

Cape Meares Road Relocation Project

Environmental Assessment



OR TILLAMOOK B780(1)
Cape Meares Loop Road

Prepared for

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



Prepared by

WSP USA



October 18, 2017

**Cape Meares Road Relocation Project
Tillamook County, Oregon
Environmental Assessment**

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

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

In Cooperation with
Tillamook County

10.11.2017

Date Approved



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Acronyms and Abbreviations

ADT	Average Daily Traffic
APE	Area of Potential Effect
BA	Biological Assessment
BMPs	Best Management Practices
CDP	Census Designated Place
County	Tillamook County
DLCD	Oregon Department of Land Conservation and Development
DOT	Department of Transportation
DSL	Department of State Lands
EA	Environmental Assessment
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FHWA	Federal Highway Administration
FLAP	Federal Lands Access Program
ILF	In-Lieu Fee
MP	Mile Post
MSAT	Mobile Source Air Toxic
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
OAR	Oregon Administrative Rules
OHWM	Ordinary High Water Mark
ONA	Oceanside Neighborhood Association
OPRD	Oregon Parks and Recreation Department
Oregon DEQ	Oregon Department of Environmental Quality
OWD	Oceanside Water District
PEM	Palustrine Emergent
PM	Particulate Matter
PM ₁₀	Particulate Matter with a diameter of 10 micrometers or less
PM _{2.5}	Particulate Matter with a diameter of less than 2.5 micrometers
POM	Polycyclic Organic Matter
Project	Cape Meares Road Relocation Project
Refuge	Cape Meares National Wildlife Refuge
Scenic Viewpoint	Cape Meares State Scenic Viewpoint and Lighthouse
SHPO	State Historic Preservation Office
SWPPP	Stormwater Pollution Prevention Plan
Tillamook PUD	Tillamook People’s Utility District
TMDL	Total Maximum Daily Load
Uniform Act	<i>Uniform Relocation Assistance and Real Property Policies of 1970</i>
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
WFLHD	Western Federal Lands Highway Division



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Executive Summary

The National Environmental Policy Act of 1969 (NEPA) requires that all projects carried out by a federal agency, or which involve federal funding, require a federal permit, or occur on federal land must consider the effects of their actions on the quality of the human environment. This environmental assessment (EA) is part of the NEPA process.

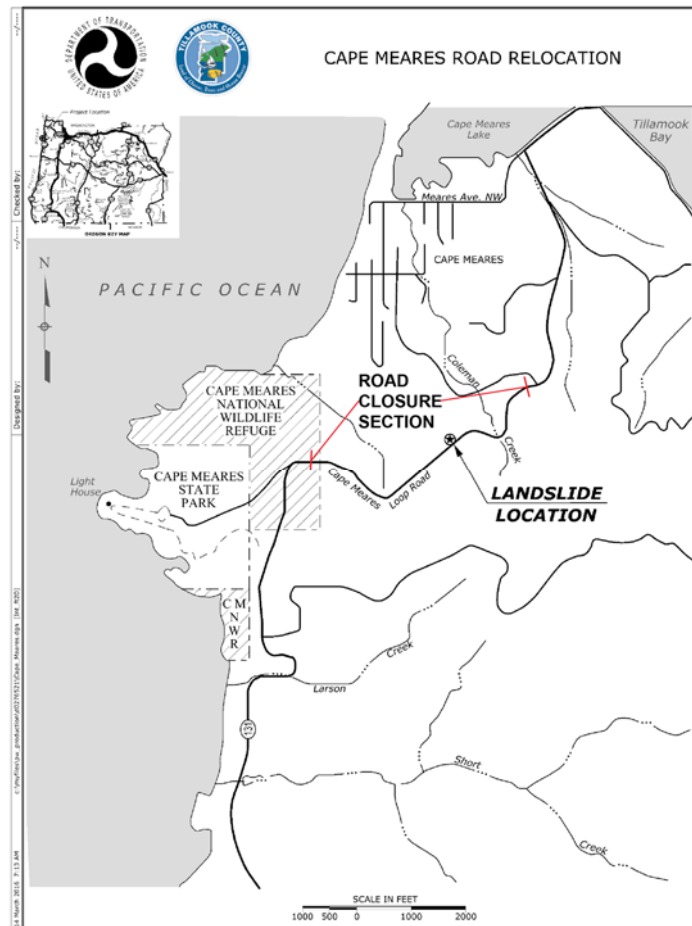
The Western Federal Lands Highway Division (WFLHD) of the Federal Highway Administration (FHWA), in cooperation with Tillamook County (County), is proposing to restore service on Cape Meares Loop Road and reopen this section of the Three Capes Scenic Route that provides visitor access to Cape Meares National Wildlife Refuge (Refuge) and Cape Meares State Scenic Viewpoint and Lighthouse (Scenic Viewpoint). The Cape Meares Road Relocation Project (project) proposes to construct a bypass around a historic landslide area that closed an approximate 1.5-mile section of Cape Meares Loop Road located between the communities of Oceanside and Cape Meares on January 11, 2013. The proposed project is located in the northern Coast Range in Tillamook County, Oregon, approximately 5.7 miles west of Tillamook (Figure ES-1). The project is located in Section 18 of Township 1 South, Range 10 West.

Cape Meares Loop Road is part of the Three Capes Scenic Loop that provides visitor access to the Refuge and Scenic Viewpoint, and connects Cape Meares State Park, Cape Lookout State Park, and Cape Kiwanda State Park. With Cape Meares Loop Road closed to through traffic, visitors, and local residents may only access the Refuge and Scenic Viewpoint from the south.

The purpose of the project is to restore service on Cape Meares Loop Road and reopen this section of the Three Capes Scenic Route. The needs associated with the project are to provide:

- a bypass of the historic and active slide areas,
- visitor access to the Refuge and Scenic Viewpoint, and
- a tsunami bypass route for Oceanside and Netarts when Highway 131 (Netarts Highway) is closed.

Figure ES-1. Project Vicinity Map



Alternatives that would repair the existing alignment and alternative bypass alignments were evaluated. After evaluating eight conceptual alternatives and the No Build Alternative, followed by three preliminary alternatives and the No Build Alternative, the North Alignment was selected as the project's Preferred Alternative. As described in the *Cape Meares Road Relocation Project Alternatives Analysis Memorandum* (Appendix A of this EA), the North Alignment (refined from conceptual alternative 1B referenced in the memorandum) was selected as the Preferred Alternative because it met the project's purpose and need and best met the screening criteria, including having the lowest estimated construction cost and project risk (WFLHD 2017a). The Preferred Alternative is approximately 1.7 miles in length. Beginning in the north, the Preferred Alternative uses a small section of the existing roadway before traversing south, west, and south again (along existing topography to the extent possible) and connecting back to the existing roadway (Figure ES-2).

The alternatives analyzed in this EA include the No Build Alternative and the Preferred Alternative. Table ES-1 summarizes the project's potential environmental impacts, including both adverse and beneficial impacts, by alternative.

Figure ES-2. Preferred Alternative Vicinity Map

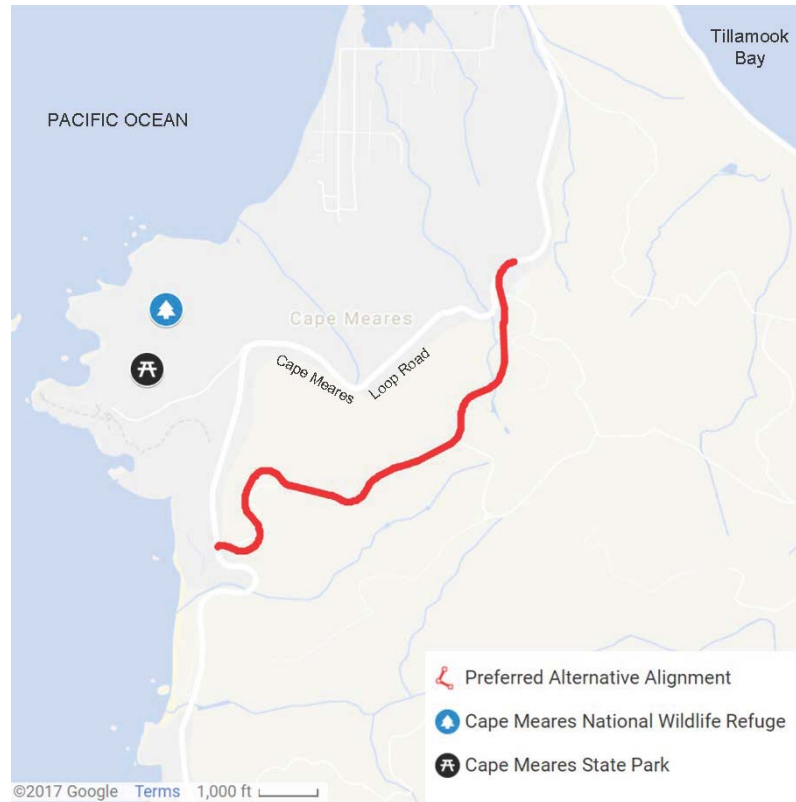


Table ES-1. Summary of Impacts by Alternative for the Proposed Cape Meares Road Relocation Project

Environmental Resource	No Build Alternative	Preferred Alternative
Transportation	<p>Temporary construction effects</p> <ul style="list-style-type: none"> • None <p>Direct and indirect effects</p> <ul style="list-style-type: none"> • The Refuge and Scenic Viewpoint would remain accessible only from the south. The community of Cape Meares would remain accessible only from the north. • Traffic along Cape Meares Loop Road, north/south of the road closure, would have out-of-direction travel to get to other locations along Cape Meares Loop Road. • When landslides or slope failures close Highway 131 or Bayocean Road, Cape Meares and Oceanside would be isolated, including from emergency services. • Cape Meares Loop Road would not provide a tsunami escape route. 	<p>Temporary construction effects</p> <ul style="list-style-type: none"> • Construction could result in short-term traffic delays and/or detours on Cape Meares Loop Road where the Preferred Alternative would connect to the existing roadway. <p>Direct and indirect effects</p> <ul style="list-style-type: none"> • Restores access to the Refuge and Scenic Viewpoint from the north. Restores access to the community of Cape Meares from the south. • Restores the secondary access to Netarts, Cape Meares, and Oceanside when Highway 131 and Bayocean Road are closed. • Provides a tsunami escape route. • Slightly modify the access route to destinations along the current alignment of Cape Meares Loop Road.

Environmental Resource	No Build Alternative	Preferred Alternative
<p>Land Use, Farmland, Forestland, and Utilities</p>	<p>Temporary construction effects</p> <ul style="list-style-type: none"> • None <p>Direct and indirect effects</p> <ul style="list-style-type: none"> • Properties south of the road closure, such as the Refuge and Scenic Viewpoint, would continue to be accessible only from the south. 	<p>Temporary construction effects</p> <ul style="list-style-type: none"> • Temporary easements of approximately 8 acres for construction activities. • Access to adjacent properties could be temporarily affected by traffic delays and lane closures. <p>Direct and indirect effects</p> <ul style="list-style-type: none"> • Approximately 16 acres of land zoned Forest converted to right-of-way. • Approximately 28 acres of land used for right-of-way where the existing road is closed, which is currently included in the County’s Forest zone, may be vacated during the right-of-way process. • Requires an exception to Statewide Planning Goal 4 for conversion of forestland. • The Preferred Alternative alignment would slightly modify the access route to destinations along the current alignment of Cape Meares Loop Road. • Utility providers could locate new facilities within the roadway right-of-way. • Potential reduction in traffic along the existing road alignment could reduce traffic noise levels in the Refuge, benefitting wildlife and visitors.



Environmental Resource	No Build Alternative	Preferred Alternative
<p>Social/Economic Changes and Environmental Justice</p>	<p>Temporary construction effects</p> <ul style="list-style-type: none"> • None <p>Direct and indirect effects</p> <ul style="list-style-type: none"> • Cape Meares Loop Road would not provide an emergency access or a tsunami evacuation route for the communities of Cape Meares and Oceanside. • Over time, if storms become more frequent or intense and result in more frequent closures of Bayocean Road and/or Highway 131 the continued loss of access from the north which would cut off access to the community of Cape Meares, could reduce economic activity from visitation and could suppress vacation rentals in Cape Meares and Oceanside. • No disproportionately high and adverse effects on minority or low-income populations. 	<p>Temporary construction effects</p> <ul style="list-style-type: none"> • Residents and visitors may experience brief delays or detours due to temporary lane closures or reroutes, at the connection to the existing road. • Provide opportunities for construction-related employment and temporary increase in sales for nearby businesses. <p>Direct and indirect effects</p> <ul style="list-style-type: none"> • No residential or business displacements. • Right-of-way acquisitions could result in a slight reduction in land available for timber harvesting. Vacated right-of-way could potentially be used for future timber growth. • Increased safety of the communities and visitors from improved connectivity and emergency access. • No disproportionately high and adverse effects on minority or low-income populations.
<p>Air Quality/Noise/Energy</p>	<p>Temporary construction effects</p> <ul style="list-style-type: none"> • None <p>Direct and indirect effects</p> <ul style="list-style-type: none"> • Reduction of regional and local mobile source air toxic (MSAT) emissions from national emissions control programs, regardless of vehicle-miles traveled. 	<p>Temporary construction effects</p> <ul style="list-style-type: none"> • Increased dust, noise levels and energy consumption from construction activities and equipment. <p>Direct and indirect effects</p> <ul style="list-style-type: none"> • Since changes in regional vehicle miles traveled are not anticipated, no long term increase in regional air pollutants. National emissions control programs are anticipated to reduce regional and local MSAT emissions regardless of vehicle-miles traveled. • Minor increase in noise levels from traffic along the realigned roadway. Noise levels at sensitive receptors, such as the nearby rural residence, are not expected to change.



Environmental Resource	No Build Alternative	Preferred Alternative
		<ul style="list-style-type: none"> Negligible effect on Oregon’s predicted statewide energy consumption.
Soils and Geology	Temporary construction effects <ul style="list-style-type: none"> None Direct and indirect effects <ul style="list-style-type: none"> None 	Temporary construction effects <ul style="list-style-type: none"> Areas of ground disturbance could be prone to erosion if left unprotected. Slopes could be unstable if not retained or flattened. Direct and indirect effects <ul style="list-style-type: none"> Roadway alignment avoids the active landslide area that resulted in the existing closure along Cape Meares Loop Road. A future large earthquake or tsunami event could result in slope and/or retaining wall failures along the roadway.
Water Resources, Water Quality, and Floodplains	Temporary construction effects <ul style="list-style-type: none"> None Direct and indirect effects <ul style="list-style-type: none"> None 	Temporary construction effects <ul style="list-style-type: none"> Soil compaction during construction could result in localized impacts to groundwater flows, reduce the infiltration capacity and increase surface runoff. Small, accidental petroleum spills could occur where groundwater levels are shallow. Direct and indirect effects <ul style="list-style-type: none"> Vegetation removal, soil disturbance, and paving may increase impervious surfaces, erosion, sediment deposition, and stormwater runoff that could affect water quality. Potential for increased roadway pollutants in stormwater.
Wetlands	Temporary construction effects <ul style="list-style-type: none"> None Direct and indirect effects <ul style="list-style-type: none"> None 	Temporary construction effects <ul style="list-style-type: none"> Approximately 0.04 acre of temporary wetland effects Potential increase in sedimentation of nearby streams Direct and indirect effects <ul style="list-style-type: none"> Approximately 0.02 acre of permanent wetland fill Installation of new or replaced culverts at stream crossings



Environmental Resource	No Build Alternative	Preferred Alternative
Fish, Wildlife, and Vegetation	Temporary construction effects <ul style="list-style-type: none"> • None Direct and indirect effects <ul style="list-style-type: none"> • None 	Temporary construction effects <ul style="list-style-type: none"> • Vegetation and habitat removal of approximately 20.50 acres within the 100-foot-wide construction corridor. • Construction noise would cause some wildlife to temporarily reduce their use of the surrounding habitat, including nesting activities of marbled murrelet and northern spotted owl (threatened species). • Removal of approximately 0.28 acre of habitat for marbled murrelet and approximately 8.34 acres of habitat for northern spotted owl. Direct and indirect effects <ul style="list-style-type: none"> • Permanent removal of approximately 12.34 acres of vegetation and habitat, which could also alter predator-prey relationships. • Removal of approximately 0.07 acre of habitat for marbled murrelet and 5.04 acres of habitat for northern spotted owl. • Potential to spread noxious weeds.
Cultural Resources	Temporary construction effects <ul style="list-style-type: none"> • None Direct and indirect effects <ul style="list-style-type: none"> • None 	Temporary construction effects <ul style="list-style-type: none"> • None Direct and indirect effects <ul style="list-style-type: none"> • No direct effect on cultural resources. • Geotechnical boring could expose buried cultural resources.



Environmental Resource	No Build Alternative	Preferred Alternative
Recreation	<p>Temporary construction effects</p> <ul style="list-style-type: none"> • None <p>Direct and indirect effects</p> <ul style="list-style-type: none"> • Continued limited access and/or out-of-direction travel to reach recreation lands in the area. • Bicyclists on the Oregon Coast Bike Route would continue to use Highway 101, which has higher traffic volumes. • No effect to the Oregon Coast Trail. 	<p>Temporary construction effects</p> <ul style="list-style-type: none"> • Visitors to recreation lands may experience brief delays or detours due to temporary lane closures or reroutes, at the connection to the existing road. • Temporary increases in noise levels and dust along the portion of the Oregon Coast Trail that uses Cape Meares Loop Road. <p>Direct and indirect effects</p> <ul style="list-style-type: none"> • No conversion of recreation land to a roadway use. • No use of any Section 4(f) or Section 6(f) properties. • Restore access from Cape Meares Loop Road to recreation lands. • Reconnect the Three Capes Scenic Route. • Reopen the use of Cape Meares Loop Road for the Oregon Coast Bike Route.
Hazardous Materials	<p>Temporary construction effects</p> <ul style="list-style-type: none"> • None <p>Direct and indirect effects</p> <ul style="list-style-type: none"> • None 	<p>Temporary construction effects</p> <ul style="list-style-type: none"> • Potential to disturb unknown hazardous materials in the soils. • Potential for accidental spills of hazardous materials used during construction. <p>Direct and indirect effects</p> <ul style="list-style-type: none"> • None. There are no known hazardous material sites located within the project area.



Environmental Resource	No Build Alternative	Preferred Alternative
Visual Quality	<p>Temporary construction effects</p> <ul style="list-style-type: none"> • None <p>Direct and indirect effects</p> <ul style="list-style-type: none"> • Slight intrusion of light and glare to residents in Oceanside from vehicles using Cape Meares Loop Road in both directions of their trip. • Would not restore the Three Capes Scenic Loop, where driving the roadway as a “loop” to access visual scenery is an important feature. • Existing portion of Cape Meares Loop Road that is closed would likely continue to be affected by landslides. 	<p>Temporary construction effects</p> <ul style="list-style-type: none"> • Construction equipment, workers, materials and staging area would add new elements into existing views. Viewers would perceive a temporary decrease in visual quality. <p>Direct and indirect effects</p> <ul style="list-style-type: none"> • Trees would block views of most of the roadway, including light and glare. Neutral effect on visual quality as perceived by residential viewers. • Restored connection of the Three Capes Scenic Loop would allow recreationists, touring and local motorists to drive the roadway as a “loop” to access the visual scenery. Beneficial effect to visual quality as perceived by these viewers. • Existing portion of Cape Meares Loop Road that is closed would likely continue to be affected by landslides.
Cumulative Effects	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • None





Chapter 1 Purpose of and Need for Action

1.1 Introduction

The Western Federal Lands Highway Division (WFLHD) of the Federal Highway Administration (FHWA), in cooperation with Tillamook County (County), is proposing to restore service on Cape Meares Loop Road and reopen this section of the Three Capes Scenic Route that provides visitor access to Cape Meares National Wildlife Refuge (Refuge) and Cape Meares State Scenic Viewpoint and Lighthouse (Scenic Viewpoint). The proposed Cape Meares Road Relocation Project (project) is located in the northern Coast Range in Tillamook County, Oregon, approximately 5.7 miles west of Tillamook. See Figure 1 for a project vicinity map. The project is located in Section 18 of Township 1 South, Range 10 West, Willamette Meridian.

The project proposes to construct a bypass around a historic landslide area that closed a 1.5-mile section of Cape Meares Loop Road located between the communities of Oceanside and Cape Meares on January 11, 2013. Following the closure of Cape Meares Loop Road, Tillamook County received \$250,000 in Federal Emergency Relief Funding to perform a geotechnical landslide study and alternate route analysis within the project area. The geotechnical landslide investigation and evaluation was initiated in October 2013 and culminated in a report that was finalized in summer 2014.

Following the report, Tillamook County applied for and received \$4 million in funding through the 2015 Federal Lands Access Program (FLAP; WFLHD 2015). That funding is currently being used to work on preliminary design work and the environmental review process. In addition to the FLAP funding, an additional \$2.4 million in Federal Emergency Relief Funding has been committed to the project. In November 2016, the County received notification that their proposal for an additional \$6,100,000 from the Oregon FLAP was approved by the Oregon Program Decisions Committee. All federal funding is dependent on the availability of appropriations from Congress. All FLAP funding is subject to local match and funding agreements.

1.2 Purpose and Need Statement

The following identifies the purpose of the project and the needs to be addressed.

1.2.1 Purpose

The purpose of the project is to restore service on Cape Meares Loop Road and reopen this section of the Three Capes Scenic Route that provides visitor access to the Refuge and Scenic Viewpoint. The project proposes to construct a bypass around a historic landslide area that closed an approximate 1.5-mile section of Cape Meares Loop Road located between the communities of Oceanside and Cape Meares on January 11, 2013.

1.2.2 Need

Cape Meares has documented ongoing landslide activity dating back to the late 1890s. The hillside is prone to rapid and significant movement, with the slide moving approximately nine feet between 2007 and 2013. An emergency bypass of the active slide area on Cape Meares Loop Road was built in 2007, but additional slide activity in early 2008 prompted the County to complete a damage



assessment. The assessment documented that the roadway had moved approximately 90 feet since the 1960s when the road was originally constructed.

With Cape Meares Loop Road closed to through traffic, visitors and local residents may only access the Refuge and Scenic Viewpoint from the south (Highway 131). According to visitor counts in 2011 and 2013, there was approximately a 12 percent decrease in visitors to the Refuge and Scenic Viewpoint following the closure of Cape Meares Loop Road.

Additional benefits of the project include providing a tsunami escape route for the communities of Oceanside and Cape Meares and an emergency detour route for Oceanside and Netarts when Highway 131 (Netarts Highway) is closed due to slope failures. Additionally, when slides and roadway closures occur on Bayocean Road, the community of Cape Meares is cut off from emergency services, schools and jobs. Construction of the bypass would alleviate the concerns caused by the current roadway closure.

1.3 NEPA Compliance

This environmental assessment (EA) was prepared by the FHWA as the federal lead agency for compliance with the National Environmental Policy Act (NEPA). Tillamook County is a partner agency. This EA describes the reasonable range of alternatives and the process used to determine these alternatives. It analyzes the impacts of these alternatives in the context of the existing environmental conditions and, if needed, proposes measures to avoid, minimize or mitigate potential impacts.

1.4 Scoping Process

NEPA defines scoping as an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action. Since the Cape Meares Loop Road closure occurred in January 2013, the County has provided opportunities for the public, tribes, and agencies to give comments and input on the project in a number of different forums, such as at community meetings, public hearings and meetings with local agencies. A complete list of the public, tribal and agency outreach activities conducted for the project is in Chapter 4 of this EA. The input that was received through this process was used by FHWA and the County to develop and narrow the range of alternatives.



Chapter 2 Proposed Action and Alternatives

This chapter provides a description of the two alternatives that are being considered, which are the No Build Alternative and the Preferred Alternative. In addition, this chapter describes the alternatives development and screening process that was conducted to narrow the range of alternatives and identify the Preferred Alternative.

2.1 No Build Alternative

With the No Build Alternative, no work would be done to repair or realign the portion of Cape Meares Loop Road and the section of the Three Capes Scenic Route that was damaged by the 2012 landslide would remain closed. The segment of the existing alignment of Cape Meares Loop Road that is currently open, and that provides access from the south to the Refuge and Scenic Viewpoint, would remain. In the closed segment of the existing alignment of Cape Meares Loop Road the existing roadway pavement would not be removed. Tillamook County would continue to not maintain this section of the road and it would remain impassable. Figure 2-1 shows the existing alignment of the Cape Meares Loop Road, including the portions of the existing road that would continue to be open and those that would remain closed with the No Build Alternative.

The No Build Alternative would not address the purpose and need of the project because it would not restore service on Cape Meares Loop Road or reopen this section of the Three Capes Scenic Route. In addition, the No Build Alternative would not provide a tsunami escape route for the communities of Oceanside and Cape Meares nor would it provide an emergency detour route for Oceanside and Netarts when Highway 131 is closed due to slope failures.

