlets of all new culverts.
- Widening ditches to increase infiltration of stormwater

- Rock lining ditches with greater than 4 percent slope
- Diverting ditches carrying stormwater into uplands before ditch empties into a waterway

Floodplains

Executive Order 11988 – Floodplain Management (1977) requires federal agencies to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative (FEMA 2004a). In accomplishing this objective, "each agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by floodplains in carrying out its responsibilities" (FEMA 2004a) for the following actions:

- Acquiring, managing, and disposing of federal lands and facilities
- Providing federally-undertaken, financed, or assisted construction and improvements
- Conducting federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulation, and licensing activities. Administering Agency (FEMA 2004a).

No-Action Alternative

Under the no-action alternative, the floodplain would remain as it is currently.

Preferred Alternative

The road currently crosses one floodplain at Neil Creek. The culverts at this location currently convey the 100-year flood flows adequately. The reconstructed road will remain on the existing alignment and a new culvert will be installed at this location. The new culvert would transport water under the road and would not result in loss of flood storage capacity or obstruction of flood flows. The new culvert would be designed to convey the 100-year flood flows and therefore no change in flooding of the floodplain is anticipated.

Mitigation Measures

Mitigation measures for impacts to floodplains are similar to those described in the water resources section, with the addition of the following mitigation measure:

- New culverts would be designed to allow water to flow under the road to maintain the existing hydrology of the floodplain and minimize the amount of fill in the floodplain.

Wetlands

No-Action Alternative

Under the no-action alternative, there would be no alteration of the existing wetlands within the project corridor.

Airborne sediments are most prevalent during the summer, when the roadway is dry. Up to 0.5 inch of dust accumulation was observed during the July survey in wetlands that adjoin the road. This dust completely covers trees, shrubs and herbaceous species, with physiological damage to plants and animals likely. Additionally, soil test pits revealed many years of such accumulation, with layers of dust sandwiching annual leaf fall. These sediments are several inches thick in some areas and often contain dust palliatives that are sprayed on the road to reduce dust. In addition, the frequent regrading and application of fresh gravel to the roadway results in ongoing incremental fill of adjacent wetlands. Some culverts are completely submerged under side-cast gravels. These receiving ditches also appear to be cleared and excavated on at least an annual basis.

Under the no-action alternative, there would be no indirect post-construction effects.

Preferred Alternative

The paving of Camp Grisdale Road would result in major reductions in the amount of sediment delivered to wetlands, their buffers, and upland areas throughout the project area. Under the existing condition, the regular, heavy truck and recreational traffic on the road results in airborne and rain-washed fine sediments from the roadway distributed several hundred feet into adjacent areas.

The replacement of culverts throughout the project corridor would improve hydraulic connectivity through the project corridor and enhance lateral movement of wetland plants and wildlife which exploit wetland habitats.

The proposed action would result in the disturbance of 3.7 acres of wetlands. An additional 2.4 acres of a combination of streams and ditches are expected to be affected by project construction. The wetland areas that would be disturbed are shown categorized by USFWS wetland type, hydrogeomorphic type, and Washington State Ecology rating in Table 5-1. FHWA has calculated that approximately 1.6 acres of wetland would be temporarily disturbed during construction and the remaining 2.1 acres would be permanently filled.

The long-term operation of Camp Grisdale Road may indirectly affect wetlands due to changes in hydrologic connections, shading of the water bodies, and noise.

Table 5-1. Estimated area of wetland types impacted in the Camp Grisdale Road project corridor.

Classification System	Wetland Type	Estimated Impacts for Each Wetland Type (acres)
U.S. Fish and Wildlife Services (Cowardin et al. 1979)	Palustrine forested (PFO)	3.3
	Palustrine scrub-shrub (PSS)	0.1
	Palustrine emergent (PEM)	0.3
Hydrogeomorphic (Brinson 1993)	Depressional outflow	3.0
	Riverine impounding	0.2
	Riverine flow-through	0.3
	Slope	0.2
Washington State rating (Ecology 1993)	Category II	1.9
	Category III	1.8

Mitigation Measures

A conceptual wetland mitigation plan would be prepared for the Camp Grisdale Road improvement project. The mitigation measures for adverse impacts to wetlands are summarized below.

The overall mitigation goal is to protect existing wetlands and provide for wetland areas and functions lost as a result of the proposed road improvements, by creating and restoring wetland areas and by protecting remaining high-quality wetland areas through the enhancement and preservation of buffer areas.

To realize this goal:

- Fill in wetlands would be minimized to the extent possible. Disturbance within wetlands would be limited to that necessary to construct the roadway.

- Wetland creation, establishment, or enhancement would compensate for the acreage of wetlands filled as a result of the Camp Grisdale Road project.

The purpose of Executive Order 11990 – Protection of Wetlands (1977) is to “minimize the destruction, loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands” (FEMA 2004b). To meet these objectives, the Order requires federal agencies, in planning their actions, to consider alternatives to wetland sites and limit potential damage if an activity affecting a wetland cannot be avoided (FEMA 2004b). The Order applies to:

- Acquisition, management, and disposition of federal lands and facilities construction and improvement projects which are undertaken, financed or assisted by federal agencies

- Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulation, and licensing activities (FEMA 2004b).

In compliance with Executive Order 11990, a wetlands assessment (Herrera 2004a) has been prepared that describes the alternatives considered.

- There are no practicable alternatives to the proposed action as wetlands abut both sides of the roadway within the project area.

- Once a jurisdictional determination of wetland areas was completed, WFLHD modified road alignments and design to avoid and minimize wetland impacts. Wetland areas temporarily disturbed during construction will be restored. The permanent filling of wetland area will be mitigated.

- Based on the above considerations, it is determined that there is no practicable alternative to the proposed construction in wetlands and that the proposed action includes all practicable measures to minimize harm to wetlands which may result from such use.

Vegetation

No-Action Alternative

Dust from the road would continue to cover roadside vegetation. Dust interferes with plant physiology and would be an adverse impact.

Sensitive Species

Vascular Plants—No sensitive or listed vascular plant species were encountered in the project corridor. No change in these species' distribution is anticipated as a result of the no-action alternative.

Bryophytes—The no-action alternative would not affect populations of sensitive bryophytes. The existing populations have persisted despite the dust distribution into their habitats or the populations of sensitive lichens.

Lichens—The no-action alternative would not indirectly affect populations of sensitive lichens. The existing population has persisted despite the copious dust distribution into its habitats.

Noxious Weeds

The no-action alternative would not appreciably alter the existing assemblage of noxious weed species. Four species—reed canarygrass, Himalayan blackberry, English holly, and evergreen blackberry—are likely to continue to spread in the absence of control efforts. Ongoing road side clearing, grading, and timber harvest adjacent to the project corridor would continue to provide exposed mineral soils and other disturbance features which support the establishment of noxious weeds.

Preferred Alternative

Paving the road would result in a reduction of dust deposited on roadside vegetation and would be a beneficial effect.

Sensitive Species

Vascular Plants—No sensitive or listed vascular plant species were encountered in the project corridor. No change in these species' distribution is anticipated as a result of the ongoing operation of the proposed roadway improvement project.

Bryophytes—The proposed roadway improvements are likely to modestly improve overall bryophyte habitat by reducing the distribution of gravel dust into the habitats occupied by these species. No indirect effects are anticipated for the preferred alternative.

Lichens—The proposed roadway improvements are likely to modestly improve overall lichen habitat by reducing the distribution of gravel dust into the habitats occupied by these species. No indirect effects are anticipated for the preferred alternative.

Noxious Weeds

Populations of noxious weeds are a pre-existing condition in the project corridor, particularly adjacent to Camp Grisdale Road.

The proposed roadway improvements are likely to reduce overall noxious weed species habitat within the project corridor. This effect would result from a reduced frequency of disturbance from ongoing roadside clearing, grading and excavation that occurs as part of the maintenance of this gravel road. No indirect effects are anticipated for the preferred alternative. Mitigation measures implemented during construction would inhibit noxious weed growth on disturbed soils.

Mitigation Measures

The following mitigation measures are proposed:

- Revegetation of all temporarily cleared areas would occur as soon as possible after construction is complete. Native species would be planted

in areas where vegetation is removed. Restrictions to vegetation removal for threatened and endangered wildlife habitat is covered in the threatened and endangered effects analysis section.

Wildlife

A detailed discussion of wildlife impacts is provided in Biological Resources: Wetlands, Fisheries, Wildlife, and Vegetation: Resource Studies for Camp Grisdale Road, Washington (Herrera 2004c).

No-Action Alternative

No effects on wildlife species are expected from the no-action alternative. Legal driving speeds would remain lower on the unpaved roadway. No wildlife habitat would be removed for the no-action alternative.

Preferred Alternative

Adverse impacts on wildlife due to the proposed project would include permanent loss of habitat along the proposed road edge. During construction approximately 25 acres of habitat would be disturbed, and a portion of that would be permanently lost. Most of the forested habitat permanently lost would be forest edge that is already somewhat disturbed. Forest habitat lost in realignment areas would include second growth conifer forest that contains some large diameter trees (SGCL in Table 5-2), which is valuable to wildlife, but has been disturbed by nearby clear-cutting. Permanent loss of nesting, foraging, roosting, perching, and refuge habitat that is currently within the project area would occur. Animals that are mobile would likely relocate to other areas where habitat is available. Others that are less mobile such as amphibians, reptiles, and mollusks are not likely to survive roadway construction.

Loss of wetland and riparian habitat would result in impacts on wildlife species that use these areas for all or a portion of their life cycle. Wildlife that use these areas were described under the construction section above. A reduction in wetland and riparian habitat would displace these animals to other locations where they would have to compete for less habitat. Habitat lost is for the most part adjacent to the existing road. Because of vehicle travel and maintenance, wildlife are less likely to use habitat closest to the road compared to areas farther from the road. The amount of habitat lost is small in comparison to that remaining. Twenty acres of habitat would be removed, out of 7,000 acres remaining within 0.5 mile on either side of the road.

Post-construction indirect effects on wildlife due to the proposed project may include potential harm from increased traffic and vehicle speed. Increased traffic and speed have the potential to harm a greater number of animals that would cross the road. Animals such as mammals, amphibians, reptiles, and mollusks are those that may be affected by increased traffic and speed. Elk regularly occur in the project corridor and cross the roadway frequently. As such, elk would be at increased risk of collision as a result of increased traffic and speed.

Table 5-2. Potential acres of road construction clearing by habitat type.

Habitat Type	Description of Habitat Type	Percent of Habitat Type within Project Corridor [a]	Potential Disturbance by Habitat (acres)
CC	Recent clear-cut	14.9	3.7
MOGC	Mature old-growth conifer forest, large-diameter trees, snags present, dense stand	9.1	2.3
OF	Open-field area with sporadic large-diameter conifers	0.2	0.1
SGCL	Second-growth conifer forest, large-diameter trees, dense stand, snags present	43.5	10.9
SGDL	Second-growth deciduous forest, large-diameter trees, sparse stand	1.3	0.3
STGD	Second/third-growth deciduous forest found in small strips within clear-cuts, small- and large-diameter trees, dense stand	2.0	0.5
STGM	Second/third-growth mixed forest, small- and large-diameter trees, dense stand	6.9	1.7
STGMR	Second/third-growth mixed forest, regeneration size, dense stand	4.4	1.1
TGCR	Third-growth conifer forest, regeneration size, dense stand	14.6	3.7
TGCS	Third-growth conifer forest, from regeneration size to small-diameter trees, dense stand	1.4	0.4
TGDR	Third-growth deciduous forest from regeneration size to small-diameter trees, snags present, dense stand	1.7	0.4
All habitat types		100.0	25.0

[a] In a corridor 100 feet on either side of the centerline of the road.

Mitigation Measures

There are no federal, state, or local regulations that specifically require mitigation for loss of wildlife habitat for nonprotected species. However, the measures implemented to protect wetlands, streams, fish habitat, and protected species would also protect other wildlife species and habitat.

- Areas temporarily cleared would be revegetated.
- Conservation measures prescribed under the threatened and endangered species section would also benefit non-special-status wildlife species.
- Trees and brush cleared for road construction within Olympic National Forest will be left at the edge of the vegetation clearing limits to provide habitat for terrestrial mollusks.

In addition, the following specific mitigation measure is proposed:

- Wildlife crossing signs would warn motorists of the potential of animals crossing the road.

Fish and Fish Habitat

No-Action Alternative

Continued sedimentation and gravel migration to streams would occur under the no-action alternative. Direct effects of sedimentation on sensitive fish and fish habitat would be similar to those described under the Threatened and Endangered Species impacts section for bull trout and coastal cutthroat trout. Fish spawning habitat downstream of the project corridor would be affected and could impair fish migration over time. Existing culverts would continue to act as fish passage barriers, which precludes available habitat from use by fish species.

Preferred Alternative

Replacement of culverts that currently create fish passage barriers would have a beneficial effect on sensitive fish species by removing the barrier and increasing the availability of fish habitat. Additional spawning, rearing, and foraging habitat would be available to these fish species after culvert replacements are complete.

Reduction of sedimentation and gravel from road runoff from the new paved road would decrease sedimentation in adjacent streams. This would have a beneficial effect on sensitive fish species and fish habitat near the project corridor.

Indirect effects on fish would be similar to the direct effects for construction for fish present downstream from the project corridor. Beneficial effects are expected for fish downstream of the project corridor from the reduction in sedimentation due to the paved road. Also, fish from downstream would travel farther upstream to utilize additional spawning, rearing, and foraging habitat that would be available due to fish-passable culvert replacement.

Mitigation Measures

- All projects potentially affecting the bed or banks of streams, lakes, or other water bodies must meet all conditions specified by WDFW, USFWS, and NOAA Fisheries.

- Disturbed ground where runoff has the potential to drain into stream channels would be revegetated or protected from surface erosion by seeding, mulching, and other methods prior to the fall rainy season. Within one year after project completion, disturbed stream banks would be revegetated.

- Excess material (spoils) would be disposed of in a site approved by WFLHD to prevent entry to stream channels or other water bodies.

- If placement of large woody debris is undertaken, it will be done in coordination with WDFW, the Forest Service, NOAA, and USFWS.

Additional conservation measures are described under the threatened and endangered species section.

Threatened and Endangered Species

Fish and Fish Habitat

Bull Trout

No-Action Alternative

No change in existing effects to bull trout habitat would result (continued sedimentation of stream channel habitat under) from the no-action alternative. The effects of sedimentation to bull trout and its habitat will have effects on prey species survival, the food web, and water quality conditions.

Preferred Alternative

The proposed action would have effects on stream habitat due to vegetation removal and culvert replacement as discussed under the water resources section. Although bull trout have not been documented in the study area and its vicinity, potential habitat does exist within the project corridor and study area (Table 4-6). Potential construction-related impacts on bull trout are discussed at the end of Chapter 5. Most existing culverts are planned to be replaced along the project corridor, and some of them would affect bull trout habitat. Bull trout habitat is present in ARs 25, 27, 35, 44, and 48 and culverts may be replaced for all except AR-35, which has a bridge at the road crossing, and AR-44.

Potential impacts on bull trout due to sedimentation that are relevant to the Camp Grisdale Road project are described in the biological opinion regarding culvert removal on Forest Service lands (USFWS 2004):

> *Sediment inputs may result from the following activities associated with culvert replacement or removal: 1) excavation above the wetted perimeter, 2) restoring streamflow on the reconstructed streambed, 3) backfilling and headwall construction, 4) disturbance of the bank and riparian area by construction and restoration activities, and 5) maintenance and remedial construction activities.*
>
> *The introduction of sediment can have multiple adverse effects on channel conditions and processes resulting in effects on bull trout and prey species survival, the food web, and water quality conditions, such as water temperature and dissolved oxygen (Rhodes et al. 1994). Fine sediments can influence incubation survival and emergence success (Weaver and White 1985). Emergence success of bull trout has been shown to be approximately 80 percent*

when no fine materials are present, and approximately 30 percent when 35 percent fine materials are present (Weaver and White 1985 in MBTSG 1998).

Sediment can modify stream morphology and function through the degradation of spawning and rearing habitat, simplification and damage to habitat structure and complexity, loss of habitat, and decreased connectivity between habitats (Bash et al. 2001). Biological implications of this habitat damage can include underutilization of stream habitat, abandonment of traditional spawning habitat, displacement of fish from their habitat, and avoidance of habitat (Newcombe and Jensen 1996).

As sediment enters a stream it is transported downstream under normal fluvial processes and deposited in areas of low shear stress (MacDonald and Ritland 1989). These areas are usually behind obstructions, near banks (shallow water) or within interstitial spaces. This episodic filling of successive storage compartments continues in a cascading fashion downstream until the flow drops below the threshold required for movement of the sediment or all pools have reached their storage capacity (MacDonald and Ritland 1989). As sediment loads increase, the stream compensates by geomorphologic changes such as increased slope, increased channel width, decreased depths, and decreased flows (Castro and Reckendorf 1995). These processes contribute to increased erosion and sediment deposition.

Construction impacts are short-term. Replacement of culverts during the dry summer season (June 1 to September 30) would reduce sedimentation in streams and adjacent wetlands.

The long-term effects of culvert replacement as part of the proposed road construction project would aid bull trout access to additional potential habitat within the project corridor.

Conservation Measures

The following conservation measures will be implemented to mitigate for long-term impacts of the Camp Grisdale Road project. More detailed conservation measures are provided in the Biological Assessment for this project (Herrera 2004d).

- Monitor and maintain erosion controls until site restoration is complete.

Culverts requiring aquatic organism passage (AOP) will be designed consistent with accepted stream simulation methods. Spans will be defined based on measured active channel widths. Culverts will be countersunk approximately 35 percent of culvert rise and backfilled with a mixture of conserved and imported streambed material. Stone will be added to the streambed material mixture as needed for simulating natural stream roughness elements and energy dissipation features. Fine-grained material will be added for reducing subsurface flow conditions.

Where cost-effective, flow diversion around AOP culvert construction will be accomplished with temporary gravity pipelines. Pumping will occur where gravity pipelines are not cost-effective. Flow diversion intakes will be screened to control fish entrance and impingement. Temporary flow barriers upstream and downstream of the AOP culvert will be used for isolating the construction sites from live streams. Fish removal activity will be completed before initiating excavation needed for AOP culvert installation.

Recommended Effect Determination

The proposed action *may affect, is not likely to adversely affect* bull trout because they have not been documented in the vicinity of the project corridor; however, adverse effects on potential habitat might occur during construction.

Coastal Cutthroat Trout

No-Action Alternative

Continued airborne dust and sedimentation of fish habitat adjacent to the road would occur under the no-action alternative. Effects on fish species due to sedimentation are the same as those described for the no-action alternative under the bull trout section.

Preferred Alternative

The long-term effects of culvert replacement as part of the proposed action would aid cutthroat trout recovery and restore passage for all life stages of coastal cutthroat trout through culverts, resulting in upstream access to spawning, rearing, foraging, migration, and over-wintering habitat.

Conservation Measures

The same conservation measures proposed for bull trout apply to coastal cutthroat trout.

Recommended Effect Determination

If the species is listed under ESA, the effect determination would be *may affect, is likely to adversely affect* coastal cutthroat trout where present in the project corridor. This fish species has been documented in ARs 25, 27, 35, 44, and 48 and would be present throughout the year. This effect is likely to be short-term, limited to the period of construction and immediately following and confined to ARs 25, 27, 35, 44, and 48.

In the long term, beneficial effects on coastal cutthroat trout are expected to result from removal of fish barriers to additional spawning, rearing, and foraging habitat.

Because the coastal cutthroat trout is a proposed species, the determination is *not likely to jeopardize the continued existence of coastal cutthroat trout*.

Coho Salmon

No-Action Alternative

Continued airborne dust and sedimentation of fish habitat adjacent to the road would occur under the no-action alternative. Effects on fish species due to sedimentation are the same as those described for the no-action alternative under the bull trout section.

Preferred Alternative

Similar impacts to coho salmon as those for coastal cutthroat trout are expected due to the proposed action.

Conservation Measures

Similar conservation measures as those proposed for bull trout and coastal cutthroat trout are recommended for coho salmon. More detailed conservation measures for coho salmon are provided in the Biological Assessment (Herrera 2004d).

Recommended Effect Determination

The proposed action *may affect, is likely to adversely affect* coho salmon where present in the project corridor. This fish species has been documented in ARs 18, 22, 25, 27, 29, 30, 35, 44, 46, and 48 and would be present throughout the year. This effect is likely to be short-term, limited to the period of construction and immediately following and confined to ARs 18, 22, 25, 27, 29, 30, 35, 44, 46, and 48.

In the long term, beneficial effects on coho salmon are expected to result from removal of fish barriers to additional spawning, rearing, and foraging habitat.

Essential Fish Habitat

No-Action Alternative

Continued airborne dust and sedimentation of essential fish habitat adjacent to the road would occur under the no-action alternative.

Preferred Alternative

In the short term, essential fish habitat will be temporarily affected by sedimentation during construction. In the long term, essential fish habitat will benefit from the proposed project, because water quality will be improved by reducing sedimentation from dust and gravel migration that occurs under existing conditions. Also, replacement of existing culverts with fish-passable culverts in select streams will increase fish access to habitat, benefiting essential fish habitat.

Recommended Effect Determination

Overall, the proposed project *may affect, is not likely to adversely affect essential fish habitat for Pacific salmon*.

Wildlife

Marbled Murrelet

No-Action Alternative

No adverse effects on marbled murrelets are expected to result from the no-action alternative.

Preferred Alternative

Three occupied marbled murrelet sites have been determined to be present at the northern extent of the project corridor on Olympic National Forest land. Also marbled murrelets were preliminarily detected at a site located within the lower 1.5 miles of the project corridor. The proposed road improvement and realignment activities would result in potential impacts on marbled murrelet from loss or modification of suitable and critical habitat and in the form of disturbance by increased noise, increased traffic and human activity. Road realignment or widening might result in the removal of individual trees with suitable nest or roosting sites, although this is undetermined. It is estimated that approximately 2.3 acres of old-growth forest may be cleared due to the project, affecting suitable habitat for marbled murrelet. Vegetation removal is planned to occur within 30 feet of the existing road edge, except in realignment areas where a new road curve would cut a swath through vegetation farther from the existing road. Removal of roadside vegetation at murrelet sites might result in removal of potential nest trees. Alignment changes are in areas with poor quality habitat for marbled murrelet and not in nesting habitat.

A paved surface would reduce noise generated by vehicles on the existing uneven gravel surface. On-going maintenance activities and roadway improvements (bridge and road surface or prism improvements and maintenance, weed control and clear zone maintenance) require the use of heavy machinery, which will generate minor noise impacts. There may be some increases in traffic levels due to improved driving conditions but the increases are not expected to significantly differ from projected increases in traffic for the existing road. Noise impacts during construction are discussed under the Construction Impacts section for marbled murrelet.

Conservation Measures

The conservation measures below are extracted from those specified by USFWS (2003b) in the biological opinion regarding effects of Olympic National Forest program activities on spotted owl, marbled murrelet, and bald eagle. These program activities include road building. More details regarding conservation measures for marbled murrelet are provided in the Biological Assessment for this project (Herrera 2004d).

Measures for Habitat Removal

- When feasible, avoid or minimize harvesting of trees from within 300 feet of suitable murrelet habitat.

Measures for Handling Individual Trees

- Known occupied murrelet nest trees shall not be removed.
- If hazard trees or potential nest trees are to be removed within suitable murrelet habitat during the early breeding season (April 1 to August 5) on Forest Service land, review by an Olympic National Forest wildlife biologist is required.
- When feasible, minimize the number of large conifers (≥21 inches diameter at breast height) removed. Fall trees in a manner to minimize impacts on surrounding trees, and away from suitable habitat if it is possible and safe to do so.
- When feasible, avoid or minimize the removal of platforms, trees with platforms, and trees providing cover to platforms even if the stand is currently unoccupied by murrelets.
- On Forest Service land, proposed removal of any tree larger than 36 inches diameter at breast height within marbled murrelet nesting habitat requires review by an Olympic National Forest wildlife biologist.

Measures for Ground-Level Disturbance

- Avoid habitat or nest sites to the extent possible in the final design.