2.2 Preferred Alternative – North Alignment

The alignment of the Preferred Alternative is shown in Figure 2-1. At the northeast end the Preferred Alternative would follow the existing alignment of Cape Meares Loop Road for approximately 500 feet west of the existing road closure barrier. From there, the alignment would travel south for approximately 1,700 feet along the east side of Coleman Creek, following the existing topography to the extent possible. The alignment would then head southwest, crossing over Coleman Creek and along the west side of the property owned by the Oceanside Water District (OWD). From there, the alignment would travel west and south, connecting back to the existing roadway to the north of an existing gravel quarry (the Lighthouse Quarry). The total length of the Preferred Alternative is approximately 1.7 miles.

To minimize the extent of clearing and grading, the Preferred Alternative would follow the alignment of existing forest roads where possible. Currently, these existing forest roads are privately-owned and maintained and are primarily single-lane gravel roads. With the Preferred Alternative, this section of Cape Meares Loop Road would consist of one 11-foot travel lane in each direction and 2-foot paved shoulders, for a total of a 26-foot paved roadway. Additional lane width would be considered if additional funds become available. The paved roadway would be located within a standard right-of-way width of 60 feet, which would include side slopes, roadway drainage ditches and retaining walls if required. Figure 2-2 shows a typical roadway cross-section of the Preferred Alternative, one without a retaining wall and one with a retaining wall. The Preferred Alternative would require approximately 16 acres of new public right-of-way. Culverts



would be installed where the Preferred Alternative crosses Coleman Creek and other streams. Typical traffic control and wayfinding signage would be provided. The roadway would be maintained by Tillamook County.

The segment of Cape Meares Loop Road that is currently open, and that provides access from the south up to the Refuge and Scenic Viewpoint, would remain. The County right-of-way and roadway within the segment of Cape Meares Loop Road that is currently closed may be vacated as County right-of-way; this would be determined during right-of-way negotiations with landowners.

The Preferred Alternative meets the purpose and need for the project because it would restore service on Cape Meares Loop Road and reopen this section of the Three Capes Scenic Route that provides visitor access to the Refuge and Scenic Viewpoint. The Preferred Alternative would construct a bypass around the historic landslide area. In addition, the Preferred Alternative would provide a tsunami escape route that provides both an immediate higher ground location for visitors and residents as well as providing access and detour routes between the communities of Netarts, Oceanside, and Cape Meares following potential natural disasters.

2.2.1 Construction

Construction of the Preferred Alternative would occur within an approximately 100-foot-wide construction corridor, which accounts for the maximum potential extent of the grading needed for side slopes and ground-disturbing activities. Temporary easements would be obtained for the portions of the construction corridor that would be outside of the 60-foot-wide right-of-way.

All construction access and staging would be from Cape Meares Loop Road and contained within existing private roadways and the construction corridor. Construction of the Preferred Alternative would be expected to last approximately two years. Construction activities would include:

- Pre-construction geotechnical activities
- Clearing vegetation
- Earthwork including excavation (with some areas of potential rock blasting), embankment construction, and grading of the roadbed
- Construction of walls (wall type to be determined)
- Installation of culverts and other drainage features, as needed
- Asphalt paving
- Installation of permanent traffic control, such as painted striping and signage
- Revegetation

During project construction, there would be in-water work to install a culvert where the alignment crosses Coleman Creek and at other stream locations throughout the alignment.

Figure 2-1. Cape Meares Road Relocation Project – Existing Alignment (No Build Alternative) and Preferred Alternative

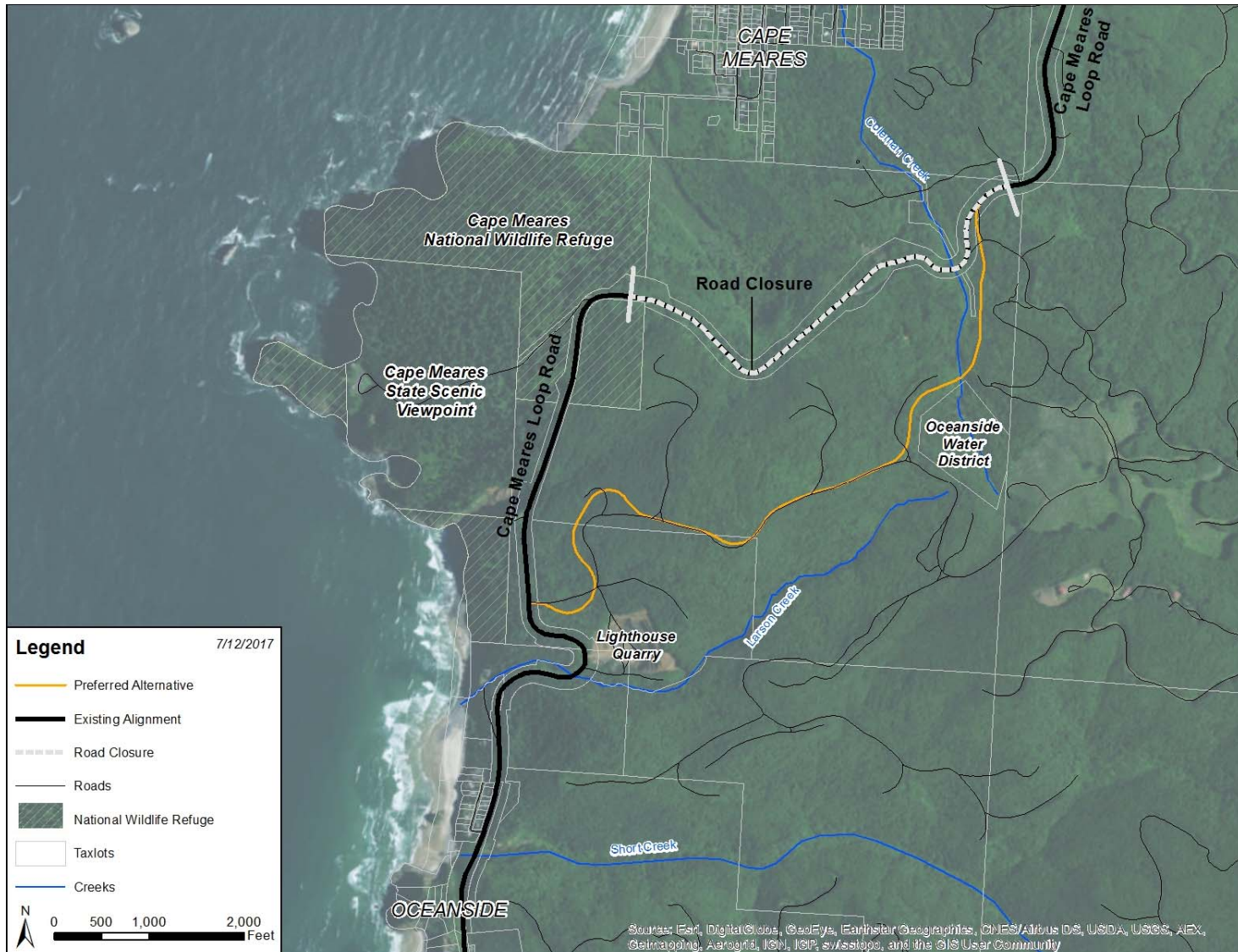
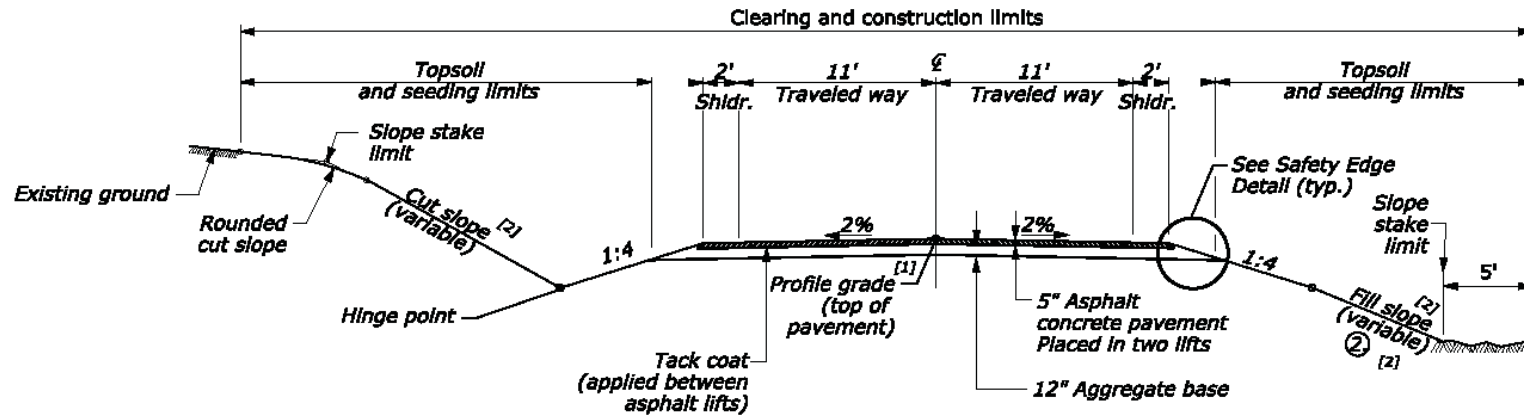
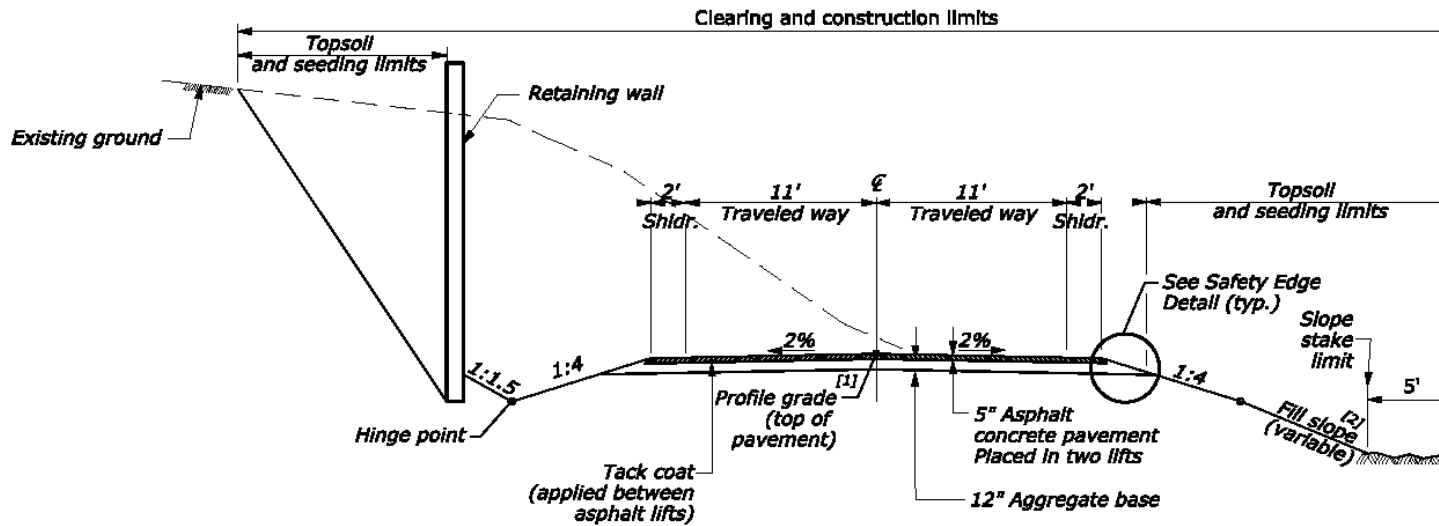


Figure 2-2. Cape Meares Road Relocation Project – Preferred Alternative Typical Cross Sections

Typical section, without retaining wall



Typical section, with retaining wall



2.2.2 Interrelated and Interdependent Projects

A potential interrelated project is the relocation of the OWD water intake system upstream of the Preferred Alternative, which would be upstream of stormwater runoff from the realigned Cape Meares Loop Road. The relocation of the OWD intake would not be required as a result of the proposed action. There are no interdependent projects.

2.3 Alternatives Development and Screening

This section describes the process that occurred to develop and screen alternatives to meet the project's purpose and need and how the Preferred Alternative was selected. The process included an initial evaluation of eight conceptual alternatives and the No Build Alternative, followed by an analysis of the No Build Alternative and three preliminary alternatives, which were refinements of three of the conceptual alternatives. Additional detail is provided in the *Cape Meares Road Relocation Project Alternatives Analysis Memorandum* in Appendix A of this EA.

2.3.1 Conceptual Alternatives

In 2014, following the landslide, the County prepared a geotechnical study and alternative analysis. The geotechnical report evaluated eight alternatives and the No Build Alternative. These conceptual alternatives included two proposed landslide mitigation options (to stabilize the slide), one maintenance-only repair along the existing alignment, and five alternative bypass routes.

The two proposed landslide mitigation options included drainage/dewatering or earthwork/buttress designs. Both options were costly, with estimates ranging from \$12 to \$17.5 million to design and construct. In addition, it was noted in the report that without further investigation it is unknown if these options would be successful.

A maintenance-only option considered using a deep patch repair which was estimated to cost approximately \$2.42 million. However, the report noted that the repair would not address stability of the landslide and that further slope movement would be expected, likely resulting in the need for additional emergency repairs in the future.

Five alternative bypass routes, around the active slide, were examined as part of the study. Routes 1A, 1B, 1C, and 2 were designed to reconnect to the existing Cape Meares Loop Road near the Lighthouse Quarry. Route 3 reconnected to the current Cape Meares Loop Road north of Oceanside near the entrance to the water treatment plant in Oceanside. The estimated cost for each of the alternative bypass routes were:

- Route 1A—\$17.1 million
- Route 1B—\$18.2 million
- Route 1C—\$15.2 million
- Route 2—\$51.7 million
- Route 3—\$54.1 million

As part of the study, the nine alternatives were evaluated using a risk matrix that looked at the following risks:

- Traveling public safety
- Life cycle risk
- Constructability concerns
- Potential for community isolation

Through this process, it was determined that alternative bypass routes 1B and 1C around the slide would be the most effective and lowest risk solutions. However, route 1C was considered to have a higher level of constructability risk, compared to route 1B. Mitigation to prevent further landslide movement was found to be impractical given the depth of slide movement and soft earthflow nature of some sections. This information was presented to the Tillamook County Board of County Commissioners during a workshop held on June 24, 2014. The workshop resulted in a recommendation by the project team and a vote by the Commissioners to move forward with pursuing additional funding for conceptual alternative bypass route 1B.

2.3.2 Preliminary Alternatives

Following the initial screening of conceptual alternatives, the project moved forward into preliminary design. In 2015, FHWA and the County began working together on the project, which included a brief review of the 2014 conceptual alternatives to help identify which alternatives would be evaluated further as preliminary alternatives through the NEPA process. Following review of the conceptual alternatives, FHWA and the County decided to refine and evaluate the alignments of routes 1A, 1B, and 1C, and reconsider an alternative that would follow the existing alignment.

Preliminary design efforts focused on ensuring the proposed alignments were constructible and avoiding impacts where possible. This work resulted in adjusting the western portion of alternative 1B to avoid impacts to the Refuge which would have resulted in additional right-of-way needs and increased impacts to older growth timber. In addition, the alignments of 1A, 1B and 1C were adjusted following a meeting with the OWD to avoid impacts to the community of Oceanside's drinking water source. The refined alternatives were referred to as the North (refined from alternative 1B) and South alignments (refined from alternatives 1A and 1C). While the 2014 report determined that fixes along the Existing alignment would be impractical given the depth of slide movement, the project team included a comprehensive review of a structural repair along the current alignment of Cape Meares Loop Road.

To inform the alternatives screening process additional surveys and analysis were conducted for the No Build Alternative and three preliminary alternatives (North alignment, South alignment, and Existing alignment). The three preliminary alternatives were evaluated using the following criteria:

- Project cost
- Environmental impact



- Right-of-way impacts
- Geotechnical stability
- Schedule
- Risk

The evaluation identified the North alignment as best meeting the criteria. While the impacts of the South alignments would be similar to the North alignment the project team had concerns about poor subsurface conditions that had greater risk and uncertainty related to future geotechnical stability. The Existing alignment ranked the lowest because of cost, risk and future slide uncertainty. Therefore, the North alignment was selected as the Preferred Alternative.

2.3.3 Alternatives Previously Considered but Dismissed

As discussed in detail in the *Cape Meares Road Relocation Project Alternatives Analysis Memorandum* in Appendix A, the conceptual and preliminary alternatives that do not meet the project's purpose and need were not advanced for further study in the EA. Additionally, some alternatives may meet the purpose and need but were determined not reasonable because they are more costly or difficult to construct or may have greater environmental or property impacts than the reasonable alternatives. These alternatives were considered, but were dismissed based on the evaluation criteria. Refer to Appendix A for further details.



Chapter 3 Affected Environment, Environmental Consequences and Mitigation Measures

This chapter describes the current conditions of the environment and documents the potential adverse, beneficial, or negligible effects (environmental consequences) to environmental resources associated with the No Build Alternative and the Preferred Alternative. No Build Alternative effects are discussed in terms of the direct effects and indirect effects (which are caused by the action at a later time or farther removed in distance but still reasonably foreseeable) that would occur as a result of not relocating or reopening Cape Meares Loop Road. Since no project-related construction would occur with the No Build Alternative, temporary effects are not discussed. Preferred Alternative effects are discussed in terms of temporary effects during construction, direct effects resulting from project implementation and associated with the operation and maintenance of the facility, and indirect effects. If applicable, mitigation measures are proposed to address potential adverse effects from the Preferred Alternative. Cumulative effects of the project with other past, present, and reasonably foreseeable future activities are documented in Section 3.13.

3.1 Transportation

3.1.1 Affected Environment – Existing Conditions

Existing Road Conditions and Deficiencies

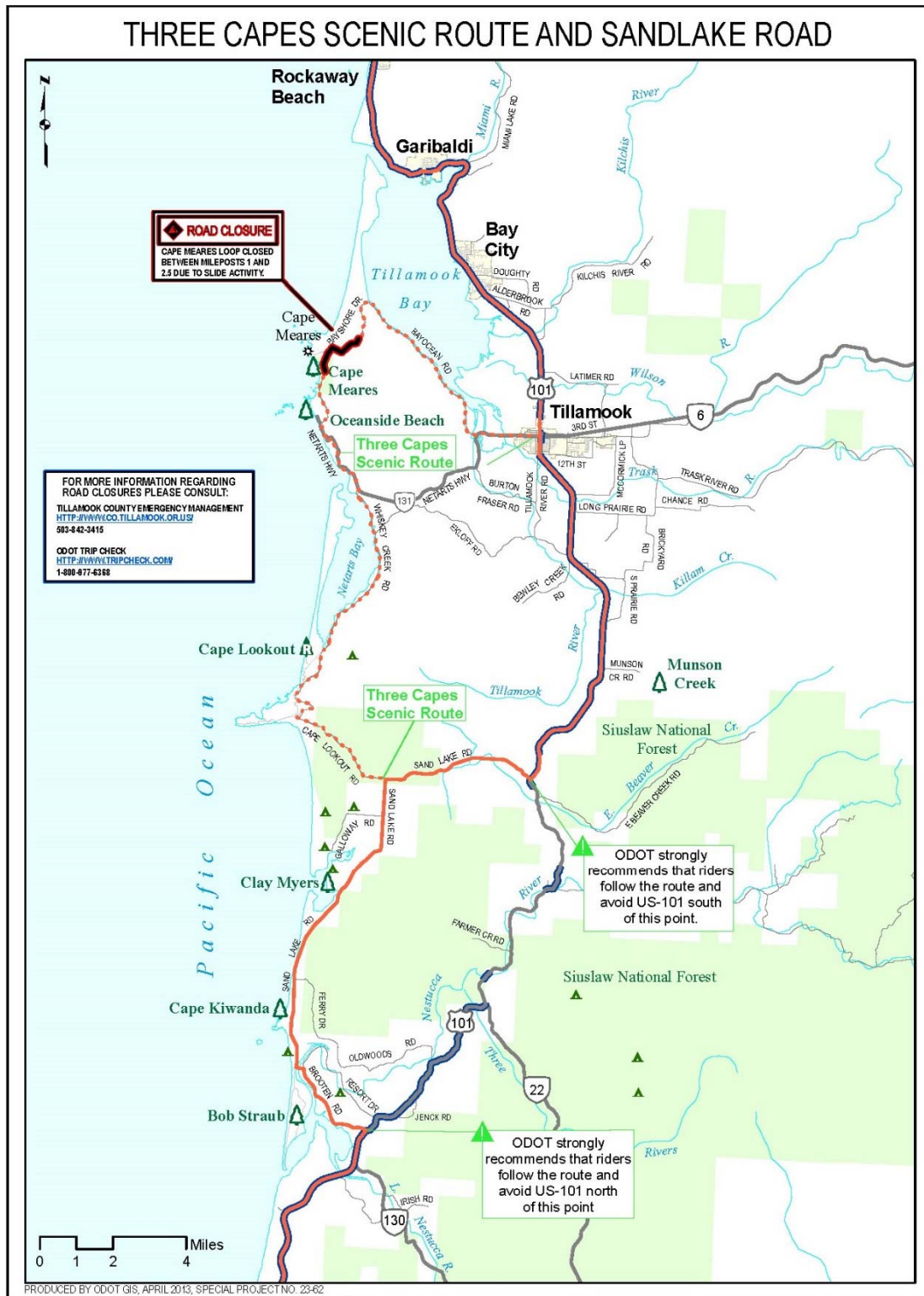
Cape Meares Loop Road is an approximately 4.5-mile county collector road connecting the communities of Cape Meares and Oceanside and providing a northern link between Highway 131 and Bayocean Road. The existing paved road is approximately 28-feet wide, with one lane each direction and narrow shoulders but no bike lanes or sidewalks (Tillamook County 2004). An approximately 1-mile section of the road has been closed since 2013 due to a large landslide that has periodically affected the road since the 1970s. In 2008, a shoofly detour was constructed around the worst part of the landslide area but the shoofly, too, quickly succumbed to slope failure. Currently, Cape Meares Loop Road is closed between mile post (MP) 1 near the community of Cape Meares and MP 2, just east of the entrance to the Scenic Viewpoint and Refuge (Tillamook County 2016). Geotechnical studies of the road closure area have confirmed the landslide is still active (MBG 2014; WFLHD 2017b).

Road Uses

As shown in Figure 3-1, Cape Meares Loop Road is part of the Three Capes Scenic Route/Highway. The Cape Meares Loop Road is a designated State Scenic By-Way, is included in the Oregon Coast Bike Route as an alternative to Highway 101 (which has greater traffic volumes) and is part of the Oregon Coast Trail. Cape Meares Loop Road is used by local residents, tourists, and emergency services. The road also serves as the access to the Refuge, Scenic Viewpoint, and other nearby recreation areas.



Figure 3-1. Three Capes Scenic Route Map



Source: ODOT 2013

Note: This map includes minor revisions to roadway labels made for this EA.



Before the 2013 closure, Cape Meares Loop Road provided a second access to the communities of Oceanside and Cape Meares that supplemented the access provided by Highway 131 and Bayocean Road, respectively. Both Highway 131 and Bayocean Road are often closed due to landslides and slope failures. Without Cape Meares Loop Road as an emergency backup road the communities of Oceanside and Cape Meares can be isolated. Cape Meares Loop Road is also a tsunami escape route and emergency detour route for the two communities, and an access route for the OWD and other utilities providing service in the area and emergency responders between Oceanside and Cape Meares.

Cape Meares Loop Road also provides access to the privately-owned forestland to the east of the roadway. Private unpaved logging roads extend from Cape Meares Loop Road for harvests. The privately-owned Lighthouse Quarry is also accessed from Cape Meares Loop Road.

In addition to a few pullouts on the side of the road near viewpoints, there is one parking area near the road closure where the road turns off for the Scenic Viewpoint and Refuge. The Cape Meares Loop Road closure occurs just east of the Oregon Coast Trail trailhead junction, where hikers continue from Cape Meares Loop Road onto the trailhead into the Scenic Viewpoint and Refuge (see Figure 3-2). Bicyclists on the Oregon Coast Bike Route, however, are advised to stay on Highway 101 due to the closure.

Traffic Volumes

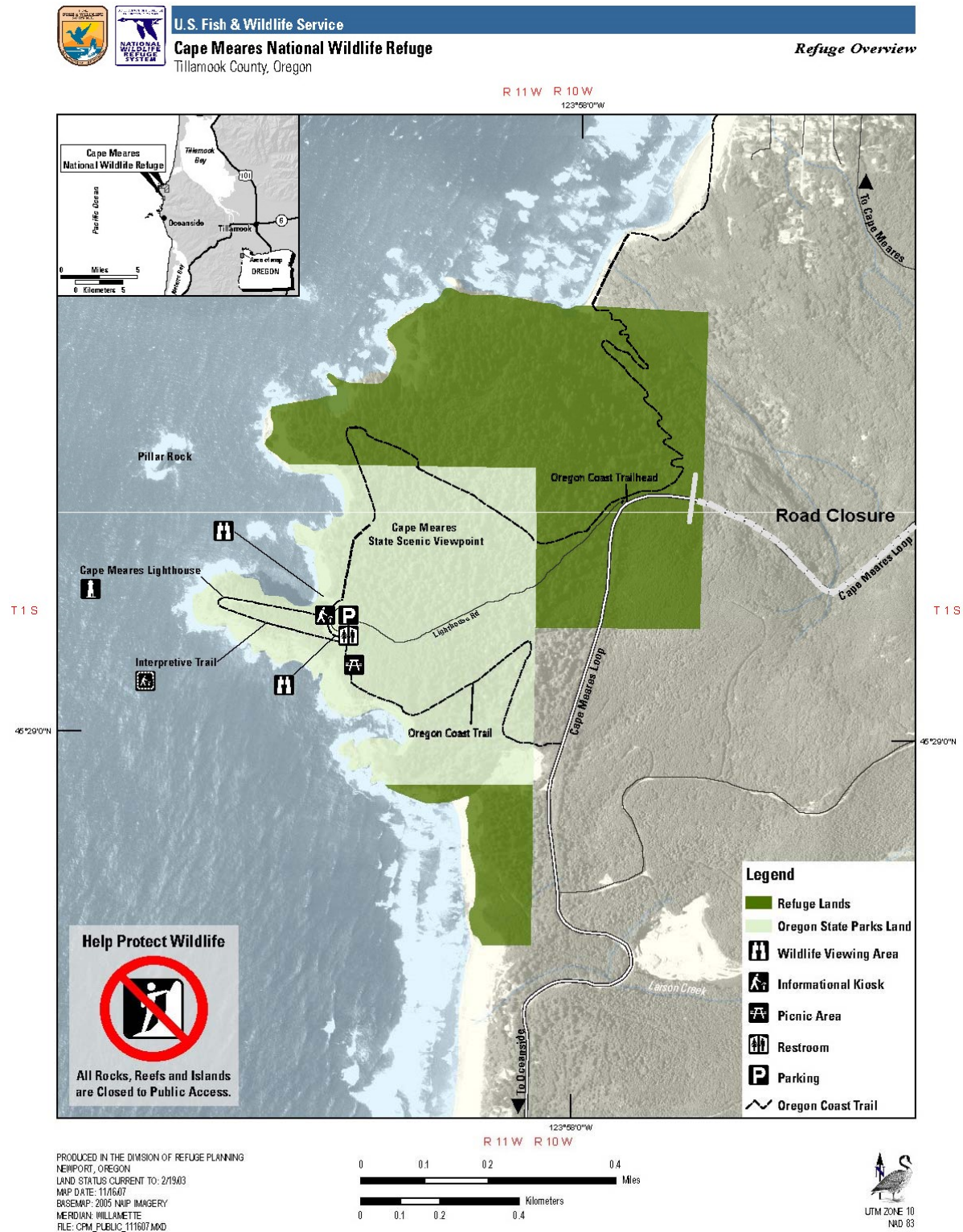
Traffic counts for Cape Meares Loop Road are not available (Tillamook County 2017b). Recent annual visitor counts to the Refuge and Scenic Viewpoint provide a rough indication of traffic volumes on the road. Data from the Oregon Parks and Recreation Department (ORPD) and U.S. Fish and Wildlife Service (USFWS) show annual visitor counts to the Refuge and Scenic Viewpoint fluctuated between the years 2012 and 2016 from about 430,000 to 620,000 per year; it would be expected that more than one visitor would travel in a single vehicle so the number of vehicles would be expected to be lower than the number of individual visitors. These visitor counts would not include traffic using the roadway to access adjacent land uses which could add to traffic volumes on Cape Meares Loop Road.

The proposed roadway design of the Preferred Alternative is utilizing an estimate of Average Daily Traffic (ADT) of 700 cars, which is consistent with the annual visitor counts above assuming an average of two people per vehicle.

Crash History

Between 2010 and 2015 data from ODOT shows that three crashes occurred in the project area (ODOT 2017b).

Figure 3-2. Oregon Coast Trail Map through the Cape Meares Area



Source: USFWS 2007

Note: This map includes minor revisions to roadway labels made for this EA.



3.1.2 Environmental Consequences – No Build Alternative

Direct Effects

Without the project, Cape Meares Loop Road would remain closed and options for accessing Oceanside, the Scenic Viewpoint, and the Refuge would remain restricted to the limited options currently available from the south. The community of Cape Meares would remain accessible only from the north. Since the road no longer continues through, all vehicle, bicycle, and pedestrian travel on Cape Meares Loop Road would require backtracking and/or out-of-direction travel to get to and from other destinations along Cape Meares Loop Road. Hikers on the Oregon Coast Trail would not be expected to be impacted by the No Build Alternative.

Indirect Effects

With the No Build Alternative, Cape Meares Loop Road would continue to be closed and would not provide a second access to the communities of Oceanside and Cape Meares when Highway 131 and Bayocean Road are closed due to landslides and slope failures. This would result in isolating Cape Meares and Oceanside during these events, including isolation from utility and emergency services. Cape Meares Loop Road would also not provide a tsunami escape route.

3.1.3 Environmental Consequences – Preferred Alternative

Temporary Construction Effects

Construction of the Preferred Alternative would likely result in minor, short-term delays and/or detours of traffic on Cape Meares Loop Road in both locations where it would connect to the existing alignment. Otherwise, construction would take place away from the existing roadway in new right-of-way that would be acquired from private forestland. Therefore, impacts to transportation during construction would be minimal and limited to a small area at the connection between the new alignment and existing roadway.

Direct Effects

The Preferred Alternative would restore the access previously provided by the closed portion of Cape Meares Loop Road. The Three Capes Scenic Route would once again be continuous. Visitors to the Refuge and Scenic Viewpoint would be able to access these federal lands and recreation areas from the north, and visitors traveling from the south would not have to backtrack south to get to other destinations along Cape Meares Loop Road. Locals, tourists, and emergency service vehicles would also be able to access Cape Meares from the south or Oceanside from the north using the new alignment. The Preferred Alternative would maintain access to the surrounding private forestlands, Lighthouse Quarry, and OWD property.

The new alignment would also restore the secondary access to Cape Meares and Oceanside in the event that Bayocean Road or Highway 131 are closed due to landslides or slope failures. It would also provide an extension to the Cape Meares Loop Road tsunami escape route and provide an emergency detour for Cape Meares and Oceanside.

Parking and roadside pullouts would not be impacted by the Preferred Alternative. Bicyclists on the Oregon Coast Bike Route could once again take the scenic alternative route along the new alignment rather than traveling on Highway 101, which has higher traffic volumes and may be considered less safe, between Tillamook and Sand Lake Road. The new alignment would be a paved, two-lane road with shoulders.

The Oregon Coast Trail would continue to use the portion of the existing Cape Meares Loop Road that terminates in the Refuge and would therefore not be impacted by the Preferred Alternative.

Indirect Effects

Indirect effects to transportation are anticipated to be minimal under the Preferred Alternative. Travel routes to Cape Meares, Oceanside, and the recreation areas would change for some travelers and could make wayfinding to these destinations slightly less clear; however, installation of directional signs would help ensure travelers are still able to navigate to their destinations. For example, from the north, previously visitors would directly access the Refuge or Scenic Viewpoint from Cape Meares Loop Road. Travel and access directions under the Preferred Alternative could be clarified by installing new signage to direct Refuge or Scenic Viewpoint visitors to make a right-turn where the new roadway intersects with the existing Cape Meares Loop Road alignment.

With the Cape Meares Loop Road restored, in the event of a landslide along Highway 131 or Bayocean Road, the communities of Cape Meares and Oceanside would not be isolated. In the event of a tsunami or other emergency Cape Meares Loop Road would be available as an emergency escape route.

Mitigation Measures

Measures to avoid, minimize, and mitigate impacts to transportation under the Preferred Alternative include:

- Construct the Preferred Alternative to Tillamook County roadway standards for a county collector road.
- Coordinate and communicate the construction schedule with the Refuge, the Scenic Viewpoint, Cape Meares, and Oceanside so they can post alerts on their preferred communication channel of construction activities that may impact travelers in the area.
- Use traffic safety signs and flaggers to inform motorists, bicyclists, and pedestrians and manage traffic on affected roads during construction activities.
- Prepare a notice about construction activities and a proposed schedule for posting on Oregon Department of Transportation (DOT)'s traffic advisory web site called Trip Check (<http://www.tripcheck.com>).
- Install new wayfinding signage to direct travelers to the Refuge, the Scenic Viewpoint, Cape Meares, Oceanside, Oregon Coast Trail, and Oregon Coast Bike Route.

3.2 Land Use, Farmland, Forestland, and Utilities

3.2.1 Affected Environment – Existing Conditions

Land Uses

Land in the project area is primarily used for forest and public recreation. The forested land is privately-owned, while the recreation land is within the publicly-owned Scenic Viewpoint and Refuge. These recreation areas are shown on Figure 3-3 and further described in Section 3.10. Within the forested area, the Lighthouse Quarry is located adjacent to Cape Meares Loop Road and there are two parcels owned by OWD. See the land ownership map in Figure 3-3. Due to the current closure of Cape Meares Loop Road, the Scenic Viewpoint, the Refuge, the quarry and the water district's property can only be accessed from the south. There are residential land uses located to the north and south of the project area, which are part of the communities of Cape Meares and Oceanside, respectively. In addition, there is a rural residence on tax lot 1S10000000501.

According to soil survey maps by the U.S. Department of Agriculture Natural Resource Conservation Service, there are no soils in the project area that are identified as prime farmlands or farmlands of statewide important (NRCS 2017). There are no lands actively used for farming in the project area.

Land Use Plans and Zoning

The project is located within Oregon's federally approved Coastal Zone and is subject to the requirements of the Coastal Zone Management Act. The purpose of the Coastal Zone Management Act is to preserve, protect, develop and where possible, restore or enhance the nation's coastal zone. In Oregon, the Coastal Zone Management Act is managed by the Oregon Department of Land Conservation and Development (DLCD). Projects with a federal nexus require a federal consistency review to ensure the project is consistent with the Oregon Coastal Management Program. To be consistent with the enforceable policies of the Oregon Coastal Management Program, the proposed project must be consistent with: Oregon's statewide planning goals; the applicable acknowledged local comprehensive plan; and selected state authorities such as those governing wetlands, water quality and fish and wildlife protections.

On September 26, 2017, DLCD issued a letter stating they have no objection to the project's federal funding under their Coastal Zone Management Act authority provided the project receives and complies with the conditions of all necessary local, state, and federal permits (Appendix B). DLCD would then conduct a full consistency review of the coastal zone certification and statement of federal consistency as part of the project's Joint Permit Application for the removal and fill of wetlands, which would be provided to DLCD for review by the U.S. Army Corps of Engineers. Tillamook County would certify the Coastal Zone Management Act consistency during the permitting process.

The Tillamook County Comprehensive Plan is structured in chapters that correspond to Oregon's Statewide Planning Goals, including Goal 4 (Forest Lands), Goal 8 (Recreation), Goal 12 (Transportation), and Goal 17 (Coastal Shorelands) (Tillamook County 1982). Zoning in the project area, and shown in Figure 3-4, corresponds to the existing land uses. Descriptions of the



land use zones in the project area are provided in Table 3-1. The existing alignment of Cape Meares Loop Road runs through the Forest and Recreation Management zones.

Table 3-1. Tillamook County Zoning Descriptions

Zoning Designation & Code Section	Purpose
Forest (F) Section 3.004	The purpose of the Forest (F) Zone is to protect and maintain forest lands for grazing, and rangeland use and forest use, consistent with existing and future needs for agricultural and forest products. The F zone is also intended to allow other uses that are compatible with agricultural and forest activities, to protect scenic resources and fish and wildlife habitat, and to maintain and improve the quality of air, water and land resources of the county.
Recreation Management (RM) Section 3.040	The purpose of the RM zone is to designate areas for public and private parks and day-use facilities, including such areas that contain significant natural or scenic values. The RM zone is intended to accommodate the type of recreational developments that preserve an area's natural values; it is not intended for intensive recreational developments that do not retain substantial open space on the property.
Rural Residential 2 Acre (RR-2) Section 3.010	The purpose of the RR zone is to provide for the creation and use of small-acreage residential homesites. Land that is suitable for Rural Residential use has limited value for farm or forest use; it is physically capable of having homesites on parcels of five acres or less; and it can be utilized for residential purposes without constraining the use of surrounding resource-zoned properties for resource-production purposes.
Residential Oceanside (ROS) Section 3.310	The purpose of the ROS zone is to designate areas for low-density one and two-family residential development and other, compatible, uses. Suitability of land for low-density uses is determined by the availability of public sewer services, and limitations to density such as geologic and flood hazards, shoreline erosion, and the aesthetic or resource values of nearby natural features. Where any provision of the ROS zone imposes a restriction on the use of land greater than is provided by other ordinance provisions, then the ROS zone shall prevail.
Small Farm and Woodlot 10 Acre (SFW-10) Section 3.008	The purpose of the SFW-10 zone is to permit small-scale farms and large-acreage rural residential homesites on land that has potential for small-scale farm or forest uses, but because of limitations it is impractical for the Farm or Forest zone. It also provides a buffer between non-resource uses and lands that are managed for farm or forest uses, thereby assuring that the conversion of such lands to higher density uses occurs in an orderly and economical manner.

Source: Tillamook County 2015 and 2017e

Note: Per Tillamook County Planning Department staff, Tillamook County does not have a Comprehensive Plan map with separate designations from zoning categories



Figure 3-3. Land Ownership Map

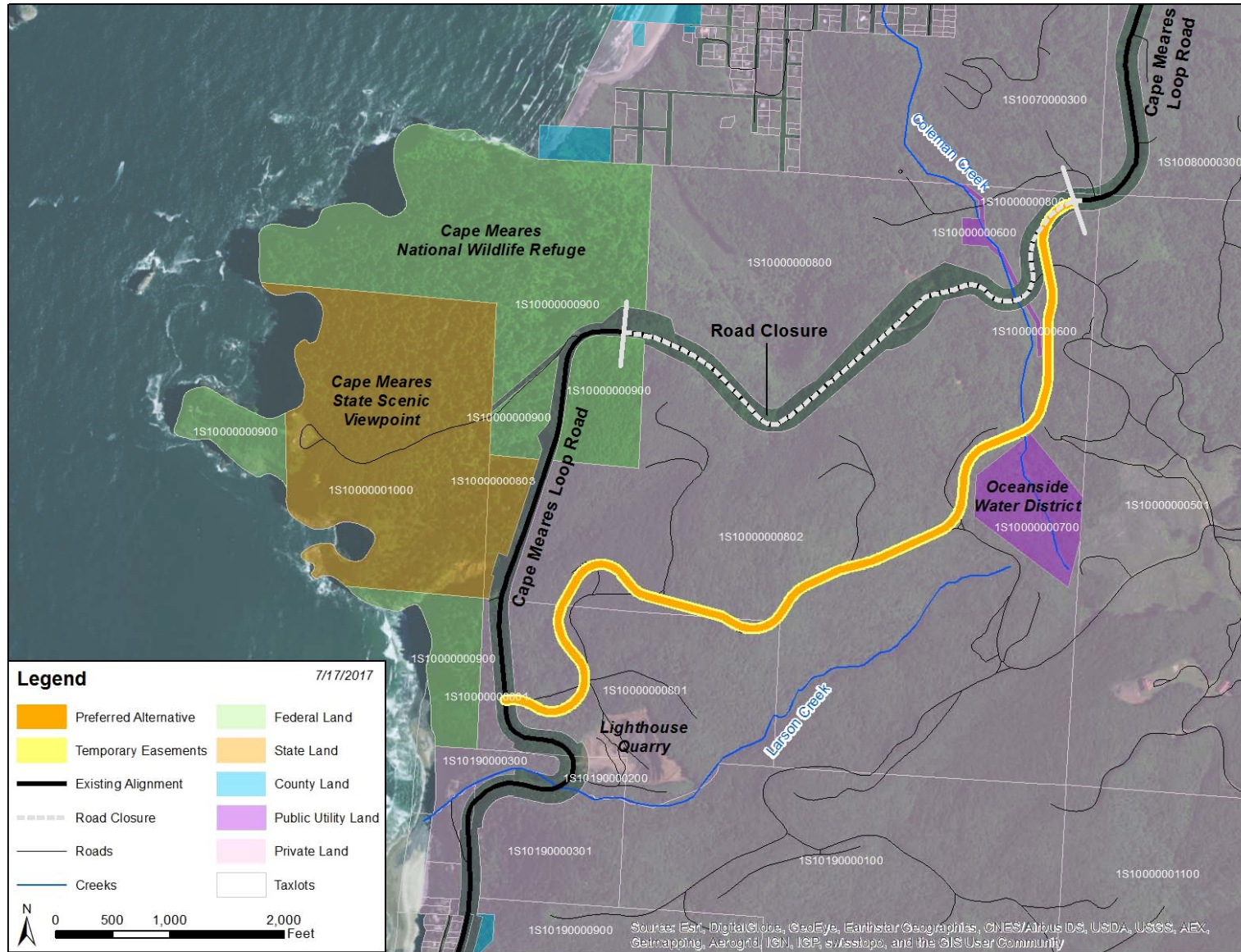
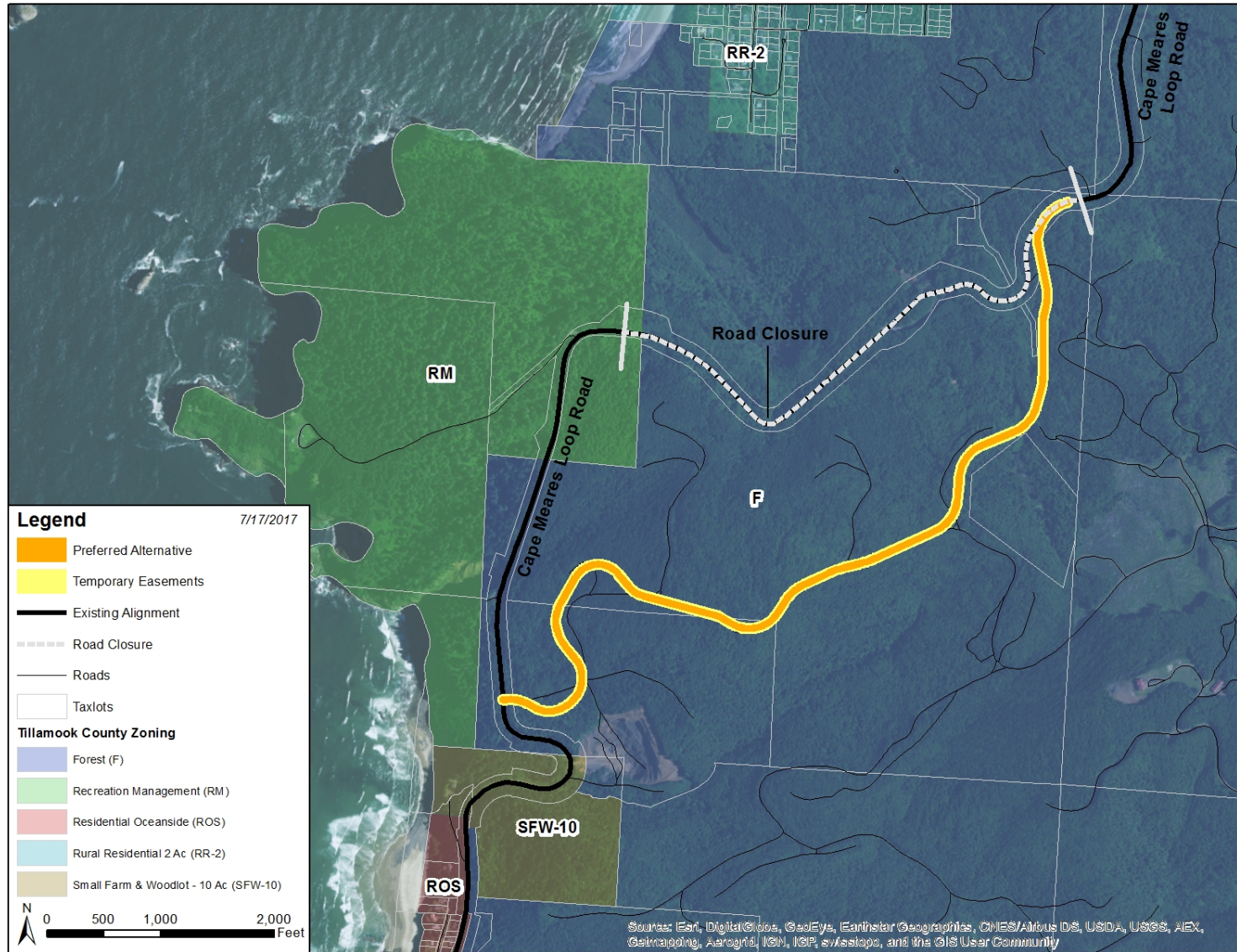


Figure 3-4. Zoning Map



Utilities

Tillamook People’s Utility District (Tillamook PUD) provides power to the project area. An above ground transmission line located in Cape Meares Loop Road carries electrical power from Oceanside up to the Lighthouse Quarry; north of the quarry, the transmission line transitions to an underground line that continues to the north to the point of the road closure and then west into the Scenic Viewpoint. A separate underground transmission line east of the project area provides electrical service to the rural residence on tax lot 1S10000000501 and other properties east of the road closure. Tillamook PUD has expressed interest in locating three additional 2-inch electrical conduits through the project area (Tillamook PUD 2017a). Beyond the immediate project area, Tillamook PUD plans to add a substation and an additional transmission line closer in to Oceanside to address capacity needs (Tillamook PUD 2017b).

OWD provides water service to the communities of Oceanside and Cape Meares. The District owns tax lot 1S10000000700 at the headwaters of Coleman Creek and tax lot 1S10000000600, which follows Coleman Creek. The Cape Meares Point of Diversion is located on the south side of where Coleman Creek crosses the existing Cape Meares Loop Road alignment North of that point, the District has a 6-inch water main in the east side of Cape Meares Loop Road (OWD 2017a). Following the road closure, the water line in the closed portion of Cape Meares Loop Road was decommissioned. The Coleman Creek water rights were reinstated and a new treatment plant for the community of Cape Meares was constructed to continue to provide service to Cape Meares (OWD 2017b). OWD has expressed interest in constructing a new water line through the project area to provide connectivity between their facilities in Oceanside and Cape Meares.

3.2.2 Environmental Consequences – No Build Alternative

Direct Effects

Land Conversion: The No Build Alternative would not convert land from its current use to public right-of-way for a roadway. In addition, with the No Build Alternative the portion of Cape Meares Loop Road that is closed would remain as public right-of-way land. Existing land uses would be expected to continue.

Property Access: All parcels adjacent to the existing roadway would continue to have access to the non-closed portions Cape Meares Loop Road except for tax lot 1S10000000600, which is landlocked by the road closure. Tax lot 1S10000000700 would remain landlocked; both parcels are owned by the OWD. Travelers to properties south of the road closure, such as the Refuge and Scenic Viewpoint, would have to continue to use travel routes from the south under this alternative.

Farmlands and Forests: The No Build Alternative would not impact farmlands or forests.

Utilities: Existing utilities would continue to operate as they have since the road closure in 2013. However, under the No Build Alternative, existing utilities within the current alignment could be damaged and/or become inaccessible if the roadway continues to slide. Furthermore, Tillamook PUD would not be able to construct the additional conduits in the proposed roadway alignment, and the OWD would not be able to construct a new waterline in the proposed roadway alignment;



additional facilities would likely have to be constructed in private lands, rather than adjacent to a public roadway.

Indirect Effects

Landlocking tax lot 1S10000000600 and not restoring travel routes to the Refuge and Scenic Viewpoint from the north are unlikely to reduce the potential for these parcels to be used for forestry and recreation purposes in accordance with their zoning designations. Therefore, the No Build Alternative would not have indirect effects to land use.

3.2.3 Environmental Consequences – Preferred Alternative

Temporary Construction Effects

Temporary Easements: Construction of the Preferred Alternative would occur within a 100-foot wide construction area, centered on the realigned roadway. This would require a total of approximately 8 acres of temporary easements along the alignment of the Preferred Alternative in addition to the land that would be permanently acquired, as discussed under the direct effects. All land outside of temporary easements and acquisition areas could continue its existing uses during construction. Once construction is complete the temporary easements would be vacated. Temporary easements for construction are shown in Figure 3-3 and Figure 3-4.

Property Access: During construction, access to nearby properties could be affected by construction activities. When the new intersection of the existing roadway and the realigned roadway is constructed south of the Scenic Viewpoint and Refuge, there could be traffic delays and temporary lane closures; however, access would be maintained and delays would be a short-term impact.