Recommended Effect Determination

Marbled murrelets occupy sites adjacent to the project corridor starting at the Olympic National Forest boundary and extending north for approximately 2 miles. Murrelets at these sites would be adversely affected by noise generation during their breeding season. According to the USFWS (2003b) biological opinion, noise within the injury threshold distances provided in Table 5-3 during the early breeding season (April 1 to August 5) would result in a *may affect, likely to adversely affect* determination. For example, if heavy equipment or motorized tools are used within 35 yards of the habitat during the early breeding season, then this *may affect, is likely to adversely affect* marbled murrelets. For activities occurring within the injury threshold distances during the late breeding season (August 6 to September 15), the recommended effect determination is *may affect, not likely to adversely affect* marbled murrelets.

Table 5-3. Sound-only injury threshold distances for construction and timber harvesting-related activities for marbled murrelet.

Activity or Equipment	Combined Injury Threshold Distances for Murrelet [a]
A blast larger than 2 pounds	1 mile
A blast of 2 pounds or less	120 yard
An impact pile driver, a jackhammer, a rock drill	60 yards
A helicopter or single-engine airplane	120 yards
Chainsaws (firewood cutting, hazard trees, pre-commercial thinning, and commercial thinning)	45 yards
Heavy equipment	35 yards

[a] Source: USFWS 2003.

Clearing of approximately 2.3 acres of old-growth forest vegetation in marbled murrelet suitable habitat may occur. If clearing does occur during the breeding season and potential nest trees are cut, then the recommended effect determination is *may affect, likely to adversely affect* marbled murrelets.

Spotted Owl

No-Action Alternative

No effects are anticipated from the no-action alternative.

Preferred Alternative

Though no spotted owls were identified in the vicinity of the project corridor during initial surveys, because potential suitable habitat is present and there is historic evidence that the area was occupied by spotted owls, it is assumed that potential project impacts could affect spotted owls. Surveys are to be conducted over 2 years between March and August. In the first year, 2004, three complete surveys (each completed within a 1- to 2-day period) took place from early May through late July. Two of these surveys were completed before June 30. The proposed road improvement and realignment activities would result in potential impacts on remaining suitable habitat and in the form of disturbance by noise, increased traffic and human activity. Road realignment could potentially remove vegetation that buffers the trees that provide suitable nesting or roosting characteristics for spotted owl. Areas of realignment would result in the largest swath of vegetation removal, but these realignment areas pass through poor-quality but potentially suitable habitat for spotted owls. Construction-related impacts including potential noise impacts are discussed in the Construction Impacts section at the end of Chapter 5.

Conservation Measures

More detailed conservation measures for spotted owl are provided in the Biological Assessment (Herrera 2004d).

- The removal or disturbance of suitable and dispersal habitat would be minimized.
- Damage to potential spotted owl nesting trees adjacent to the project would be minimized.
- Project activities within sound-only injury threshold distances to spotted owl suitable habitat will be restricted to *outside* the early breeding season (March 1 to July 15). Also, where feasible, activities listed in Table 5-4 would be limited to distances beyond the injury threshold distances.

Table 5-4. Sound-only injury threshold distances for construction and timber harvesting-related activities for spotted owls.

Activity or Equipment	Combined Injury Threshold Distances for Spotted Owl [a]
A blast larger than 2 pounds	1 mile
A blast of 2 pounds or less	120 yards
An impact pile driver, a jackhammer, a rock drill	60 yards
A helicopter or single-engine airplane	120 yards
Chainsaws (firewood cutting, hazard trees, pre-commercial thinning, and commercial thinning)	65 yards
Heavy equipment, motorized tools	35 yards

[a] Source: USFWS 2003.

USFWS (2003b) specified the following conservation measures in the biological opinion regarding effects of Olympic National Forest program activities on spotted owl, marbled murrelet and bald eagle. The following are additional conservation measures:

Measures for Handling Individual Trees

- If a spotted owl nest tree is found in the project corridor, it would not be removed.
- The number of large conifers (21 inches diameter at breast height or larger) removed would be minimized or avoided. Fall trees in a manner to minimize impacts to surrounding trees, and away from suitable habitat if it is possible and safe to do so.
- On Forest Service land, any removal of dispersal habitat within spotted owl designated critical habitat would require a Forest Service biologist review.
- On Forest Service land, any proposed removal of any tree larger than 36 inches diameter at breast height within suitable spotted owl habitat would require an Olympic National Forest wildlife biologist review.

Recommended Effect Determination

Preliminary surveys of spotted owls indicate that they may not be present in habitat within 0.5 miles of the project corridor. However, a second year of surveys is required to determine their status in this area. Also, potential habitat for the spotted owl exists along the project corridor. If spotted owls occupy habitat along the alignment, then the following effect determinations are recommended. The project is planned to limit construction activities within sound-only injury threshold distances of suitable spotted owl habitat to *outside* the early nesting season (March 1 to July 15). Therefore, the effect determination is recommended to be *may affect, not likely to adversely affect*. The second year results of spotted owl surveys will be provided to USFWS and, if necessary, consultation with the agency will be reopened.

Bald Eagle

No-Action Alternative

The no-action alternative is not expected to impact bald eagle.

Preferred Alternative

Though no bald eagles were identified within the project corridor, eagles may perch and possibly forage in areas adjacent to the project corridor. Impacts would include loss or modification of potential perching habitat, and potential disturbance by noise and human activity. Road realignment could potentially remove vegetation that buffers trees that provide suitable perching habitat. Areas of realignment would result in the largest amount of vegetation removal, but these realignment areas pass through poor quality bald eagle habitat. Eagles are unlikely to frequently perch in the poor quality habitat areas.

Implementation of the preferred alternative would result in temporary construction impacts on wildlife species within the project corridor. These impacts include vegetation clearing, temporal loss of habitat, displacement of wildlife, and noise. Estimated amount of clearing by habitat type is provided in Table 5-2, based on total clearing of 25 acres within the entire project corridor. Approximately 20 acres of forest habitat would be cleared under the proposed project. The remaining 4 acres is currently clearcut or open field. Out of the estimated 20 acres of forest that would be cleared, 2.3 acres is old growth forest (MOGC in Table 5-2) and 11 acres is second-growth, large diameter forest, both of high value to wildlife and potentially to bald eagle.

Construction-related impacts including noise impacts are provided in the Construction Impacts section at the end of Chapter 5. Sound-only injury threshold disturbances for bald eagle are provided in Table 5-5.

Conservation Measures

The following conservation measures were derived from the biological opinion for Olympic National Forest program activities (USFWS 2003b). More detailed conservation measures for bald eagle are provided in the Biological Assessment for this project (Herrera 2004d).

Table 5-5. Sound-only injury threshold distances for construction and timber harvesting-related activities for bald eagle.

Activity or Equipment	Combined Injury Threshold Distances for Bald Eagle [a]
A blast larger than 2 pounds	1 mile
A blast of 2 pounds or less	1 mile
An impact pile driver, a jackhammer, a rock drill	0.25 mile
A helicopter or single-engine airplane	1 mile
Heavy equipment, motorized tools	0.25 mile not in line-of-sight or 0.5 miles within line-of-sight

[a] Source: USFWS 2003.

Measures for Handling Individual Trees

- When feasible, minimize the number of large conifers (≥21 inches diameter at breast height) removed. Fall trees in a manner to minimize impacts to surrounding trees, and away from potential roosting or nesting habitat if it is possible and safe to do so.
- On Forest Service land, any proposed removal of any tree larger than 36 inches diameter at breast height within a bald eagle use area requires Olympic National Forest wildlife biologist review.

Measures for Active Nests

- If an active bald eagle nest is found on Forest Service land, notify an Olympic National Forest wildlife biologist immediately.

Recommended Effect Determination

The closest documented bald eagle nest is a few miles away from the project; therefore, noise from construction is not expected to affect nesting bald eagles. However, they may be disturbed if they are perching within the sound injury threshold distance (0.25 to 0.5 mile) from the project activities. Also, vegetation clearing may result in impacts to potential perching habitat, although few large diameter trees are expected to be felled. For these reasons, the project *may affect, is not likely to adversely affect* bald eagle.

Land Use

No-Action Alternative

Under the no-action alternative, the existing Grisdale Road project corridor would be maintained and would remain operational. No substantial changes in land use would be expected. Under the no-action alternative, there would be no post-construction indirect effects.

Preferred Alternative

The project would result in some conversion of forest land to highway and right-of-way. No substantial changes in land use or development patterns would be expected from the implementation of the Camp Grisdale Road Project. Approximately 20 acres of forested land would be permanently cleared for the road expansion and realignments. Widening, paving and improving the safety of the roadway corridor would facilitate access to recreational opportunities in the project area and might generate a modest increase in use of these facilities. Widening and paving the roadway would generate a modest increase in tourist traffic, but would not contribute substantially to increased traffic levels over those conditions projected for the future without road improvements.

Some minor indirect impacts to land use might result from redevelopment of the roadway corridor, including the development of material source sites, however the scope of indirect effects to land use in the area would be minimal.

Mitigation Measures

No substantial changes in current land use are expected to result from the preferred alternative, therefore no mitigation is proposed.

Socioeconomics

No-Action Alternative

Under the no-action alternative, Camp Grisdale Road would continue to be maintained as a gravel road, periodically graded to maintain road quality. Loggers, tourists, and dam workers would continue to use the road for access to Wynoochee Lake and the surrounding forest. No socioeconomic benefits or adverse effects are expected to result from the no-action alternative.

Preferred Alternative

An improved road would have a positive effect on the local economy if recreational use of the project area increases. Improvements in the roadway within the project corridor would result in increased efficiencies for logging and log-transporting operations. The paved road surface would reduce gravel-related damage to tourist vehicles and boats.

Following the improvement of Camp Grisdale Road, Wynoochee Valley Road (the county road that links Camp Grisdale Road to Montesano) would experience a marginal increase in tourist traffic. However, the magnitude of this effect would not be great, because the road is used primarily by local residents, and the newly paved route would not attract large numbers of tourists from outside the area. In addition, the paved Camp Grisdale Road is not expected to result in the development of additional businesses in the area.

Paving the road would decrease maintenance needs and costs. Maintenance should be substantially reduced for the projected 20-year lifespan of the roadway and appurtenances. This represents a considerable cost saving for the maintaining agency.

Mitigation Measures

Project communication and coordination would be maintained with the Forest Service and the Green Diamond Resource Company, so that Forest Service timber sales and Green Diamond Resource Company logging operations may be scheduled to avoid or minimize traffic delays associated with project construction.

Environmental Justice

No-Action Alternative

Under the no-action alternative, Camp Grisdale Road would continue to function in its current condition, and racial and ethnic minorities, as well as low-income persons, would not be adversely affected if the road is not improved. Under current conditions, the unpaved road is fully functional and does not result in any disproportional effect on minority or low-income people.

Preferred Alternative

Because there are no racial or ethnic minorities or low-income populations within the project corridor, no disproportionate impact would occur. No residences are located within the project corridor. After construction is complete, operation of Camp Grisdale Road would have no disproportionate effect on racial or ethnic minorities, or low-income people. There would be no indirect effect on environmental justice after construction of the proposed project is complete.

Mitigation Measures

Mitigation is not required.

Public Services and Utilities

No-Action Alternative

Under the no-action alternative, there would be no interruption to public services or utilities, and therefore no impact. Emergency vehicles would continue to travel slowly on the existing unpaved road.

Preferred Alternative

Emergency vehicles responding to calls in recreation areas served by the road currently must travel at low speeds to avoid potholes. An improved road surface would allow emergency vehicles to more efficiently reach and evacuate injured persons to emergency facilities.

Three Tacoma Power vaults associated with the Wynoochee River Project are located close to the road near the northern terminus of the project corridor. The roadway design avoids these vaults. There would be no impacts on utilities in the remainder of the project corridor because no other utilities exist along the project corridor.

The improved road may draw more recreational users to the area, which might lead to an increased demand for public services. There are currently no plans to increase police or fire protection or other public services for the project corridor.

Wynoochee Road residents and Tacoma Power employees have commented that they believe an improved road will increase recreational use and will increase demand for emergency use of private phones.

Mitigation Measures

Potential mitigation measures for impacts on public services and utilities include the following:

- The roadway design avoids the power vaults.

Archaeological and Cultural Resources

One site, the Simpson Timber Company logging railroad roadbed, was found to be mostly outside the area of potential effect, with a small segment extending slightly into the area of potential effect. The abandoned roadbed is not eligible for listing in the NRHP.

No-Action Alternative

Under the no-action alternative, no direct or indirect impacts on the railroad roadbed are expected because there would be no disturbance affecting it.

Preferred Alternative

The previously recorded cultural resource, the Simpson Timber Company logging railroad roadbed, is not eligible for listing on the NRHP, and the resource would not be affected by the proposed project. Therefore, the proposed project would have *no effect* upon any known cultural resource. The cultural resources report (AHS 2004) will be submitted to SHPO for concurrence.

Mitigation Measures

In the event that cultural resources are identified during Camp Grisdale Road improvement project activities, work would be halted in the immediate vicinity of the find and a professional archaeologist notified to assess the resource.

Scenery and Aesthetics

Aesthetic values and the perception of visual impacts are subjective and vary from person to person. Although this section attempts to present objective descriptions of the potential visual impacts of the alternatives, it cannot address all individual perceptions of the study area. This assessment of impacts is based on concepts of contrast and harmony underlying most systems of visual evaluation. Visual impacts have been evaluated based on the predicted responses of both viewers of the road and viewers from the road.

No-Action Alternative

Under the no-action alternative, there would be minimal impacts on scenery and aesthetics. The existing visual environment would remain the same. As in the past, the existing roadway would be periodically graded, although this would have no new visual impact. Dust from the road would continue to settle on adjacent vegetation.

Preferred Alternative

The improved and widened roadway would not contrast with its surroundings much more than does the existing roadway.

Permanent visual changes resulting from the project would be the most apparent to persons who are familiar with the project corridor. The pavement would differ in appearance from the existing gravel surface. However, because the road would remain a two-lane road, the improvements would have no substantial visual impact.

Mitigation Measures

The mitigation measures proposed for potential aesthetic impacts include the following:

- Roadside clear zones would be limited to the minimum size necessary to provide adequate visibility for safety.
- Staging areas, construction areas, and material source and waste sites on Forest Service land would be reclaimed in accordance with Forest Service requirements, as soon as feasible after construction. Staging areas and material source sites on private land would be reclaimed as appropriate.

- Areas disturbed during construction would be seeded to re-establish vegetation.

Recreation

No-Action Alternative

Under the no-action alternative, there would be minimal impacts on recreation. Use of recreational areas might gradually increase over time, resulting in a corresponding increase in traffic. Recreational vehicles would continue to travel slowly on the existing unpaved road.

Preferred Alternative

In the long term, the proposed action would enhance the driving experience of individuals using the road to access recreation areas. Visibility resulting from proposed curve realignments, wider shoulders, and increased clear zones would increase the safety for vehicles.

No additional access points or developments are proposed. However, the straighter, smoother, safer roadway would potentially encourage motorists to use the road, and having experienced its improved drivability, these motorists would potentially visit more often. Therefore, the improvements in the roadway might increase demand at recreational facilities. Tacoma Power expects visitation levels to rise for the Coho Campground and the Wynoochee River Project day use area, and the agency anticipates a corresponding rise in vandalism at its facility. This is based on similar rises in visitation and vandalism at other Tacoma Power facilities (Mazur 2004a personal communication).

No improvements are currently planned for the Tacoma Power Wynoochee River Project day use area, Forest Service campgrounds, or trails near Wynoochee Lake. These recreation areas might experience heavier use, particularly during the busy summer months.

Section 4(f) Impacts

Section 4(f) of the DOT Act stipulated that the FHWA and other Department of Transportation agencies cannot approve the use of land from a significant publicly owned public park, recreation area, wildlife or waterfowl refuge, or any significant historic site. No Section 4(f) properties are affected by the project.

Mitigation Measures

The mitigation measures proposed for potential impacts on recreation include the following:

- Adequate signage would be installed to direct recreational travelers through construction areas to recreational facilities.

Air Quality

No-Action Alternative

Under the no-action alternative, existing impacts on air quality would continue. Vehicles using the unpaved road currently generate dust, particularly during the dry summer months. Dust levels would increase as visitor use and traffic levels gradually increase over time. Dust affects the health of roadside vegetation, and this impact would increase under the no-action alternative. Safety issues related to poor visibility caused by dust would continue and would increase as traffic increases.

Preferred Alternative

Air quality would improve, because paving the roadway would eliminate dust generation. Traffic counts through the project corridor would not increase enough to affect air quality by producing excessive vehicular exhaust emissions. Despite short-term deterioration of ambient air quality during construction, including unpleasant odors, project construction would not result in long-term impacts on air quality. The preferred alternative would not affect the U.S. EPA air quality attainment status for the area. Because dust resulting from traffic impairs visibility, traffic safety conditions would improve with lower dust levels.

Mitigation Measures

No mitigation measures are proposed because no long-term adverse impacts to air quality are anticipated.

Noise

No-Action Alternative

No-action alternative noise levels would slightly increase as traffic noise levels increase.

Preferred Alternative

A paved surface would reduce noise generated by vehicles on the existing uneven gravel surface. On-going maintenance activities and roadway improvements (bridge and road surface or prism improvements and maintenance, weed control and clear zone maintenance) require the use of heavy machinery, which will generate minor noise impacts. There may be some increases in traffic levels due to improved driving conditions but the increases are not expected to significantly differ from projected increases in traffic for the existing road. The southernmost campsite at Coho Campground is located 0.3 miles north of the northern project terminus. Therefore, no adverse effects from increased noise levels would occur under the action alternatives.

Mitigation Measures

No mitigation measures for noise abatement are required for the preferred alternative because there are no adverse effects on noise conditions expected as a result of the Camp Grisdale road improvements.

Hazardous Materials

No-Action Alternative

No impacts are expected to result from the no-action alternative.

Preferred Alternative

No post-construction impacts from releases or encounters with hazardous materials are expected for the preferred alternative.

Mitigation Measures

- No mitigation is proposed for potential impacts due to hazardous materials because no long term impacts are anticipated.

Construction Impacts

Construction impacts occur only during project construction and are short-term. Construction impacts would be avoided or reduced by mitigation measures.

Geology and Soils

Impacts

The preferred alternative would result in new fill material where necessary to widen the existing roadway prism to width of 28 feet. New right-of-way in realignment areas at curves would require clearing of vegetation (see project description section and Figure 1-3). Natural drainage contours would be replaced and exposed soils would be replanted on cuts, fills, and stream banks. Culverts would be replaced, and new ones would be installed where needed along the proposed alignment; abandoned drainage structures at the major realignment area would be removed and the streambeds would be restored to their original contours. Approximately 25 acres would be cleared and graded from the existing road edge to the clearing limits of construction, including realignment segments. The existing roadbed covers approximately 47 acres and would be excavated, regraded, and paved. Source pits for fill material would be determined as the design develops. The extent of excavation, grading, and fill material required for reconstruction and paving of the Camp Grisdale Road would be calculated as the design of the road is developed.

No indirect effects on soils are anticipated during construction of the proposed project.

Mitigation Measures

The following mitigation measures are proposed to minimize the potential impacts on geology and soils:

- Careful construction methods would be used to reduce unstable slopes. Slopes would be stabilized as feasible if necessary.
- Appropriate Best Management Practices (BMPs) would be implemented during construction.

Water Resources

Impacts

Soil and sediments along the project corridor might become contaminated due to spills, leaks, and drips of fuels, solvents, and toxic construction products. Stormwater runoff carrying eroded particles could transport these types of contaminants to downstream waters and affect water quality. If a spill of fuel, asphalt emulsion, or other toxic material were to occur at the construction site, adverse water quality impacts would result.

Short-term loading of eroded sediments and other pollutants to the creeks crossing Camp Grisdale Road has the potential to result in temporary adverse affects to water quality. Construction would be scheduled during the dry months (June through September) for those areas, and given that the majority of the creeks are seasonal, construction-related water quality impacts would be avoided or minimized. Precipitation events could mobilize sediment into the stream channels and would eventually drain to the Chehalis River.

Indirect effects on streams due to construction are those that occur at a later time downstream of the project corridor. Sediment can be carried downstream of the project corridor during construction and adversely affect water quality, as discussed under direct effects. Pollutants from accidental spills during construction might also adversely affect water quality downstream of the project.

Mitigation Measures

The following mitigation measures would minimize adverse water quality impacts during construction along the project corridor:

- Preparation of a stormwater pollution prevention plan (SWPPP) prior to construction site disturbance, with updates as necessary as the project proceeds. The SWPPP could include such measures as using straw bales, rock check dams, slash filter windrows, and silt fences extensively on the perimeter of disturbed areas and in drainage channels to reduce flow velocities and trap sediments in construction site runoff, and wherever possible discharge construction site runoff to vegetated areas and not directly to stream channels or wetlands.

- Preparation of an oil spill prevention plan that manages any toxic materials used in construction.

- Limiting land disturbance to minimize the area of exposed soil at any point in time.

- Staging areas for construction equipment would be located away from stream channels and provide a barrier between staging areas and streams. All machinery maintenance involving potential contaminants (fuel, oil, hydraulic fluid, etc) would occur at a site away from stream channels, water bodies, or wetlands.

- Providing soil stabilization measures in areas that are to be revegetated within 14 days following completion of construction. Appropriate BMPs could include such measures as straw bales, rock check dams, slash filter windrows, and silt fences extensively on the perimeter of disturbed areas and in drainage channels, to reduce flow velocities and trap sediments in construction site runoff.

- Restriction of equipment use in and near stream channels that support fish (see fish and fish habitat section).
- Diversion of streamflows and other runoff around culvert construction areas while the new culverts are installed and backfilled in their final positions and the inlet and outlet areas are stabilized.
- If turbid water is observed in drainage channels or streams, adding additional BMPs to effectively control the problem.

Floodplains

Impacts

No construction impacts on floodplains are anticipated.

Mitigation Measures

Mitigation measures for impacts to floodplains during construction are similar to those described in the water resources section.

Wetlands

Impacts

The proposed improvements to Camp Grisdale Road would directly affect wetlands during construction. These direct impacts would include minor loss of water storage capacity, loss of habitat, sediment-laden runoff leaving the construction site and entering downstream waters, construction noise, and the potential for accidental spills of construction chemicals.

Potential construction impacts involve direct loss of wetlands as a result of vegetation clearing and earth moving, in addition to impacts related to runoff and other disturbances. Estimates of the amount of aquatic resource acreage that may be affected by construction activities are based on the footprint of the proposed, road alignment. The wetland delineation report (Herrera 2004a) and the draft mitigation report (Herrera 2004b) provide details on wetland delineation and proposed mitigation.

- Filling of wetlands would potentially occur during widening and realigning of the roadway and construction of stormwater conveyance facilities. A maximum of 3.7 acres of wetlands would be disturbed, of which 1.6 acre would be temporarily disturbed during construction.
- Grading and filling to adjust site contours and installation of stormwater detention or drainage facilities might release sediment-laden runoff into wetlands. Sedimentation in wetlands would reduce floodwater storage capacity, adversely affect existing soil organisms, and alter the hydrologic regime by raising the elevation of the soil.

Under the preferred alternative, the effects caused by clearing and disturbance in the construction phase would continue to affect the wetlands in the project corridor until plants in these areas recover their prior vigor and stature. Further, the stabilization of soils within the project corridor would be dependent on the recovery of vegetation in these areas.

Clearing of vegetation in both the upland and wetland areas to prepare the site of the roadway and to provide construction access would reduce available wildlife habitat by removing habitat features (e.g., trees, snags, and other plant species). This would also result in a slight alteration of the climate within the affected wetlands.

Mitigation Measures

Mitigation measures for impacts to wetlands during construction are similar to those described in the water resources section for construction impacts.

Vegetation

Impacts

Sensitive Species

Sensitive plant species that are documented to occur in Olympic National Forest and which have suitable habitat in the project corridor are listed, with their habitat requirements, in Table 4-3.

Vascular Plants—No sensitive plant species were encountered within the project corridor; therefore, the proposed construction would not impact the populations or distribution of these species. However, there are some unique habitat features, such as ground water seeps, that could provide suitable habitat for some sensitive species. Disruption of these habitat features could reduce the opportunity for sensitive plant species to become established within the project corridor. The locations of these habitat features would be indicated on future construction drawings to reduce the likelihood that they would be disrupted by the proposed construction activities. No change in these species' distribution is anticipated as a result of the ongoing operation of the proposed roadway improvement.