Farmlands and Forests: There are no farmlands that would be impacted during construction. Trees within the construction limits, including those located within the temporary easement area, would need to be removed to accommodate roadway construction. The property owners would likely retain any trees that are removed from their property which would be determined during the right-of-way process. The privately-owned forestland adjacent to the alignment of the Preferred Alternative is not planned to be harvested in the near future, so construction of the road would not interfere with forest harvesting activities beyond the construction limits.

Utilities: Utility service is not anticipated to be impacted during construction. Project construction activities would be coordinated with the local utility districts to avoid any service disruptions.

Direct Effects

Land Conversion: The Preferred Alternative would have a standard 60-foot right-of-way width for the entire length of the project, as shown in Figure 3-3, which would require the acquisition of approximately 16 acres of privately-owned land for roadway right-of-way. No publicly-owned land would be converted to right-of-way. The existing roadway where the road is closed would be abandoned. Beyond the Refuge, ownership of approximately 28 acres of land within the right-of-way may be vacated as County right-of-way and could be used as a land transfer option during the right-of-way process.



All land that would be acquired and converted to a transportation use is located within Tillamook County’s Forest zone. Per Tillamook Land Use Ordinance Section 3.004, within the Forest zone the “reconstruction or modification of public roads and highways involving the removal or displacement of buildings but not resulting in the creation of new land parcels” and “improvement of public road and highway related facilities, such as maintenance yards, weigh stations and rest areas, where additional property or right-of-way is required but not resulting in the creation of new land parcels” are conditional uses that require a Type II Conditional Use Review. Other land use permits that may be required for construction of the Preferred Alternative include a Geologic Hazard Review and an Exception to Statewide Planning Goal 4 (Tillamook County 2017b). During final design, further discussions with Tillamook County and DLCDC would occur to confirm the required permits. In addition, because the project is located within the Coastal Zone, a federal consistency review with the Coastal Zone Management Act would be required.

Property Access: Under the Preferred Alternative, all parcels adjacent to the existing roadway would have access to either the realigned roadway or remainder of the existing roadway that extends north to the Refuge except for tax lot 1S10000000600 (OWD’s parcel that follows Coleman Creek), which was landlocked by the road closure. Access to tax lot 1S10000000700 (OWD’s parcel containing the headwater of Coleman Creek) would continue to require access via adjacent private lands, but would be much closer to Cape Meares Loop Road than it was previously. The Preferred Alternative would bring the roadway closer to a private residence located on tax lot 1S10000000501, but would still be located approximately 1,000 feet from the residence at its closest point.

Travel routes to the Scenic Viewpoint and the Refuge would change slightly from conditions prior to the road closure. The entrance to the Scenic Viewpoint and Refuge would no longer be directly off the main Cape Meares Loop Road, but rather would use the portion of the existing alignment and roadway that would remain, which would continue north from the realigned roadway. Additional wayfinding signage would provide directions for travelers to these land uses.

Farmlands and Forests: Since there are no prime farmlands or farmlands of statewide importance present in the project area, none would be converted and a Farmland Conversion Impact Rating form is not required.

The approximately 16 acres of land that would be converted to right-of-way is currently used for forestry. A portion of the Preferred Alternative’s alignment coincides with an existing forestry road on private property that has been cleared of trees, so fewer trees would need to be removed in this segment. Construction of the realigned road could provide improved access to the forestland when trees are harvested in the future. With the Preferred Alternative, the existing right-of-way and roadway within the closed portion of the existing alignment may be vacated by the County and could be used as a land transfer option during the right-of-way process. Currently, the County’s Forest zoning includes the area within the right-of-way.

Utilities: Construction of the Preferred Alternative would enable the OWD to construct its new water line along the realigned roadway segment; similarly, the Tillamook PUD would be able to install new electrical conduits along this realigned public roadway rather than installing new facilities in privately-owned land.



Indirect Effects

Indirect effects to land use are anticipated to be minimal under the Preferred Alternative. Slightly changing the travel route to properties adjacent to Cape Meares Loop Road could result in minor changes or enhancements to the existing use of those properties. For instance, the remaining segment of the existing road that would dead end at the Refuge property could have less traffic on it than before the road was closed because it would not be used by through traffic. This could provide habitat benefits for wildlife that occupy the Refuge, and could create a quieter, more scenic experience for hikers and other visitors to the Refuge. Similarly, changing the roadway alignment through the privately-owned forestland could slightly change the way trees are harvested in the future.

Mitigation Measures

Measures to avoid, minimize, and mitigate impacts to land uses, farmlands, forests, and utilities under the Preferred Alternative include:

- During final design continue to minimize impacts to private property.
- Where property acquisition is unavoidable, the project would provide just compensation, per the *Uniform Relocation Assistance and Real Property Policies of 1970* (Uniform Act). Tillamook County is responsible for property acquisitions and will follow all requirements of the Uniform Act.
- Install new wayfinding signage to direct travelers to the Refuge, Scenic Viewpoint, Cape Meares, Oceanside, Oregon Coast Trail, and Oregon Coast Bike Route.
- Provide a construction schedule and notifications to all potentially affected landowners, utility providers, and nearby recreation facilities.
- If OWD relocates their intake system upstream of the Preferred Alternative (described in Section 2.2.2), coordinate with OWD to install pipe along the project corridor that would serve the new intake.
- During construction, maintain access to properties.
- During construction, work closely with the utility owners to minimize service outages and to provide advance notice of outages to affected parties.

3.3 Social/Economic Changes and Environmental Justice

3.3.1 Affected Environment – Existing Conditions

Community

Cape Meares and Oceanside, the communities nearest the project, are small and unincorporated with over half of the housing units used for seasonal, recreational, or occasional use. For example, the population in Cape Meares is known to drop below 100 people during the winter months but swell to over 400 during the summer. Residents are generally older—the majority receive Social Security income—and organize through the Cape Meares Community Association and Oceanside



Neighborhood Association (ONA) (U.S. Census Bureau 2010 and 2016; CMCA 2017; ONA 2017). Forestland immediately surrounds the project, as described in Section 3.2. One parcel about 0.5 mile southeast of the Preferred Alternative alignment is in residential use.

Economy

Much of the area's economy is dependent on tourism, including from recreation at the Refuge and Scenic Viewpoint. The Tillamook County Economic Development Council valued visitations to Cape Meares as contributing \$7 million to the regional economy in 2012 (WFLHD 2015). Additionally, over 60 percent of housing units in Cape Meares and Oceanside are used for seasonal, recreational, or occasional use, which suggests visitors to the communities are important to the region's economic vitality (U.S. Census Bureau 2010).

Most of the forestland immediately surrounding the project area is owned and actively managed for harvesting by the Stimson Lumber Company. Near the southern end of the project area Green Crow Corporation actively mines gravel from the Lighthouse Quarry. Northeast of the quarry, is the OWD property that supplies water for approximately 800 rate-payers.

Environmental Justice

Environmental justice populations include low-income and minority individuals¹, protected under Executive Order 12898, FHWA Order 6640.23A, and U.S. DOT Order 5610.2(a).

Within the communities of Cape Meares and Oceanside U.S. Census Bureau data (from years 2010 and 2015) identifies that 4 percent and 6 percent, respectively, of their population is a minority and that 5 percent and 19 percent, respectively, of their population is low-income. As shown in Table 3-2, the census data suggests that Cape Meares and Oceanside have a lower percentage of minority populations compared to the surrounding areas, which are depicted in Figure 3-5 and Figure 3-6. The census data also show that the community of Cape Meares has a lower percentage of low-income population than the surrounding areas, while the community of Oceanside has a low-income population slightly above that of Tillamook County and the State of Oregon. Table 3-2 also includes the data from the two census tracts that include the project area; however, those census tracts are much larger than the two unincorporated communities, so data for Cape Meares and Oceanside are expected to be the best representation of the project area. It is unknown which specific households may be occupied by low-income and minority individuals. The unincorporated communities do not appear to have specific clusters of low-income households, such as might be indicated by a mobile home park.

¹ The U.S. DOT Order 5610.2(a) provides these definitions:

- A) Low-income means a person whose median household income is at or below the U.S. Department of Health and Human Services poverty guidelines.
- B) Minority means a person who is:
 - 1) Black: a person having origins in any of the black racial groups of Africa;
 - 2) Hispanic or Latino: a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race;
 - 3) Asian American: a person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent;
 - 4) American Indian and Alaskan Native: a person having origins in any of the original people of North America, South America (including Central America), and who maintains cultural identification through tribal affiliation or community recognition; or
 - 5) Native Hawaiian and Other Pacific Islander: people having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.



Table 3-2. Project Area Demographics

	GEOGRAPHY						
	Cape Meares CDP ¹	Oceanside CDP ¹	Census Tract 9605	Census Tract 9606	City of Tillamook	Tillamook County	Oregon

2010 Census Data

Total Population	99	361	2,134	2,152	4,935	25,250	3,831,074
Racial ² Minority	4%	6%	15%	6%	13%	9%	16%
Ethnic ³ Minority	0%	5%	17%	7%	17%	9%	12%
Elderly (65+)	42%	40%	15%	23%	14%	21%	14%
Youth (<18)	7%	11%	24%	18%	27%	20%	23%
Total Housing Units	181	647	1,110	1,930	2,248	18,359	1,675,562
Total seasonal, recreational, or occasional use units	62%	61%	13%	41%	1%	34%	3%
Vacant Housing Units	69%	70%	20%	49%	9%	41%	9%

2011-2015 ACS⁴ Data

Total Population	143	338	2,273	2,570	4,958	25,430	3,939,233
Low-income	5%	19%	31%	14%	32%	17%	16%
LEP (5+) ⁵	0%	3%	5%	3%	3%	3%	6%
Households with Social Security income	76%	56%	41%	42%	39%	46%	32%

1 CDP = Census Designated Place, a population concentration identifiable by name but not legally incorporated by state law

2 Racial minority refers any race option on the 2010 U.S. Census other than White and regardless of ethnicity, including: Black or African American alone, American Indian and Alaskan Native alone, Asian alone, Native Hawaiian and Other Pacific Islander alone, Some Other Race alone, and Two or More Races.

3 Ethnic minority is independent of race and includes Hispanic or Latino, the only ethnic minority option available on the 2010 U.S. Census (e.g., a person can be white and Latino, and would thus be an ethnic minority but not a racial minority).

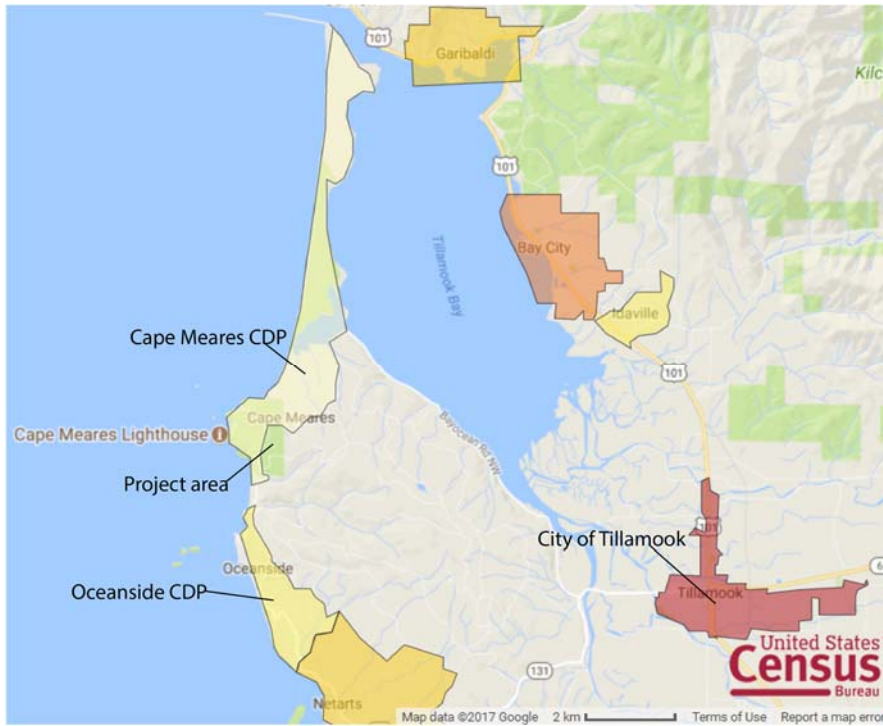
4 ACS data are population estimates. The data have inherent margins of error that can vary from small to large. As a result, ACS data varies in accuracy but it is the best data available for these demographics.

5 LEP - Limited English Proficient as determined by census respondent's self-assessment of ability to speak English; LEP data includes respondents that selected speaking English "less than very well" (Vickstrom 2015)

Sources: U.S. Census Bureau 2010, U.S. Census Bureau 2016



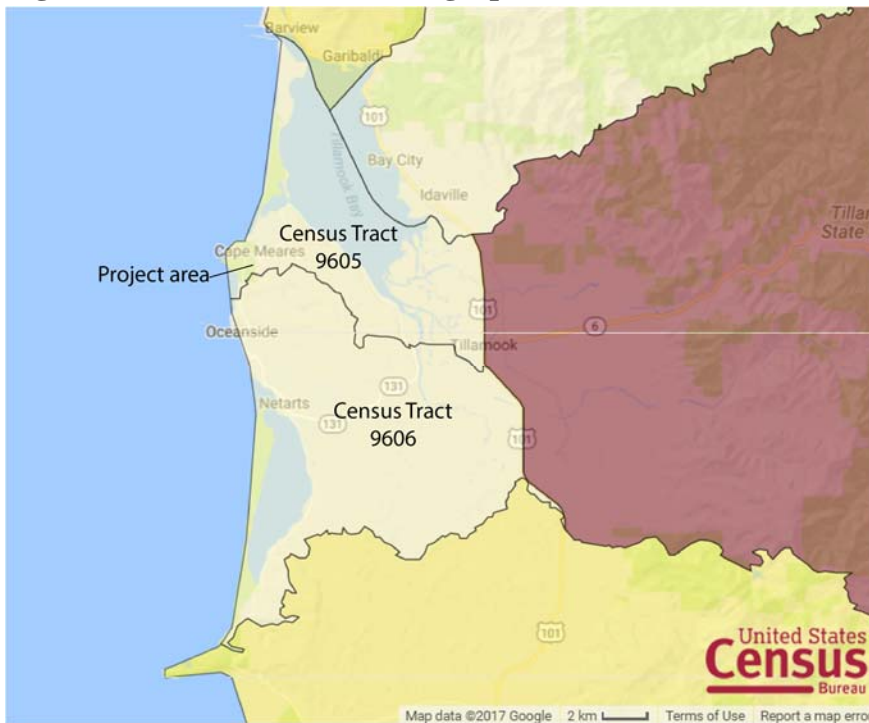
Figure 3-5. Census Designated Place Geographies



Note: CDP = Census Designated Place, a population concentration identifiable by name but not legally incorporated by state law

Source: U.S. Census 2017

Figure 3-6. Census Tract Geographies



Source: U.S. Census 2017



3.3.2 Environmental Consequences – No Build Alternative

Direct Effects

The No Build Alternative would not relocate or restore full use of Cape Meares Loop Road. The road would therefore remain unavailable for emergency access or as a tsunami evacuation route for the area and the No Build Alternative would not reduce the risk of Cape Meares and Oceanside being isolated if a storm or other catastrophe closes Bayocean Road and/or Highway 131.

Indirect Effects

Without use of Cape Meares Loop Road, visitors can only access the Refuge and Scenic Viewpoint from the south. Over time, if storms become more frequent or intense and result in more frequent closures of Bayocean Road and/or Highway 131, the continued loss of access from the north could reduce economic activity from reduced visitation. In addition, the continued road closure could suppress vacation rentals in Cape Meares and Oceanside.

Environmental Justice Determination

Environmental justice individuals in the area would experience the same impacts previously described under the No Build Alternative that are anticipated for other individuals in the area. Therefore, the No Build Alternative would not result in disproportionately high and adverse effects to environmental justice populations.

3.3.3 Environmental Consequences – Preferred Alternative

Temporary Construction Effects

During construction of the Preferred Alternative, residents and visitors to the area may experience brief delays or detours due to temporary lane closures or reroutes, but only when connecting the project alignment to the existing road in the north and south; otherwise, construction would occur away from existing roads. In addition, construction of the Preferred Alternative would not prevent access to the Refuge, Scenic Viewpoint and the communities because the project portion of Cape Meares Loop Road is already closed.

Project construction could provide short-term construction-related employment opportunities in the area, which could result in minor, temporary increases in sales for nearby businesses.

Direct Effects

The Preferred Alternative would not displace any existing residences. The Preferred Alternative would require acquiring approximately 16 acres of right-of-way from forestland owned by Stimson Lumber Company. In compliance with the *Uniform Relocation Assistance and Real Property Acquisition Policies of 1970*, as amended, Stimson Lumber Company would be fairly compensated for any loss of property. While the acquisition of land for the Preferred Alternative would reduce the existing acres of land owned by Stimson Lumber Company and available for timber harvesting it would not prevent them from harvesting timber on their remaining property. In addition, with the Preferred Alternative the right-of-way in the closed portion of the existing alignment that is outside of the Refuge property may be vacated by the County and could be utilized as a land



transfer option during the right-of-way process. Therefore, the Preferred Alternative would not displace any existing businesses and would minimize impacts to business operations.

Because the Preferred Alternative would restore access that was previously provided to the nearby recreation sites and the communities of Cape Meares and Oceanside, the project would not be expected to change the population demographics, location, distribution, or density in the project area. The Preferred Alternative would not provide access to parcels previously without public access and thus would not allow for new development of parcels. Restoring use of Cape Meares Loop Road would also restore the road's viability as an emergency service route, a tsunami evacuation route, and a backup access to Cape Meares and Oceanside if a storm blocks access via Bayocean Road or Highway 131, respectively. This would benefit the safety of the communities and the general public visiting these recreation areas.

Indirect Effects

By restoring access to the recreation areas, the Preferred Alternative could enhance tourism's economic viability in the area through increased visitor rates to the Refuge and Scenic Viewpoint.

Environmental Justice Determination

The project would not displace any existing residences or businesses nor is it expected to have other adverse effects on the communities of Cape Meares and Oceanside. Environmental justice individuals in the area would experience the same safety benefits anticipated for all individuals in the area described under the Preferred Alternative. Therefore, the Preferred Alternative would not result in disproportionately high and adverse effects to environmental justice populations.

Mitigation Measures

Though no social, economics, or environmental justice impacts are expected, the following mitigation measures may be used to maintain public involvement and information sharing about the project:

- Continue holding periodic meetings with interested stakeholders to provide project updates, address community questions or concerns, and receive feedback about the project.
- Regularly post construction schedules and information in Cape Meares and Oceanside community centers and in the Headlight Herald.
- Though data does not suggest there is a non-English speaking population in the project area, provide the option for stakeholders to request project information materials in a language other than English.

3.4 Air Quality/Noise/Energy

3.4.1 Affected Environment – Existing Conditions

The project area includes the air sheds of Tillamook County. In Tillamook County, the agencies with primary jurisdiction over air quality are the United States Environmental Protection Agency (EPA) and Oregon Department of Environmental Quality (Oregon DEQ). EPA has identified seven air pollutants as a concern nationwide. These pollutants, known as “criteria pollutants,” are



carbon monoxide, particulate matter (PM) with a diameter of 10 micrometers or less (PM₁₀), particulate matter less than 2.5 micrometers in size (PM_{2.5}), ozone, sulfur dioxide, lead, and nitrogen dioxide. Under the Clean Air Act (42 USC § 7401 *et seq.*), EPA has established National Ambient Air Quality Standards (NAAQS) that specify maximum allowable concentrations for each of the criteria pollutants. An area that fails to meet the standards established by EPA for any criteria pollutant is designated a nonattainment area. A maintenance area is an area that was designated as a nonattainment area for one of the NAAQS but later met the standard and was re-designated after a maintenance plan has been established to keep the area within the standards approved by EPA. Oregon DEQ has adopted the standards set by EPA.

In addition to criteria pollutants, air toxics are pollutants known or suspected to cause cancer or other serious health effects. Most air toxics originate from human sources, including on-road mobile sources, airplanes, and certain kinds of businesses or industries. There are seven priority mobile source air toxic (MSAT) pollutants: acrolein, benzene, 1,3-butadiene, diesel PM plus diesel exhaust organic gases (diesel PM), formaldehyde, naphthalene, and polycyclic organic matter (POM).

The project area is located outside any air quality maintenance area and is in attainment for all NAAQS criteria pollutants.

The study area for noise includes noise-sensitive land uses within 1,000 feet of the planned roadway and construction routes that could experience increases in traffic volume during construction. Noise-sensitive land uses located in the vicinity of the corridor include one rural residence located approximately 1,000 feet east of the project area. The majority of the project area is located in rural and/or undeveloped areas characterized by low noise levels.

Ambient noise levels in the project area are characteristic of rural lands with short periods of higher noise levels caused by timber harvesting, mining, and vehicle and equipment use related to those activities. Due to the current road closure, noise levels in the area remain consistently low.

Energy use in the project area is primarily from fuel consumed by vehicles on area roads and by roadway maintenance activities. Due to the roadway closure, currently energy use in the project area is quite low.

3.4.2 Environmental Consequences – No Build Alternative

Direct Effects

The No Build Alternative would not affect air quality, noise levels or energy use in the project area as the continued road closure would result in no additional or modified vehicle emissions, traffic noise, or fuel consumption from project construction or roadway operation.

Indirect Effects

Under the No Build Alternative, with the continued closure of the existing Cape Meares Loop Road, roads outside of the project area would continue to be used for timber harvest and mining operations. Future increases in vehicle traffic along these alternative routes would be expected to be minor and would not be expected to have a long-term or regional adverse effect to air quality,



a noticeable change in noise levels, or substantial increase in energy use. Therefore, the No Build Alternative would not have an indirect effect on air quality, noise levels, or energy consumption.

3.4.3 Environmental Consequences – Preferred Alternative

Temporary Construction Effects

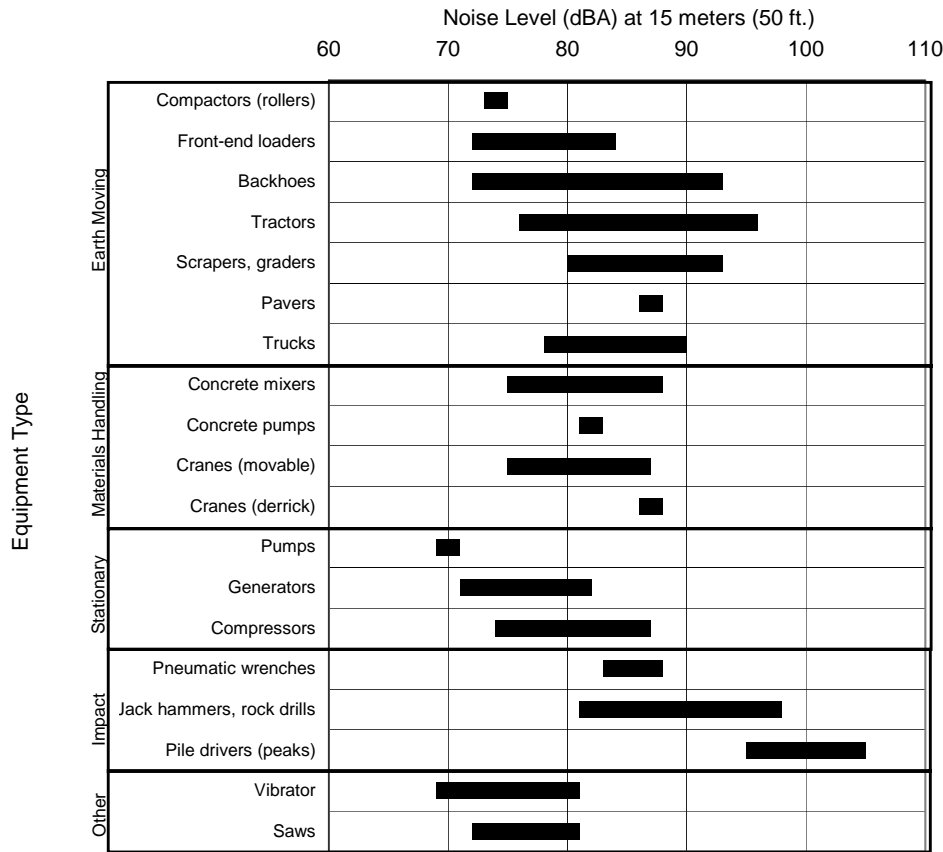
Construction of the Preferred Alternative would result in temporary adverse effects on air quality, primarily from dust and vehicle emissions. Earthwork activities, such as land clearing and ground excavation, could result in the generation of dust associated with the movement of dirt. Construction vehicle and equipment emissions would also occur along the project area during construction. These effects would be localized, temporary in nature, and would not result in violations of air quality standards. Construction contractors are required to comply with Division 208 of Oregon Administrative Rules (OAR) 340 which addresses visible emissions and nuisance requirements. Subsection 210 of OAR 340-208 places limits on fugitive dust that causes a nuisance or violates other regulations. Violations of the regulations can result in enforcement action and fines. Division 208 of OAR 340 provides a list of reasonable precautions to be taken to avoid, minimize and mitigate temporary adverse impacts to dust emissions. These measures are listed in the mitigation measures section below.