Bryophytes—The proposed construction could affect populations of *Tetraphis geniculatus* if timber-clearing and earthmoving activities either physically displace the rotted logs they inhabit or alter the local microclimate required by this species. The microclimate could be altered by the removal of trees within the vicinity of these habitat features. No indirect construction effects are anticipated.

Lichens—The proposed construction could affect populations of *Hypogymnia duplicata* if mature conifers are removed from the project corridor. This species is restricted to the upper and mid-canopy of mature conifers in the project corridor. Their removal would eliminate existing populations from the area being cleared and would reduce the colonization potential of this species by eliminating both a source of and substrate for lichen establishment. No indirect construction effects are anticipated.

Noxious Weeds

The proposed construction could temporarily enable the spread of noxious weeds by removing native vegetation and exposing large areas of soil. The long, linear nature of the construction project and the availability of seed sources throughout the project corridor exacerbate this condition. The level of soil disturbance associated with ongoing maintenance of the gravel road (grading, ditch clearing) would be less under the proposed alternative. Therefore, there is expected to be reduced habitat for invasive species along the roadway. However, weed species could spread to landings, borrow pits, and other areas used by equipment. Also, the populations of weed species are expected to rise within the watershed, due to the effects of timber clearing and road building activities associated with the operation of private timberlands which adjoin the project corridor.

Mitigation Measures

The following mitigation measures are proposed:

- The locations of observed populations of sensitive lichen and bryophyte species would be marked on construction drawings and at the population's physical location in the field, along with recommended buffers appropriate for the protection of the microclimate supporting these populations.
- To protect sensitive lichen and bryophyte species, the roadway design would avoid or minimize disturbance to them as feasible.
- To prevent importing noxious weeds into the project corridor, construction equipment would be washed prior to entering the construction area.

Wildlife

Impacts

Implementation of the preferred alternative would result in temporary construction impacts on wildlife species within the project corridor. These impacts include vegetation clearing, temporal loss of habitat, displacement of wildlife, and noise. Estimated amount of clearing by habitat type is provided in Table 5-2, based on total clearing of 25 acres within the entire project corridor. Approximately 20 acres of forest habitat would be cleared under the proposed project. The remaining 4 acres is currently clearcut or open field. Out of the estimated 20 acres of forest that would be cleared, 2.3 acres is old growth forest (MOGC in Table 5-2) and 11 acres is second-growth, large diameter forest, both of high value to wildlife. Adverse effects on wildlife species that use these areas are expected because of the large area being affected and the difficulty in replacing forest habitat within a short period of time. Animals that are mobile would likely avoid the area during construction. Others that are less mobile such as amphibians, reptiles, and mollusks are likely to be lost due to the construction of the roadway. Animals are likely to return to revegetated areas after construction is complete. Birds would be the first to return to the revegetated areas.

Noise levels associated with construction, typically up to 90 decibels (dB) at a 50-foot distance from the noise generator, might affect wildlife using habitats in the vicinity of the construction area. Studies have shown that certain wildlife species respond negatively to aircraft overflights, military operations, recreational activities, and automobile traffic (Larkin 1995; Radle undated). Noise from these activities can affect wildlife activity and communication patterns, including predator-prey relationships and reproductive success.

Temporary loss of wetland and riparian habitat would result in impacts on wildlife species that use these areas for all or a portion of their life cycle. Wildlife that use these areas as edge habitat or a water source include birds (e.g., willow flycatcher, yellow warbler, yellow-breasted chat, red-eyed vireo, Vaux's swift), amphibians (e.g., Pacific salamander and red-legged frog), reptiles (e.g., garter snake and alligator lizard), and mammals (e.g., raccoon, deer, elk, and grizzly bear). Restoration of forest habitat in areas that would be temporarily cleared during construction or where the existing road is decommissioned at realignment areas, would eventually replace lost habitat; however, 25 to 100 years would be needed to reestablish forest habitat similar to the existing habitat. Species that use grassland and shrub habitat (e.g., song birds, mice, black-tailed deer, and Roosevelt elk) would be the first to return to these areas. Gradually, species that use forest habitat would move into the area as the trees mature. Wildlife that are mobile and that use wetlands and riparian areas would relocate to other wetlands and riparian areas.

No indirect effects on wildlife due to construction are anticipated from the proposed project.

Mitigation Measures

There are no federal, state, or local regulations that specifically require mitigation for loss of wildlife habitat for nonprotected species. However, the measures implemented to protect wetlands, streams, fish habitat, and protected species would also protect other wildlife species and habitat. Conservation measures prescribed under the threatened and endangered species section would also benefit non-special-status wildlife species.

One measure is proposed for protection of terrestrial mollusk habitat:

- Trees and brush cleared for road construction within Olympic National Forest will be left at the edge of the vegetation clearing limits to provide habitat for terrestrial mollusks.

Fish and Fish Habitat

Impacts

The proposed action would have temporary adverse effects on stream habitat during construction due to vegetation removal and culvert replacement as discussed under the water resources section. Culvert replacement in perennial streams may require fish be captured and stored, if the stream segment is dewatered during in-water work. Only 24 of the 43 streams that cross the project corridor are perennial, the remaining streams are dry during summer months. Fish have been documented in 15 of the streams that cross the project corridor. These activities have

potentially adverse effects on fish species. Fish capture can result in stress or death of sensitive fish species from fish shocking or stress from handling. Dewatering may strand fish that were not captured and cause stress or death during the construction period. Vegetation removal in riparian areas would be minimal but would result in a temporary loss of cover for fish and loss of shade for maintaining low stream temperatures in small isolated sections of the project corridor.

Sedimentation and gravel from construction activities can adversely affect sensitive fish species. A description of potential adverse effects on fish species is provided under the threatened and endangered species analysis section for bull trout and coastal cutthroat trout.

Indirect effects on fish would be similar to the direct effects described above for fish present downstream from the project corridor.

Mitigation Measures

- All projects potentially affecting the bed or banks of streams, lakes, or other water bodies must meet all conditions specified by WDFW, USFWS, and NOAA Fisheries.
- Instream work would generally be conducted between July 1 and September 30 (low flow season); timing would meet current WDFW allowable work windows for hydraulic projects.
- A SWPPP would be used to minimize the entry of silt-laden water into streams or other water bodies. Erosion-control measures would include, but are not limited to, straw bales, silt fencing, erosion control blankets, temporary sediment ponds, and/or immediate mulching of exposed areas.
- Excess material (spoils) would be disposed of in a site approved by WFLHD to prevent entry to stream channels or other water bodies.
- If placement of large woody debris is undertaken, it will be done in coordination with WDFW, the Forest Service, NOAA, and USFWS.

Additional conservation measures are described under the threatened and endangered species section.

Threatened and Endangered Species

Fish and Fish Habitat

Bull Trout

Impacts—Effects on potential bull trout habitat include increased sedimentation, dewatering of stream habitat at road crossings, vegetation removal within riparian areas in the project corridor. Therefore, temporary sedimentation of streams during construction that contain potential habitat

for bull trout would occur. This might result in degradation of spawning habitat due to sediment filling the spaces between spawning gravels.

Dewatering and vegetation removal within the riparian corridor may have impacts on bull trout, if they are present in the streams. Culvert replacement also includes fish capture and storage, as well as dewatering during culvert replacement, which has potential adverse effects on bull trout, if they are present in that segment of the stream. Fish capture can result in stress or death of bull trout due to fish shocking or stress from handling. Dewatering may strand fish that were not captured and cause stress or death during the construction period. Vegetation removal is expected to be minimal in riparian areas, but it might be necessary to temporarily remove vegetation that now provides cover for fish and shading that lowers stream temperatures. Removal of vegetation leaves fish more open to predation. Stream temperatures might increase slightly from the temporary loss of the relatively small amount of vegetation within the project corridor, but effects of slight temperature rise on fish would be negligible, unless the stream temperatures are already high enough to affect fish reproduction.

Conservation Measures—The following conservation measures were extracted from those specified in the NOAA Fisheries (2004) biological opinion regarding culvert replacement on Forest Service land and will be implemented for the Camp Grisdale Road project. More detailed conservation measures are provided in the Biological Assessment for this project (Herrera 2004d).

- Complete work below bankfull elevation during the recommended in-water work period, as indicated in the most recent WDFW preferred in-water work period for the project area, unless otherwise approved in writing by NOAA Fisheries.
- Do not initiate or continue in-water work in any project area where adult fish are spawning, where spawning is imminent, or where redds are present and in-water work will displace spawning or prespawning adults from spawning areas, or where disruption or dewatering of active redds is likely, as determined by an experienced fisheries biologist.
- Follow fish exclusion protocols from in-water work areas in accordance with NOAA Fisheries, USFWS, and WDFW protocols.
- Follow fish handling and transfer protocols specified by NOAA Fisheries, USFWS, and WDFW.
- Develop a SWPPP and oil spill prevention plan for the proposed project that includes methods and measures to minimize erosion and sedimentation associated with the project. The plan elements shall be in place before and at all times during the appropriate construction phases. The plan should include measures addressing water quality; spill prevention control and containment; site preparation; heavy equipment usage; earthmoving; temporary stream crossings; dewatering; flow

reintroduction; and site restoration. Place sediment barriers around disturbed sites to prevent erosion and sedimentation associated with equipment and material storage sites, fueling operations, and staging areas from entering the stream directly, through natural drainage or road side ditches.

- Establish turbidity and suspended sediment criteria based on water quality standards of the state of Washington (or other appropriate basis). Temporary erosion and sediment control measures will be sufficient to confine water quality impacts within the limits established in the Ecology and WSDOT (1998) implementing agreement (i.e., 100-300 feet downstream of the disturbance).
- Flag boundaries of clearing limits associated with site access, riparian crossings, stream crossings, and staging and stockpile areas to minimize overall disturbance and disturbance to critical vegetation.
- Establish staging areas (used for construction equipment storage, vehicle storage, fueling, servicing, etc.) along existing roadways or turnouts beyond the 100-year floodplain area in a location and manner that precludes erosion into or contamination of the stream or floodplain.
- Minimize clearing and grubbing activities required for preparation of staging or stockpile areas, and stockpile large wood, trees, riparian vegetation, other vegetation, sand, and topsoil removed for establishment of staging areas for site restoration.
- Place sediment barriers around disturbed sites to prevent erosion and sedimentation associated with equipment and material storage sites, fueling operations, and staging areas from entering the stream directly, through natural drainage or road side ditches.
- Monitor and maintain erosion controls until site restoration is complete.
- If monitoring or inspection shows that the erosion controls are ineffective, mobilize work crews immediately to make repairs, install replacements, or install additional controls as necessary.
- Prohibit fuel or oil leakage from construction equipment into the stream channel and floodplain.
- Delineate construction impact areas on project plans, and confine work to the noted area. Confine construction impacts to the minimum area necessary to complete the project.

- Conserve native streambed materials above the bankfull elevation for later use in project restoration. To prevent contamination from fine soils, keep these materials separate from other stockpiled material that is not native to the streambed.

- Minimize sedimentation of streams during dewatering activities with methods such as use of diversion ponds where sediment can settle out of water prior to being returned to the stream. Dissipate flow at the outfall of the bypass system to diffuse erosive energy of the flow.

Coastal Cutthroat Trout

Impacts—The proposed action would have adverse effects on stream habitat during construction due to vegetation removal and culvert replacement as discussed under the water resources section. Culvert replacement also includes fish capturing and storage, and dewatering during culvert replacement, which would have a potential adverse effect on cutthroat trout. Effects on cutthroat trout from dewatering and vegetation removal are similar to those discussed for bull trout.

Replacement of culverts also would result in minimal sedimentation of streams due to soil disturbance during construction and from areas that have not yet fully revegetated during post-construction. Sedimentation can have direct adverse effects on fish. Spawning habitat and active redds might be impaired by sediment entering the river during construction and from areas not fully recovered during post-construction. If this occurs, sediment deposited on redds would result in egg and alevin mortality, particularly where existing levels of fine sediment in the streambed (embeddedness) is high. Cutthroat trout movement may also be temporarily obstructed by increased suspended sediment due to construction and post-construction sedimentation caused by precipitation events.

Effects of sedimentation on instream fish habitat would be similar to that described for bull trout.

Conservation Measures—The same conservation measures proposed for bull trout apply to coastal cutthroat trout.

Coho Salmon

Impacts—Similar impacts to coho salmon as those for coastal cutthroat trout are expected due to the proposed action.

Conservation Measures—Similar conservation measures as those proposed for bull trout and coastal cutthroat trout are recommended for coho salmon. More detailed conservation measures for coho salmon are provided in the Biological Assessment (Herrera 2004d).

Marbled Murrelet

Impacts—Noise can cause injury to nesting and roosting birds, if they are within a disturbance distance and the noise is 92 dB or greater. Ambient noise levels within the relatively undisturbed Olympic National Forest portion of the project was estimated by USFWS (2003b) to approximate an average of 40 dB. Table 5-6 provides approximate decibel levels of construction-related activities.

Table 5-6. Maximum sound levels for construction activities and equipment.

Type of Activity or Equipment	Maximum Sound Levels (decibels [dB]) at 50 Feet Distance [a]
Impact pile drivers	106 (peak)
Jackhammers, rock drills	Range 82-97
Heavy equipment, motorized tools	Range 72-96
Chainsaws	104

[a] Source: Canter 1977, cited in USFWS 2003.

The effects of noise vary with the distance from the sound, climatic conditions, topography, and presence of dense vegetation. Noises that are close enough to marbled murrelets can cause flushing, stress to birds, postponement or disruption of feeding, and nesting disruption or failure. Murrelet nesting begins in April and may last through mid-September. Murrelet eggs rely on the adult murrelet for incubation and protection from weather and predation. After hatching, the juvenile relies on the adults for feeding, spending most of the day by itself. The majority, but not all, feedings occur during the period between 2 hours before sunset and 2 hours after sunrise.

Project activities that produce loud noises during the early nesting season (April 1 to August 5) and between 2 hours before sunset and 2 hours after sunrise have the potential to adversely affect murrelets if adults are flushed from the nest or abort a feeding attempt. When murrelets fledge, usually in September, they fly directly to the ocean where noise from the proposed action would have no anticipated effect.

The USFWS (2003b) has determined the threshold distances at which marbled murrelet are affected by various construction and timber harvesting activity noises. Table 5-3 provides the sound-only injury thresholds.

Nelson and Hamer (1995) reported that successful nests were located significantly farther from forest edges than those that failed. All successful nests were located at least 60 yards from an edge (mean = 181 yards), other than the Nemah nest in Washington that was located only 33 feet from an old road near the center of a 142-hectare forest. These data suggest that although murrelets may nest close to forest edges (such as would be found associated with the proposed action) their reproductive success is low in areas that are less than or equal to 60 yards from the edge. These data suggest that adverse effects from project activities would occur in areas that already do not contribute significantly to the murrelet population through recruitment (USFWS

2004b). However, noise from the proposed project would contribute to the factors that result in poor nesting success.

Additionally there is a site-only injury threshold distance of 11 yards for marbled murrelets (USFWS 2003b). If human presence or activities occur within this distance, this may cause effects similar to the sound-only thresholds (flushing, interruption of nesting and feeding, or abandonment of nests).

Conservation Measures—The conservation measures below are extracted from those specified by USFWS (2003b) in the biological opinion regarding effects of Olympic National Forest program activities on spotted owl, marbled murrelet, and bald eagle. These program activities include road building. More details regarding conservation measures for marbled murrelet are provided in the Biological Assessment for this project (Herrera 2004d).

General Conservation Measures:

- During the marbled murrelet nesting season (April 1 to September 15), all activities that are within disturbance distance and that generate noise above 92 dB must be scheduled between 2 hours after sunrise and 2 hours before sunset.

Measures for Habitat Removal:

- When feasible, avoid or minimize harvesting of trees from within 300 feet of suitable murrelet habitat.

Measures for Handling Individual Trees:

- Known occupied murrelet nest trees shall not be removed.
- If hazard trees or potential nest trees are to be removed within suitable murrelet habitat during the early breeding season (April 1 to August 5) on Forest Service land, review by an Olympic National Forest wildlife biologist is required.
- When feasible, minimize the number of large conifers (≥21 inches diameter at breast height) removed. Fall trees in a manner to minimize impacts on surrounding trees, and away from suitable habitat if it is possible and safe to do so.
- When feasible, avoid or minimize the removal of platforms, trees with platforms, and trees providing cover to platforms even if the stand is currently unoccupied by murrelets.

- On Forest Service land, proposed removal of any tree larger than 36 inches diameter at breast height within marbled murrelet nesting habitat requires review by an Olympic National Forest wildlife biologist.

Measures for Handling Active Nests:

- If an active marbled murrelet nest is found on Forest Service land, an Olympic National Forest wildlife biologist would be notified immediately. All motorized activities and activities that produce smoke or concussive sounds within the harassment distances are prohibited during the early nesting season (April 1 to August 5).

Measures for Ground-Level Disturbance:

- Avoid habitat or nest sites to the extent possible in the final design.
- Where murrelet nests are located, construction would occur during breeding season but only between 2 hours after sunrise and 2 hours before sunset.

Spotted Owl

Impacts—Similar to marbled murrelets, noise can cause injury to nesting and roosting spotted owls and other birds, if they are within a disturbance distance and the noise is 92 dB or greater. Ambient noise levels within the relatively undisturbed Olympic National Forest portion of the project was estimated by USFWS (2003b) to be approximately an average of 40 dB. Table 5-6 provides approximate decibel levels of construction-related activities.

Noises that are within the injury threshold distances can cause flushing, stress to birds, postponement or disruption of feeding, and nesting disruption or failure. The USFWS (2003b) has determined the threshold distances at which spotted owls are affected by various construction and timber harvesting activity noises. Table 5-4 provides the sound-only injury thresholds.

Additionally, there is a site-only injury threshold distance of 20 yards for spotted owls. If human presence or activities occur within this distance, this may cause effects similar to the sound-only thresholds (flushing, interruption of nesting and feeding, or abandonment of nests).

Conservation Measures—More detailed conservation measures for spotted owl are provided in the Biological Assessment (Herrera 2004d).

- The removal or disturbance of suitable and dispersal habitat would be minimized.
- Damage to potential spotted owl nesting trees adjacent to the project would be minimized.

- Disturbance related to human presence and activities would be minimized by confining construction activities to daylight hours when owls are less active in areas that are within 3 miles of suitable habitat sites.
- Project activities within sound-only injury threshold distances to spotted owl suitable habitat will be restricted to *outside* the early breeding season (March 1 to July 15). Also, where feasible, activities listed in Table 5-4 would be limited to distances beyond the injury threshold distances.

USFWS (2003b) specified the following conservation measures in the biological opinion regarding effects of Olympic National Forest program activities on spotted owl, marbled murrelet and bald eagle. The following are additional conservation measures:

Measures for Handling Individual Trees:

- If a spotted owl nest tree is found in the project corridor, it would not be removed.
- On Forest Service land, if hazard tree removal or potential nest tree removal is to be done within suitable owl habitat during the spotted owl early breeding season (March 1 to July 15), review by an Olympic National Forest wildlife biologist is required.
- On Forest Service land, any removal of dispersal habitat within spotted owl designated critical habitat would require a Forest Service biologist review.
- On Forest Service land, any proposed removal of any tree larger than 36 inches diameter at breast height within suitable spotted owl habitat would require an Olympic National Forest wildlife biologist review.

Measures for Active Nests:

- If an active spotted owl nest is found on Forest Service land, an Olympic National Forest wildlife biologist would be notified immediately. All motorized activities, activities that produce a concussive sound, or produce smoke within the sound injury distances would be prohibited during the early nesting season (March 1 to July 15).

Bald Eagle

Impacts—Impacts due to noise would be similar those described for marbled murrelet. Bald eagles appear to acclimate to traffic noise and are more tolerant of auditory disturbances when the sources are partially or totally concealed from view (Stalmaster and Newman 1979). Wintering bald eagles are considered less sensitive to human disturbance than are nesting eagles; however, they avoid areas with significant human activity. Eagle sensitivity appears greatest

during feeding. The USFWS (2003b) has determined the threshold distances at which bald eagle are affected by various construction and timber harvesting activity-related noises. Table 5-5 provides the sound and site injury thresholds estimated for bald eagle.

Conservation Measures—The following conservation measures were derived from the biological opinion for Olympic National Forest program activities (USFWS 2003b). More detailed conservation measures for bald eagle are provided in the Biological Assessment for this project (Herrera 2004d).

Measures for Handling Individual Trees:

- When feasible, minimize the number of large conifers (≥21 inches diameter at breast height) removed. Fall trees in a manner to minimize impacts to surrounding trees, and away from potential roosting or nesting habitat if it is possible and safe to do so.

- On Forest Service land, any proposed removal of any tree larger than 36 inches diameter at breast height within a bald eagle use area requires Olympic National Forest wildlife biologist review.

Measures for Active Nests:

- If an active bald eagle nest is found on Forest Service land, notify an Olympic National Forest wildlife biologist immediately.

Land Use

Impacts

Recreational use of land accessed by the road would be reduced during construction.

Mitigation Measures

No substantial changes in current land use are expected to result from the preferred alternative, therefore no mitigation is proposed.

Socioeconomics

Impacts

The Camp Grisdale Road project would have limited socioeconomic benefits and adverse effects in the study area. The project would not displace businesses; thus residents would not be adversely affected by the loss of employment opportunities. Construction would add money to the Grays Harbor County economy.

Construction of the project would not displace residences, and residents would not be adversely affected by loss of available housing.

During construction, roadway users (primarily tourist vehicles and logging trucks) would be subject to intermittent delays. Delays would be minimized to the extent possible. Logging and log-transporting operations would experience some temporary loss of efficiency as a result of travel delays. The magnitude of these effects is uncertain and would depend upon the frequency, duration, and timing of delays. Residents at the Tacoma Power's Wynoochee River Project would also be temporarily inconvenienced by delays during construction.

No indirect effects are expected during project construction.

Mitigation Measures

Project communication and coordination would be maintained with the Forest Service and the Green Diamond Resource Company, so that Forest Service timber sales and Green Diamond Resource Company logging operations may be scheduled to avoid or minimize traffic delays associated with project construction.

Environmental Justice

Impacts

Construction would have no disproportionate impacts on minority or low-income populations.

Mitigation Measures

Mitigation is not required.

Public Services and Utilities

Impacts

Under the preferred alternative, temporary road closures or delays could occur during construction. Traffic control during construction is addressed in the Construction Traffic, Delays, and Detours section below. Emergency service providers would need to develop contingency plans in coordination with the construction contractors to reduce response time delays during construction. Emergency vehicles would be allowed through the project corridor as the need arises during construction.

Mitigation Measures

Potential mitigation measures for impacts on public services and utilities include the following:

- Anticipated road closures or schedules during construction would be coordinated with the Grays Harbor County Fire Department, the Olympic National Forest fire crews, the Washington State Patrol, and the Grays Harbor County Sheriff's Office to ensure that reliable emergency access is maintained and that alternative plans or routes are available (where possible) to avoid substantial delays in response time.

Archaeological and Cultural Resources

Impacts

There would be no construction-related impacts on known archaeological and cultural resources.

Mitigation Measures

In the event that cultural resources are identified during Camp Grisdale Road improvement project activities, work would be halted in the immediate vicinity of the find and a professional archaeologist notified to assess the resource.

Scenery and Aesthetics

Impacts

The proposed roadway improvements would result in temporary construction-related visual impacts. During construction, the visual quality of the project corridor may be compromised for both viewers of the road and viewers from the road. Adverse visual impacts on areas adjacent to the project corridor would result from the following elements of construction:

- Traffic congestion in areas of active construction
- Presence of construction vehicles and equipment
- Clearing and grading activities resulting in exposed soils (until replanting occurs)
- Erosion control devices such as silt fences and straw bales
- Dust, exhaust, and airborne debris in areas of active construction
- Stockpiles of excavated material
- Staging areas used for equipment storage and construction materials.

Excavation and fill areas along the existing roadway would be visibly evident during construction, although no views would be permanently blocked or obscured. Several newly constructed fill slopes would be visible from a greater distance until the exposed soil and fill

surfaces are revegetated. The improved and widened roadway would not contrast with its surroundings much more than does the existing roadway.