Noise levels in the project area during construction would be higher than existing noise levels due to vehicles and equipment operating during construction. As shown in Figure 3-7, maximum noise levels from construction equipment would range from 69 to 98 decibels at a distance of 50 feet. Mobile equipment operates in a cyclical fashion, while stationary equipment (e.g., generators and compressors) operates at sound levels that are fairly constant over time. Because trucks would be present during most construction phases and would not be confined to the project site, noise from trucks could affect more receptors.

With the Preferred Alternative, the highest and most prevalent construction noise levels would likely be associated with earthwork activities and material hauling. Construction noise levels would decrease at a rate of 6 to 8 decibels per doubling of distance from the source. Therefore, higher construction noise levels would be temporary and not noticeable to noise-sensitive land uses because the closest that construction activities would occur to a noise-sensitive land use (a rural residence) is approximately 1,000 feet.

Energy use under the Preferred Alternative would result in short-term construction effects due to the energy consumed by vehicles and equipment to construct the new road.

Figure 3-7. Construction Noise Levels



Source: EPA 1971

Direct Effects

The Preferred Alternative is not anticipated to affect regional vehicle miles traveled. As such, the Preferred Alternative is not predicted to impact regional pollutant burdens and would not result in long-term, regional adverse effects in air quality. The project is also not predicted to impact MSAT levels, though it should be noted that MSAT levels are predicted to decrease significantly in the future due to federally mandated programs (FHWA 2012). The project is not expected to change the predicted reductions in MSAT levels from federally mandated programs.

Prior to the road closure Cape Meares Loop Road had relatively low traffic volumes, with an estimated ADT of 700 vehicles. The Preferred Alternative is not expected to notably increase traffic volumes on Cape Meares Loop Road. In addition, while the alignment of the Preferred Alternative would move traffic closer to one rural residence east of the Preferred Alternative, the closest point of the alignment would still be 1,000 feet away. Therefore, the Preferred Alternative is not expected to result in a measurable change in the local air quality. Further, as noted above, future MSAT emissions are expected to be substantially lower than today due to implementation of the EPA’s vehicle and fuel regulations.

The Preferred Alternative would result in a minor increase in noise levels along the realigned roadway and from an anticipated minor increase in traffic volumes. Noise levels at sensitive receptors (the one rural residence) are not expected to change.

The Preferred Alternative could result in an increase of ADT along Cape Meares Loop Road, which could result in a minor increase in fuel consumption and energy use. However, re-opening Cape Meares Loop Road could also reduce local trip distances by eliminating the need for taking longer, alternative routes. Overall, the Preferred Alternative would be expected to have a negligible effect on Oregon's predicted statewide energy consumption.

Indirect Effects

The Preferred Alternative could reduce vehicle volumes on roadways that have served as alternate routes during the closure of Cape Meares Loop Road. This shift in vehicle volumes from alternate roadways to Cape Meares Loop Road could result in minor changes in the location of vehicle emissions; however, it is not expected to result in a measurable change in the local air quality.

Noise levels resulting from shifting vehicles from alternate roadways to the realigned Cape Meares Loop Road could result in a minor reduction in noise levels along those routes.

As noted in the direct effects section, the construction of the Preferred Alternative could result in an increase of ADT along Cape Meares Loop Road over time but could also reduce local trip distances currently taken around the road closure. Overall, the Preferred Alternative would be expected to have a negligible indirect effect on Oregon's predicted statewide energy consumption.

Mitigation Measures

Since no long-term adverse air quality effects are expected, no mitigation measures are necessary. During construction, the following measures listed in Division 208 of OAR 340 could be taken, to the extent practicable, to avoid, minimize and mitigate temporary adverse impacts to air quality:

- Use water or chemicals, where possible, to control dust in the clearing of land and road grading.
- Apply oil, water, or other suitable chemicals on unpaved roads, material stockpiles, and other surfaces which can create airborne dusts.
- Fully or partially enclosure material stockpiles in cases where application of oil, water, or chemicals are not sufficient to prevent PM from becoming airborne.
- Cover open-bodied trucks transporting materials likely to become airborne when in motion.
- Promptly remove materials from paved streets that does or may become airborne.

Since there would be no significant long-term changes to noise levels in the project area from vehicles using the realigned roadway, no mitigation measures would be needed for the Preferred Alternative. To minimize temporary higher noise levels during construction, all construction vehicles and equipment would be required to comply with FHWA's standard noise mitigation measures.



No energy mitigation measures are required or proposed for the Preferred Alternative.

3.5 Soils and Geology

3.5.1 Affected Environment – Existing Conditions

The project area resides in the Oregon Coast Mountain Range, approximately 5.7 miles to the west of Tillamook, Oregon. The geologic setting of the project area is mapped as volcanic bedrock of the Grande Ronde Basalt Formation and sedimentary bedrock of the Astoria Formation, both overlain with landslide deposits (Wells et al. 1994). The basalt bedrock (Grand Ronde Formation), which is the predominant mapped bedrock unit, was deposited during the middle of the Miocene Epoch from lava flows that had a geographical extent as far east as Idaho. The turbidite bedrock (Astoria Formation) is a well bedded formation of siltstone and mudstone with interbedded sandstone zones, near the bottom of the formation. This formation is primarily mapped to the northwest and north edges of the project area, and was deposited during the lower and middle Miocene Epoch.

The surficial geologic unit at the project area is primarily mapped as landslide deposits from the Holocene and Pleistocene Epoch's (Wells et al. 1994). The mapped landslide deposits are described as a poorly sorted, unconsolidated mixture of bedrock fragments surrounded in a fine-grained soil matrix.

The ground surface of the project area consists of dense evergreen forests with low-lying shrubs and grasses. The existing Cape Meares Loop Road was closed in January 2013 at MP 1 to approximately MP 2 as a result of a large complex landslide. The landslide is active, about 3,000-foot long and 4,000-foot wide, with a maximum depth of approximately 110 feet beneath the existing ground surface and a landslide mass movement rate ranging from approximately 4 to 30 inches per year (MBG 2014). While the proposed alternative alignment penetrates existing landslide deposits, there are no known active landslides within this zone.

Listed below are the current geologic hazards and hazard levels for the project area, as mapped by the Oregon Department of Geology and Mineral Industries (WFLHD 2017b).

- Landslide Hazard Area - Moderate to High
- Liquefaction Susceptibility of the Project Site Soils - Moderate
- Earthquake Shaking at the Project Site - Strong to Very Strong
- Coastal Erosion Zone - Low to Very High

3.5.2 Environmental Consequences – No Build Alternative

Direct Effects

The No Build Alternative would have no direct impact on the project area geology and soils, because no new earthwork would occur. The ongoing movement of the active landslide along the current roadway alignment would continue, and Cape Meares Loop Road would continue to be closed within this zone.



Indirect Effects

The No Build Alternative would have no indirect impact on the project area geology and soils.

3.5.3 Environmental Consequences – Preferred Alternative

Temporary Construction Effects

During construction of the Preferred Alternative, large exposed cut-slopes required for the new roadway alignment would be prone to erosion if left unprotected during periods of wet weather. The cut-slopes would be designed and constructed in general accordance with standard temporary slope design purposes, and appropriate methods would be used to prevent weather related stability or erosion effects. In areas where the cut-slopes require a retaining wall for stability purposes, the retaining wall would be designed by a licensed professional engineer and constructed in accordance with general standards. During the construction phase, the areas adjacent to the cut-slopes that required vegetation clearing, would be graded and re-planted with native species in a manner that would limit the long-term erosion and stabilize the slopes.

Construction of the Preferred Alternative would require long linear cut and fill slopes, retaining walls, and stream crossings through currently undeveloped parcels of forested land. Construction of the new roadway alignment would disturb the existing landslide surficial soil deposits, and potentially the basalt and turbidite bedrock geologic units where the bedrock is near the ground surface.

Direct Effects

The Preferred Alternative would avoid the active landslide area that closed the existing Cape Meares Loop Road segment. Clearing of existing vegetation within the Preferred Alternative alignment would have an impact on the erosion and drainage capabilities of the surface soils, but these issues would be mitigated throughout the design process, to avoid or limit impacts on soils and geology.

Indirect Effects

Indirect impacts of the Preferred Alternative could include geotechnical risks such as long-term erosion resulting from the creation of new slopes or steepening of existing slopes. Additionally, a large precipitation event, earthquake or tsunami could lead to excessive saturation of the project soils, liquefaction, or flooding of the proposed project soils, resulting in slope and/or retaining wall failures.

Mitigation Measures

During the design and construction phases of the Preferred Alternative, mitigation would be implemented to limit the effects of the construction activity on the project site soils and geology. Below is a list of anticipated mitigation efforts to limit adverse effects during the construction phase. This list should not be considered as exhaustive.

- Plan the clearing of vegetation and logging of forested areas to occur in the drier months of the year to limit slope erosion. If planned to occur during the wet season use proper



slope protection, erosion, surface water drainage, sediment containment and construction hauling techniques.

- Re-plant disturbed areas with native plants in a manner that enhances regrowth and provides slope stability adjacent to the roadway corridor.
- Design and implement erosion and sediment control measures prior to beginning construction. Maintain these erosion and sediment control measures throughout the entire construction phase, regardless of season.

3.6 Water Resources, Water Quality, and Floodplains

3.6.1 Affected Environment – Existing Conditions

The project is located within the Netarts/Sand Lake watershed in the Wilson-Trask-Nestucca sub-basin of the North Coast Basin (USGS 2017). North Coast Basin pollutants of concern include sediment/total suspended solids, bacteria, dissolved oxygen, and temperature (WFLHD 2016). However, the Netarts/Sand Lake watershed is not covered by any Total Maximum Daily Loads (TMDLs) or water quality management plans by the Oregon DEQ in its implementation of the Clean Water Act Section 303(d) (DEQ 2011).

Most of the project area is surrounded by dense forested land scattered with small streams, seeps, and springs. See Figure 3-8. Coleman Creek flows northwest into Cape Meares Lake and Larson Creek flows southwest into the Pacific Ocean (WFLHD 2016). Coleman Creek and Larson Creek, both perennial, are not listed as impaired water bodies under Section 303(d) of the Clean Water Act (DEQ 2017b). Cape Meares Lake has designated beneficial uses for fishing, aesthetics, and water contact recreation (OAR 2017).

The Federal Emergency Management Agency has not mapped floodways or floodplains in the project area, though Larson Creek appears to have a limited narrow floodplain (FEMA 1983; WFLHD 2016). There are no sole source aquifers in the project area and there are no water quality permits, including National Pollutant Discharge Elimination System permits, for water bodies in the project area (EPA 2017; DEQ 2017c). There are no well log records for the project area to indicate groundwater depth, but drilling locations during the project's geotechnical study encountered water at as little as 15 feet below ground and up to 65 feet below ground (OWRD 2013; WFLHD 2017).

Figure 3-8. Photographs of Water Resources in the Project Area

Coleman Creek



Perennial Stream

Source: WFLHD 2016

OWD collects water from streams within the project area and supplies drinking water to Cape Meares and Oceanside. OWD's property is outlined on Figure 3-3. The district's current surface water intake from Coleman Creek for the Cape Meares water treatment plant is located north of OWD's property between the existing and proposed alignments. OWD's drinking water meets or exceeds all federal and state requirements (DEQ 2017a; OWD 2016).

3.6.2 Environmental Consequences – No Build Alternative**Direct and Indirect Effects**

The No Build Alternative would not involve construction or maintenance work and would therefore not result in changes to water resources such as streams and groundwater, water quality and drinking water, or floodplains. The closed section of Cape Meares Loop Road would remain unused and erosion and stormwater runoff would continue at existing levels. Therefore, the No Build Alternative would not have direct or indirect effects on water resources, water quality, or floodplains.

3.6.3 Environmental Consequences – Preferred Alternative**Temporary Construction Effects**

Soil compaction during construction could impact groundwater flows, which would reduce the infiltration capacity and increase surface runoff to streams in localized areas. However, compacted soils outside the 28-foot-wide paved roadway but within the 100-foot construction corridor would be expected to return to pre-construction conditions after project completion. Accidental petroleum spills during construction could occur where groundwater levels are shallow, but the spills would be expected to be small in volume and the implementation of spill containment mitigation measures would contain and clean up spills quickly. Therefore, impacts to water quality during construction would be localized, short-term, and likely not exceed water quality criteria.

Direct Effects

The Preferred Alternative would not cross Federal Emergency Management Administration-mapped floodplains or Larson Creek, though the alignment would run parallel to and within 100 feet of the creek for about 0.5 mile. The Preferred Alternative would cross Coleman Creek at one location and cross numerous unnamed streams. The project would install appropriately sized culverts at stream crossings.

In general, vegetation removal, soil disturbance, and paving from the Preferred Alternative could increase impervious surfaces, erosion, sediment deposition, and stormwater runoff that could affect water quality. Where possible, the Preferred Alternative alignment was designed to avoid stream crossings, stream buffer areas, and placement of fill within active stream channels and potential floodplains. In addition, final design and construction of the roadway would occur in accordance with applicable design standards and manuals.

The design of the Preferred Alternative reduces the potential impacts to water quality by following an existing single-lane, gravel logging roadway to the extent possible, which reduces the amount of new construction and vegetation clearing required. In addition, the alignment of the Preferred Alternative avoids crossing OWD property and OWD is considering moving their water intake system upstream of the Preferred Alternative. Therefore, the project would not be expected to reduce drinking water quality.

Indirect Effects

Field studies found the Preferred Alternative alignment would result in limited potential future degradation of Coleman Creek, Larson Creek, or their small tributaries, including where crossing structures would be installed (WFLHD 2016). After the Preferred Alternative is constructed, as usage of the roadway increases, pollutants from vehicles would increase and could accumulate on the roadway before washing away in stormwater runoff. Pollutants from vehicles could include petroleum, nitrogen from exhaust, and trace heavy metals such as copper, lead, and chromium. As a result of relatively low traffic volumes, the effect from vehicle pollutants is anticipated to be minimal; the mitigation measures below would further reduce pollutants from vehicles.

Mitigation Measures

Measures to avoid, minimize, and mitigate impacts to water resources, water quality, and floodplains under the Preferred Alternative include:

- During construction, implement soil erosion and sediment control best management practices (BMPs), such as isolating construction work areas at each stream crossing location to prevent runoff from flowing across disturbed areas and to minimize sediment-laden runoff from leaving the construction area.
- Stabilize and re-vegetate disturbed areas after work is completed.
- Implement stormwater runoff BMPs where runoff has the potential to cause erosion and carry sediment into streams.
- Maintain vegetated stream buffers.



- Prepare and implement a stormwater pollution prevention plan (SWPPP).
- Maintain OWD’s water source and incorporate measures to protect the water’s quality.

3.7 Wetlands and Non-Wetland Waters

3.7.1 Affected Environment – Existing Conditions

The wetland and non-wetland waters study area is defined as a 200-foot-wide corridor centered on the existing road’s alignment and the Preferred Alternative centerline. Wetlands and non-wetland waters within the study area were identified during surveys conducted in 2016 and 2017. The purpose of these surveys was to record sufficient data to estimate wetland and water areas potentially impacted by the project. Following the 2016 survey, a *Wetland and Waters Determination Report* was completed (SWCA 2016a). Further details regarding survey methodology can be found in the 2016 report (Appendix C).

Wetlands

The study area crosses five mapped soil units, all of which are well-drained non-hydric soils. In all, four small wetlands were recorded in the study area, totaling approximately 0.07 acre (see Table 3-3 and Figure 3-9). Using the Cowardin classification system, the wetlands within the study area are classified as palustrine emergent.

The high perimeter-to-volume ratio of the many small wetlands present in the study area likely plays a crucial role in surface water to groundwater infiltration, which is important for the recharge of regional groundwater resources and for maintaining perennial and intermittent streamflows in the watershed (Weller 1994).

Table 3-3. Summary of Wetland Features in the Wetland Study Area

Wetland	Cowardin Class	Approximate Size (Acre)
W1	PEM ¹	0.03
W2	PEM	0.02
W3	PEM	0.01
W5	PEM	<0.01
Total		0.07

¹ PEM = palustrine emergent

The palustrine emergent wetlands in the study area are generally small, groundwater-fed wetland seeps that occur on slopes and form complex areas of saturation and flowing water, with some small colluvial channels. Groundwater outlets with upwelling water were commonly observed throughout the study area. Palustrine emergent wetlands are generally characterized by a dominance of facultative-wet and obligate herbaceous species, including Pacific golden saxifrage (*Chrysosplenium glechomifolium*), seaside bittercress (*Cardamine angulata*), skunk cabbage (*Lysichiton americanus*), and Pacific water drop-wort (*Oenanthe sarmentosa*). Most wetlands also exhibited a high percentage of bare ground and moss cover. Documented hydric soil indicators



included redox dark surface and hydrogen sulfide. All palustrine emergent wetlands documented in the study area are fed by groundwater seeps and passed hydrology criteria with the observed presence of saturation and often flowing seep water.

Non-Wetland Waters

The study area contains 10 streams and 3 ditches. The type of stream and average ordinary high water mark (OHWM) are detailed below in Table 3-4 and in Figure 3-9 above. Throughout the study area, some additional roadside areas exhibit evidence of historical drainage ditching, however these are minor discontinuous features that do not connect to jurisdictional waters.

Table 3-4. Summary of Non-Wetland Water Features in the Study Area

Stream ID	Average OHWM (feet)	Stream Type
Ditch 1	3	Ditch
Ditch 2	3	Ditch
Ditch 3	1	Ditch
Stream 1	4	Intermittent
Stream 2	5	Intermittent
Stream 3	5	Perennial
Stream 4	2	Ephemeral
Stream 5	3	Ephemeral
Stream 6	4	Intermittent
Stream 7	6	Ephemeral
Stream 8	2	Intermittent/Ephemeral
Stream 9	3	Ephemeral
Stream 10 (Coleman Creek)	10	Perennial

3.7.2 Environmental Consequences – No Build Alternative

Direct Effects

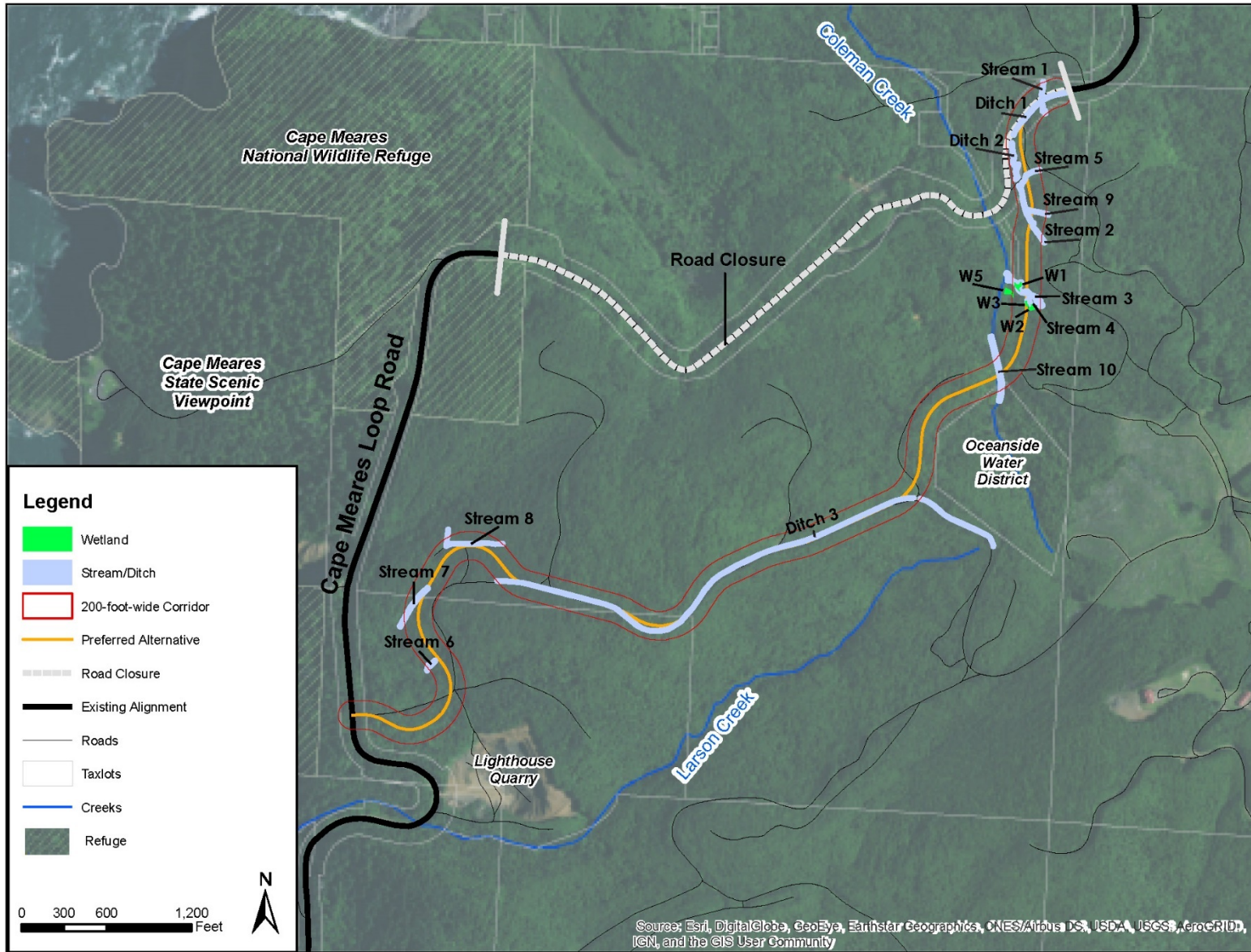
Under the No Build Alternative, there would be no direct effects to wetlands or non-wetlands waters as a result of the proposed project.

Indirect Effects

Under the No Build Alternative, there would be no indirect effects to wetlands or non-wetland waters as a result of the proposed project.



Figure 3-9. Wetlands and Non-Wetland Waters in the Study Area



3.7.3 Environmental Consequences – Preferred Alternative

Temporary Construction Effects

Wetlands

With the Preferred Alternative temporary construction effects to wetlands could include increased sediment into wetlands that would not be directly affected. Within the 100-foot-wide Preferred Alternative construction corridor three wetlands could be temporarily impacted, totaling approximately 0.04 acre of temporary effects to wetlands, which is 57 percent of the total wetlands within the study area.

Table 3-5 details the acreages of wetlands affected by the Preferred Alternative. However, prior to beginning project-related ground-disturbing activities, the contractor would prepare a SWPPP and install erosion control measures, such as sediment fences, as described in the SWPPP, to prevent soil erosion into nearby wetlands. Removal of trees and other vegetation would be necessary along the Preferred Alternative and would involve heavy machinery. Removal of trees along the portion of the Preferred Alternative that overlaps the existing roadway would not be necessary. Erosion control measures would be in place to reduce or eliminate potential soil erosion from tree removal and other site preparation activities. After construction has been completed, revegetation of the road shoulder and affected areas would be implemented, with erosion control measures remaining in place until vegetation becomes established.

Table 3-5. Summary of Acres of Wetlands Affected – Preferred Alternative

Wetland Name	Approximate Existing Acres (within the 200-foot-wide study area)	Approximate Acres Temporarily Affected (within the 100-foot-wide corridor)	% of Existing Wetland Acres Temporarily Affected	Approximate Acres Filled	% of Existing Wetland Acres Directly Affected
W1	0.03	0.01	21%	0.00	0%
W2	0.02	0.02	100%	<0.01	0%
W3	0.01	0.01	100%	0.01	100%
W5	0.01	0.00	0%	0.00	0%
Total	0.07	0.04	57%	0.02	28%

Non-wetland Waters

With the Preferred Alternative temporary construction effects to non-wetland waters could include increased sedimentation during the installation of culverts and general construction around the streams. However, prior to beginning project-related ground-disturbing activities, the contractor would install erosion control measures, such as sediment fences, as described in the project's SWPPP, to prevent soil erosion and a culvert replacement plan to ensure minimal disturbance to the streams. Erosion control measures would be in place to reduce or eliminate potential soil



erosion from tree removal and other site preparation activities. After construction has been completed, revegetation of the road shoulder and affected areas would be implemented, with erosion control measures remaining in place until vegetation becomes established.

Construction actions associated with installing culverts in streams have the potential to alter the water quality of the stream through temporary turbidity increases, which would stop as soon as construction ceases.

Direct Effects

Wetlands

Direct effects to wetlands include the permanent removal and fill of wetlands during construction. This would result in the loss of wetlands. The 60-foot-wide Preferred Alternative right-of-way would impact two wetlands totaling approximately 0.02 acre of direct effects to wetlands, which is 28 percent of the total wetlands within the study area. Table 3-5 details the acreages of wetlands affected by the Preferred Alternative.