Construction staging areas typically contrast strongly with their forested surroundings, and use of these areas could result in adverse aesthetic impacts during and after construction, unless the areas are carefully chosen, prepared, and subsequently revegetated. If existing borrow and source material sites are used, visual impacts at these sites would generally be modest, and many of the visual problems described above would be avoided.

Mitigation Measures

The mitigation measures proposed for potential aesthetic impacts during construction include the following:

- During grading and excavation, cut lines into slopes would be contoured at the clearing limits as feasible to help soften the visual effect of clearing vegetation from the right-of-way.
- Roadside clear zones would be limited to the minimum size necessary to provide adequate visibility for safety.

Recreation

Impacts

Traffic control through the construction zone would inconvenience recreational travelers during the construction season (spring through fall) but would not preclude existing recreational opportunities. Temporary detours might be necessary, adding to travel time.

Adverse impacts on parks and recreation would also include construction equipment and construction-related noise encroaching on scenic overlooks, wildlife viewing areas, hunting and fishing areas, and local campgrounds. Construction-related economic impacts on local campgrounds are not anticipated, because use is already heavy and detour routes would be provided.

Depending on the locations of road-building material source sites, site operations, and truck hauling might temporarily reduce the quality of recreational experience in nearby areas.

Adequate signage would be installed to direct recreational travelers through construction areas to recreational facilities. Construction staging areas would be located as far from recreation areas and facilities as feasible.

Mitigation Measures

The mitigation measures proposed for potential impacts on recreation during construction include the following:

- Construction staging areas would be located as far from recreation areas and facilities as feasible.

Air Quality

Impacts

Construction activities would result in minor, short-term emissions of dust and diesel exhaust from heavy equipment and trucks during work hours on weekdays. Paving would produce brief, minor asphalt odors. Airborne dust would be controlled by periodically using dust suppression methods on exposed soils in haul route areas. Exhaust emissions and asphalt odors would dissipate rapidly.

The southernmost campsite at Coho Campground is located 0.3 miles north of the northern project terminus. The Wynoochee River Project day use picnic area is located 0.2 miles from the terminus, and the Wynoochee River Project boat ramp is located 0.5 miles away. Visitors using these recreational facilities might detect odors from asphalt and diesel-powered equipment. No permanent adverse construction-related air quality impacts would be expected to result from construction.

Development of material source sites for gravel extraction would result in indirect impacts on air quality. Traffic to and from material sources sites, in addition to the heavy machinery required to extract materials, would result in fugitive dust and emissions impacts similar to those described for direct construction-related impacts.

Mitigation Measures

The mitigation measures proposed for potential impacts on air quality during construction include the following:

- Airborne dust would be controlled using dust suppression methods.

Noise

Impacts

Construction noise sources for the preferred alternative include earth-moving equipment, generators and compressors, trucks, and impact equipment. Construction noise would be temporary and limited to the duration of the project which is expected to occur from June to September over three to five years. The severity of noise impacts from construction would depend on the type, amount, and location of construction activities and the presence of noise-sensitive receptors. The U.S. EPA (1971) estimates that maximum noise levels from construction activities at 50 feet range from 69 to 106 decibels, and at 200 feet range from 57 to 94 decibels. There are no human receptors in close proximity to the project. Construction activity and resulting noise impacts at any particular location in the Camp Grisdale project corridor would occur for a period of several weeks to more than one month. Much of Green

Diamond Resource Company's logging operations occur in the summer when most construction would take place.

Operation of material source sites for gravel extraction would result in noise-related indirect impacts. While the material source sites for the proposed project have not been identified, these materials are normally extracted as near as possible to the project site. Traffic to and from material source sites, in addition to the heavy machinery required to extract materials, would have noise-related impacts similar to those described for direct construction-related impacts. There are no human receptors in close proximity to the project. Blasting would not be required for road construction.

Mitigation Measures

The mitigation measures proposed for potential noise impacts during construction include the following:

- Construction equipment mufflers would be maintained and in good working order.

Hazardous Materials

Impacts

No direct effects resulting from construction activities would occur, due to the lack of hazardous materials facilities along the project corridor. Potential short-term impacts could result from the use of hazardous materials (lubricants, fuels, solvents, etc.) during construction of the preferred alternative; the likelihood of impacts (releases) from construction activities is low. A site-specific oil spill prevention plan or pollution control plan would be prepared to manage any hazardous materials used in construction. While no sites have been identified in or adjacent to the project corridor, project construction could encounter undocumented sites with existing soil or ground water contamination. The likelihood of impacts from encountering these existing contaminated sites would depend on the extent and character of contamination and would be minimized by identifying the sites prior to construction and employing appropriate control, cleanup, and disposal measures. If contaminated soil or water is encountered, WFLHD would be notified. Appropriate measures to minimize further contamination will be undertaken.

There are no known contaminated sites that will be affected by this project.

Mitigation Measures

The following mitigation measures will be implemented for the preferred action alternative:

- A site-specific oil spill prevention plan or pollution control plan would be prepared to manage any hazardous materials used in construction.

Natural Resources and Energy

The source of aggregate to produce pavement has not yet been identified. Both grading and paving will use fossil fuel energy sources, but this use would not be considered substantial. Energy impacts relate to the energy consumed by vehicles and equipment used in construction and the long-term usage of the improved road. The preferred alternative would consume more energy over the short term than the no-action alternative, through road construction activities and workers traveling to and from the work site. Grading and paving would use fossil fuel energy sources, although this use is not considered substantial. Vehicles may move with more constant speed on the proposed paved road than on the existing gravel road, thereby using fuel more efficiently. No major changes in vehicle usage are expected to result from the proposed action; therefore no substantial increase in fuel use is expected after construction.

Staging, Borrow, and Waste Areas

All staging, borrow and waste areas identified by the contractor will comply with Section 106 of the National Historic Preservation Act and the Endangered Species Act.

Cumulative Effects

A cumulative effect is "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR 1508.7). The Federal Highway Administration's January 2003 memorandum, *Interim Guidance: Questions and Answers Regarding Indirect and Cumulative Impact Considerations in the NEPA Process* provides guidance on the interpretation of 40 CFR 1508.7 and states that, "indirect impacts as well as direct impacts, can be considered a subset of cumulative impacts…but are distinguished by an established cause and effect relationship to a proposed Federal action such as a transportation project." The document also states, "cumulative impact analysis is resource specific and generally performed for the environmental resources directly impacted by a Federal action under study." Actions that have resulted in cumulative effects upon specific resources in the vicinity of Camp Grisdale Road are addressed below.

Past, Present, and Future Actions

Past actions considered in the cumulative impact analysis for this project that have contributed, in general, to the present environmental conditions in the project area include road development, a completed project on Wynoochee Road that corrected two curves, timber production, timber harvesting, and a dam and hydroelectric plant were constructed on the Wynoochee River upstream of the proposed project. These activities have had the most substantial effects on wetlands, streams, and wildlife habitat availability. These past actions have resulted in the loss of riparian vegetation, erosion of stream banks, decreases in stream flows, loss of native grasslands, introduction of nonnative and noxious weeds, and fragmentation of habitat. In addition, past road development has affected wetland and stream hydrology and decreased water quality due to untreated roadway runoff. Past road development has, for the most part, not resulted in adverse effects on the visual quality of the project area, however logging activities have.

Present actions considered in this cumulative impact analysis include logging operations.

Reasonably foreseeable future actions considered in the cumulative impact analysis for this project include continued logging, forestry related activities, and a recently completed project that included three curve corrections on Wynoochee Road. Environmental analysis for the project has not begun.

Analysis of Cumulative Effects

The potential cumulative effects resulting from the incremental effects of the proposed action alternatives when added to other past, present, and future actions are described below. The proposed action alternative is not expected to contribute to cumulative effects on the following resources for the reasons stated:

- No cumulative effects on floodplains are anticipated because culverts would transport water under the road and there would be no loss of floodplain capacity.
- No cumulative effects on land use are anticipated because the majority of the project corridor is expected to remain in timber production for the foreseeable future and because the majority of the activity will occur within the existing route.
- Because a low percentage of minority racial or ethnic residents live in the project area, these groups would not suffer disproportionately from the project. The project would not cause any cumulative impact on minority or low-income populations.
- The proposed reconstruction of Camp Grisdale Road, along with past roadway projects and logging activity, would not contribute to cumulative losses of historic resources in this area. Other present and future logging and road-building activities may contribute to cumulative losses of physical evidence of cultural or historic sites in this area.
- Air quality is excellent and ambient noise levels are low in the project area, so that air quality and noise are not likely to become issues of concern. The project would not result in increased traffic levels beyond those predicted for expected regional growth; therefore, this project is not expected to contribute to cumulative impacts on air quality or noise in the project area.
- The proposed action alternative is not expected to contribute to cumulative effects on noise. The project would not result in increased traffic levels beyond those predicted for expected regional growth.
- Past actions, future actions, and the proposed project are not expected to contribute to cumulative impacts from hazardous materials in the project corridor because there are no known or documented facilities within the project corridor.
- The proposed action has little, if any, potential for resulting in cumulative energy impacts. Construction activities will consume energy but vehicles may move with more constant speed on the proposed paved road than on the existing gravel road, thereby using fuel more efficiently. No major changes in vehicle usage are expected to result from the proposed action; therefore no substantial increase in fuel use is expected after construction.

Geology and Soils

The geographic area considered for the analysis of cumulative effects on geology and soils includes a 0.5-mile radius extending from the limits of the Camp Grisdale Road project corridor,

including staging and storage areas, and the same radius extending from material source sites and access roads to those sites. Past and ongoing activities with the most substantial effects on water resources include logging, development, agriculture, and road construction. These actions have resulted in the erosion and topographic modifications of soils. Stream cleaning of woody debris has caused geomorphic changes to streambeds in the watershed (Chehalis River Council 1992). All of these activities have caused substantial erosion on steep slopes, particularly near the Wynoochee Lake dam (see discussion below).

Construction of the proposed road project and exposure of cut slopes and development of material source sites would contribute to incremental cumulative effects on geology and soils, such as erosion and topographical modifications. Ongoing logging will continue to contribute to erosion of soils and topographical modifications.

The completed Wynoochee Road and the proposed Camp Grisdale Road projects did and would disturb soil. A minor soil disturbance cumulative effect in the area will result. Because most of the construction on Camp Grisdale Road would be on relatively flat ground and no blasting would be necessary, impacts to soil and geology would be minor.

Water Resources

The geographic area considered for the analysis of cumulative effects on water resources includes all of the Chehalis River watershed, which supports water quality and resources in the project corridor. Past and ongoing activities with the most substantial effects on water resources include logging, development, agriculture, and road construction. These actions have resulted in the erosion of stream banks, decrease in infiltration of stormwater, and decreases in water quality in streams within the watershed including those that cross the proposed project corridor. Stream cleaning of woody debris has caused geomorphic changes to the streams in the watershed (Chehalis River Council 1992). All of these activities have caused substantial erosion on steep slopes, particularly near the Wynoochee Lake dam (see discussion below).

Tacoma Power constructed the Wynoochee Lake dam in 1972 for flood control and installed hydropower facilities in 1987 at the northern terminus of the project corridor. Variable flows and pulses of water within the Wynoochee River have altered the geomorphology of the stream and caused erosion of stream banks (COE 2004). Sedimentation in the stream has impaired water quality and affected the available oxygen in the stream.

The Forest Service plans to continue road maintenance and development within the Olympic National Forest, but no new road development is anticipated in the Wynoochee River watershed.

The completed Wynoochee Road project temporarily impacted water quality during installation of culverts. Water quality returned to ambient conditions upon completion of construction. Project long-term impacts to water quality would be beneficial and would not add to adverse impacts from other activities in the area.

Wetlands

The geographic area considered for the analysis of cumulative effects on wetlands includes the entire Wynoochee River watershed. Past and ongoing activities with the most substantial effects on wetlands include logging, development, agriculture, and road construction.

The loss of wetland habitat due to past, present, and future activities within the vicinity of the project corridor has resulted in changes to the species and structural composition of the wetland communities present. Many wetlands have been filled or drained to develop agriculture along the Wynoochee Valley. Most other wetlands in the watershed have been cleared of trees or hydrologically altered by adjacent road building or clear-cuts. Plant communities have been altered to favor species tolerant of these disturbances. The Wynoochee Road project disturbed 0.28 acres of wetland that were mitigated with a 2:1 mitigation ratio of created wetland. Approximately 1.6 acres of wetland will be permanently disturbance by the proposed Camp Grisdale Road project. These impacts will be mitigated through wetland creation and restoration at a minimum of 2:1 mitigation ratio. Because permanent wetland losses will be mitigated for the Camp Grisdale project, no cumulative impacts to wetlands are expected to occur.

Disturbance of the wetland communities in the project corridor continues to allow introduction of noxious weeds and nonnative vegetation. Ongoing timber extraction within the vicinity of the project corridor is likely to reduce and further alter wetland habitat, and to isolate remaining wetland areas.

Vegetation

The geographic area considered for the analysis of cumulative effects on vegetation includes the area within contiguous vegetation communities (or habitat units) that extend from the project corridor. Mitigation measures taken during construction will inhibit noxious weed growth, so this project is not expected to add to existing noxious weeds in the project area. Past and ongoing activities with the most substantial effects on vegetation include logging, development, agriculture, and road construction. The loss of forest and wetland habitat due to past, present, and future activities within the vicinity of the project area have resulted in changes to the species and structural composition of the vegetation communities within the vicinity of the project corridor.

The only remaining old growth forest habitat within the project corridor is on Olympic National Forest lands at the northern end of the project corridor. These areas are particularly important to wildlife species, because they are structurally diverse and provide habitat features such as snags and down wood in varying states of decay. Logging has changed the habitat along the project corridor so that it is a patchwork of clear-cut, third-growth, second-growth, and newly regenerating vegetation communities. Ongoing disturbance of these vegetation communities continues to allow introduction of noxious weeds and nonnative vegetation. Ongoing timber extraction within the vicinity of the project corridor is likely to reduce late-successional forested habitat, isolate remaining forested areas, and increase the proportion of young, regenerating vegetation types within the project study area.

The completed Wynoochee Road project removed vegetation that was mitigated by seeding disturbed areas. Approximately 20 acres of vegetation would also be removed for the proposed Camp Grisdale Road project, adding some cumulative impact to vegetation communities. Areas that would be temporarily disturbed would be revegetated to mitigate for this impact and would not contribute to the cumulative impact to vegetation communities.

Wildlife

The geographic area considered for the analysis of cumulative effects on wildlife habitat includes the area within the home range for species likely to occur in the project corridor. Generally this area is contiguous habitat types approximately 1 mile from the proposed project corridor. Past and ongoing activities with the most substantial effects on wildlife habitat include logging, development, agriculture, and road construction. These activities result in cleared and fragmented habitat areas, which in turn reduce cover, roosting, nesting, and foraging habitat for wildlife.

Most of the area in the vicinity of the project corridor was old growth conifer forest prior to logging. Green Diamond Resource Company land is currently a patchwork of newly cut, third growth, newly regenerating, and second growth forest habitat. The logging has caused a shift from forested areas being dominant in the landscape to predominantly open areas and a concomitant shift in wildlife use. For example, deer and some songbirds are likely to thrive with the addition of edge habitat. However, species that inhabit deep forest habitats, such as woodpeckers or the fisher, would relocate to habitat and compete with other wildlife species for smaller habitat areas, or they may experience mortality.

Logging, development, and agriculture have also resulted in loss of wetland and stream habitat. The loss of wetland and stream habitat continues to affect most animals, because they use water sources for a portion of their life cycle. Loss of wetland habitat results in loss of nesting, foraging, and cover habitat for wildlife. The reproductive success of amphibians, reptiles, and bird species that use water for breeding continues to be affected by these activities. The Camp Grisdale Road project would contribute to the loss of wetland habitat, although restoration of wetland habitat elsewhere would offset this loss. The amount of wetland habitat lost due to the project is anticipated to be minor compared to historical losses or as a proportion of remaining wetland areas.

A small amount of habitat was removed for the completed Wynoochee Road project. Approximately 20 acres of habitat would be removed for the curve realignments of the proposed Camp Grisdale Road project, of which 2.3 acres are prime old-growth habitat. This would have only a minor amount of additional cumulative impact in the watershed, since thousands of acres of forest habitat remain in the watershed.

Fish and Fish Habitat

The geographic area considered for the analysis of cumulative effects on fish and fish habitat includes all of the Chehalis River watershed, which support fish and fish habitat in the project

corridor. Past and ongoing activities with the most substantial effects on fish and fish habitat include logging, development, agriculture, and road construction. These actions have resulted in the erosion of stream banks, decrease in infiltration of stormwater, and decreases in water quality that have affected fish habitat. Stream cleaning of woody debris has also disturbed fish habitat in the Chehalis and Wynoochee Rivers and caused geomorphic changes to the streams in the watershed (Chehalis River Council 1992).

Tacoma Power constructed a dam at the northern terminus of the project corridor, which regulates water flow in the Wynoochee River, blocking fish passage above the dam and resulting in mortality of smolts (COE 2004). Tacoma Power transports anadromous fishes upstream of the dam during migration periods, which assists fish migration but can cause stress, impairment of the reproduction process, and possibly mortality. Water is released in pulses from the dam, which has increased high peak flows and decreased low flows, resulting in degradation of cover and spawning habitat for fish. The Corps of Engineers and Tacoma Power are working on a fish restoration project to provide a constructed fish bypass of the dam. Together with fish passages added by the Camp Grisdale Road project, fish habitat in the area would improve. No fish habitat was impacted by the completed Wynoochee Road project. The Camp Grisdale Road project will improve fish passage and will not affect fish habitat, therefore no adverse cumulative impacts to fish and fish habitat are expected.

Threatened and Endangered Species

Fish and Fish Habitat

The cumulative effects from past, present, and future activities to threatened and endangered fish species that are addressed for this project (bull trout, coastal cutthroat trout, and coho salmon [candidate]) are the same as those mentioned in the cumulative effects section for fish and fish habitat. However, the threatened and endangered fish species are more sensitive to modifications to fish habitat than species that are not federally listed. Projects, such as fish habitat restoration at the Wynoochee dam and culvert replacement with fish-passable culverts, may contribute to the recovery of the threatened and endangered species.

The completed Wynoochee Road project did not impact endangered or threatened fish or fish habitat. At this time, threatened or endangered fish or fish habitat may be temporarily affected, but is not likely to be adversely affected by the proposed Camp Grisdale Road project. However, the Camp Grisdale Road project will improve fish passage and will not affect fish habitat, therefore no adverse cumulative impacts to fish and fish habitat are expected.

Wildlife

The cumulative effects from past, present, and future activities to threatened and endangered wildlife species addressed for this project (marbled murrelet, northern spotted owl, and bald eagle) are similar to those mentioned in the cumulative effects section for wildlife habitat. Logging and new road building have and will continue to have the major adverse effects on habitat for marbled murrelet and northern spotted owl, because old growth forest communities are and will be eliminated. Both these species require large (greater than 21 inches diameter at

breast height) trees within old growth forest habitats for their reproduction, so loss of these trees directly affects this part of the bird's life cycle. A substantial decrease in old growth habitat has already occurred and is expected to continue, although the Forest Service prohibits cutting in late successional reserves, which provide critical habitat for marble murrelet and important nesting and roosting habitat for northern spotted owl and bald eagle. The completed Wynoochee Road project did not impact threatened or endangered wildlife. The amount of late successional forest disturbed by the proposed Camp Grisdale project is small (2.3 acres) compared to the area of late successional forest within 0.5 mile of either side of the road (325 acres), and is small in comparison to that removed by other activities in the area.

Socioeconomics

The geographic area considered for the cumulative effects impact analysis includes the project corridor; Grays Harbor County census tract 4, census block 5; and the City of Montesano.

Past actions that have generally contributed to the present socioeconomic conditions in the project vicinity include road development, residential development, farming, logging, and business development. Past development within the project corridor has been limited to logging and road building. Improvement of Camp Grisdale Road, together with these past actions, is not expected to result in a cumulative effect on socioeconomic conditions, because the 17.5-mile improved road is not expected to draw large numbers of visitors or economic development.

After construction, improvements on Camp Grisdale Road could result in some increased use of the roadway, which may be greater than would result if only one segment of the road were improved. The magnitude of this effect is not expected to be great, because the road is used primarily by local residents, and the proposed improvements are not expected to draw large numbers of tourists from outside the area. In addition, the longer length of paved road is not expected to result in the development of additional businesses or recreational facilities in the area.

Neither Wynoochee Road nor the proposed Camp Grisdale Road projects will impact socioeconomics, except for construction money added to the economy. Additional construction dollars will result from the proposed Camp Grisdale Road project.

Public Services and Utilities

The geographic area of cumulative effects includes the project corridor, recreation areas at the northern end of the project corridor, and public service agencies that serve the area.

After construction, improvements on both segments of the road may draw more users to the roadway, which may lead to a marginally greater increase in demand for public services than if only one road segment were improved.

Neither Wynoochee Road nor the Camp Grisdale Road project will contribute to cumulative impacts on public services and utilities.

Archaeological and Cultural Resources

The geographic area considered for the analysis of cumulative effects on historic and cultural resources includes the existing right-of-way and the two major curve realignment areas. Past actions that have likely contributed to the loss of evidence of historical and cultural resources in this area include roadway development, logging activities, and the amount of time that has passed since the resources were placed. The proposed reconstruction of Camp Grisdale Road, along with past roadway projects and logging activity, would not contribute to cumulative losses of the evidence of historic resources in this area. Potential impacts from the proposed Camp Grisdale Road project have not been analyzed.

Scenery and Aesthetics

The geographic area of cumulative effects is taken to include those areas visible from the roadway.

Past timber production activities and construction of the existing Camp Grisdale Road have introduced human-made visual elements into a landscape that was mostly natural. Road construction has created a visual contrast between the surrounding forest and the roadway. The completed Wynoochee Road and the proposed Camp Grisdale Road projects did and would contribute to this visual contrast. Logging activities have resulted in a patchwork of forest stands of differing ages, in some areas forming a canopy over the roadway and in others allowing views across open areas to distant hills. With the exception of future logging activities, the continued addition of human-made visual elements is not likely, because further development along the project corridor is not anticipated.

Recreation

The geographic area considered for the analysis of cumulative effects on recreational facilities includes recreational areas accessible from the project corridor. Past beneficial effects on recreational resources have included recreational opportunities associated with Tacoma Power's Wynoochee River Project area and the construction of campgrounds, fishing access, and trails. Construction of these recreational opportunities and improvements to them, as well as both Wynoochee Road and the Camp Grisdale Road projects, have the cumulative effect of increasing recreation in the area.

Summary of Impacts

Beneficial (or neutral) long-term effects of the preferred alternative, compared to the no-action alternative, include a reduction in ongoing soil erosion; a reduction in airborne sediment

deposited in adjacent areas; major reductions in the amount of sediment delivered to wetlands, streams, their buffers, upland areas, and vegetation; improved hydraulic connectivity through the project corridor; and a minor increase in pollutant loading in receiving waters that would not result in water quality impacts. The preferred alternative would be beneficial to fish because of the installation of fish passage culverts.

The preferred alternative would result in no substantial changes in land use or development patterns; it may have a positive effect on the local economy if recreational use of the area increases; there would be no disproportionate effect on racial or ethnic minorities or low-income people; there would be a decrease in road maintenance needs and costs and a reduction in travel time for emergency vehicles; there would be no effects on any known cultural resource; no substantial visual impact; and there would be improved access to Wynoochee Lake.

Air quality would be improved, and there would be minor changes in noise levels, no effects related to hazardous materials, and minimal effects on natural resources and energy.

Compared to the no-action alternative, the preferred alternative would result in some adverse effects including wider fillslope areas along the existing roadway; a potential increase in volumes of surface runoff entering streams that cross the project corridor; the loss of a small area of disturbed forest edge habitat; and the potential loss or modification of marbeled murrelet, spotted owl, and bald eagle habitat.

The Camp Grisdale Project is expected to result in the filling of 3.7 acres of wetlands. An additional 2.4 acres of a combination of streams and ditches are expected to be affected by project construction. The wetland impact is small compared to the 4,900 acres of palustrine wetlands within the Lake Wynoochee watershed and wetland losses will be mitigated.

Approximately 20 acres of habitat loss is expected due to the proposed project, of which 2.3 acres is mature old-growth forest. Mature old-growth habitat is utilized by federally listed marbled murrelets and potentially by northern spotted owls, along with other wildlife species. Twenty acres of habitat loss is only 0.7 percent of overall habitat available within 0.5 mile of either side of the Camp Grisdale Road.

A cumulative effects analysis for this project indicates that some cumulative effects on natural resources likely would result from the Camp Grisdale Road improvement project, particularly in vegetation communities in realignment areas. Past actions considered in the cumulative impact analysis that have contributed to the present environmental conditions in the project area include road development, timber harvesting, and timber production. Present actions considered in the cumulative impact analysis for the project include logging operations. Reasonably foreseeable future actions considered in the cumulative impact analysis include continued logging and forestry-related activities and improved access to and use of recreation facilities.

Construction Traffic, Delays, and Detours

Existing and projected traffic volumes are discussed in Chapter 2, Purpose and Need.

Construction activities would result in traffic delays and inconvenience for the users of Camp Grisdale Road. The affected population would include persons using national forest lands along the roadway for commercial and recreational purposes, logging truck operators, and employees at the Tacoma Power Wynoochee River Project and fish collection facility. Additional impacts on motorists would result from the poor road conditions and road roughness during construction. In addition, truck traffic along all segments of the roadway would increase as construction materials are hauled to and from material source and disposal sites. The detour discussed (SR 12, US 101, FR 22) in the project description would be able to handle diverted traffic. The number of vehicles diverted would be small. Some roadway users would choose not to go to Wynoochee Lake if the detour were to be implemented.

Mitigation Measures

The mitigation measures proposed to minimize traffic impacts during construction are the following:

- A traffic control plan would be developed before construction to move traffic through the project corridor as efficiently as possible and to provide prior public notification of activities that would substantially delay traffic.
- Traffic stoppages would be limited to the minimum length of time practicable.
- A public information plan would be prepared and implemented by the Forest Service to warn motorists in advance of construction activity and to indicate potential alternative routes.
- Work zone signage would be installed to alert motorists of construction activity.
- Work zone signage would be removed when construction is complete.
- Notification and coordination with regular users of Camp Grisdale Road would be ongoing during construction.

6.0 Summary of Mitigation Measures

Mitigation measures were selected in order to minimize direct, indirect, and cumulative effects of the proposed project on natural and cultural elements. The proposed measures are listed by subject in this section.

Geology and Soils

The following mitigation measures would be considered as part of a Stormwater Pollution Prevention Plan (SWPPP) to minimize the potential impacts on geology and soils:

- The slopes would be rounded and contours graded as feasible to blend into the surrounding terrain
- Appropriate Best Management Practices (BMPs) would be implemented during and following construction
- A borrow source development plan and a reclamation plan would be prepared and approved by WFLHD for each of the proposed material source sites and waste disposal sites if the sites are not commercial.

Water Resources

The following mitigation measures would minimize adverse water quality impacts during construction along the project corridor.

- Preparation of a stormwater pollution prevention plan (SWPPP) prior to construction site disturbance, with updates as necessary as the project proceeds. The SWPPP could include such measures as using straw bales, rock check dams, slash filter windrows, and silt fences extensively on the perimeter of disturbed areas and in drainage channels to reduce flow velocities and trap sediments in construction site runoff, and wherever possible discharge construction site runoff to vegetated areas and not directly to stream channels or wetlands.
- Preparation of an oil spill prevention plan that manages any toxic materials used in construction.
- Limiting land disturbance to minimize the area of exposed soil at any point in time.

- Best management practices could include locating staging areas for construction equipment away from stream channels and providing a barrier between equipment and streams. All machinery maintenance involving potential contaminants (fuel, oil, hydraulic fluid, etc) would occur at a site away from stream channels, water bodies, or wetlands.

- Providing soil stabilization measures in areas that are to be revegetated within 14 days following completion of construction. Appropriate BMPs could include such measures as straw bales, rock check dams, slash filter windrows, and silt fences extensively on the perimeter of disturbed areas and in drainage channels, to reduce flow velocities and trap sediments in construction site runoff.

- Restriction of equipment use in and near stream channels that support fish (see fish and fish habitat section).

- Diversion of streamflows and other runoff around culvert construction areas until the new culverts are installed and backfilled in their final positions and the inlet and outlet areas are stabilized.

- If turbid water is observed in drainage channels or streams, adding additional BMPs to effectively control the problem.

- Stabilization of the inlets and outlets of all new culverts, or in the case of fish-bearing streams, in a manner approved by the Washington Department of Fish and Wildlife.

Floodplains

- New culverts would be designed to allow water to flow under the road to maintain the existing hydrology of the floodplain and minimize the amount of fill in the floodplain.

Wetlands

The project is expected to result in the filling of 3.7 acres of wetlands. The overall mitigation goal is to protect existing wetlands and provide for wetland areas and functions lost as a result of the proposed road improvements, by protecting remaining high-quality wetland areas through the enhancement and preservation of buffer areas.

- Fill in wetlands would be minimized to the extent possible. Disturbance within wetlands would be limited to that necessary to construct the roadway.

- Wetland creation, re-establishment, or enhancement is proposed to compensate for functions provided by the acreage of wetlands filled as a result of the Camp Grisdale Road project.

- Wetland buffer enhancement and preservation is proposed to provide protective buffers, composed of native species, to be set aside from future timber extraction. The widening of the roadway and permanent wetland and buffer impacts associated with the road project would result in a reduction in the existing buffer that surrounds wetlands throughout the project corridor. The goal of protecting buffers is to preserve the existing high level of wetland function within the project corridor.

Vegetation

- The locations of observed populations of sensitive lichen and bryophyte species would be marked on construction drawings and at the population's physical location in the field, along with recommended buffers appropriate for the protection of the microclimate supporting these populations.

- To protect sensitive lichen and bryophyte species, the roadway design would be minimized.

- Revegetation of all temporarily cleared areas would occur as soon as possible after construction is complete. Native species would be planted in areas where vegetation occurred. Restrictions to vegetation removal for threatened and endangered wildlife habitat is covered in the threatened and endangered effects analysis section.

Wildlife

- Areas temporarily cleared would be revegetated and would mitigate lost habitat

- Conservation measures prescribed under the threatened and endangered species section would also benefit non-special-status wildlife species.

- General warning signs would be placed at major elk crossings (e.g., near Wynoochee Dam).

Fish and Fish Habitat

- All projects potentially affecting the bed or banks of streams, lakes, or other water bodies would meet all conditions specified in the WDFW

Hydraulic Project Approval (HPA) for the project, including appropriate timing of in-water work.

- Instream work would generally be conducted from July through September (low flow season); timing would vary to meet current WDFW allowable work windows for hydraulic projects.
- A SWPPP would be used to minimize the entry of silt-laden water into streams or other water bodies. These would include, but are not limited to, straw bales, silt fencing, erosion control blankets, temporary sediment ponds, and/or immediate mulching of exposed areas.
- Disturbed ground where runoff has the potential to drain into stream channels would be revegetated or protected from surface erosion by seeding, mulching, and other methods prior to the fall rainy season. Within one year after project completion, disturbed stream banks would be revegetated.
- Excess material (spoils) would be disposed of in a site approved by WFLHD to prevent their entry to stream channels or other water bodies.
- Placement of large woody debris would be done in coordination with WDFW, the Forest Service, NOAA, and USFWS.

Additional conservation measures for fish and fish habitat protection during construction and post-construction periods are described under the threatened and endangered species section.

Threatened and Endangered Species

Bull Trout, Coastal Cutthroat Trout, and Coho Salmon

The following conservation measures were extracted from those specified in the NOAA Fisheries (2004) biological opinion regarding culvert replacement on Forest Service land. More detailed conservation measures are provided in the Biological Assessment for this project (Herrera 2004d).

- Work would be completed below bankfull elevation during the recommended in-water work period, as indicated in the most recent WDFW preferred in-water work period for the project area, unless otherwise approved in writing by NOAA Fisheries.
- In-water work would not be done in any project area where adult fish are spawning, where spawning is imminent, or where redds are present and in-water work would displace spawning or prespawning adults from spawning areas, or where disruption or dewatering of active redds is likely, as determined by an experienced fisheries biologist.

- Fish exclusion protocols from in-water work areas in accordance with NOAA Fisheries, USFWS, and WDFW protocols would be followed.

- Fish handling and transfer protocols specified by NOAA Fisheries, USFWS, and WDFW would be followed.

- A SWPPP and oil spill prevention plan for the proposed project that includes methods and measures to minimize erosion and sedimentation associated with the project would be developed. The plan elements would be in place before and at all times during the appropriate construction phases. The plan should include measures addressing water quality; spill prevention control and containment; site preparation; heavy equipment usage; earthmoving; temporary stream crossings; dewatering; flow reintroduction; and site restoration. Sediment barriers would be placed around disturbed sites to prevent erosion and sedimentation associated with equipment and material storage sites, fueling operations, and staging areas from entering the stream directly, through natural drainage or road side ditches.

- Turbidity and suspended sediment criteria based on water quality standards of the state of Washington (or other appropriate basis) would be established, and activities for compliance and effectiveness of conservation measures for limiting erosion during project construction and site restoration would be monitored. Temporary erosion and sediment control measures would be sufficient to confine water quality impacts within the limits established in the Ecology and WSDOT (1998) implementing agreement (i.e., 100-300 feet downstream of the disturbance).

- Boundaries of clearing limits associated with site access, riparian crossings, stream crossings, and staging and stockpile areas would be flagged to minimize overall disturbance and disturbance to critical vegetation.

- Staging areas (used for construction equipment storage, vehicle storage, fueling, servicing, etc.) would be located along existing roadways or turnouts beyond the 100-year floodplain area in a location and manner that precludes erosion into or contamination of the stream or floodplain.

- Clearing and grubbing activities required for preparation of staging or stockpile areas, and stockpile large wood, trees, riparian vegetation, other vegetation, sand, and topsoil removed for establishment of staging areas for site restoration would be minimized.

- Sediment barriers would be placed around disturbed sites to prevent erosion and sedimentation associated with equipment and material storage

sites, fueling operations, and staging areas from entering the stream directly, through natural drainage or roadside ditches.

- Erosion controls would be monitored and maintained until site restoration is complete.
- Work crews would be mobilized immediately to make repairs, install replacements, or install additional controls as necessary if monitoring or inspection shows that the erosion controls are ineffective.
- Fuel or oil leakage from construction equipment into the stream channel and floodplain would be prohibited.
- Construction impact areas would be delineated on project plans, and confine work to the noted area. Construction impacts would be confined to the minimum area necessary to complete the project.
- All project operations would cease, except efforts to minimize storm or high-flow erosion, under high-flow conditions that would result in inundation of the project area.
- Native streambed materials above the bankfull elevation would be conserved for later use in project restoration. To prevent contamination from fine soils, these materials would be separated from other stockpiled material that is not native to the streambed.
- Sedimentation of streams would be minimized during dewatering activities with methods such as use of diversion ponds where sediment can settle out of water prior to being returned to the stream. Flow would be dissipated at the outfall of the bypass system to diffuse erosive energy of the flow.

For streams where fish passage culverts would be constructed, designs would be developed with accepted stream simulation methods.

Marbled Murrelet

USFWS (2003b) specified the following conservation measures in the biological opinion regarding effects of Olympic National Forest program activities on marbled murrelet.

General Conservation Measures

- During the marbled murrelet nesting season (April 1 to September 15), all activities that are within disturbance distance and that generate noise above 92 dB would be scheduled between 2 hours after sunrise and 2 hours before sunset.

Measures for Habitat Removal

- When feasible, harvesting of trees would be avoided or minimized from within 300 feet of suitable murrelet habitat.

Measures for Handling Individual Trees

- Known occupied murrelet nest trees would not be removed.
- If hazard trees or potential nest trees are to be removed within suitable murrelet habitat in the ONF during the early breeding season (April 1 to August 5), review by an Olympic National Forest wildlife biologist would be required.
- When feasible, the number of large conifers (≥21 inches diameter at breast height) removed would be minimized. Trees would be felled in a manner to minimize impacts on surrounding trees, and away from suitable habitat if it is possible and safe to do so.
- When feasible, the removal of platforms, trees with platforms, and trees providing cover to platforms would be avoided or minimized even if the stand is currently unoccupied by murrelets.
- On Forest Service land, proposed removal of any tree larger than 36 inches diameter at breast height within marbled murrelet nesting habitat would be reviewed by an Olympic National Forest wildlife biologist.

Measures for Handling Active Nests

- If an active marbled murrelet nest is found on Forest Service land, an Olympic National Forest wildlife biologist would be notified immediately. All motorized activities and activities that produce smoke or concussive sounds within the harassment distances would be prohibited during the early nesting season (April 1 to August 5).

Measures for Ground-Level Disturbance

- Habitat or nest sites would be avoided to the extent possible in the final design.
- Construction would occur during breeding season but only between 2 hours after sunrise and 2 hours before sunset.

Measures for Designated Critical Habitat for Marbled Murrelet

- Avoid habitat or nest sites to the extent possible in the final design.

Spotted Owl

USFWS (2003b) specified the following conservation measures in the biological opinion regarding effects of Olympic National Forest program activities on spotted owl.

- The removal or disturbance of suitable and dispersal habitat would be minimized. Trees removed in suitable spotted owl habitat are to be dropped in a manner that prevents damage to other trees.
- Damage to potential spotted owl nesting trees adjacent to the project would be minimized.
- Disturbance related to human presence and activities would be minimized, by confining construction activities to daylight hours when owls are less active in areas that are within 3 miles of suitable habitat sites.
- If a nest site is identified within the sound injury threshold distances from the project corridor, noise-generating activities would be confined to a period outside the sensitive breeding season for spotted owls (March 1 through September 30). Also, where feasible, activities listed in Table 5-4 would be limited to distances beyond the injury threshold distances.

Measures for Handling Individual Trees

- If a spotted owl nest tree is found in the project corridor, it would not be removed.
- If hazard tree removal or potential nest tree removal is to be done within suitable owl habitat in the ONF during the spotted owl early breeding season (March 1 to July 15), review by an Olympic National Forest wildlife biologist is required.
- The number of large conifers (21 inches diameter at breast height or larger) removed would be avoided or minimized.
- On Forest Service land, any removal of dispersal habitat[2] within spotted owl designated critical habitat would require Forest Service biologist review.
- On Forest Service land, any proposed removal of any tree larger than 36 inches diameter at breast height within suitable spotted owl habitat would require Olympic National Forest wildlife biologist review.

[2] Dispersal habitats provide linkage and connectivity between owl subpopulations and consist of stands with adequate tree size and canopy closure to provide protection from avian predators and some foraging potential (FR Vol. 57 No. 10).

Measures for Active Nests

- If an active spotted owl nest is found on Forest Service land, an Olympic National Forest wildlife biologist would be notified immediately. All motorized activities, activities that produce a concussive sound, or produce smoke within the harassment distances would be prohibited during the early nesting season (March 1 to July 15).

Bald Eagle

The following conservation measures were derived from the biological opinion for Olympic National Forest program activities (USFWS 2003b).

Measures for Handling Individual Trees

- When feasible, the removal number of large conifers (≥21 inches diameter at breast height) would be minimized. Trees would be felled in a manner to minimize impacts to surrounding trees, and away from potential roosting or nesting habitat if it is possible and safe to do so.

- On Forest Service land, any proposed removal of any tree larger than 36 inches diameter at breast height within a bald eagle use area would require Olympic National Forest wildlife biologist review.

Measures for Active Nests

- If an active bald eagle nest is found on Forest Service land, an Olympic National Forest wildlife biologist would be notified immediately. All motorized activities, activities that produce a concussive sound, or produce smoke within the harassment distances (Table 5-5) would be prohibited during the nesting season (January 1 to August 15).

Land Use

- No substantial changes in current land use are expected to result from the preferred alternative, therefore no mitigation is proposed. The majority of the project corridor is used for timber production and no change from that land use is expected in the near future. The *Grays Harbor County Comprehensive Zoning Ordinance* would provide the strategy to control or enhance patterns of residential and economic development on private lands within the project corridor should land uses begin to change.

Socioeconomics

- Project communication and coordination would be maintained with the Forest Service and the Green Diamond Resource Company, so that Forest Service operations and Green Diamond Resource Company logging operations would be scheduled to avoid or minimize traffic delays associated with project construction.

Environmental Justice

- There would be no disproportionate impact on any minority or low-income group, and specific mitigation is not required.

Public Services and Utilities

- Anticipated road closures or schedules during construction would be coordinated with the Grays Harbor County Fire Department, the Olympic National Forest fire crews, the Washington State Patrol, and the Grays Harbor County Sheriff's Office to ensure that reliable emergency access is maintained and that alternative plans or routes are available (where possible) to avoid substantial delays in response time.

- The roadway design would avoid the power vaults.

Archaeological and Cultural Resources

- In the event that cultural resources are identified during Camp Grisdale Road improvement project activities, work would be halted in the immediate vicinity of the find and a professional archaeologist notified to assess the resource.

Scenery and Aesthetics

The mitigation measures proposed for potential aesthetic impacts include the following:

- During grading and excavation, cut lines into slopes would be contoured at the clearing limits as feasible to help soften the visual effect of clearing vegetation from the right-of-way.

- Roadside clear zones would be limited to the minimum size necessary to provide adequate visibility for safety.

- Staging areas, construction areas, and material source and waste sites on Forest Service land would be reclaimed in accordance with Forest Service requirements, as soon as feasible after construction. Staging areas and material source sites on private land would be reclaimed as appropriate.

Recreation

The mitigation measures proposed for potential impacts on recreation include the following:

- Adequate signage would be installed to direct recreational travelers through construction areas to recreational facilities.

- Construction staging areas would be located as far from recreation areas and facilities as feasible.

Air Quality

- Dust suppression would be implemented during construction.

Noise

Construction equipment mufflers would be maintained and in good working order.

Hazardous Materials

The following mitigation measures would be implemented for the preferred action alternative:

- A site-specific oil spill prevention plan or pollution control plan would be prepared to manage any hazardous materials used in construction.

Natural Resources and Energy

No major changes in vehicle usage are expected to result from the proposed action; therefore no mitigation is proposed.

Construction Traffic, Delays, and Detours

Existing and projected traffic volumes are discussed in Chapter 2, Purpose and Need.

Construction activities would result in traffic delays and inconvenience for the users of Camp Grisdale Road. The affected population would include persons using national forest lands along the roadway for commercial and recreational purposes, as well as employees at the Tacoma Power Wynoochee River Project and fish collection facility. Additional impacts on motorists would result from the poor road conditions and road roughness during construction. In addition, truck traffic along all segments of the roadway would temporarily increase as construction materials are hauled to and from material source and disposal sites.

Mitigation Measures

The mitigation measures proposed to minimize traffic impacts during construction are the following:

- A traffic control plan would be developed before construction to move traffic through the project corridor as efficiently as possible and to provide prior public notification of activities that would substantially delay traffic.
- Traffic stoppages would be limited to the minimum length of time practicable.
- A public information plan would be prepared and implemented by the Forest Service to warn motorists in advance of construction activity and to indicate potential alternative routes.
- Work zone signage would be installed to alert motorists of construction activity.
- Work zone signage would be removed when construction is complete.

7.0 Permits and Approvals Required

Federal Permits

- National Pollutant Discharge Elimination System (NPDES) permit from the U.S. Environmental Protection Agency (EPA)
- Department of the Army (Section 404) permit from the U.S. Army Corps of Engineers for filling or dredging in waters of the United States, which include project wetlands
- Certification of compliance with Section 401 of the Clean Water Act by the Washington Department of Ecology.

8.0 Coordination and Consultation

As the lead federal agency in the preparation of this environmental assessment, the Western Federal Lands Highway Division of the Federal Highway Administration follows its Nationwide Action Plan procedures in developing highway improvements in conformance with the 1969 National Environmental Policy Act. These steps are taken to ensure that an interdisciplinary approach is used in addressing the social, economic, and environmental impacts of all phases of highway planning, location, design, and construction.

SEE Team

The social, economic, and environmental (SEE) team was established before the environmental study phase of this project began. The SEE team is responsible for clarifying issues, recommending alternatives, and identifying and assessing environmental impacts. The team includes representatives from the Federal Highway Administration, Forest Service, and Grays Harbor County. SEE team members call on available disciplines within their agencies for technical assistance as needed.

The SEE team members for the proposed project are listed below:

- Mike Traffalis, Design Operations Engineer, Western Federal Lands Highway Division
- Rochelle Byars, Environmental Specialist, Western Federal Lands Highway Division
- Darin Bowman, Project Designer, Western Federal Lands Highway Division
- Russell Esses, Grays Harbor County Engineer, Washington State Department of Transportation
- Kyle Noble, U.S. Forest Service.

Coordinating Agencies and Other Interested Parties

The following public agencies are on the mailing list and are scheduled to receive a copy of this environmental assessment.

Grays Harbor County
100 West Broadway
Montesano, Washington 98563

National Marine Fisheries Service
510 Desmond Drive SE
Lacey, Washington 98503

Olympic National Park
P.O. Box 186
Hoodsport, Washington 985548

Tacoma Power
P.O. Box 1107
Tacoma, Washington 98411

U.S. Army Corps of Engineers
Seattle District
P.O. Box 3755
Seattle, Washington 98124-3755

U.S. Department of Agriculture, Forest Service
Olympic National Forest
1835 Black Lake Blvd. SW
Olympia, Washington 98512-5623

U.S. Fish and Wildlife Service
Western Washington Office
510 Desmond Drive SE, Suite 102
Lacey, Washington 98501

Washington State Department of Ecology
Southwest Region Office
P.O. Box 47775
Olympia, Washington 98504-775

Washington State Department of Fish and Wildlife
Region 6
48 Devonshire Road
Montesano, Washington 98563

Washington State Department of Transportation
Olympic Region
5720 Capitol Boulevard
Olympia, Washington 98504-7440

Public Involvement

As part of scoping, a display ad announcing the initiation of the project was published in local newspapers in December 2003. The announcement was also sent to persons and organizations on a Forest Service mailing list. On May 20, 2004, a public notice for the Camp Grisdale Road project open house was published in the Montesano paper, *The Vidette*, and the Aberdeen paper, *The Daily World*. Copies of the notice were sent to persons and organizations on a Forest Service mailing list. The notice is posted on the Western Federal Lands Highway Division web site (<http://www.wfl.fha.dot.gov/projects/campgrisdale/>).

The open house was held at Montesano City Hall on May 24, 2004 from 5:00 p.m. to 7:00 p.m. (WFLHD 2004b). Nineteen members of the public attended. Two did not sign the sign-in sheet, and three attendees were county commissioners. All SEE team members attended. In addition to the SEE team, attendees included Brian Minor from WFLHD and Chuck Dissan, the WFLHD construction engineer.

An 8-page handout was provided that included the following: a map showing the project vicinity and the beginning and the end of the project corridor, a project name and route identification sheet that included agency contact and SEE team information, a brief description of WFLHD, a

brief description of the project and its purpose and need, a map of potential realignment areas, a diagram of existing and proposed road sections, a proposed project schedule and list of environmental considerations, and a comment sheet that could be mailed to WFLHD by June 7, 2004.

Participants were given the opportunity to make verbal or written comments at the meeting, or to comment after the meeting via letter, email, or phone call. Instructions on how to comment after the meeting are provided on the project website.

The oral comments from the meeting are listed in the *Summary of Open House* (WFLHD 2004b) and included the following subjects: need for the project; possible speeding, drinking, crime, illegal camping and the need for increased law enforcement; possible increased accident rate; lack of phones for emergency use in the corridor; Coho Campground use levels; potential increases in trail use; need for improvement to Wynoochee Valley Road; potential impacts on horse trails; and allocation of funds to other projects. Comments were considered during further development of the action alternative.

Three written comments and two email comments were received. Two supported the project. The comments are available in Appendix D.

The comments are summarized below:

- Increased usage of the area would discourage "unsavory types." Improvement of the road would be the first step in improving transportation to Olympic National Park from I-5.

- Fire response would be faster and fire trucks would not be damaged by the rough road surface. Law enforcement would need to be increased to match the increased traffic.