As part of the project permitting process, FHWA will submit a *Wetland and Stream Delineation Report* to the Oregon Department of State Lands (DSL). This report has not yet been prepared.

Non-wetland Waters

The portions of the ditches and streams (including Coleman Creek) that intersect the 60-foot-wide Preferred Alternative right-of-way would receive culvert replacements or be newly culverted. Following FHWA standards, the culverted crossings would be designed to allow a 100-year flood event. In locations along the Preferred Alternative where there are existing roadway crossings of ditches and streams the design of the replacement culverts would be an improvement that would benefit ditches and streams. However, in locations that are not currently culverted, streams would be adversely affected because their channels would be altered from their current natural condition. Despite designing for the 100-year flood event, these stream channels may have reduced hydrologic and geomorphic function within the vicinity of the new culverts.

Indirect Effects

The Preferred Alternative would not have indirect effects to wetlands or non-wetland waters.

Mitigation Measures

Wetlands

Measures to avoid, minimize, and mitigate impacts to wetlands identified in the project's study area may include the following:

- Prepare a Wetland and Stream Delineation Report and obtain concurrence from DSL for the removal-fill activities proposed within jurisdictional features.
- Obtain a Joint Permit Application for the DSL wetland removal/fill permit and a U.S. Army Corps of Engineers (USACE) Clean Water Act Section 404 permit.



- Provide payment to an In-Lieu Fee (ILF) program to compensate for unavoidable wetland losses. If the ILF program is not available for use, consider on-site mitigation.

Non-wetland Waters

FHWA consulted with the Oregon Department of Fish and Wildlife regarding the proposed culverted stream crossings and confirmed that fish are not present, nor historically present, in the project area due to the steep topography to the west of the project area that drops into the Pacific Ocean.

Measures to avoid, minimize, and mitigate impacts to non-wetland waters identified in the project's study area may include the following:

- Design culverts to meet the FHWA 100-year design criteria.

3.8 Vegetation, Fish, and Wildlife

3.8.1 Affected Environment – Existing Conditions

The study area for biological resources includes a total of 46.5 acres and is defined as a 200- to 350-foot-wide survey corridor centered on the Preferred Alternative. A biological resources field survey was conducted for the project from April 11 to April 13 and on May 16, 2016, and from March 29 to 30, 2017. The purpose of the biological resources survey was to record the occurrence, distribution, and abundance of flora and fauna in the study area, including vegetation communities, special-status species, and noxious weeds. Further details regarding survey methodology and results can be found in the *Biological Resources Survey Report: Wildlife and Botanical (Biological Resources Report)* and the *Biological Assessment (BA)* included in Appendices D and E of this EA (SWCA 2016b; 2017).

No fish species were observed in the study area during the field survey. Due to downstream blockages/waterfalls there is no documented fish presence on streams in the study area (Sinnott 2017). Endangered Species Act (ESA)-listed fish species are not known to occur in the study area due to the lack of suitable habitat and lack of adequate fish passage downstream of the overall action area; further discussion of ESA-listed fish species is included in Appendix A of the BA (Appendix E of this EA) (SWCA 2017).

Vegetation

As a result of logging activities, the landscape is dominated by seral forest communities. Wetland seeps and drainages are common in valleys throughout the study area and are the only locations exhibiting a robust herbaceous understory. Cape Meares Loop Road and logging roads run perpendicular to steep forested slopes throughout the landscape, and provide habitat for non-native and noxious plant species. During the field surveys, six distinguishable vegetation communities were identified in the study area: 1) disturbed land (road prism/logging infrastructure), 2) mature coniferous forest (Sitka spruce–western hemlock/swordfern), 3) riparian forest (including study-area streams), 4) seral coniferous forest (Sitka spruce–western hemlock/salal–swordfern), 5) shrub meadow (salal), and 6) wetland. Approximate acreages of each community type within the study area are provided in Table 3-6 and their locations are shown in Figure 3-10. Descriptions of these communities are provided in the following sections.



Sixty-six species of plants were identified during the survey. Of these, 46 are native, 12 are non-native, and 8 are invasive and/or noxious. A completed list of species is included in Table 2 of the *Biological Resources Survey Report* (Appendix D of this EA).

Table 3-6. Vegetation Community Summary in the Study Area

Vegetation Community	Approximate Acreage
Disturbed land (road prism/logging infrastructure)	5.98
Mature coniferous forest (Sitka spruce–western hemlock/salal–swordfern)	0.69
Riparian forest (including study-area streams)	2.32
Seral coniferous forest (Sitka spruce–western hemlock/salal–swordfern)	36.95
Shrub meadow (salal)	0.51
Wetland	0.07
Total	46.52

Disturbed Land (road prism/logging infrastructure)

Several gravel roads and the existing paved Cape Meares Loop Road are located in the study area (see Figure 3-10). These road prisms display a mix of native, non-native, and invasive plant species growing in or adjacent to the roadway. Common non-native herbaceous species found throughout the road prisms include creeping buttercup (*Ranunculus repens*), velvet grass (*Holcus lanatus*), orchard grass (*Dactylis glomerata*), purple foxglove (*Digitalis purpurea*), plantain species (*Plantago lanceolata* and *P. major*), and hairy cat’s ear (*Hypochaeris radicata*). Swordfern (*Polystichum munitum*) and other native plants are scattered along the edge of the road prism.

Mature Coniferous Forest (Sitka spruce–western hemlock/swordfern)

Mature coniferous forest dominated by Sitka spruce (*Picea sitchensis*), western hemlock (*Tsuga heterophylla*), and swordfern is located northwest of the Preferred Alternative, south of where the existing road is closed (see Figure 3-10). Additional inclusions of mature coniferous forest are located near the western end of the Preferred Alternative situated along an existing gravel road, near where the Preferred Alternative connects back to the existing Cape Meares Loop Road. These forests contain Sitka spruce that are greater than 32 inches in diameter at breast height (DBH). Large stumps greater than 48 inches DBH provide evidence of historic logging activities and differentiate this forest community from the old-growth forest described below. Swordfern, salal (*Gaultheria shallon*), and Oregon beaked moss (*Kindbergia oregana*) are common in the understory. Western dwarf mistletoe is present in at least two spruce trees.

Riparian Forest (including study-area streams)

Riparian forests adjacent to streams (locations shown in Figure 3-10) are represented by the same tree species as the seral coniferous forest described below; however, tree density is much lower in these areas and allows more light to penetrate the canopy. As a result, the shrub and herbaceous strata are well represented and high in vigor. Dominant herbaceous and woody riparian vegetation



includes swordfern, redwood-sorrel (*Oxalis oregana*), deer fern (*Blechnum spicant*), false lily of the valley (*Maianthemum dilatatum*), Siberian springbeauty (*Claytonia sibirica*), piggyback-plant (*Tolmiea menziesii*), Scouler's fumewort (*Corydalis scouleri*), salmonberry (*Rubus spectabilis*), red elderberry (*Sambucus racemosa*), and red huckleberry (*Vaccinium parvifolium*). Red alder (*Alnus rubra*) is typically present in or near these communities, and an Oregon beaked moss ground cover is common throughout these areas as well.

Seral Coniferous Forest (Sitka spruce–western hemlock/salal–swordfern)

The most common vegetation community found in the study area (locations shown in Figure 3-10) is a seral coniferous forest dominated by Sitka spruce, western hemlock, salal, and swordfern. These forests consist mostly of even-aged stands that were last logged an estimated 35 to 40 years ago. The closed canopy forest transitions from western hemlock dominance in the northern portion of the study area to Sitka spruce and western hemlock co-dominance in the southern portions. Tree density is high and representative of revegetation following clear-cut forest practices. Shrubs and herbaceous plants are generally absent from the forest understory; however, abundant tall stands of salal as well as stands of evergreen huckleberry (*Vaccinium ovatum*), both greater than 6 feet in height, are present in openings where trees have fallen or have been prevented from growing due to early successional shrub growth. The understory is characterized by fuels including duff, fallen branches, thickets of dead salal stems, and small dead trees. Scattered herbaceous plants such as swordfern and drops-of-gold (*Prosartes hookeri*) are the exception. There are several downed trees and tree stumps greater than 48 inches DBH scattered throughout the study area, but there are no standing snags. There are several occurrences of wetland and riparian areas (described below and above, respectively) throughout the seral coniferous forest where understory vegetation is common.

Shrub Meadow (salal)

Salal is the dominant species of the one shrub-dominated community that exists on steep slopes in the northeastern portion of the study area (see Figure 3-10). Other shrub species include red alder, red huckleberry, and salmonberry. Herbaceous plants are lacking in this area.

Wetland

Wetland seeps are scattered throughout the study area (see Figure 3-10). Dominant herbaceous wetland vegetation includes Pacific golden-saxifrage (*Chrysosplenium glechomifolium*), seaside bittercress (*Cardamine angulata*), Pacific water-dropwort (*Oenanthe sarmentosa*), Mexican hedge-nettle (*Stachys mexicana*), and skunk cabbage (*Lysichiton americanus*). Salmonberry and red alder are typically present at or near the boundaries of these wetlands.

Special-status Plant Species

The Oregon Department of Agriculture administratively protects all state and federally-listed threatened and endangered plant species in Oregon. Nelson's checker-mallow (*Sidalcea nelsoniana*), a state and federally-listed threatened species, and Coast Range fawn lily (*Erythronium elegans*), a state threatened and federal species of concern, have the potential to occur within the northern portion of the Coast Range (Pendergrass and Gisler 2010; ODA 2014). Habitat for these species is not present in the study area, and no occurrences of these species were found during field surveys.



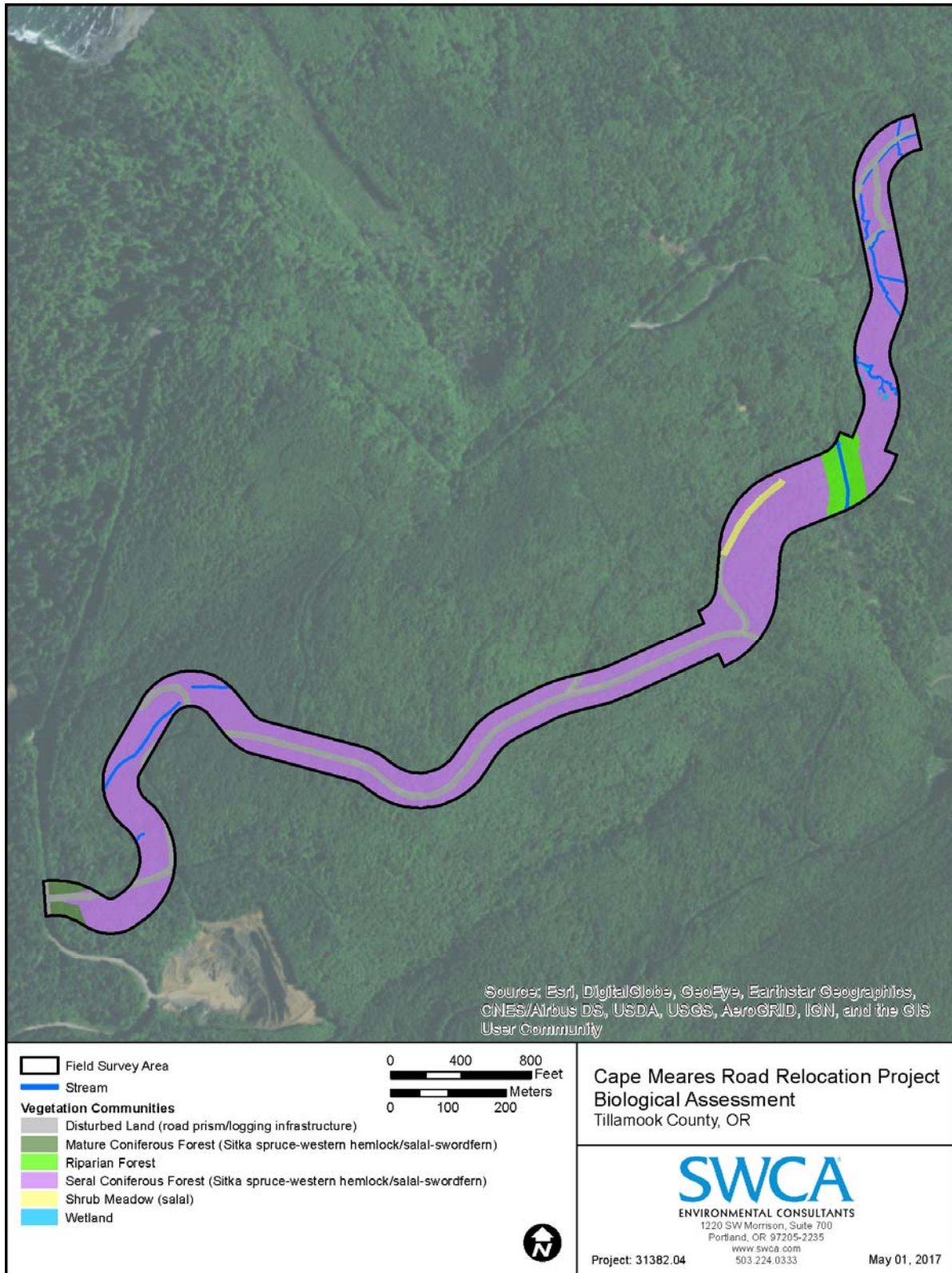
Noxious Weeds

The Oregon Department of Agriculture has produced a noxious weed list for the state of Oregon (ODA 2015). A-Listed species are weeds of known economic importance, and occur in small enough infestations to make eradication or containment possible. B-Listed species are weeds of economic importance and are regionally abundant. Four noxious weeds have been identified in the road prism in the study area. A list of noxious weeds in the study area is included in Table 3-7.

Table 3-7. Noxious Weed Species Recorded in the Study Area

Common Name	Scientific Name	Distribution	Weed Class
Bull thistle	<i>Cirsium vulgare</i>	Scattered individuals throughout road prism	B
Scotch broom	<i>Cytisus scoparius</i>	Scattered groups throughout road prism	B
Stinking willie	<i>Jacobaea vulgaris</i>	Common throughout road prism	B
Himalayan blackberry	<i>Rubus armeniacus</i>	Scattered throughout road prism	B

Figure 3-10. Vegetation Communities along the Preferred Alternative



Wildlife

The East Cascades Audubon Society identifies approximately 45 species of bird that are considered summer (nesting) residents of Tillamook County, and 78 species that are considered year-round residents (ECAS 2015). Many of these species, including passerines and raptors, could use the vegetation communities in the study area for foraging or nesting. Four big-game species have both 1) ranges that overlap the study area and 2) the potential to use the study area vegetation communities. These species are black-tailed deer (*Odocoileus hemionus*), elk (*Cervus elaphus roosevelti*), black bear (*Ursus americanus*), and cougar (*Puma concolor*) (ODFW 2016). Wetlands and waterbodies in the project area provide habitat for amphibians and aquatic reptiles. No fish species were observed in the study area during the field survey. Due to downstream blockages/waterfalls there is no documented fish presence in streams in the study area (Sinnott 2017). Table 3-8 provides a list of the species observed during field surveys.

Table 3-8. Wildlife Species Recorded in the Study Area

Common Name	Scientific Name	Sighting Type
Birds		
Orange-crowned warbler	<i>Oreothlypis celata</i>	Calling throughout study area.
Pacific wren	<i>Troglodytes pacificus</i>	Calling throughout study area.
Northern flicker	<i>Colaptes auratus</i>	Seen and heard.
Raven	<i>Corvus corax</i>	Calls heard on occasion.
Chestnut-backed chickadee	<i>Poecile rufescens</i>	Calling throughout study area.
Mammals		
Black-tailed deer	<i>Odocoileus hemionus</i>	Footprints near waterway, scat in a few areas. Jaw bones with teeth on ground.
Elk	<i>Cervus elaphus roosevelti</i>	Scat in a few areas.
Moles	<i>Talpidae spp.</i>	Mound complexes seen in two areas.
Herptiles		
Northern red-legged frog	<i>Rana aurora</i>	Two seen on separate occasions, in wetland areas. One individual found dead on large woody debris.
Frog (species unknown)	–	One unidentified frog species found at the base of a hemlock tree within 100 feet of waterway.
Rough-skinned newt	<i>Taricha granulosa</i>	Three seen in and near seeps.



Threatened and Endangered Wildlife

The USFWS IPaC query identified 11 federally-listed or proposed threatened and endangered wildlife species with the potential to occur in or near the project's study area (see Appendix E). These species, along with their potential to occur in the vegetation communities in the study area, are noted in Appendix B of Appendix D.

Three species have a moderate or a moderate to high potential for occurring in the project's study area: marbled murrelet, northern spotted owl, and red tree vole (north Oregon coast population).

Marbled Murrelet

The USFWS listed the Washington, Oregon, and California populations of the marbled murrelet as threatened under the ESA in 1990 (USFWS 1992). The marbled murrelet occurs from the Aleutian Islands and southern Alaska to central California, spending most of its life at the ocean, roosting and feeding (USFWS 2016). This species nests up to 50 miles inland in coniferous forest stands with old-growth components. The *Biological Opinion for FY 13-14 LAA Habitat and Disruption Projects, North Coast Planning Province* (USFWS 2015) provides the following criteria for marbled murrelet nesting structures:

- Must be within 50 miles of the coast.
- Must be in a conifer tree.
- Tree diameter must be at least 19.1 inches, height at least 107 feet, and it have at least one platform that is at least 4 inches in diameter. Nesting substrate must be present on the platform in the form of moss, epiphytes, or duff.
- Stand must have good canopy access, enabling murrelets to approach and land on platform.
- Platforms must be at least 32.5 feet above ground.
- Platform trees (or adjacent trees) must have a tree branch or foliage that provides protective cover over the platform.

A desktop analysis of potential marbled murrelet habitat was conducted prior to field surveys of the project's Preferred Alternative. Field surveys for the project were conducted on April 11–13, 2016 and March 29–30, 2017. The field survey conducted on April 11-13, 2016 included the Existing and South alignments that were also being evaluated at that time. During the March 29-30, 2017, field survey an area ranging from 200 to 350 feet wide, centered on the Preferred Alternative, was surveyed to determine if suitable habitat occurs near the road construction disturbance corridor action area. Areas outside of what was field surveyed, but within the 0.25-mile noise disturbance action area, were evaluated using vegetation data from the Gap Analysis Project (Geospatial Enterprise Office 2016). Areas that the Gap Analysis Project vegetation data showed as mature forest communities were assumed to be suitable nesting habitat for marbled murrelet. In Figure 3-11 the areas not shown as suitable habitat for marbled murrelet were either not defined in the Gap Analysis Project vegetation dataset or were field-mapped as an unsuitable habitat type.

Field surveys determined that suitable marbled murrelet habitat did not occur within most of the study area, except in two small patches near the western end of the Preferred Alternative. These



two small patches are separated by an existing logging road. The patch of suitable habitat north of the existing road includes one potential nesting stand (Stand 1). The patch of habitat south of the existing road does not include a potential nesting stand. A 20-foot buffer of suitable habitat was added around the potential nesting stand (Stand 1). Southeast and northwest of the Preferred Alternative additional potential nesting stands (Stands 2 and 3) were discovered along the alignments that were evaluated in April 11-13, 2016.

Critical habitat for the marbled murrelet in western California, Oregon, and Washington was designated in 2011 (USFWS 2011b). As shown in Figure 3-11, 24.5 acres of designated critical habitat are located west of the study area. Stand 1 is within approximately 340 feet of this designated critical habitat, Stand 2 is within approximately 1,850 feet, and Stand 3 is located within 300 feet.

Northern Spotted Owl

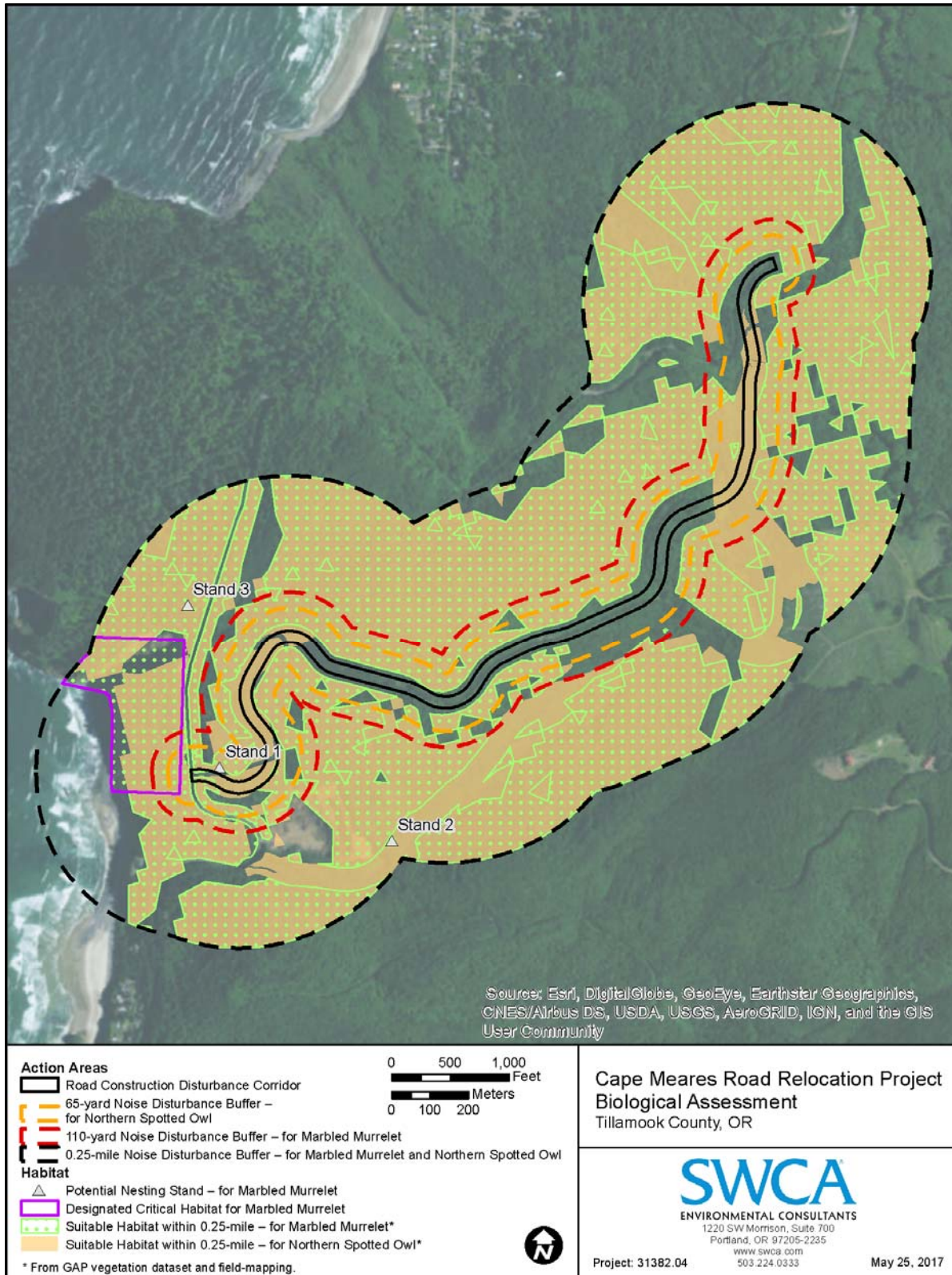
The USFWS listed the northern spotted owl as threatened under the ESA in 1990 (USFWS 1990). The northern spotted owl lives in forests characterized by a dense canopy closure of mature and old-growth trees, abundant logs, standing snags, and live trees with broken tops (ODFW 2016). This species prefers older stands (150 to 200 years old) with multilayered canopies of several tree species of varying size and age, standing and fallen dead trees, and good stand access via open canopy space in the lower branches (ODFW 2016).

The potential for northern spotted owls to occur in the study area is driven by the presence of suitable nesting habitat and abundant prey species, such as rodents. Although species-specific surveys for northern spotted owl were not conducted during the field survey, it is likely that they occur in the study area because the mature and old-growth coniferous forests in the study area are contiguous with other mature and old-growth coniferous forests outside of the study area. Together, these are large areas of suitable foraging and nesting habitat in the form of mature forests with a multilayered canopy, trees with large cavities and deformities, large snags, an abundance of dead woody debris on the ground, and open space within and below the upper canopy. Using Gap Analysis Project data, suitable habitat for northern spotted owls was assumed to be present in all areas mapped in the study area as harvested forest-tree regeneration (seral forest), North Pacific hypermaritime Sitka spruce forest, North Pacific lowland riparian forest and shrubland, and North Pacific maritime mesic-wet Douglas-fir–western hemlock forest (USGS 1991). No individuals or signs of individuals were observed in the study area; however, the potential for northern spotted owls to occur, and possibly nest, within the study area is moderate to high.

Critical habitat for the northern spotted owl in western Oregon and Washington was designated in 2012 (USFWS 2012). The nearest northern spotted owl designated critical habitat is located approximately 6 miles east of the study area and would not be affected by the proposed project. Therefore, there would be no effect to designated critical habitat for northern spotted owl and it is not further analyzed in this EA.