- Concern was expressed over lack of phones and cell phone capabilities, speed (both now and after paving), the small capacity of Coho Campground, the lack of law enforcement, and the need to improve Wynoochee Valley Road south of Camp Grisdale Road.

- Speed and lack of phone facilities were a concern, along with the increased fire hazard that would result from the project. Drivers would underestimate how far they could travel on a tank of gas, more trash would be left, questions from drivers would annoy residents, and more parties would occur. Squatters would come to the area, and environmental impacts to the forest would result. Fees should be increased, it should be a toll road with speed bumps.

- Concern was expressed about safety.

The EA distribution list is provided in Appendix A.

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APPENDIX A

Environmental Assessment Distribution List

A – Environmental Assessment Distribution List

Grays Harbor Chamber of Commerce
506 Duffy St., Suite 100
Aberdeen, Washington 98520

Grays Harbor County
100 West Broadway
Montesano, Washington 98563

Montesano Chamber of Commerce
100 Brumfield Ave.
Montesano, Washington 98563

National Marine Fisheries Service
510 Desmond Drive SE
Lacey, Washington 98503

Olympic National Park
P.O. Box 186
Hoodsport, Washington 985548

Skokomish Tribe
North 80 Tribal Center Rd.
Skokomish, Washington 98584

Tacoma Power
P.O. Box 1107
Tacoma, Washington 98411

U.S. Army Corps of Engineers
Regulatory Branch
Seattle District
P.O. Box 3755
Seattle, Washington 98124-3755

U.S. Department of Agriculture, Forest Service
Olympic National Forest
1835 Black Lake Blvd. SW
Olympia, Washington 98512-5623

U.S. Fish and Wildlife Service
Western Washington Office
510 Desmond Drive SE, Suite 102
Lacey, Washington 98501

Washington State Department of Ecology
Southwest Region Office
P.O. Box 47775
Olympia, Washington 98504-775

Washington State Department of Fish and Wildlife
Region 6
48 Devonshire Rd.
Montesano, Washington 98563

Washington State Department of Transportation
Olympia Region
5720 Capitol Blvd.
Tumwater, Washington 98504-7440

APPENDIX B

Agency Correspondence

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Western Washington Fish and Wildlife Office
510 Desmond Drive SE, Suite 102
Lacey, Washington 98503
Phone: (360) 753-9440 Fax: (360) 534-9331

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Dear Species List Requester:

We (U.S. Fish and Wildlife Service) are providing the information you requested to assist your determination of possible impacts of a proposed project to species of Federal concern. Attachment A includes the listed threatened and endangered species, species proposed for listing, candidate species, and/or species of concern that may be within the area of your proposed project.

Any Federal agency, currently or in the future, that provides funding, permitting, licensing, or other authorization for this project must assure that its responsibilities under section 7(a)(2) of the Endangered Species Act of 1973, as amended (Act), are met. Attachment B outlines the responsibilities of Federal agencies for consulting or conferencing with us.

If both listed and proposed species occur in the vicinity of a project that meets the requirements of a major Federal action (i.e., "major construction activity"), impacts to both listed and proposed species must be considered in a biological assessment (BA) (section 7(c); see Attachment B). Although the Federal agency is not required, under section 7(c), to address impacts to proposed species if listed species are not known to occur in the project area, it may be in the Federal agency's best interest to address impacts to proposed species. The listing process may be completed within a year, and information gathered on a proposed species could be used to address consultation needs should the species be listed. However, if the proposed action is likely to jeopardize the continued existence of a proposed species, or result in the destruction or adverse modification of proposed critical habitat, a formal conference with us is required by the Act (section 7(a)(4)). The results of the BA will determine if conferencing is required.

The Federal agency is responsible for making a determination of the effects of the project on listed species and/or critical habitat. For a Federal agency determination that a listed species or critical habitat is likely to be affected (adversely or beneficially) by the project, you should request section 7 consultation through this office. For a "not likely to adversely affect" determination, you should request our concurrence through the informal consultation process.

Candidate species and species of concern are those species whose conservation status is of concern to us, but for which additional information is needed. Candidate species are included as an advance notice to Federal agencies of species that may be proposed and listed in the future. Conservation measures for candidate species and species of concern are voluntary but recommended. Protection provided to these species now may preclude possible listing in the future.

For other federally listed species that may occur in the vicinity of your project, contact the National Marine Fisheries Service (NOAA Fisheries) at (360) 753-9530 to request a list of species under their jurisdiction. For wetland permit requirements, contact the Seattle District of the U.S. Army Corps of Engineers for Federal permit requirements and the Washington State Department of Ecology for State permit requirements.

Thank you for your assistance in protecting listed threatened and endangered species and other species of Federal concern. If you have additional questions, please contact Yvonne Dettlaff (360) 753-9582.

Sincerely,

L. Carol Queen

for Ken S. Berg, Manager
Western Washington Fish and Wildlife Office

Enclosure(s)

ATTACHMENT A

December 3, 2002

LISTED AND PROPOSED ENDANGERED AND THREATENED SPECIES, CRITICAL HABITAT, CANDIDATE SPECIES, AND SPECIES OF CONCERN THAT MAY OCCUR IN THE VICINITY OF THE PROPOSED CAMP GRISDALE ROAD RECONSTRUCTION PROJECT IN GRAYS HARBOR COUNTY, WASHINGTON

(T20N R7W S5-8,17-19,30; T20N R8W S1,12,25,36; T21N R7W S6-7,18-19,30-31; T21N R8W S1; T22N R7W S17-20,29-31)

FWS REF: 1-3-03-SP-0355

LISTED

There is one bald eagle (*Haliaeetus leucocephalus*) nesting territory located in the vicinity of the project at T22N R7W S9. Nesting activities occur from January 1 through August 15.

Wintering bald eagles may occur in the vicinity of the project. Wintering activities occur from October 31 through March 31.

Bull trout (*Salvelinus confluentus*) occur in the vicinity of the project.

Marbled murrelets (*Brachyramphus marmoratus*) occur in the vicinity of the project. Nesting activities occur from April 1 through September 15.

Northern spotted owls (*Strix occidentalis caurina*) occur in the vicinity of the project. Nesting activities occur from March 1 through September 30.

Major concerns that should be addressed in your biological assessment of the project impacts to listed species include:

1. Level of use of the project area by listed species;
2. Effect of the project on listed species' primary food stocks, prey species, and foraging areas in all areas influenced by the project; and
3. Impacts from project construction (i.e., habitat loss, increased noise levels, increased human activity) that may result in disturbance to listed species and/or their avoidance of the project area.

PROPOSED

None

CANDIDATE

None

CRITICAL HABITAT

Critical habitat for the marbled murrelet has been designated in the vicinity of the project.

SPECIES OF CONCERN

The following species of concern have been documented in the county where the project is located. These species or their habitat could be located on or near the project site. Species in **bold** were specific occurrences located on the database within a 1-mile radius of the project site.

Aleutian Canada goose (*Branta canadensis leucopareia*)
Cascades frog (*Rana cascadae*)
Coastal cutthroat trout (*Oncorhynchus clarki clarki*)
Columbia torrent salamander (*Rhyacotriton kezeri*)
Long-eared myotis (*Myotis evotis*)
Long-legged myotis (*Myotis volans*)
Makah's copper (*Lycaena mariposa charlottensis*)
Newcomb's littorine snail (*Algamorda newcombiana*)
Northern goshawk (*Accipiter gentilis*)
Olive-sided flycatcher (*Contopus cooperi*)
Olympic torrent salamander (*Rhyacotriton olympicus*)
Pacific lamprey (*Lampetra tridentata*)
Pacific western big-eared bat (*Corynorhinus townsendii townsendii*)
Pacific fisher (*Martes pennanti pacifica*)
Peregrine falcon (*Falco peregrinus*)
River lamprey (*Lampetra ayresi*)
Tailed frog (*Ascaphus truei*)
Tufted puffin (*Fratercula cirrhata*)
Van Dyke's salamander (*Plethodon vandykei*)
Western toad (*Bufo boreas*)
Aster curtus (white-top aster)
Dodecatheon austrofrididum (frigid shootingstar)

ATTACHMENT B

FEDERAL AGENCIES' RESPONSIBILITIES UNDER SECTIONS 7(a) AND 7(c) OF THE ENDANGERED SPECIES ACT OF 1973, AS AMENDED

SECTION 7(a) - Consultation/Conference

Requires:

1. Federal agencies to utilize their authorities to carry out programs to conserve endangered and threatened species;

2. Consultation with the U.S. Fish and Wildlife Service (FWS) when a Federal action may affect a listed endangered or threatened species to ensure that any action authorized, funded, or carried out by a Federal agency is not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat. The process is initiated by the Federal agency after it has determined if its action may affect (adversely or beneficially) a listed species; and

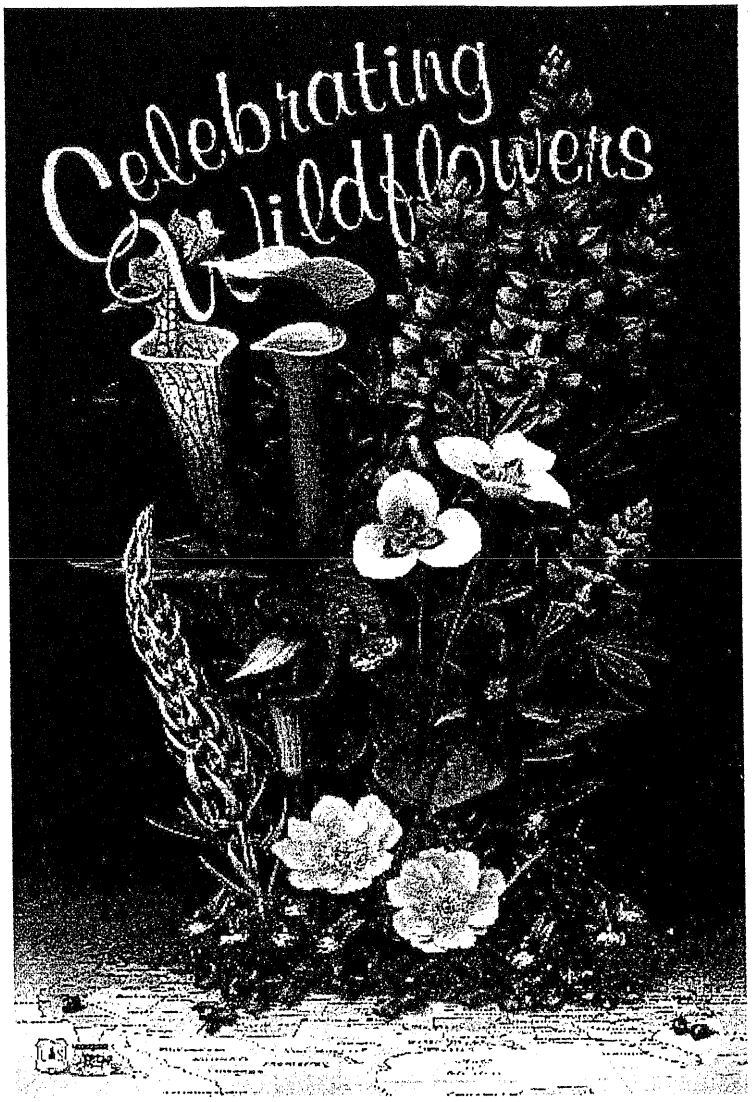
3. Conference with the FWS when a Federal action is likely to jeopardize the continued existence of a proposed species or result in destruction or an adverse modification of proposed critical habitat.

SECTION 7(c) - Biological Assessment for Construction Projects *

Requires Federal agencies or their designees to prepare a Biological Assessment (BA) for construction projects ›nly. The purpose of the BA is to identify any proposed and/or listed species that is/are likely to be affected by – construction project. The process is initiated by a Federal agency in requesting a list of proposed and listed threatened and endangered species (list attached). The BA should be completed within 180 days after its ›itiation (or within such a time period as is mutually agreeable). If the BA is not initiated within 90 days of ›eceipt of the species list, please verify the accuracy of the list with the Service. No irreversible commitment of resources is to be made during the BA process which would result in violation of the requirements under ection 7(a) of the Act. Planning, design, and administrative actions may be taken; however, no construction may begin.

› complete the BA, your agency or its designee should (1) conduct an onsite inspection of the area to be affected by the proposal, which may include a detailed survey of the area to determine if the species is present ›d whether suitable habitat exists for either expanding the existing population or potential reintroduction of the ecies; (2) review literature and scientific data to determine species distribution, habitat needs, and other biological requirements; (3) interview experts including those within the FWS, National Marine Fisheries rvice, state conservation department, universities, and others who may have data not yet published in entific literature; (4) review and analyze the effects of the proposal on the species in terms of individuals and ›opulations, including consideration of cumulative effects of the proposal on the species and its habitat; (5) lyze alternative actions that may provide conservation measures; and (6) prepare a report documenting the ›ults, including a discussion of study methods used, any problems encountered, and other relevant nformation. Upon completion, the report should be forwarded to our Endangered Species Division, 510 ›mond Drive SE, Suite 102, Lacey, WA 98503-1273.

"Construction project" means any major Federal action which significantly affects the quality of the human ironment (requiring an EIS), designed primarily to result in the building or erection of human-made ructures such as dams, buildings, roads, pipelines, channels, and the like. This includes Federal action such as ›mits, grants, licenses, or other forms of Federal authorization or approval which may result in construction



March 14, 2003

Hello!

I have included the following sources for information about Sensitive Plant and Survey and Manage species for our area.

- **Sensitive Species Plant List, Pacific Northwest Region, U.S. Forest Service - April 1999** (with species for the Olympic highlighted)
- 2001 Annual Species Review, **Table 1 - 1. Species Included in Survey and Manage Standards and Guidelines and Category Assignment (June 2002)**
- Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer and other Mitigation Measures Standards and Guidelines (January 2001). **III. Survey and Manage Categories**

I have also included a worksheet which we use for prescreening projects on the Hood Canal Ranger District.This could be expanded to include several other species due to the project location.

- **Initial Review Worksheet for Botany**

Please let me know if there is any additional information that will assist in your environmental review.

Sincerely,

Patricia A. Graves

SENSITIVE SPECIES PLANT LIST
PACIFIC NORTHWEST REGION
U.S. FOREST SERVICE - April 1999

Below is the "key" to the defininations in the spreadsheet.

Key to Region 6 Sensitive Species List

USFWS Status - status under the Endangered Species Act as administered by the U.S. Fish and Wildlife Service

- **LE**- Listed Endangered
- **LT**- Listed Threatened
- **PE** – Proposed Endangered
- **PT** – Proposed Threatened

C- Candidate

- **SoC**- Species of Concern

Washington Status- status under the Endangered Species Act of Washington as administered by **Washington Department of Natural Resources**

- **E**-Endangered
- **T**- Threatened
- **S**-Sensitive
- **X**-Extirpated

Oregon Status - status under the Endangered Species Act of Oregon as administered by the Oregon Department of Agriculture Plant Conservation Biology Program

LE- Listed Endangered

- **LT**- Listed Threatened
- **C**- Candidate

Regional Forester's Sensitive Species List - status under Forest Service internal Manual standards

- **O**- Listed for the state of Oregon

W- Listed for the state of Washington
W/O- Listed in both Washington and Oregon

Heritage GRANK- Global ranking as assigned by national Heritage Program ranging from 1-5, rarest being G1. Some include T ranks. These are used if the taxon in question has a trinomial (is a subspecies or variety).

Heritage SRANK WA/OR – State ranking as assigned by state Heritage Program for the state in which it is listed as Regional Forester's Sensitive. If sensitive in both states, there will be a slash separating the two and Washington will be first, Oregon last.

National Forest Names – Names of National Forests in Region 6

D- Documented
S-Suspected

State of Washington
DEPARTMENT OF FISH AND WILDLIFE

Mailing Address: 600 Capitol Way N • Olympia, WA 98501-1091 • (360) 902-2200, TDD (360) 902-2207
Main Office Location: Natural Resources Building • 1111 Washington Street SE • Olympia, WA

Date: MAR 31 2003

Dear Habitats and Species Requester:

Enclosed are the habitats and species products you requested from the Washington Department of Fish and Wildlife (WDFW). This package may also contain documentation to help you understand and use these products.

These products only include information that WDFW maintains in a computer database. They are not an attempt to provide you with an official agency response as to the impacts of your project on fish and wildlife, nor are they designed to provide you with guidance on interpreting this information and determining how to proceed in consideration of fish and wildlife. These products only document the location of important fish and wildlife resources to the best of our knowledge. It is important to note that habitats or species may occur on the ground in areas not currently known to WDFW biologists, or in areas for which comprehensive surveys have not been conducted. Site-specific surveys are frequently necessary to rule out the presence of priority habitats or species.

Your project may require further field inspection or you may need to contact our field biologists or others in WDFW to assist you in interpreting and applying this information. Generally, for assistance on a specific project, you should contact the WDFW Habitat Program Manager for your county and ask for the area habitat biologist for your project area. Refer to the enclosed directory for those contacts.

Please note that sections potentially impacted by spotted owl management concerns are displayed on the 1:24,000 scale standard map products. If specific details on spotted owl site centers are required they must be requested separately.

These products are designed for users external to the forest practice permit process and as such, does not reflect all the information pertinent to forest practice review. The Forest Practice Rules adopted August 22, 1997 by the Forest Practice Board and administered by the Washington Department of Natural Resources require forest practice applications to be screened against marbled murrelet detection areas and detection sections. Marbled murrelet detection locations are included in the standard priority habitats and species products, but the detection areas and detection sections are not included. If your project is affected by Forest Practice Regulations, you should specially request murrelet detection areas.

WDFW updates this information as additional data become available. Because fish and wildlife species are mobile and because habitats and species information changes, project reviews for fish and wildlife should not rest solely on mapped information. Instead, they should also consider new information gathered from current field investigations. Remember, habitats and species information can only show that a species or habitat type is present, they cannot show that a species or habitat type is not present. These products should not be used for future projects. Please obtain updates rather than use outdated information.

Because of the high volume of requests for information that WDFW receives, we need to charge for these products to recover some of our costs. Enclosed is an invoice itemizing the costs for your request and instructions for submitting payment.

Please note that sensitive information (e.g., threatened and/or endangered species) may be included in this request. These species are vulnerable to disturbances and harassment. In order to protect the viability of these species we request that you not disseminate the information as to their whereabouts. Please refer to these species presence in general terms. For example: "A Peregrine Falcon is located within two miles of the project area".

If your request required a Sensitive Fish and Wildlife Information Release Agreement and you or your organization has one on file, please refer to that document for conditions regarding release of this information.

For more information on WDFW you may visit our web site at http://www.wa.gov/wdfw or visit the Priority Habitats and Species site at http://www.wa.gov/wdfw/hab/phspage.htm.

For information on the state's endangered, threatened, and sensitive plants as well as high quality wetland and terrestrial ecosystems, please contact the Washington Department of Natural Resources, Natural Heritage Program at PO Box 47014, Olympia Washington 98504-7014, by phone (360) 902-1667 or visit the web site at http://www.wa.gov/dnr/htdocs/fr/nhp/wanhp.html.

If you have any questions or problems with the information you received please call me at (360) 902-2543 or fax (360) 902-2946.

Sincerely,

Lori Guggenmos

Lori Guggenmos, GIS Programmer
Priority Habitats and Species

Enclosures

WASHINGTON DEPARTMENT OF FISH AND WILDLIFE
REGIONAL HABITAT PROGRAM MANAGER CONTACTS

For assistance with Priority Habitats and Species Information contact a regional habitat program manger and they will direct your questions to a biologist.

County project is in...	Contact...
Asotin, Columbia, Ferry, Garfield Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman	Kevin Robinette 8702 North Division Street Spokane, WA 99218-1199 Phone: (509) 456-4082
Adams, Chelan, Douglas, Grant, Okanogan	Tracy Lloyd 1550 Alder Street NW Ephrata, WA 98823-9699 Phone: (509) 754-4624
Benton, Franklin, Kittitas, Yakima	Ted Clausing 1701 24th Avenue Yakima, WA 98902-5720 Phone: (509) 575-2740
Island, King, San Juan, Skagit, Snohomish, Whatcom	Deborah Cornett 16018 Mill Creek Blvd. Mill Creek, WA 98012-1296 Phone: (425) 775-1311
Clark, Cowlitz, Klickitat, Lewis, Skamania, Wahkiakum	Steve Manlow 2108 Grand Blvd. Vancouver, WA 98661 Phone: (360) 696-6211
Clallam, Grays Harbor, Jefferson, Kitsap, Mason, Pacific, Pierce, Thurston	Steve Kalinowski 48 Devonshire Road Montesano, WA 98563-9618 Phone: (360) 249-4628

Dan Weiss

From: Barb Wood [Barb.Wood@noaa.gov]
Sent: Tuesday, August 05, 2003 2:50 PM
To: Dan Weiss
Subject: Re: Species Concurrence

Card for Barb Wood

Hi Dan,

Yes, you are correct. No listed species...

Take care!

Dan Weiss wrote:

> Hi Barb,
> I was given your name as a contact person at the NOAA Fisheries. I am
> conducting a Biological Resources assessment for the Federal Highways
> Department along the Lake Wynoochee Road, in Grays Harbor County,
> Washington. The major rivers in the area of the project include the
> Wynoochee River, Anderson Creek, Save Creek, Coal Creek, Schafer Creek, and
> Neil Creek. From the NOAA Fisheries web page I have determined that within
> the project area I will expect to find the following species:
> * Lower Columbia River/Southwest Washington ESU Coho Salmon - listed
> candidate species
>
> Please concur or revise this list as appropriate and don't hesitate to call
> or email me with questions thank you for your time. Also please let me know
> if this request should go to a different representative from NOAA Fisheries.
> Thank you for your time.
>
> Dan Weiss CHMM
> Biologist/ Environmental Scientist
> Herrera Environmental Consultants, Inc.
> 2200 Sixth Avenue, Suite 1100
> Seattle, WA 98121
> (206) 441-9080 ext. 143
> Fax: (206) 441-9108
> www.herrerainc.com

State of Washington
DEPARTMENT OF FISH AND WILDLIFE

Mailing Address: 600 Capitol Way N • Olympia, WA 98501-1091 • (360) 902-2200, TDD (360) 902-2207
Main Office Location: Natural Resources Building • 1111 Washington Street SE • Olympia, WA

RECEIVED
JUN 18 2004
By_____

Dear Authorized Representative:

Thank you for requesting habitats and species information from the Washington Department of Fish and Wildlife (WDFW). Enclosed is a copy of the Sensitive Fish and Wildlife Information Release Agreement that has been agreed to by your organization and ours. Please inform all users about WDFW Releasing Sensitive Fish and Wildlife Information Policy - 5210 and Release Agreement for conditions regarding the use of the requested habitats and species maps and digital data products, and the resolutions that the information can be disclosed and displayed.

If you have any questions, please contact me at (360) 902-2543.

Sincerely,

Lori A Guggenmos

Lori Guggenmos, GIS Programmer
Priority Habitats and Species

Enclosures

Washington Department of Fish and Wildlife
Mailing Address: 600 Capitol Way N • Olympia, WA 98501-1091 **Main Office Location:** Natural Resources Building • 1111 Washington Street SE •Olympia, WA

Washington Department of FISH and WILDLIFE

Sensitive Fish and Wildlife Information Release Agreement

In the event that Information released under this agreement is deemed an "agency record" under the Freedom of Information Act (FOIA), the Washington Department of Fish and Wildlife (WDFW) considers the Sensitive Fish and Wildlife Information subject to this agreement to be confidential and privileged under that act. For instance, Exemption 4 of FOIA protects commercial and financial information. 5 U.S.C. § 552(b)(4). Release of this information would cause substantial harm to the competitive position of the person from whom the information was obtained and/or to the person owning property identified by the information. The resulting disadvantage to such person's competitive position would significantly impair WDFW's and the *Herrera Environmental Consultants, Inc.* ability to obtain this information in the future. Other exemptions to FOIA may also apply.

Sensitive Fish and Wildlife Information is defined according to the attached list of the species and habitats and associated finest display resolution allowable for their specific locations.