Figure 3-11. Map of Suitable Nesting Habitat in the Vicinity of the Preferred Alternative



Red Tree Vole

The North Oregon Coast population of the red tree vole became a candidate for ESA protection in 2011 (USFWS 2011a). The North Oregon Coast population of the red tree vole is found in late-successional coniferous forests in western Oregon and northwestern California. This species nests in larger-diameter trees, and expanses of land without suitable cover can be a barrier to its movement and population connectivity (USFWS 2016). Suitable habitat is present in the study area in the mature and old-growth coniferous forest (see Figure 3-10) but no individuals or signs were incidentally observed.

The most recent documentation of red tree voles within 0.5 mile of the study area was in 1996 during a small mammal survey at the Refuge. In all, 606 small mammal individuals were recorded, comprising 17 species. Three out of the 606 individual recordings were of the red tree vole (Gomez et al. 1997). A more recent red tree vole–focused survey was conducted in 2011–2013 in the nearby Tillamook and Clatsop State Forests, within 6 miles of the study area (Price et al. 2015). Thirty-three red tree vole nests were located, 60 percent of which were in old forests (more than 80 years old) (Price et al. 2015). Based on these data, and because the study area contains some mature and old-growth coniferous forest in and adjacent to it, the potential for this species to occur in the study area is considered moderate.

Species of Concern

Although not formally used in the ESA, species of concern is a term used by federal and state agencies to refer to species that are declining or appear to be in need of conservation. The Oregon Conservation Strategy lists 12 bird, herptile, and mammal species of concern whose ranges overlap the study area. Of these 12 species, seven may occur in the vegetation communities in the study area (marked with an asterisk) (ODFW 2006).

- Coastal-tailed frog (*Ascaphus truei*)
- Northern red-legged frog (*Rana aurora aurora*)*
- Northern goshawk (*Accipiter gentilis*)*
- Olive-sided flycatcher (*Contopus cooperi*)*
- Acorn woodpecker (*Melanerpes formicivorus*)
- Band-tailed pigeon (*Patagioenas fasciata*)*
- Western purple martin (*Progne subis*)
- Pallid bat (*Antrozous pallidus*)
- Townsend’s bird-eared bat (*Corynorhinus townsendii*)*
- Silver-haired bat (*Lasionycteris noctivagans*)
- Fringed myotis (*Myotis thysanodes*)*
- Long-legged myotis (*Myotis volans*)*

Biologists observed three northern red-legged frogs during the field surveys, two living and one dead. All frog observations were made in wetland areas.



3.8.2 Environmental Consequences – No Build Alternative

Direct Effects

Under the No Build Alternative, there would be no direct effects to vegetation, fish, and wildlife as a result of the proposed project.

Indirect Effects

Under the No Build Alternative, there would be no indirect effects to vegetation, fish, and wildlife as a result of the proposed project.

3.8.3 Environmental Consequences – Preferred Alternative

Temporary Construction Effects

Vegetation

All construction access and staging would be contained within existing roadways and the designated 100-foot-wide temporary construction corridor. Access to the construction area would be exclusively from Cape Meares Loop Road and existing private roads. The Preferred Alternative could result in temporary vegetation removal within a 100-foot-wide construction corridor, centered on the alternative's centerline. The Preferred Alternative crosses primarily forested upland habitat and ground disturbance and tree removal within the road construction corridor would occur throughout all or portions of this alternative. Within the 100-foot-wide corridor area, which represents approximately 20.49 acres, the following vegetation communities could be impacted: disturbed land, mature coniferous forest, riparian forest, seral coniferous forest (Sitka spruce-western hemlock/salal-swordfern), stream, and wetland (see Table 3-9). Of these vegetation communities, the seral coniferous forest would be the most affected at approximately 15.18 acres.

Table 3-9. Acres of Vegetation Communities Temporarily Affected in the 100-foot-wide construction corridor

Vegetation Community	Approximate Acres	% of Vegetation Community Affected
Disturbed land (road prism/logging infrastructure)	4.33	73%
Mature coniferous forest (Sitka spruce-western hemlock/salal-swordfern)	0.21	30%
Riparian forest (including study-area streams)	0.73	31%
Seral coniferous forest (Sitka spruce-western hemlock/salal-swordfern)	15.18	41%
Wetland	0.04	57%
Total	20.49	44%



After construction has been completed, revegetation of the road shoulder and affected areas would be implemented, with erosion control measures remaining in place until vegetation becomes established. Revegetation would be accomplished with native vegetation only. No other restoration activities are planned within the temporary construction corridor.

Wildlife

Some species, such as small rodents, snakes, and insects, could be affected by the ground disturbing activities due to temporary habitat alteration and could suffer mortalities from direct contact with construction equipment. More commonly, wildlife would be displaced to adjacent habitat areas. The effects from ground disturbance during construction would be considered low with respect to common wildlife species, all of which can be expected to have robust populations that would be minimally affected by the temporary and localized construction activities associated with the project.

Construction of the project would involve some culvert replacement/installation along the Preferred Alternative at creeks or smaller drainages within the temporary construction corridor, including Coleman Creek. In-water construction could have short-term and minor impacts to water quality in the vicinity of construction, but would not measurably reduce long-term water quality. Sedimentation could be measurable up to 800 feet downstream of culvert replacement. This effect would be short lived, with 95 percent of sediment released within several hours (USFS 2013). Fish species do not occur within the temporary construction corridor; therefore, project activities that would have short-term and minor impacts to water quality would have no effect on fish.

Construction of the project would involve the use of heavy equipment typically used for road construction, causing increased noise disturbance in the immediate area and up to 0.25 mile from the construction activity. Increased noise levels would be temporary, in both time and location as construction occurs, and would only occur during construction activities. Noise disturbance from construction activities would cause some wildlife to reduce their use of habitat during construction. Noise from heavy equipment could invoke a startle response from wildlife, or cause short-term modifications of behaviors. The increased energy expended when fleeing is especially detrimental during sensitive times of year, such as breeding, and if done repeatedly could ultimately decrease individual fitness. Nearby nesting birds and other wildlife could decrease parental attention to their young, potentially resulting in juvenile mortality. The distance at which the disturbance effect would abate is dependent on the tolerance levels of the species and individuals within species.

Threatened and Endangered Species

Within the proposed 100-foot-wide temporary construction corridor, the removal of trees within marbled murrelet and northern spotted owl suitable habitat would cause a direct negative impact on the habitat for both species, removing up to approximately 0.28 acre and 8.34 acres, respectively. The clearing and tree removal activities would be limited to between October 1 and February 28, outside of the nesting seasons for both species.

Noise disturbance from construction activities would have a direct effect on nesting marbled murrelets and spotted owls near the project area. Marbled murrelet nesting behavior may be disrupted when construction activities are within 110 yards of their nesting sites during their “critical” nesting season (April 1 to August 5) and activities within that distance may even cause



nest abandonment (ODFW 2016). Similarly, northern spotted owls would be disturbed when construction activities are within 65 yards of their nesting sites during their “critical” nesting period, between March 1 and July 7 (ODFW 2016). However, nesting surveys would be conducted prior to construction and construction activities would only proceed outside of a 65-yard or 110-yard noise disturbance buffer from active northern spotted owl or murrelets nests, respectively.

The raised noise levels may still initiate some minor displacement or behavior-altering effects on both species up to 0.25 mile from the source of the noise disturbance. During their respective nesting seasons marbled murrelets and northern spotted owls would be disrupted, to a lesser degree, up to 0.25 mile from construction activities.

Direct Effects

Vegetation

The Preferred Alternative could result in the removal of vegetation within a 60-foot-wide right-of-way, centered on the alternative’s centerline, for construction of the roadway and ground disturbing activities for roadway side slopes. The Preferred Alternative crosses primarily forested upland habitat. Within the 60-foot-wide corridor, which represents approximately 12.34 acres, the same vegetation communities would be impacted as under the temporary effects (see Table 3-10). Of these vegetation communities, the seral coniferous forest would be the most affected at approximately 8.28 acres.

Table 3-10. Acres of Vegetation Communities Directly Affected in the 60-foot-wide Road Right-of-Way Corridor

Vegetation Community	Approximate Acres	% of Vegetation Community Affected
Disturbed land (road prism/logging infrastructure)	3.54	59%
Mature coniferous forest (Sitka spruce-western hemlock/salal-swordfern)	0.07	9%
Riparian forest (including study-area streams)	0.43	18%
Seral coniferous forest (Sitka spruce-western hemlock/salal-swordfern))	8.28	22%
Wetland	0.02	28%
Total	12.34	27%

The Preferred Alternative does not cross habitat for any special-status plant species, and no occurrences of individuals were observed during field surveys. No direct effects to special-status plants would occur under the Preferred Alternative.



Wildlife

Permanent effects to terrestrial wildlife habitat within the proposed 60-foot-wide right-of-way would likely result from the removal of trees and vegetation in areas where clearing is necessary. The total number and type of trees that would be removed have not yet been determined, but removal of these trees would not result in a significant decrease in canopy cover.

Negative effects to the Oregon species of concern, the northern red-legged frog, as a result of the project would primarily be habitat loss (wetland seeps and drainages in the study area) and reduction in habitat quality from road construction.

Threatened and Endangered Species

Within the proposed 60-foot-wide right-of-way, the removal of trees within marbled murrelet and northern spotted owl suitable habitat would cause a direct negative impact on the habitat for both species, removing approximately 0.07 acre and 5.04 acres, respectively. The clearing and tree removal activities would be limited to between October 1 and February 28, outside of the nesting seasons for both species.

Indirect Effects

Vegetation

Areas disturbed by road construction can provide an opportunity for increased density of existing native plant populations, as well as the expansion of invasive plants and noxious weeds into previously non-infested areas. The road construction corridor could also become a potential corridor for the introduction, establishment and expansion of new noxious weeds and invasive plants to the area. The use of BMPs and implementation of mitigation measures discussed below would prevent the introduction or spread of noxious weeds in or adjacent to the study area, and prevent the transport or spread of known noxious weeds from within to outside the project area.

Wildlife

Indirect effects to wildlife include altered predator-prey relationships, long term habitat alteration, and indirect land use impacts. Potential indirect impacts to fish and wildlife, including species of concern, as well as threatened and endangered species are described in the following sections.

Altered Predator-Prey Relationships

The clearing of forest along any of the Preferred Alternative alignment could decrease the habitat for prey species such as rodents. This could have a negative effect to raptors that forage in and near the study area. Depending on the species, other resident and migratory birds feed on insects and/or plant material that are often associated with trees. The clearing of forest along the Preferred Alternative could decrease the availability of these prey species for these birds. For ground-nesting and ground-foraging birds, there could also be a decrease in prey availability in that suitable prey that is shade-dependent would decrease due to forest clearing.

The clearing and resulting fragmentation of forests from the Preferred Alternative could decrease the habitat and prey (deer) for the big-game carnivorous prey species, such as the cougar. The



clearing and resulting fragmentation of these forested habitats could impact the cougar because these fragments may become too small, which could lead to greater competition on deer.

No impacts to predator-prey relationships are likely to occur for marbled murrelet as a result of this project because of the lack of aquatic prey species within the 100-foot-wide road construction corridor. Northern spotted owl may be affected by the removal of suitable foraging habitat along portions of the Preferred Alternative where tree removal and ground disturbance would occur, as described above. The clearing of forest litter along the Preferred Alternative could decrease the habitat for prey species, such as rodents. These actions would potentially affect approximately 8.34 acres of northern spotted owl suitable habitat along the Preferred Alternative.

Long-Term Habitat Alteration

Because of the likely removal of conifer trees within the road construction corridor along the Preferred Alternative, the project would likely have a long-term effect on the available forested habitat within the 60-foot-wide right-of-way. The number and types of trees that would be removed as a result of this project have not yet been determined, but it is estimated that approximately 8.34 acres of conifer trees could be removed.

Tree removal along the Preferred Alternative would likely cause long-term habitat alteration in areas of the alignment that cross forested habitat types. Areas that were previously forested with smaller, unpaved logging roads scattered throughout would now have a wider, paved road bisecting them. Long-term vegetation maintenance along the paved roadsides would keep vegetation away from the road prism.

Within the 100-foot-wide temporary construction corridor, approximately 8.34 acres of northern spotted owl suitable habitat may experience long-term habitat alteration along the Preferred Alternative. In addition, approximately 0.28 acre of marbled murrelet suitable habitat exists along this alignment and may be negatively affected by this alternative; therefore, there may be a long-term removal or alteration of these species suitable habitat to some degree.

Indirect Land Use Impacts

The project would restore visitor access to the Refuge and Scenic Viewpoint from the south, and would connect Cape Meares State Park, Cape Lookout State Park, and Cape Kiwanda State Park. Since the 2012 landslide, the Cape Meares Loop Road has been closed to through traffic, limiting access to the Refuge and Scenic Viewpoint. The project would not be expected to cause an increase to long-term use of the general area compared to pre-landslide levels.

Along the Preferred Alternative, northern spotted owls that forage in areas that do not currently contain infrastructure could be affected by the presence of road traffic after the project's implementation. Road traffic in new areas could increase the likelihood of vehicle-owl collisions.

Mitigation Measures

Vegetation

For the Preferred Alternative, mitigation measures to protect vegetation communities identified in the project's study area may include the following:



- Locate staging areas in existing cleared upland areas where possible.
- Following construction, revegetate all disturbed areas with native vegetation.
- Install appropriate sediment and erosion control BMPs before construction begins and maintain them in working order throughout the construction period and until vegetation is established. Inspect and repair all BMPs according to the stipulations of applicable permits to maintain the continued effectiveness of the controls.
- Ensure fueling or storage of petroleum products complies with permit requirements. Within 100 feet of wetlands or waterbodies do not store fuel, refuel vehicles, or conduct other maintenance activities.
- Prior to construction, prepare a hazardous materials spill plan to identify actions to take in the event of a spill. Incorporate preventative measures such as the placement of refueling facilities and the storage and handling of hazardous materials. Prepare an emergency spill plan and keep a spill containment kit on-site at all times to help prevent petroleum products and other chemicals from entering wetlands or water bodies during construction.
- Develop a temporary erosion sediment control plan and SWPPP, describing BMPs that would be implemented during construction to minimize construction site erosion and sedimentation into wetlands and waterbodies.
- Establish a dewatering and diversion plan for proposed in-water work.

For the Preferred Alternative, mitigation measures to prevent the introduction or spread of noxious weeds in or adjacent to the project’s study area, and prevent the transport or spread of known noxious weeds from within to outside the project area may include the following:

- Use gravel or material source sites for road construction or rehabilitation that are free of new weed invader species. Suitable material source sites must be either state-certified as “weed free” or be routinely treated for weed control at least twice during the ideal treatment season when weeds are readily identifiable but before they have gone to seed (July through late August).
- Where feasible, conduct weed treatment of all immediately adjacent or affected roads prior to ground-disturbing activities, where feasible. If the timing of ground-disturbing activities would not allow weed treatment to occur when it would be most effective, it would occur in the next treatment season following the disturbance.
- Clean all road maintenance and off-road equipment prior to entry onto the study area. If operations occur in areas infested with new invaders, all equipment would also be cleaned prior to moving to new sites.
- Seed disturbed areas (including project disturbed cut/fill slopes), with the most current Oregon DOT native, moist site, locally adapted, certified, weed-free seed mix upon activity completion. Revegetation species used should be source-identified, site-appropriate, and genetically adapted to the study area, when feasible, to comply with Oregon DOT’s OAR 603-052-1200. When reseeding is necessary, seeding would occur during an appropriate

season (spring or fall) or weather conditions (at least 2 weeks prior to forecasted cooler, wetter weather) to ensure the most effective germination/establishment.

- Use certified weed-free straw for mulching and erosion control. Preferably, local native materials or wood mulch would be used.

Wildlife

Mitigation measures to protect wildlife in the study area may include the following:

- During culvert replacement/installation conduct work in a manner to reduce turbidity and erosion impacts in the project's study area seeps and streams.
- Consider installing wildlife signage at areas that may concentrate big-game road crossings (such as the bottom of a drainage, migration or movement route, or well-worn game travel pathway) to alert motorists of the possibility of wildlife on the road at these locations.
- Avoid using high-quality big-game forage species (such as buckwheat, timothy, oats, chicory, annual ryegrass, red clover, white clover, perennial ryegrass and crimson clover [Oregon Forest Resources Institute 2013]) to revegetate the road edge so big-game are not attracted to the roadways.
- Where possible, locate roads away from streams, lakes, open water wetlands, wetland inclusions, seasonal ponds, seeps and springs whenever possible.
- Avoid locating roads below the high water mark of streams, lakes, wetlands, and seasonal ponds whenever possible.

3.9 Cultural Resources

3.9.1 Affected Environment – Existing Conditions

To comply with Section 106 of the National Historic Preservation Act for the Cape Meares Road Relocation Project, FHWA defines the cultural resources area of potential effect (APE) as a 400-foot wide corridor, with 200 feet on either side of the Preferred Alternative centerline.

No previous archaeological surveys have been conducted in the APE and no archaeological or historic sites are present on the State Historic Preservation Office (SHPO) databases.

In March 2016, a team of archaeologists from the Museum of Natural and Cultural History at the University of Oregon conducted a pedestrian survey of the preliminary North and South alignments, excluding the portion of the APE on private property for which right-of-entry was not obtained. In early August 2017, the team conducted a follow-up pedestrian survey which then with the two pedestrian surveys covered the entire Preferred Alternative's alignment.

The APE includes rugged, steeply sloping, forested landscape that has been logged a number of times and subsequently deeply eroded. Most of the Coast Range forests were initially logged between 60 and 100 years ago (CCO 2016), and they continue to be replanted and logged. The surface is covered deeply with forest duff and decaying plants, logs, and tree limbs. Landslides and slumping are present throughout the area.



The steepness of most of the APE made it a low probability for encountering cultural materials, and the absolute lack of ground visibility made the discovery of small items unlikely. Further, the extensive landslides and slumping apparent throughout suggested that all cultural materials which might be present would be heavily disturbed. Flat ground within or near the project lies within the OWD watershed land.

During the 2016 survey, four cultural resource items were located. Eight possible road grades were also identified, but they have no clear historical association and no attributes that can identify them as having been created earlier than the last 50 years. Therefore, the road grades were not considered a cultural resource because they appear to be of insufficient age to be eligible for the National Registration of Historic Places. The 2017 survey did not identify any cultural resource items.

On May 9, 2016, FHWA mailed letters to the following two tribes requesting government-to-government consultation (for a copy of the letters, see Appendix F):

- Confederated Tribes of Siletz Indians
- Confederated Tribes of the Grand Ronde

Neither tribe replied with any concerns.

3.9.2 Environmental Consequences – No Build Alternative

Direct Effects

The No Build Alternative would have no change over present conditions and would have no direct effects to historic or archaeological resources.

Indirect Effects

The No Build Alternative would have no change over present conditions and would have no indirect effects to historic or archaeological resources.

3.9.3 Environmental Consequences – Preferred Alternative

Temporary Construction Effects

All cultural sites identified within the project's APE are outside of the 100-foot wide corridor that would contain all potential roadway construction and ground disturbing activities associated with the Preferred Alternative. Therefore, project construction would have no temporary effects on cultural resources.

Direct Effects

In general, the APE possesses low probability for cultural materials due to the steepness of most of the area. All cultural sites identified within the project's APE are outside of the 100-foot wide corridor that would contain all potential roadway construction and ground disturbing activities associated with the Preferred Alternative. Therefore, the project would have no direct effect on the identified cultural items.



Geotechnical boring would occur during construction of the Preferred Alternative and could potentially expose and directly affect buried cultural resources. Mitigation measures to minimize the potential impacts from construction boring are described at the end of the section.

Indirect Effects

The Preferred Alternative would not have indirect effects to cultural resources.

Mitigation Measures

Measures to avoid, minimize, and mitigate impacts to cultural resources under the Preferred Alternative include:

- After geotechnical drilling, conduct a post-disturbance survey at the drill locations to identify potential buried cultural resources exposed.
- Avoid the concrete dam and vault located just outside the APE.

3.10 Recreation

3.10.1 Affected Environment – Existing Conditions

Cape Meares Loop Road is one of the roads that makes up the northern end of the Three Capes Scenic Loop, a highlight on the Pacific Coast Scenic Byway (see Figure 3-1). As part of the Three Capes Scenic Loop, Cape Meares Loop Road provides access to the following recreation facilities north of the road closure (Tillamook County 2017c and 2017d):

- **Memaloose Point Boat Launch:** a Tillamook County-operated boat ramp for motorized boats to access Tillamook Bay.
- **Bayocean Peninsula Park:** a 1,050-acre Tillamook County day-use park where the former town of Bayocean once existed.
- **Kinchelo Point Boat Launch:** a Tillamook County-operated boat ramp for motorized boats to access Tillamook Bay.
- **Cape Meares Boat Launch:** a Tillamook County-operated boat ramp for motorized boats for boats to access Cape Meares Lake.

South of the road closure, Cape Meares Loop Road provides access to several recreation facilities before the Three Capes Scenic Loop intersects the next east-west connection, Highway 131, to Highway 101 (Tillamook County 2017e):

- **Cape Meares National Wildlife Refuge:** a 140-acre wildlife refuge that provides hiking trails and wildlife viewing adjacent to Cape Meares Loop Road (location identified on Figure 3-3). The Refuge is owned and managed by the USFWS as part of the Oregon Coastal Refuge Complex.
- **Cape Meares State Scenic Viewpoint:** a 240-acre state park is adjacent to the wildlife refuge and Cape Meares Loop Road (see Figure 3-3). This park includes the historic Cape

Meares Lighthouse, an unusually large Sitka spruce tree known as the “Octopus Tree,” scenic overlooks, wildlife viewing, trails, interpretive displays, picnic area, restrooms, gift shop, and a parking area. The Scenic Viewpoint is owned and managed by OPRD.

- **Oregon Islands National Wildlife Refuge:** a refuge that protects 1,853 rocks, reefs, and islands and stretches from Tillamook Head (near Seaside) to the California border. The islands near Cape Meares are not accessible to the public. Most of the refuge is also designated as national wilderness. This refuge is owned and managed by the USFWS as part of the Oregon Coastal Refuge Complex.
- **Three Arch Rocks National Wildlife Refuge:** a 15-acre refuge consisting of three large and six smaller rocks off shore, approximately one-half mile from the town of Oceanside. This refuge is not accessible to the public. It is also designated as national wilderness and is owned and managed by the USFWS as part of the Oregon Coastal Refuge Complex.
- **Oceanside Beach State Recreation Site:** a 7-acre park that provides beach access, restrooms, picnic areas, fishing, and wildlife viewing. This park is located in the town of Oceanside, approximately ¼ mile from Cape Meares Loop Road. This park is owned and managed by OPRD. OPRD received a grant from the Land and Water Conservation Fund to acquire property for this park in 1969.
- **Symons State Park:** a 3-acre park providing beach access adjacent to the town of Netarts. This park is owned and managed by OPRD.
- **Happy Camp Beach Access:** a day-use beach access area, managed by Tillamook County. In 1970 Tillamook County received a grant from the Land and Water Conservation Fund for construction of restrooms at this site.

The Three Capes Scenic Loop provides access to numerous additional recreation resources as it continues south to Cape Lookout and Cape Kiwanda past the intersection with Highway 131.

All of the parks, refuges, and boat accesses listed above would qualify for protection under Section 4(f) of the *Department of Transportation Act of 1966*, as they are public recreation facilities and/or wildlife refuges. Oceanside Beach State Recreation Site and Happy Camp Beach Access also qualify as Section 6(f) properties as they received funding from the Land and Water Conservation Fund (NPS 2017).

Annual visitation data from OPRD and USFWS show that visitation at the Scenic Viewpoint and Refuge dropped following the road closure in early 2013 (OPRD 2017c, USFWS 2017a). USFWS data on annual visitation to the Refuge between the years 2007 and 2016 shows that visitation has fluctuated somewhat year-to-year. Overall, while the Refuge has experienced some growth in visitors from year-to-year since 2007, the cumulative percent change in visitors is notably lower than that for the rest of the Oregon Coast National Wildlife Refuge Complex properties (USFWS 2017b).

As part of the Three Capes Scenic Route, Cape Meares Loop Road is identified as an alternate route to Highway 101 on the 370-mile Oregon Coast Bike Route (ODOT 2017a). Since the closure



of Cape Meares Road in January 2013, Oregon DOT’s website has advised bicyclists to use Highway 101 for the section of the bike route north of Sand Lake Road (see Figure 3-1).

The 382-mile Oregon Coast Trail extends from Washington to California. This hiking trail uses segments of the Three Capes Scenic Loop, including part of Cape Meares Loop Road south of the entrance to Cape Meares Scenic Viewpoint (OPRDa 2017). See Figure 3-2. The portion of Cape Meares Loop Road that is closed is not part of the Oregon Coast Trail.

There are no other planned trails or parks in the project vicinity (OPRD 1986 and 2017b).