Redistributing or Displaying Sensitive Fish and Wildlife Information

1. WDFW is the exclusive owner of the Sensitive Fish and Wildlife Information subject to this agreement. The *Herrera Environmental Consultants, Inc.* shall in all respects treat it as the proprietary information of WDFW in accordance with all procedures reasonably necessary to protect WDFW's proprietary rights therein. Any unauthorized storage, display, reproduction, transmission, transfer, or dissemination of any portion of the information is strictly prohibited.

2. *Herrera Environmental Consultants, Inc.* shall not transfer any printout or other tangible form of Sensitive Fish and Wildlife Information to any person other than a *Herrera Environmental Consultants, Inc.* employee without first obtaining a written agreement from such person not to further disseminate the information.

3. Once this agreement is terminated the information may not be used for any purpose whatsoever. At or before the termination date, all copies of Sensitive Fish and Wildlife Information must be destroyed.

4. Sensitive Fish and Wildlife Information shall not be integrated into *Herrera Environmental Consultants, Inc.* files without prior approval from WDFW. Integration includes extracting information from the WDFW databases and including specific maps or GIS location information that meets Sensitive Fish and Wildlife Information definitions into any reports and/or files in digital or hard copy format.

Term of Agreement

The term of this agreement shall be *six (6) months* from the date of final signature.

The signing of this agreement indicates that *Herrera Environmental Consultants, Inc.* agrees to abide by the terms of this agreement to the extent allowable under the Freedom of Information Act at 5 U.S.C. § 552.

To the fullest extent permitted by law, Herrera Environmental Consultants, Inc. shall indemnify, defend and hold harmless WDFW, its officials, agents, and employees, from and against all claims arising out of the unauthorized disclosure or dissemination of Sensitive Fish and Wildlife Information being provided under this agreement. "Claim" as used in this agreement means any financial loss, claim, suit, action, damage, or expense, including but not limited to attorneys' fees, attributable for bodily injury, sickness, disease or death, or injury to or destruction of tangible or real property, sensitive habitat, including loss of use resulting there from. *Herrera Environmental Consultants, Inc.*'s obligation to indemnify, defend, and hold harmless includes any claim by *Herrera Environmental Consultants, Inc.*'s agents, employees, or representatives. *Herrera Environmental Consultants, Inc.* expressly agrees to indemnify, defend, and hold harmless WDFW for any claim arising out of or incident to the receiving and improper dissemination or displaying of Sensitive Fish and Wildlife Information.

Please return the signed Sensitive Fish and Wildlife Information Release Agreement form to Washington Department of Fish and Wildlife, Priority Habitats and Species, 600 Capitol Way North, Olympia WA 98501-1091. For questions about the form or to address special needs for information distribution not covered in the agreement call (360) 902-2543.

Washington Department of Fish and Wildlife
Mailing Address: 600 Capitol Way N • Olympia, WA 98501-1091 **Main Office Location:** Natural Resources Building • 1111 Washington Street SE •Olympia, WA

Washington Department of FISH and WILDLIFE

Sensitive Fish and Wildlife Information Release Agreement

FOIA Agreement with a Six month term of agreement

Organization Name Herrera Environmental Consultants, Inc.

Authorized Representative Diane Hennessey Phone Number 206-441-9080

Technical Contact(s) Amanda Azous

Mailing Address 2200 Sixth Ave, Seattle, WA 98121

Description of information that you are requesting Environmental documentation for the US Department of Transportation Federal Highway Administration Camp Grisdal Road improvement project # 02-01499-009.

I, The Authorized Representative Herrera Environmental Consultants, Inc., agree to the terms on the reverse side.

Authorized Representative

Title Ecologist

Name Diane Hennessey

Signature Diane Hennessy

Date 5-26-04

Washington Department of Fish and Wildlife

Title GIS Programmer

Name Lori L. Guggenmos

Signature Lori L Guggenmos

Date 6/15/2004

Effective Date: 8/21/02	Page: 1 of 6

POLICY - 5210

Cancels: WDW 1004
See Also: RCW 42.17.310 (1) (yy)
POL - 1005

Approved by: Jeff Koenings, Director

POL - 5210 RELEASING SENSITIVE FISH AND WILDLIFE INFORMATION

This policy applies to all WDFW employees and parties holding fish and wildlife information that the Director has determined as sensitive.

Definitions:

Sensitive Fish and Wildlife Information: As determined by the Director, fish and wildlife locational information displayed on maps or by other media (including video or print media, digital data, web-based information, press releases, public service announcements, public display items, and Department or journal publications) that meet the criteria for determining that fish and wildlife information is sensitive.

Criteria for Determining That Fish and Wildlife Information is Sensitive: Fish and wildlife information is determined to be sensitive by the Director when the viability of a fish or wildlife population may be compromised by displaying the locations of a species or its habitat, and meets at least one (1) of the following criteria:

A. The species has a known commercial or black-market value;

B. The species behavior or ecology renders it especially vulnerable and has a history of malicious take;

C. A known demand to visit, take, or disturb; or

D. Extremely limited distribution and concentration of the species.

Additional fish and wildlife information considered sensitive, includes:

A. Radio frequencies used in telemetry studies[1];

B. Locational data generated by telemetry studies[2].

Sensitive Fish and Wildlife Information Release Agreement: An agreement that indicates that the signatory (person or organization) recognizes the appropriate guidelines for disseminating Sensitive Fish and Wildlife Information and has agreed to the provisions of this policy.

1. **Washington State Law Exempts Sensitive Fish and Wildlife Information from Public Inspection and Copying**

2. **Employees Shall Only Release Sensitive Fish and Wildlife Information to the Following Parties:**

   A. Government agencies;

   B. Tribes;

   C. Researchers affiliated with an accredited college or university;

   D. Private landowners (for their lands), or other parties with permission from the landowner; or

   E. Agents of the above parties (e.g., consultants, realtors, etc.).

3. **Employees Shall Only Release Sensitive Fish and Wildlife Information in Conjunction With a WDFW Sensitive Fish and Wildlife Information Release Agreement**

---

[1]Radio frequencies used in radio telemetry studies have been determined by the Director to be sensitive because they provide an increased opportunity to take or harass individual radio-tagged animals.

[2]The locational data generated by telemetry studies has been determined by the Director to be sensitive because disclosure may provide a facilitated advantage to hunters or collectors who receive this information.

A. Releasing information covering an area **less than** thirty-six square miles (one Township):

(1) Employees will release Sensitive Fish and Wildlife Information covering an area less than thirty-six square miles (one Township) to the parties listed in Section 2 of this policy along with a request for a signed Sensitive Fish and Wildlife Information Release Agreement.

(2) Employees will grant subsequent releases of Sensitive Fish and Wildlife Information only to those parties from whom the signed Sensitive Fish and Wildlife Information Release Agreement has been obtained.

B. Releasing information covering an area **greater than** thirty-six square miles (one Township):

(1) Employees will release Sensitive Fish and Wildlife Information covering an area greater than thirty-six miles (one Township) only to the parties listed in Section 2 of this policy after a signed Sensitive Fish and Wildlife Information Release Agreement has been obtained.

4. Individuals and Organizations May Release Sensitive Fish and Wildlife Information Obtained From WDFW Subject to the Following Provisions

A. Parties holding Sensitive Fish and Wildlife Information obtained from the WDFW may release it for areas less than 36 square miles (one Township) only to the parties listed in Section 2 of this policy when such a release accompanies an agreement to abide by the provisions of this policy.

B. Parties holding Sensitive Fish and Wildlife Information obtained from the WDFW shall not disclose or release it for areas greater than thirty-six square miles (one Township). Refer back to WDFW for these information requests.

5. Employees May Release Sensitive Fish and Wildlife Information During Certain Governmental Activities

The following activities constitute circumstances appropriate for the release of maps or other items that display Sensitive Fish and Wildlife Information. Any Sensitive Fish and Wildlife Information released in these circumstances shall abide by the other provisions of this policy.

A. When working with citizen advisory committees.

B. In public meetings and hearings, Sensitive Fish and Wildlife Information shall not be displayed at resolutions finer than 1:100,000. Maps or other media that display or refer to Sensitive Fish and Wildlife Information in accordance with this policy may not be reproduced or distributed. Answer specific questions only to the extent as provided in the provisions of this policy.

C. Very small-scale maps (1:250,000) that display Sensitive Fish and Wildlife Information may be reproduced and distributed to the public.

6. The Director, or a Designee, May Waive Sensitive Fish and Wildlife Information Release Requirements in Emergencies

In the event of an emergency, as defined by the Administrative Procedure Act, the Director, or a designee, may waive restrictions on release of sensitive information to assist in minimizing negative impacts to fish and wildlife, to assess damage, or to otherwise assist in managing the emergency.

7. Appendix A Lists Sensitive Fish and Wildlife Information

APPENDIX A

SENSITIVE FISH AND WILDLIFE INFORMATION

Information concerning the specific locations of the species and habitats listed below is considered to be fish and wildlife information that has been determined to be sensitive by the Director. Locations are not regarded as sensitive if they are generalized to the Finest Resolution Allowable Without Release Agreement.

Note: Not all information related to a species or habitat may be considered sensitive. The information that is considered sensitive is indicated in the column titled "Information Considered Sensitive" in the table below. For example, the only Grizzly Bear information considered sensitive involves DEN SITES. The release of locations or other information related to DEN SITES would be restricted to the disclosure of *which* Township(s) have Grizzly Bear DEN SITES but not *where* they occur.

Species or Habitat for Which Information is Considered Sensitive	Sensitive Criteria*	Information Considered Sensitive	Finest Resolution Allowable Without Release Agreement
FISH/SHELLFISH			
Abalone	A,C	All	Township
AMPHIBIANS			
Tiger salamander	A	All	Township
REPTILES			
Western pond turtle	A,D	All	Township
BIRDS			
Northern goshawk	A,C	Nest sites	Section
Merlin	A,C	Nest sites	Section
Peregrine falcon	A,C	Nest sites	Township
Prairie falcon	A,C	Nest sites	Township
Sage grouse	C,D	Leks	Section
Sharp-tailed grouse	C,D	Leks	Section

Species or Habitat for Which Information is Considered Sensitive	Sensitive Criteria*	Information Considered Sensitive	Finest Resolution Allowable Without Release Agreement
Spotted owl**	B	All	Township
MAMMALS			
All Bats	B	Roost Sites	Township
Gray wolf	B	Den Sites	Township
Grizzly bear	B	Den Sites	Township
HABITATS			
Caves	B,C	All	Township

*See POL - 5210: Criteria for Determining Sensitive Fish and Wildlife Information.

**Data will be provided that indicates the presence of a spotted owl circle in a given section without a WDFW Sensitive Fish and Wildlife Information Release Agreement.

Diane Hennessey

From: Vaughan D Marable [vdmarable@fs.fed.us]
Sent: Friday, August 06, 2004 12:08 PM
To: dhennessey@herrerainc.com
Subject: Fw: sensitive species

En-4_RF_Sens_Animal_List_2004.... En-1_RF-Sens_Animals_S&M.xls blank_project_review_form_1_14... Deep_ck_BE_Ziegltrum_7_04.doc pic05574.jpg

Diane, I don't think that I've sent this to you already?? If there is something else that you're looking for, please let me. I hope this helps.

Thanks

Vaughan D. Marable
Wildlife Biologist
Hood Canal Ranger District
Olympic National Forest
(360) 765-2230

----- Forwarded by Vaughan D Marable/R6/USDAFS on 08/06/2004 12:01 PM -----

Joan Ziegltrum/R6/USDAFS
07/28/2004 09:50 AM

To: Vaughan D Marable/R6/USDAFS@FSNOTES
cc: Susan D Piper/R6/USDAFS@FSNOTES, Deborah McConnell/R6/USDAFS@FSNOTES, Pat Grover/R6/USDAFS@FSNOTES, Karen K Holtrop/R6/USDAFS@FSNOTES
Subject: sensitive species

Vaughan - here's the sensitive animal list, which includes the mollusk species that were added to sensitive status. I'd also recommend that the analysis of the project also includes the former survey & manage species that were NOT added to sensitive. This is because there is currently a lawsuit on the latest ROD, and if it comes to a judge enjoining our projects (and basically going back to "survey & manage"), we'd have all the bases covered. So the survey & manage project form is good for that.

I'm also attaching a draft report I wrote for the Deep Creek road restoration NEPA (I still need to do some edits on this document - I ran out of time before my vacation, and I need to add mitigation measures for the invasive plants for this project).

So basically, we have 2 snails and 4 slugs on the Sensitive list (snails: Cryptomastix devia and Hoko Vertigo; slugs: Hemphillia glandulosa, H. burringtoni and H. malonei, and Prophysaon coeruleum). There are 11 former survey & manage species that were NOT added to the Sensitive list - nine are lichens and two are mollusks (Megomphix hemphilli snail and Deroceras hesperium slug).

Hope this helps - call if you have questions. - Joan

(See attached file: En-4_RF_Sens_Animal_List_2004.xls)(See attached file: En-1_RF-Sens_Animals_S&M.xls) (See attached file: blank_project_review_form_1_14_2004.doc) (See attached file: Deep_ck_BE_Ziegltrum_7_04.doc)

(Embedded image moved to file: pic05574.jpg) warty jumping slug	JOAN ZIEGLTRUM, Ph. D., Ecologist Olympic National Forest 1835 Black Lake Blvd. SW, Suite A Olympia, WA 98512-5623 Tel. (360) 956-2320 FAX (360) 956-2330 email jziegltrum@fs.fed.us

EASTERN
WASHINGTON
UNIVERSITY

Cheney • Spokane

August 18, 2004

Mr. Delbert Miller, Tribal Historic Preservation Officer
Skokomish Tribe
N. 80 Tribal Center Road
Skokomish, WA 98584

RE: Camp Grisdale Road Improvement

Dear Mr. Miller:

Archaeological and Historical Services (AHS), Eastern Washington University, is conducting cultural resources investigations for the Camp Grisdale Road improvement project in the Wynoochee River Valley (see included map). The proposed Federal Highways Administration, Western Federal Lands Highway Division project is to pave the existing gravel road from the end of the existing pavement about 17.5 miles south of Lake Wynoochee north to near the Wynoochee Lake dam.

To assist the with the environmental project planning process and regulatory compliance, AHS is conduct ing investigations including the identification of cultural resources that might be affected by the proposed project. In the course of project research we have examined a variety of records and literature at the Washington State Office of Archaeology and Historic Preservation, university libraries and archives, and local repositories. We recognize that the Skokomish Tribe may have cultural information concerning the proposed project area.

I write to elicit Skokomish Tribal participation in the cultural resources identification process. If you or other tribal members have information concerning traditional use areas that might be affected by the proposed project, we encourage the Tribe to contact us. We are aware that some of this information is of a sensitive nature and we are committed to working with the Tribe in a responsible manner, respectful of tribal concerns. Please contact me at your earliest convenience if you would like to discuss this project further. I look forward to hearing from you.

Sincerely,

Stan Gough
Director

Encl. project area map

Cc: The Honorable Gordon James

ARCHAEOLOGICAL AND HISTORICAL SERVICES
Cheney: 201 Isle Hall, Cheney, WA 99004-2420 • (509) 359-2239 • FAX (509) 359-6051
Tumwater: PO Box 14488, Tumwater, WA 98511-4488 • (360) 586-1040 • FAX (360) 586-1041

Eastern Washington University is committed to equal opportunity and affirmative action in employment.

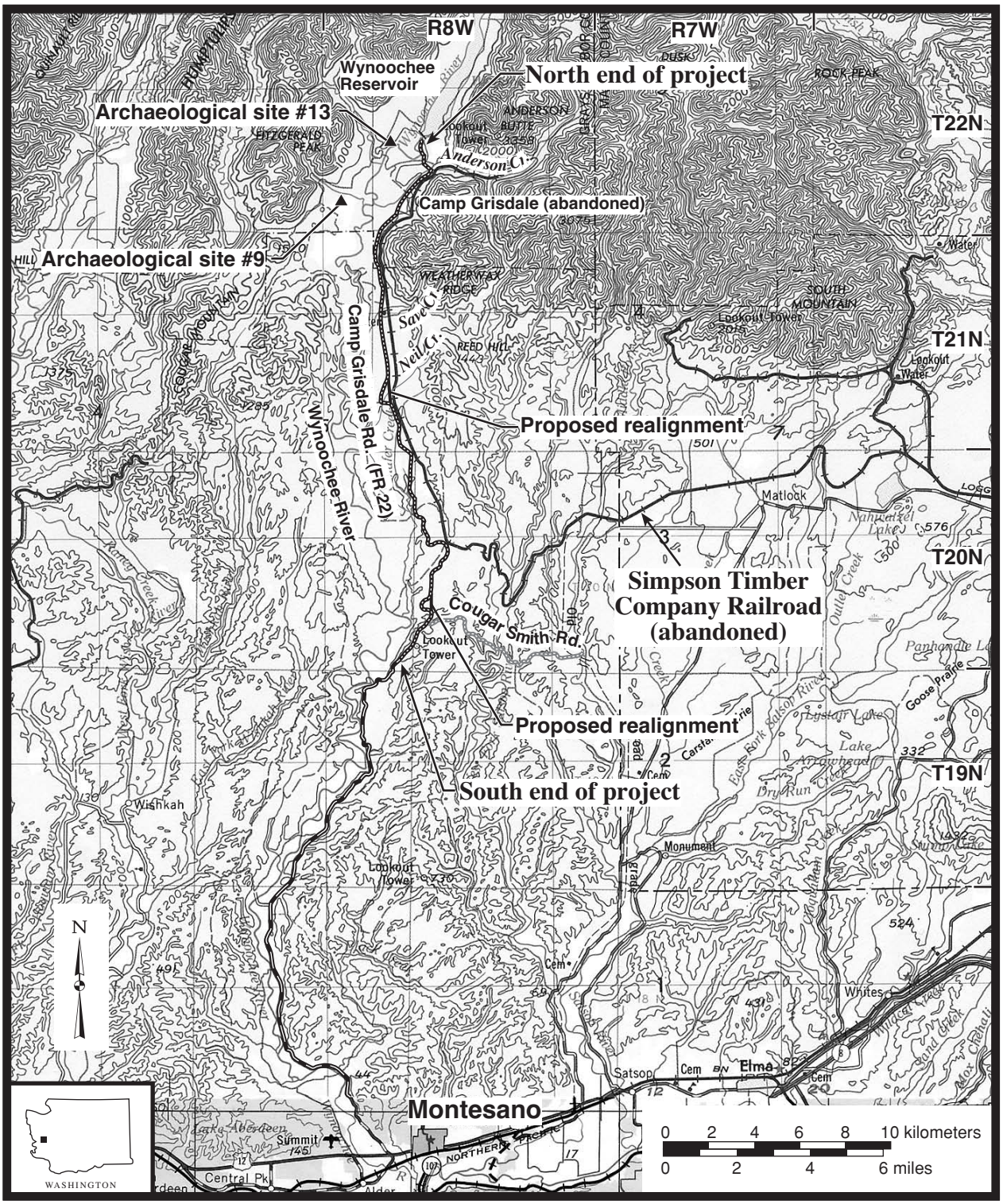


Figure 1. *Camp Grisdale Road improvement project area APE showing the proposed realignments, previously recorded archaeological sites, and the Simpson Timber Company Railroad (adapted from Hoquiam, WA., (1958) and Seattle, WA., [1958, photorevised 1974] 1:250,000 USGS topographic maps).*

EASTERN
WASHINGTON
UNIVERSITY

Cheney • Spokane

MEMORANDUM

TO: Grisdale Road File

FROM: Stan Gough

RE: Tribal cultural resources informal consultation

DATE: August 31, 2004

Following up on my letter of August 18th, 2004, on Tuesday August 31, 2004 I spoke by phone with Mr. Delbert Miller (Skokomish Tribe, Tribal Historic Preservation Officer) regarding Tribal concerns, interest or comments regarding cultural resources investigations for the Grisdale Road project. Mr. Miller had seen my letter and was well acquainted with the Grisdale project area. We spoke about the project area, the Simpson Logging railroad that AHS personnel had documented, and Camp Grisdale. Mr. Miller did not express any cultural resources concerns with the project. He did express his sadness over the proposed road paving, but this was not in reference to any particular cultural resource of which I am aware.

ARCHAEOLOGICAL AND HISTORICAL SERVICES
Cheney: 201 Isle Hall, Cheney, WA 99004-2420 (509) 359-2239 FAX (509) 359-6051
Tumwater: P.O. Box 14488, Tumwater, WA 98511-4488 (360) 586-1040 FAX (360) 586-1041

Eastern Washington University is committed to equal opportunity and affirmative action in employment.

APPENDIX C

List of Resource Reports and Other Applicable Documents Available for Review at WHLHD and Forest Service Offices

C – List of Resource Reports and Other Applicable Documents Available for Review at WFLHD and Forest Service Offices

AHS. 2004. Cultural Resources Investigations for the Camp Grisdale Road Project, Grays Harbor County. Short Report 817. Archaeological and Historical Services. Eastern Washington University. August 2004.

Herrera. 2003. Biological Resources—Wetlands, Fisheries, Wildlife, and Vegetation: Resource Studies for Camp Grisdale Road, Washington. Project Number PFH 208-1(1). Prepared for U.S. Department of Transportation, Federal Highway Administration, Western Federal Lands Highway Division. Herrera Environmental Consultants, Inc., Seattle, Washington.

Herrera. 2004. Camp Grisdale Road Biological Assessment. Project Number PFH 208-1(1). Prepared for U.S. Department of Transportation, Federal Highway Administration, Western Federal Lands Highway Division. Herrera Environmental Consultants, Inc., Seattle, Washington.

Herrera. 2004. Camp Grisdale Road Biological Resources Report. Project Number PFH 208-1(1). Prepared for U.S. Department of Transportation, Federal Highway Administration, Western Federal Lands Highway Division. Herrera Environmental Consultants, Inc., Seattle, Washington.

Herrera. 2004. Camp Grisdale Road Conceptual Wetland Mitigation Report. Project Number PFH 208-1(1). Prepared for U.S. Department of Transportation, Federal Highway Administration, Western Federal Lands Highway Division. Herrera Environmental Consultants, Inc., Seattle, Washington.

Herrera. 2004. Camp Grisdale Road Wetland Delineation Report. Project Number PFH 208-1(1). Prepared for U.S. Department of Transportation, Federal Highway Administration, Western Federal Lands Highway Division. Herrera Environmental Consultants, Inc., Seattle, Washington.

NOAA Fisheries. 2003. Endangered Species Act - Section 7 Consultation Biological Opinion & Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation Programmatic Culvert Replacement Activities in Washington and Eastern Oregon. Prepared for USDA Forest Service by NOAA Fisheries, September 2, 2003.

US Forest Service. 1996. Camp Road ROW Timber Sale, Environmental Assessment and Project Watershed Analysis. Olympic National Forest. January 1996, revised April 1996.

US Forest Service. 1996. Upper Wynoochee Watershed Analysis. Olympic National Forest. September 1996.

USFWS. 2003. Biological Opinion and Letter of Concurrence for Effects to Bald Eagles, Marbled Murrelets, Northern Spotted Owls, Bull Trout, and Designated Critical Habitat for Marbled Murrelets and Northern Spotted Owls from Olympic National Forest Program of Activities for August 5, 2003, to December 31, 2008 (FWS Reference Number 1-3-03-F-0833) U.S. Department of the Interior U.S. Fish and Wildlife Service Western Washington Fish and Wildlife Office, Lacey, Washington, August 2003.

Washington State Department of Transportation (WSDOT). 1999. Traffic Noise Analysis and Abatement Policy and Procedures. Olympia, Washington.

WFLHD. 2004. Camp Grisdale Road WA PFH 208-1 Summary of Public Open House. Western Federal Lands Highway Division, Vancouver, Washington. May 24, 2004.

WFLHD. 2004. Project Checklist for Camp Grisdale Road, WA PFH 208-1(1). U.S. Department of Transportation, Federal Highway Administration, Western Federal Lands Highway Division, Vancouver, Washington. May 2004.

APPENDIX D

Comment Letters From the Public Meeting

Camp Grisdale Road Public Open House
WA PFH 208-1(1)
May 24, 2004

Comment Sheet

Name_____

Address_____ [redacted]

_____

Your comments, concerns, suggestions, and questions will help us develop this project. Please leave it with us at this open house or mail it to us by folding this sheet. The mailing address is on the back. Please mail your comments to us by June 7, 2004.

The road improvement will be good for our fire responders from F.D. 2 but will cause more wear and tear on the trucks. On the minus side it may increase speeding requiring more responses. I hope the county intends to increase law enforcement to match the increase in traffic

Camp Grisdale Road Public Open House
WA PFH 208-1(1)
May 24, 2004

Comment Sheet

Name [redacted]

Address [redacted]

Your comments, concerns, suggestions, and questions will help us develop this project. Please leave it with us at this open house or mail it to us by folding this sheet. The mailing address is on the back. Please mail your comments to us by June 7, 2004.

Cel Phone - no use after 7 miles up the Wynoochee Valley

People drive 50 MPH+ on Grisdale Rd now - with it paved they will go 60-70 MPH.

Bad Accidents will happen with no way to get help

How much larger will Co-Ho Campground be enlarged? - once the new Rd. gets in the present Campground will not be able to accomodate the campers - It doesn't accomodate them now - it fills up by Friday for Spring/Summer Holidays

How many deputies are scheduled to Patrol the Rd.

There are 53 BAD & dangerous curves from the beginning of the Wynoochee to Matzen Rd. - These need work and straightened out before the [illegible] is started?

Camp Grisdale Road Public Open House
WA PFH 208-1 (1)
May 24, 2004

Comment Sheet

Name: [redacted]

Address: [redacted]

Your comments, concerns, suggestions, and questions will help us develop this project. Please leave it with us at this open house or mail it to us by folding this sheet. The mailing address is on the back. Please mail your comments to us by June 7, 2004.

I am completely in favor of the Camp Grisdale Road project as it will facilitate access into the Wynooche Lake area for recreational purposes. It should also help to discourage some of the more unsavory characters who have been camping in the area because of it's relative remoteness.

Once the paved road to the lake is completed the next step would be to upgrade the gravel forest road # 2270 leading to trail # 874 which enters Olympic National Park. I haven't been up that way for a few years but understand that the upper reaches of the logging road are now impassable. Having that road usable would provide a short, if not the shortest, route between the I-5 corridor and the Park.

Thanks for the opportunity to comment,

[redacted]

Byars, Rochelle

To: [redacted]

Subject: RE: paving grisdale road

Thank you, [redacted] for your comments. We will carefully consider them during project development.

Rochelle Byars
Environmental Protection Specialist

-----Original Message-----
From: [redacted]
Sent: Tuesday, May 25, 2004 8:50 PM
To: Byars, Rochelle
Subject: paving grisdale road

5/25/2004

My concerns with the paving of Camp Grisdale Road

- Emergency Services: From the Wishkah cut-off(10Mile marker apx.)- North there is no cell phone service; no communication for county and fire from 18 miles - North. There are a few spots but nothing consistent. The reason for my concern for this need is: The road as is has speeding and wrecks but the speed usually does not cause deaths because they don't get up that much speed and most people won't take their good cars up there, chuck holes and gravel. When the road is paved it will be a perfect place for the modern low-slung cars. Such as the Hondas and Mitsubishis. These cars go well over a 100 mph. Without the threat of getting caught, they will be road racing. Alcohol with speed Kills. Also needed are turnouts and some type of roadside service for those who underestimate the life of their tires and how far a gallon of gas will go, 33 miles is a long walk to get gas.
- Increased in fire hazard with no way to communicate this problem.
- Local road impact: More traffic on road, leading to more road trash, garbage dumping. Increased pavement maintenance on existing 17 miles of county road,
- Local citizen annoyance impact: With the increase of traffic (campers, hunters, fishermen) there will be more people stopping for directions, asking or not asking to use river access, asking to use

phone for emergency or non emergency (honey I forgot the beer, Its by the ice chest), etc. Maybe putting in a ranger station would be an option. And better signs. Some stating no service beyond this point, no cell signals past here, etc.

- Camping facility: The facilities that are in existence now (Coho Camp ground, and every side road that is open) is already full on the major holidays. When the road is paved and advertised in the federal bulletins, my rough estimates is 3 to 4 times increase in the first 2 years, where will the campers go. If you travel 33 miles of road to find no camping available what would you do? Go back down the road to town or camp in the first wide spot you come to. More garbage and human waste in the woods.
- Available drinking water and sanitation: the Coho has been shut down several times due to bad water. The restrooms around the Wynoochee Dam are closed most of the time.
- Increase in number of young people having Parties involving alcohol.
- Squatters: Who will be available to monitor the long term, 12 months at a time squatters.
- Environmental Impact: Every person that comes to the forest takes something home with them and leaves something. Some more than others.

What can be done: restricted areas and more rangers to monitor the people, day passes @ 5.00 a car and weekend passes @ 10.00. Camping passes etc. That would help pay the additional cost. Speed bumps to slow down traffic. Toll road.

I've visited a lot of National Parks in the Rockies and Cascades and they all have a couple of things in common. Careless, thoughtless, ignorant tourists and lots of Rangers to protect what hasn't been destroyed.

I love the idea that we would be able to drive up there with a nice smooth road, but we probably won't go.

Thank you,

[redacted]

Location 17 miles North of Montesano. Come up for a visit…
Please get copy to Mike and Darin and any of the Federal agencies that might be able to help.

Byars, Rochelle

To: [redacted]
Subject: RE: WA PFH 208-1(1) PROJECT

Mr. Smith, thank you for your comment. We will be considering all comments received.

We are developing the project. The No-Build Alternative will be evaluated in the environmental assessment along with the Build Alternative.

The environmental assessment will be circulated in the fall of 2004 and a public meeting will be held at that time.

Again, thank you for notifying us of your concerns.

Rochelle Byars
Environmental Protection Specialist

-----Original Message-----
From: [redacted]
Sent: Thursday, May 20, 2004 3:29 PM
To: Byars, Rochelle
Subject: WA PFH 208-1(1) PROJECT

Hi Rochelle,

In the past when this matter has been brought up, the issue was safety. It hasn't changed any Rochelle. While there is a small amount of commercial traffic use compared to recreational traffic use, enough can't be said for what would transpire after the paving and staightening was complete.

The past/current condition of the road forces lower traffic speeds and thus keeps vehicle accidents in check without the aide of traffic patrol expense. I am in agreement about the conditions, and sympathetic with those who have provided the impetus for this project, however having some experience with the average mentality of driver that drives this road, it is not in the visiting public's best interest to make this a "drag strip in the middle of no where".

If I've read this announcement right, the department has made its mind up to proceed with the project and are putting aside the past warnings from others who have expressed the same concerns. Please consider me an objector of this project in light of ill situations it will bring to that area of travel.

Thank you for the opportunity to speak on this matter.

[redacted]

APPENDIX E

Expected or Observed Wildlife

Table E-1. Wildlife expected or observed during the spring and summer 2004 field investigation within the vicinity of the Camp Grisdale Road project.

Type of Species	Common Name	*Scientific Name*
Mammals	American Beaver	*Castor canadensis*
	American Pika	*Ochotona princeps*
	Big Brown Bat	*Eptesicus fuscus*
	Black Bear	*Ursus americanus*
	Black-tailed Deer	*Odocoileus hemionus columbianus*
	Bobcat	*Lynx rufus*
	California Myotis	*Myotis californicus*
	California Wolverine	*Gulo gulo*
	Common Porcupine	*Erethizon dorsatum*
	Coyote	*Canis latrans*
	Creeping Vole	*Microtus oregoni*
	Deer Mouse	*Peromyscus maniculatus*
	Douglas' Squirrel	*Tamiasciurus douglasii*
	Fisher	*Martes Pennanti*
	Gray Wolf	*Canis lupus*
	Grizzly Bear	*Ursus arctos*
	Hoary Bat	*Lasiurus cinereus*
	Little Brown Myotis	*Myotis lucifugus*
	Long-eared Myotis	*Myotis evotis*
	Long-legged Myotis	*Myotis volans*
	Long-tailed Weasel	*Mustela frenata*
	Marsh Shrew	*Sorex bendirii*
	Masked Shrew	*Sorex cinereus*
	Mountain Beaver	*Aplodontia rufa*
	Mountain Lion	*Puma concolor*
	Mule Deer	*Odocoileus hemionus ssp. Columbianus*
	Raccoon	*Procyon lotor*
	Roosevelt Elk	*Cervus elaphus roosevelti*
	Short-tailed Weasel	*Mustela erminea*
	Shrew-mole	*Neurotrichus gibbsii*
	Silver-haired Bat	*Lasionycteris noctivagans*
	Snowshoe Hare	*Lepus americanus*
	Striped Skunk	*Mephitis mephitis*
	Townsend’s Big-eared Bat	*Corynorhinus townsendii*
	Townsend’s Chipmunk	*Tamias townsendii*
	Townsend’s Mole	*Scapanus townsendii*
	Townsends Vole	*Microtus townsendii*

Type of Species	Common Name	*Scientific Name*
Mammals (continued)	Trowbridge's Shrew	*Sorex trowbridgii*
	Vagrant Shrew	*Sorex vagrans*
	Virginia Opossum	*Didelphis virginiana*
	Western Small-footed Myotis	*Myotis ciliolabrum*
	Western Spotted Skunk	*Spilogale gracilis*
Birds	American Crow	*Corvus brachyrhynchos*
	American Pipit	*Anthus rubescens*
	American Robin	*Turdus migratorius*
	Anna's Hummingbird	*Calypte anna*
	Bald Eagle	*Haliaeetus leucocephalus*
	Band-tailed Pigeon	*Columba fasciata*
	Black-capped Chickadee	*Parus atricapillus*
	Black-headed Grosbeak	*Pheucticus melanocephalus*
	Black-throated Gray Warbler	*Dendroica nigrescens*
	Barred Owl	*Strix varia*
	Blue Grouse	*Dendragapus obscurus*
	Brewer's Blackbird	*Euphagus cyanocephalus*
	Brown Creeper	*Certhia americana*
	Brown-headed Cowbird	*Molothrus ater*
	Bushtit	*Psaltriparus minimus*
	Canada Goose	*Brana canadensis*
	Cassin's Vireo	*Vireo cassinii*
	Chestnut-backed Chickadee	*Parus rufescens*
	Chipping Sparrow	*Spizella passerina*
	Cliff Swallow	*Petrochelidon pyrrhonota*
	Common Nighthawk	*Chordeiles minor*
	Common Raven	*Corvus corax*
	Common Yellowthroat	*Geothlypis trichas*
	Dark-eyed Junco	*Junco hyemalis*
	Downy Woodpecker	*Picoides pubescens*
	Dusky Flycatcher	*Empidonaz oberholseri*
	European Starling	*Sturnus vulgaris*
	Eastern Kingbird	*Tyrannus tyrannus*
	Evening Grosbeak	*Coccothraustes vespertinus*
	Golden Eagle	*Aquila chrysaetos*
	Golden-crowned Kinglet	*Regulus satrapa*
	Goldfinch	*Carduelis sp.*
	Gray Jay	*Perisoreus canadensis*
	Great Horned Owl	*Bubo virginianus*
	Gull sp.	*Larus spp.*

Type of Species	Common Name	*Scientific Name*
Birds (continued)	Hairy Woodpecker	*Picoides villosus*
	Hammond's Flycatcher	*Empidonax hammondii*
	Hermit Thrush	*Catharus guttatus*
	Hermit Warbler	*Dendroica occidentalis*
	House Wren	*Troglodytes aedon*
	Hutton's Vireo	*Vireo huttoni*
	Killdeer	*Charadrius vociferus*
	Lewis's Woodpecker	*Melanerpes lewis*
	Lincoln's Sparrow	*Melospiza lincolnii*
	Marsh Wren	*Cistothorus palustris*
	Mountain Quail	*Oreortyx pictus*
	Mourning Dove	*Zenaida macroura*
	Northern Flicker	*Colaptes auratus*
	Northern Goshawk	*Accipiter gentilis*
	Northern Pygmy Owl	*Glaucidium gnoma*
	Northern Saw-whet Owl	*Aegolius acadicus*
	Northern Spotted Owl	*Strix occidentalis*
	Northwestern Crow	*Corvus caurinus*
	Olive-sided Flycatcher	*Contopus cooperi*
	Orange Crowned Warbler	*Vermivora celata*
	Pacific Sloped Flycatcher	*Empidonax difficilis*
	Peregrine Falcon	*Falco peregrinus anatum*
	Pileated Woodpecker	*Dryocopus pileatus*
	Pine Siskin	*Carduelis pinus*
	Purple Finch	*Carpodacus purpureus*
	Red Crossbill	*Loxia curvirostra*
	Red-breasted Nuthatch	*Sitta canadensis*
	Red-breasted Sapsucker	*Sphyrapicus ruber*
	Red-eyed Vireo	*Vireo olivaceus*
	Red-tailed Hawk	*Buteo jamaicensis*
	Rock Dove	*Columbia livia*
	Rough-winged Swallow	*Stelgidopteryx serripennis*
	Ruffed Grouse	*Bonasa umbellus*
	Rufous Hummingbird	*Selasphorus rufus*
	Sharp-tailed Grouse	*Tympanuchus phasianellus*
	Sharp-shinned Hawk	*Accipter striatus*
	Song Sparrow	*Melospiza melodia*
	Sora Rail	*Porzana carolina*
	Spotted Towhee	*Pipilo maculatus*
	Steller's Jay	*Cyanocitta stelleri*

Type of Species	Common Name	*Scientific Name*
Birds (continued)	Swainson's Thrush	*Catharus ustulatus*
	Townsend's Solitaire	*Myadestes townsendi*
	Townsend's Warbler	*Dendroica townsendi*
	Turkey Vulture	*Cathartes aura*
	Varied Thrush	*Ixoreus naevius*
	Vaux's Swift	*Chaetura vauxi*
	Violet-green Swallow	*Tachycineta thalassina*
	Virginia Rail	*Rallus limicola*
	Warbling Vireo	*Vireo gilvus*
	Western Kingbird	*Tyrannus verticalis*
	Western Bluebird	*Sialia mexicana*
	Western Tanager	*Piranga ludoviciana*
	Western Wood-pewee	*Contopus sordidulus*
	White-crowned Sparrow	*Zonotrichia leucophrys*
	Willow Flycatcher	*Empidonax traillii*
	Wilson's Warbler	*Wilsonia pusilla*
	Winter Wren	*Trogolodytes trogolodytes*
	Yellow Warbler	*Dendroica petechia*
	Yellow-billed Cuckoo	*Coccyzus americanus*
	Yellow-breasted Chat	*Icteria virens*
	Yellow-rumped Warbler	*Dendroica coronata*
Reptiles	Common Garter Snake	*Thamnophis Sirtalis*
	Northern Alligator Lizard	*Elgaria Coerulea*
	Northwestern Garter Snake	*Thamnophis Ordinoides*
	Pacific Coast Aquatic Garter Snake	*Thamnophis Elegans Terrestris*
	Rubber Boa	*Charina Bottae*
	Western Pond Turtle	*Clemmys Marmorata*
	Western Skink	*Eumeces Skiltonianus*
Amphibians	Cascade Torrent Salamander	*Rhyacotriton Cascadae*
	Cascades Frog	*Rana Cascadae*
	Clouded Salamander	*Aneides Ferreus*
	Columbia Spotted Frog	*Rana Luteiventris*
	Del Norte Salamander	*Plethodon Elongatus*
	Ensatina	*Ensatina Eschscholtzii*
	Green Frog	*Rana Clamitans*
	Larch Mountain Salamander	*Plethodon Larselli*
	Long-Toed Salamander	*Ambystoma Macrodactylum*
	Northern Leopard Frog	*Rana Pipiens*
	Northwestern Salamander	*Ambystoma Gracile*
	Oregon Spotted Frog	*Rana Pretiosa*
	Pacific Giant Salamander	*Dicamptodon Tenebrosus*

Type of Species	Common Name	*Scientific Name*
Amphibians (continued	Pacific Treefrog	*Hyla Regilla*
	Red-Legged Frog	*Rana Aurora*
	Roughskin Newt	*Taricha Granulosa*
	Tailed Frog	*Ascaphus Truei*
	Van Dyke's Salamander	*Plethodon Vandykei*
	Western Redback Salamander	*Plethodon Vehiculum*
	Western Toad	*Bufo Boreas*

Source: Corkran and Thomas 1996; Leonard et al. 1993; Nagorsen and Brigham 1993; St. John 2002; USFS 2002a.

APPENDIX F

Hazardous Materials Investigation

F—Hazardous Materials Laws and Regulations

Hazardous materials may be classified in different categories based on the laws and regulations that define their characteristics and use. These classifications include the following:

- Hazardous waste
- Dangerous waste
- Hazardous substances
- Toxic substances.

The EPA and Ecology maintain databases to track sites with potential and confirmed releases of chemicals to the environment and monitor facilities that manage hazardous materials as part of their operations. A brief summary of regulations enforced by the agencies is provided below.

The federal Resource Conservation and Recovery Act (RCRA) defines what is meant by hazardous waste. In Washington, Ecology has been authorized by EPA to implement most of the RCRA program. Authorization is based on state hazardous waste regulations that are consistent with and at least as stringent as the federal requirements, defined in Washington as dangerous waste. EPA tracks hazardous waste management at individual facilities throughout the state based on notification requirements and records. These requirements and records define the magnitude of waste generated (e.g., small or large quantity); define the type of handling performed (e.g., treatment, storage, or type of disposal); or identify whether a release to the environment has occurred. Ecology tracks facilities based on required registration of underground storage tanks; it also maintains an inventory of solid waste facilities and landfill sites. Within Washington State, the following regulations have authority over dangerous waste activities:

- Chapter 70.105 RCW (1976), Washington's Hazardous Waste Management Act

- Dangerous Waste Regulations WAC 173-303 (2000)

- Chapter 70.95 RCW, Hazardous Waste Reduction Act

- Pollution Prevention Plans WAC 173-307 (1991)

- Hazardous Waste Fees WAC 173-305 (1992).

Nationally, the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), also known as Superfund, defines hazardous substances. Ecology operates a parallel program in Washington State under the Model Toxics Control Act (MTCA). Both programs are designed and administered to provide appropriate responses to the release of hazardous substances to the environment. MTCA also addresses releases of petroleum products

not covered under federal statutes. EPA tracks sites based on reported potential or actual releases of hazardous substances to the environment, emergency response notifications, and cleanup progress at major release sites. Ecology tracks the same type of sites and also tracks petroleum releases, including releases from underground storage tanks. Within Washington State, the following regulations have authority over hazardous substance activities:

- RCW Chapter 70.105D RCW (1989), State Hazardous Waste Cleanup (MTCA)
- Chapter 70.102.020 RCW, Hazardous Substance Information Act
- Chapter 15.54 RCW, Fertilizer Regulation Act. Clarifies the Department of Ecology's oversight authority over waste-derived fertilizers.

Toxic substances are a subset of hazardous substances also regulated by the federal Toxic Substances Control Act (TSCA). TSCA was adopted so that all new chemical substances and existing chemicals put to new uses, other than pesticides, could be evaluated for health and environmental effects. Additional controls governing disposal, beyond CERCLA and RCRA, have been specifically applied to polychlorinated biphenyls (PCBs). TSCA sites are tracked by the EPA.

Hazardous Material Site Categories

Hazardous materials sites in the project area fall into two categories based on whether a release to the environment has been documented or is considered a potential threat.

Documented Release Sites

Documented releases of hazardous materials to the environment as identified in regulatory agency site files, directly affect soil and/or ground water. Releases to soil only are generally limited in lateral extent and have limited potential for migration beyond the release area. Releases to ground water tend to extend farther from the area of origin and can potentially result in impacts to the project area even when the source is located offsite.

Potential Release Sites

A potential for release of hazardous materials is identified based on the site activity registered with regulatory agencies, the development of site activities evident from historical documentation (e.g., a foundry site that became a service station and then was developed for an office building), or the current activity evident from visual observation (e.g., junk yard). Potential release sites have been identified based on the following categories:

- Reported current activities (e.g., hazardous waste generator)
- Reported current features (e.g., registered underground storage tanks)

- Recorded historical activities (e.g., mapped “oil and gas” designation)
- Recorded historical features (e.g., mapped tank farm)
- Visually identified activity or feature.

Sites of potential for releases have not been characterized and may or may not have soil or ground water contamination.

Methodology

Facilities that generate hazardous waste and sites identified with actual or potential hazardous materials releases are registered with either Ecology or EPA. These facilities and sites are tracked on databases available to the public for review. For this project, hazardous materials sites were identified through a search of federal and state regulatory databases; a review of historical photographs and books covering logging camps in the project area; historical parcel maps; historical county directories; and a visual reconnaissance of the project corridor.

Federal Databases Searched

Comprehensive Environmental Response and Liability Information System (CERCLIS)

CERCLIS contains data on potentially hazardous waste sites that have been reported to the EPA by states, municipalities, private companies, and private persons pursuant to Section 103 of CERCLA. CERCLIS contains sites either proposed or on the National Priorities List (NPL) and sites in the screening and assessment phase for possible inclusion on the NPL. The CERCLIS list contains sites from 1983 to the present.

Resource Conservation and Recovery Information System (RCRIS)

RCRIS includes selective information on sites that generate, transport, store, treat and/or dispose of hazardous waste, as identified by the Resource Conservation and Recovery Act (RCRA).

Toxic Chemical Release Inventory System (TRIS)

TRIS identifies facilities that release toxic chemicals to the air, water, and land in reportable quantities under SARA Title III Section 313.

State Databases Searched

Confirmed & Suspected Contaminated Sites List (CSCSL)

State hazardous substance site records are the states’ equivalent to the federal Superfund CERCLIS. These sites may or may not be included on the federal CERCLIS list.

Hazardous Sites List (HSL)

The HSL is a subset of the CSCSL Report. It includes sites that have been assessed and ranked using the Washington Ranking Method (WARM).

Leaking Underground Storage Tank Site List (LUST)

LUST records contain an inventory of reported leaking underground storage tank incidents. The LUST list may also identify the type of material released and the affected media (i.e., air, soil, and water).

Underground Storage Tank Database (UST)

USTs are regulated under Subtitle I of RCRA and must be registered with Ecology. The database contains information on the site location, number of tanks, materials stored, status of the tank (i.e., operational, removed, closed-in-place, etc.), date of tank installation, etc. of registered tanks. Heating oil tanks are not regulated or registered, and are not listed in this database.

Historical Records

- Historical photographs of Simpson Timber Company's logging camps from the University of Washington Digital Collection (UW 2004) and the book titled *Grisdale, last of the logging camps: a photo story of Simpson camps from 1890 into 1986* (James 1986)
- Historical Metsker's Atlas (parcel maps) of Grays Harbor, Washington (1941, 1952, and 1976)
- Aberdeen and Hoquiam (including Grays Harbor County) directories (1959 and 1969).

Site History

Logging activities began in the area surrounding the project corridor in the early 1900s. Various timber companies, including the Simpson Timber Company, constructed logging railroads throughout the forested areas, as well as logging camps for the workers. Two camps existed between the 1920s and the 1940s within the Wynoochee River valley either adjacent to the logging railroad or within the river valley (see Figure 4-5; Camp No. 5 located east of Schafer Creek and Camp No. 7 located west of Camp No. 5). Wood stoves were used for heating at these camps. Prior to the 1930s, logging equipment (i.e., donkey engines) was powered by steam. Diesel-powered caterpillar tractors and bulldozers were used for logging in the 1930s and 1940s; no historical information was available regarding where and how diesel fuel was stored.

By 1946, residences at Camp No. 5 moved 8 miles north to Camp Grisdale, a forest community complex built by the Simpson Timber Company. The complex was constructed between the existing logging railroad and a paved road (Camp Grisdale Road), and included 52 family homes, 38 bunkhouses, a cookhouse, a mercantile store, and other structures associated with Simpson's lumber processing, including machine repair shops. Heating oil was used throughout the complex, indicating possible underground storage tanks used to store the oil at each of the residences and other structures. No historical information is available on whether a gasoline service station operated in Grisdale; however, based on an aerial photograph view of the town (page 68; James 1986), a small pump island appeared connected to the mercantile store and may have been used for gasoline service. Based on a comparison of the historical photo to current maps of the area, the pump island appears to be located approximately two blocks from the current roadway, and closer to the railroad track. Grisdale continued as an active company town until Simpson Timber closed its lumber processing plant in 1986. Based on the visual reconnaissance, the building foundation pads are all that remains of the town.