3.10.2 Environmental Consequences – No Build Alternative

Direct Effects

Land Conversion: The No Build Alternative would not convert any recreation lands to roadway right-of-way. There would be no use of Section 4(f) or Section 6(f) properties.

Access: With the continued closure of Cape Meares Loop Road to travelers on Highway 101 coming from the north, travel to the recreation facilities southwest of the closure point, including the Refuge and the Scenic Viewpoint, would continue to require travelers to travel further south on Highway 101 before heading west on Highway 131 to reach these recreation facilities.

North of Sand Lake Road, bicyclists on the Oregon Coast Bike Route would have to continue to use Highway 101 instead of the Three Capes Scenic Route, including Cape Meares Loop Road, because of the road closure. This detour would reduce the scenic quality of this bike route, as numerous scenic vistas, including Cape Meares and Cape Lookout would no longer be part of the bike route, would require cyclists to double back if they wanted to visit those locations and may be considered less safe as traffic volumes are higher on Highway 101.

The Oregon Coast Trail would not be impacted by the No Build Alternative.

Indirect Effects

Under the No Build Alternative, it is likely that the altered travel route to the Refuge and the Scenic Viewpoint could result in minor reductions to visitation numbers. As demonstrated in recent years, visitation has rebounded since the road closure despite the change in travel route; however, it is possible that if the road was open visitation numbers would be even higher.

3.10.3 Environmental Consequences – Preferred Alternative

Temporary Construction Effects

Temporary Easements: Under the Preferred Alternative no temporary construction easements would be required from recreation properties.

Access: During construction of the Preferred Alternative, access to nearby recreation facilities could be affected by construction activities. When the new intersection of the existing roadway and the realigned roadway is constructed south of the Scenic Viewpoint and Refuge, there could

be traffic delays and temporary lane closures; however, access would be maintained and these delays would be short-term.

These temporary access changes could also temporarily impact hikers on the Oregon Coast Trail and could result in increased noise levels and dust along the short segment of this trail that passes the new intersection. However, the trail would still be accessible; the alignment would not be altered; and the length of the trail that would be impacted is minimal in terms of the overall 382-mile long trail.

Bicyclists on the Oregon Coast Bike Route would continue to use Highway 101 during construction of the realigned roadway. Once the new segment of road is opened, it would reconnect the Three Capes Scenic Route portion of the Oregon Coast Bike Route.

Direct Effects

Land Conversion: Construction of the Preferred Alternative would not convert any recreation lands to roadway right-of-way, as the alignment avoids all existing park, recreation, and refuge properties. Therefore, there would be no use of any Section 4(f) or Section 6(f) properties.

Access: The new alignment of Cape Meares Loop Road, would restore routes for travelers coming from the north on Highway 101 to the Refuge and Scenic Viewpoint so that they would not have to travel an additional distance south to Highway 131 to reach these recreation destinations. Under the Preferred Alternative, the existing roadway would terminate at the closure point in the Refuge property.

The Preferred Alternative would also reconnect the Three Capes Scenic Route portion of the Oregon Coast Bike Route, allowing bicyclists to take this scenic alternate route rather than traveling on Highway 101, which has higher traffic volumes and may be less safe, between Tillamook and Sand Lake Road.

The Oregon Coast Trail would continue to use the portion of the existing roadway that terminates in the Refuge.

Indirect Effects

Indirect effects to recreation are anticipated to be minimal under the Preferred Alternative. Access to the Refuge, Scenic Viewpoint, and Oregon Coast Trail would require turning off the new roadway alignment onto the portion of the existing roadway alignment that leads to these entrances. This could make wayfinding slightly less direct, but installation of directional signage would mitigate this potential effect.

Mitigation Measures

Measures to avoid, minimize, and mitigate impacts to recreation under the Preferred Alternative include:

- Coordinate the construction schedule with OPRD, USFWS, and Tillamook County recreation specialists to post alerts for construction activities that may impact users of recreational facilities.



- Use traffic safety signs and flaggers to inform motorists, bicyclists, and pedestrians and to manage traffic during construction activities on affected roads.
- Prepare a notice about construction activities and a proposed schedule for posting on Oregon DOT’s traffic advisory web site called Trip Check (<http://www.tripcheck.com>).
- Install new wayfinding signage to direct travelers to the Refuge, Scenic Viewpoint, Cape Meares, Oceanside, Oregon Coast Trail, and Oregon Coast Bike Route.

3.11 Hazardous Materials

3.11.1 Affected Environment – Existing Conditions

The Oregon DEQ is authorized by the federal EPA to regulate hazardous waste in Oregon. Government environmental databases that record the handling, storage, and release of hazardous materials to the environment were reviewed to document existing conditions in the project area.

The project area is mostly vacant and forestland. The Lighthouse Quarry actively mines gravel and is located within the western end of the project area on Cape Meares Loop Road. The only other land uses identified within 1,000 feet of the project area were a lumber company and a rural residence located to the southeast of the project area. This hazardous materials analysis considered only land within the area of project construction as within the “project area” as construction of the project would not disturb land outside the construction area.

Reviews of federal and state environmental government databases were reviewed to determine the likelihood of project construction encountering known contamination. No areas of hazardous material contamination within the project area were identified during the database reviews. No areas of obvious hazardous material contamination were observed during a site visit or reviews of recent, aerial photos or historical land use maps of the project area.

3.11.2 Environmental Consequences – No Build Alternative

Direct Effects

Since there are no known hazardous materials sites located within the project area, the No Build Alternative is not expected to have a direct effect on the release of hazardous materials into the environment.

Indirect Effects

The No Build Alternative would have no indirect effect on hazardous materials.

3.11.3 Environmental Consequences – Preferred Alternative

Temporary Construction Effects

Unknown hazardous materials could potentially be disturbed during construction of the Preferred Alternative, resulting in an unexpected release to the environment and a temporary adverse effect to the health and safety of construction workers. In addition, construction activities associated with the Preferred Alternative could involve the use of small amounts of solvents, motor and lubricating



oils, and cleaners, which could be released into the environment. Any accidental spills of these hazardous materials would be immediately contained, cleaned up, and disposed of in accordance with federal and state laws. With the implementation of the proposed mitigation measures, the contamination of soils or groundwater resulting from a hazardous materials release during construction would likely be low.

Direct Effects

Since there are no known hazardous materials sites located within the project area, the Preferred Alternative would have no direct effect on the release of hazardous materials into the environment.

Indirect Effects

The Preferred Alternative would have no indirect effect on hazardous materials.

Mitigation Measures

The following mitigation measures could be applied to avoid, minimize, or mitigate contamination prior to and during construction:

- Develop procedures for identifying, characterizing, managing, handling, storing, and disposing of contaminated soil and groundwater encountered that would cover all project improvement areas during construction activities.
- Dispose contaminated material generated during construction at a facility permitted to accept the material and follow the facility's applicable guidance.
- Develop health and safety plans, to be prepared by the construction contractor, for construction activities. The health and safety plans should be read and signed by all onsite workers accessing the site before each work day. The health and safety plan would identify potential contaminants of concern, required personal protective equipment, and emergency response procedures.

3.12 Visual Quality

3.12.1 Affected Environment – Existing Conditions

The project area is comprised almost entirely of natural environment elements. It consists of densely forested, undulating slopes of the northwest Coast Range, including headlands with streams of steep gradients and slopes dominated by Douglas-fir/western hemlock forests with inclusions of Sitka spruce forest communities (SWCA 2017). Within the project area the project environment of the existing roadway alignment is a two-lane paved roadway (one lane in either direction) with narrow shoulders. The existing natural harmony of the surrounding landscape is generally high (unless intruded upon by tree removal from actively managed timber lands), consisting mostly of mature vegetation, wildlife, the open sky above. The project coherence of the winding two lane road is also high.

Cape Meares Loop Road is a designated State Scenic Byway and part of the Three Capes Scenic Loop that connects several scenic viewpoints and vistas including the Scenic Viewpoint. The



project area is visually distinct and vivid. Existing land uses in the project area includes forest and recreational uses.

Viewer groups include neighbors, who have views of the proposed project, and travelers, who have views from the project. Types of neighbors in the project area include recreational neighbors/viewers traveling along the scenic byway and visiting the many recreational uses nearby, and residential neighbors/viewers in the communities of Cape Meares, Oceanside, and a private property near the project area. Residential viewers' visual preferences typically include a desire to maintain the existing landscape. They are generally characterized as highly sensitive viewers because of their stationary, long-term views. However, for this project residential viewers would likely expect the potential for large scale changes to their surrounding views because of the potential removal of trees on adjacent, actively managed private timber lands.

Types of travelers in the project area include touring and local motorists and potentially a few bicyclists. Touring travelers on nearby roads are traveling primarily for enjoyment. While they are typically only in the project area for a limited duration, viewing the scenery is an important aspect of their experience and their sensitivity to visual changes would be expected to be moderate. Local motorists are more focused on wayfinding to their destination and, therefore, would be expected to have low sensitivity to changes in visual character.

During the project's public engagement activities, no concerns related to visual quality were raised.

3.12.2 Environmental Consequences – No Build Alternative

Direct Effects

Under the No Build Alternative, no construction would occur. There would be no vegetation removal or changes to landform from grading and earthwork. Therefore, there would be no changes to the existing natural and project environments.

For residential viewers in Oceanside and east of the project area, with the No Build Alternative there would be no change to the existing visual character of the natural environment which would have a neutral effect to visual quality. Vehicles traveling to and from the Scenic Viewpoint would need to travel along the southern portion Cape Meares Loop Road twice. Light and glare from these vehicles would have slight intrusion on nighttime views near residents in Oceanside on both directions of their trip. However, this is anticipated to be a minor adverse visual effect and of short duration.

The Three Capes Scenic Loop, of which Cape Meares Loop Road is a part, is a designated scenic byway and an important attraction for visitors exploring the Oregon coast. Being able to drive this roadway as a "loop" to access the visual scenery of the surrounding area and continue on is an important feature of this byway. The No Build Alternative would not restore the connection of Cape Meares Loop Road, which would also leave a gap in the larger Three Capes Scenic Loop. Recreational viewers, touring and local motorists, who would be expecting the roadway to connect and continue on, would be expected to perceive this as an adverse effect on the visual quality of their experience.

Indirect Effects

Over time, the existing portion of Cape Meares Loop Road that is closed would likely continue to be affected by landslides and could revegetate. As this area would be viewed by few, if any, viewers this would be a neutral effect to visual quality.

3.12.3 Environmental Consequences – Preferred Alternative

Temporary Construction Effects

Construction equipment, workers, materials and staging areas would temporarily add manmade activity and brightly colored machines, signs and lights to the views. Dust would likely be visible in the immediate vicinity of earthwork. Tree felling activity would slowly create a cleared path for the new portions of road along the alignment of the Preferred Alternative. The construction impacts would be temporary and last for approximately two years. These effects during construction could result in viewers' perceiving a temporary decrease in the natural harmony and project coherence of the area, which would temporarily have a moderate adverse effect on visual quality.

Direct Effects

With the Preferred Alternative, vegetation removal and earthwork would result in a cleared road corridor that would be permanent. However, the design of the Preferred Alternative would be sensitive to the high visual quality of the Three Capes Scenic Loop viewshed and follow, where feasible, existing contours to help the road blend into adjacent topography. The roadbed itself would be narrow, which would minimize vegetation removal and terrain changes, while also maintaining safety. Moreover, roughly half of the Preferred Alternative alignment would be along an existing single-lane logging road which is already cleared of vegetation (Figure 2-2). Light and glare from vehicles would be introduced into a new area along the Preferred Alternative alignment.

No concerns were raised during public engagement activities for the project about visual quality effects of the Preferred Alternative.

The area that includes the Preferred Alternative is currently visible to a very limited number of residential viewers. Once the roadway is constructed the existing, dense vegetation of tall trees would be expected to shield most views of the roadway and of vehicles on the roadway, including preventing the spillover of light and glare. Residents in Oceanside may experience less light and glare as viewers would not need to drive past their community twice when accessing the nearby recreation areas. Overall, the Preferred Alternative would be expected to have a neutral effect on visual quality as perceived by residential viewers.

The Preferred Alternative would restore the connection of Cape Meares Loop Road and the Three Capes Scenic Loop. This would restore an important feature of this designated byway by allowing recreational viewers, touring and local motorists to drive this roadway as a "loop" to access the visual scenery of the surrounding area and continue on. Therefore, the Preferred Alternative would be expected to have a beneficial effect on visual quality as perceived by these viewers.

Indirect Effects

Like the No Build Alternative, with the Preferred Alternative over time the existing portion of Cape Meares Loop Road that is closed would likely continue to be affected by landslides. As this area would be viewed by few, if any, viewers this would be a neutral effect to visual quality. An indirect effect of the Preferred Alternative could be an increase in recreational viewers along the restored scenic loop. This would be expected to have a neutral effect on visual quality.

Mitigation Measures

The following mitigation measures could be applied to avoid, minimize, or mitigate impacts to visual quality:

- Following construction, revegetate all disturbed areas with native vegetation.

3.13 Cumulative Effects

Cumulative effects are the combination of a project's impacts on a particular resource with the impacts of other past, present, and future human activities on that same resource. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time (40 Code of Federal Regulations [CFR] 1508.7).

The scope of a cumulative effects analysis is related to the magnitude of the impacts of the proposed action. If a project does not have permanent adverse impacts on a particular resource, the project cannot contribute to cumulative effects on that specific resource. Therefore, the majority of resources discussed in Chapter 3 of this EA were dismissed from this cumulative effects analysis and only those resources that the project would permanently adversely impact are included.

Past actions that have had the most measurable effect on the project area include timber harvesting, quarry development and mining, drinking water facility development and distribution, private residence development, construction of the existing Cape Meares Loop Road, and recreation development.

Currently, there are no planned future public projects or site improvements in the vicinity of Cape Meares Loop Road. The Tillamook PUD and OWD have expressed interest in possible utility projects, such as the aforementioned potential relocation of the OWD water intake system upstream of the Preferred Alternative, but specific plans are unknown at this time. Tillamook County is not planning future roadway, park, or trail projects in the project area (Tillamook County 2017a; Tillamook County 2017b). There are no planned site improvements at the Scenic Viewpoint and no significant improvements planned for the Refuge (OPRD 2017b; K. Moroney of USFWS, personal communication, July 5, 2017).

Stimson Lumber Company, who owns the private forestland surrounding the Preferred Alternative, has noted that they have plans to harvest the trees on their land in the next 15 years. No other plans to develop the surrounding forest area are known.



3.13.1 No Build Alternative

When combined with past, present, and reasonably foreseeable future actions, the No Build Alternative would result in no change to the environment in and around the project area and, therefore, would not contribute to cumulative effects.

3.13.2 Preferred Alternative

Land Use and Forestland

The project area is immediately surrounded by private forestland with limited past actions that have changed land use from undeveloped forest to partially-developed resource-extraction industry, utility, residential, and roadway uses. The majority of the land area remains forested.

Construction of the Preferred Alternative would permanently convert approximately 16 acres of forestland into new roadway and right-of-way; this conversion is a small percentage of the total forestland in the area. In addition, the existing right-of-way for the closed portion of Cape Meares Loop Road (approximately 28 acres) that is zoned Forest may be vacated by the County and could be utilized as a land transfer option during the right-of-way process. The Preferred Alternative does not provide access to parcels that were landlocked before the 2013 road closure and would not affect the type of land use and rate of development in the area. Combined with past, present, and reasonably foreseeable future actions, the Preferred Alternative would not be expected to contribute to cumulative effects to land use.

Soils and Geology

Past ground disturbance and vegetation clearing of the land surrounding the project area has impacted soils. Future timber harvests would likely leave some soil exposed and susceptible to erosion, but revegetation and other mitigation measures would minimize impacts to the soil.

Roadway construction under the Preferred Alternative would increase the amount of exposed cut-slopes, stream crossings, and cleared vegetation in the project area. However, by using existing private forest roads where possible and by implementing recommended mitigation measures, erosion and slope stability would be limited and permanent effects on soils and geology would be minimized. Roadway construction and mitigation measures, combined with effects from past, present, and reasonably foreseeable future actions—such as future harvests on the private forestland surrounding the Preferred Alternative—would be expected to have minimal impact to the overall soils and geology in the area and therefore not contribute to cumulative impacts.

Wetlands

Past activities in the project area have likely impacted wetlands through ground-disturbing and development activities, though most of the land remains forested. Though no future projects are identified at this time, future development in the area could impact wetlands.

Roadway construction under the Preferred Alternative would include removal and fill of approximately 0.01 acre of the approximately 0.06 acre of existing wetlands in the study area. Implementation of recommended mitigation measures, such as payment to an ILF program, would be expected to achieve “no net loss” of wetland functions. Though removal and fill of the



approximately 0.01 acre of wetlands would be an unavoidable impact, with mitigation the Preferred Alternative would have a negligible effect to wetlands. Combined with past, present, and reasonably foreseeable future actions, the impacts to wetlands from the Preferred Alternative would be expected to have a negligible contribution to cumulative effects.

Vegetation and Wildlife

Past activities surrounding the project area include timber harvesting and other vegetation removal. The previously-harvested forestland is not currently high-quality habitat, but does provide suitable habitat for the marbled murrelet and northern spotted owl. Though no future projects are identified at this time, development in the area could result in additional vegetation removal. Future timber harvests on the private forestland surrounding the project area is planned in the foreseeable future by Stimson Lumber Company and would involve vegetation removal.

When combined with past, present, and reasonably foreseeable future actions including future timber harvests, the impacts to vegetation and wildlife from this project creates the potential for the following cumulative impacts:

- Further reduction of habitat over the long term for both the marbled murrelet and northern spotted owl
- Depending on the timber harvest timing could:
 - 1) destroy nests of both species
 - 2) disturb nesting individuals of both species within the timber harvest units and out to areas within 0.25 mile
- Reduce the northern spotted owl prey source (rodents) because of the reduction in suitable foraging habitat
- Increased traffic associated with timber harvest that could increase the likelihood of vehicle-owl collisions

3.14 Irreversible and Irretrievable Commitment of Resources

Irreversible commitments are those that cannot be regained, such as the extinction of a species, the expenditure of federal funds, or the removal and use of fossil fuels. Irretrievable commitments are those that are lost for a period of time, such as the loss of production, harvest, or use of renewable resources.

Fossil fuels, labor, and construction materials such as aggregate would be irreversibly expended by construction of the proposed project. Labor and fossil fuels would be consumed during operation of construction equipment for grading, material movement, and construction activities. In addition, labor and natural resources would be used in the fabrication and preparation of construction materials. Construction would also require an expenditure of federal funds that could not be used for any other projects.



Chapter 4 Consultation and Coordination

An integral part of the environmental review process is engagement of other stakeholders, such as other agencies, tribes and the public. The goal of the consultation and coordination process is to develop public awareness and understanding of the project, gain input from potentially affected interests, and then appropriately considering that input in the project development process.

4.1 Public Outreach

Tillamook County has been leading the project's public outreach, using a variety of public meetings and outreach to inform the community of the status of the roadway closure and project progress (refer to Table 4-1 below).

Table 4-1. Public and Stakeholder Meetings/Notices/Workshops/Articles/Website

Public Outreach Type	Date	Notes/Comments
Public Notice: Road Closure	01/11/2013	County has provided updates throughout the ongoing road closure.
Public Meeting	01/17/2013	County discussed the road closure at the Tillamook County Library.
Stakeholder Meeting	04/2013	County staff provided a project briefing and presentation regarding the road closure.
Public Meeting	05/19/2014	County provided an update on the road closure at the Board of County Commissioners' public meeting.
Board of County Commissioners Workshop	06/24/2014	County staff provided a project briefing and presentation regarding conceptual alternatives to County Commissioners and public in attendance.
Public Meeting	10/06/2014	County staff provided a project briefing and presentation to the County Road Advisory Committee.
Project Article	12/10/2014	Article about the funding of a project alternative was published in the Tillamook County Headlight Herald.
Stakeholder Meeting	08/18/2015	County and FHWA staff met with OWD. Presented preliminary alternatives and discussed avoiding impact to the community's water source.
Stakeholder Meeting	10/07/2015	County and FHWA staff met with a landowner representative. Reviewed project site and discussed preliminary alternatives.
ONA Meeting	04/02/2016	County staff provided a project briefing/update.
Oceanside Community Potluck Meeting	04/04/2016	County staff provided a project briefing/update.



Public Outreach Type	Date	Notes/Comments
Project Website	04/26/2016	Website is updated by County staff as needed. Provides option for electronic comment and/or written comment.
County Roads Advisory Committee Meeting	05/02/2016	County staff provided a project briefing/update.
Board of County Commissioners Meeting	05/04/2016	Commissioners reviewed project agreement between County and FHWA, item postponed to future meeting.
Project Article/Press Release	06/23/2016	Article about the project published in Tillamook County Pioneer.
OWD Board Meeting	12/13/2016	County staff met with OWD Board to provide a project update.
Project Article	12/14/2016	Article published in Tillamook Headlight-Herald
Oceanside Community Meeting	02/04/2017	County presentation to Oceanside community
Stakeholders Meeting	02/08/2017	County staff met with the Green Crow Corporation, owners of the Lighthouse Quarry
Cape Meares Community Meeting	02/17/2017	County presentation to Cape Meares community
Netarts Community Meeting	03/21/2017	County presentation to Netarts community
Board of County Commissioners Meeting	04/12/2017	Project update to County Commissioners
Public Meeting	05/01/2017	County staff provided a project briefing and presentation to the County Road Advisory Committee.
Kiwanis Meeting	05/31/2017	County presentation to Kiwanis

Public interest in re-establishing the connection that was lost with the road closure has been high throughout the alternative review process. While Tillamook County received informal input and suggestions throughout the process, the ONA provided a formal comment to the County after their December 3, 2016, Board Meeting:

"Accept and recommend to the Public Works Director the Water District's 'potential adjustment alignment corridor' and defer ONA's choice of the two proposed alignments until the next ONA meeting." The "two proposed" alignments refer to the "South" and "North" alignment as shown on the map you provided."



4.2 Agency Involvement

In May 2016, FHWA mailed letters to the following agencies and stakeholder groups:

- USFWS
- National Marine Fisheries Service
- U.S. Army Corps of Engineers
- Oregon DEQ
- Oregon DSL
- Oregon Department of State Parks
- OWD
- Community of Cape Meares
- Community of Netarts
- Community of Oceanside

In February 2017, FHWA followed up with an e-mail to the above groups with the *Alternatives Analysis Memorandum* and a project status update.

4.3 Tribal Outreach

In May 2016, FHWA mailed letters to the following two tribes requesting government-to-government consultation (for a copy of the letters, see Appendix F):

- Confederated Tribes of Siletz Indians
- Confederated Tribes of the Grand Ronde

Neither tribe replied with any concerns.

4.4 List of Preparers

This EA was prepared by FHWA, with assistance from Tillamook County and technical assistance from WSP USA, SWCA, and the University of Oregon. For the individuals involved in preparing the EA, Table 4-2 provides their names, their organization and their role on the project.

Table 4-2. List of EA Preparers

Name	Organization	Project Role
Kevin Gray	FHWA	Project Manager
Jennifer Chariarse	FHWA	Environmental Specialist
Shay Witucki	FHWA	Designer
Michael Schurke	FHWA	Archaeologist
Liane Welch	Tillamook County	Public Works Director (former)
Chris Laity	Tillamook County	Public Works Director (current)
Gregory Cickavage	Tillamook County	Engineer
Jeanette Steinbach	Tillamook County	Grants
Scott Polzin	WSP USA	Consultant Project Manager
Larissa King Rawlins	WSP USA	EA Author
Kirsten Tilleman	WSP USA	Transportation, Social, Economic and Environmental Justice, Water Quality, Cumulative
Jennifer Rabby	WSP USA	Land Use and Recreation Areas
Patrick Romero	WSP USA	Air Quality, Energy, Noise and Hazardous Materials
Stephanie Sprague	WSP USA	Social, Economic, and Environmental Justice and Visual
Travis Kapua	WSP USA	Soils and Geology
Jamie Young	SWCA	Wetlands and Other Waters and Fish, Wildlife and Vegetation
Evan Dulin	SWCA	
Amanda Childs	SWCA	
Linda Burfitt	SWCA	
Christopher Ruiz	University of Oregon	Archaeological
Paul Baxter	University of Oregon	
Jaime Kennedy	University of Oregon	

4.5 EA Distribution

Table 4-3 documents the interested parties distribution list, which includes agencies and organizations identified as project stakeholders and who were provided with electronic copies of this EA. In addition, as a partner agency the County distributed this EA to the Tillamook County Board of Commissioners, applicable County departments and the City of Tillamook.

A public notice that the EA is available to review was published in the Tillamook Headlight Herald and the Oregonian. Copies of the EA were made available to the public at the following locations:

Tillamook County Library – Main Branch
1716 3rd Street
Tillamook, OR 97141

Oregon State University Open Campus
(in partnership with Tillamook Bay
Community College)
4301 Third Street
Tillamook, OR 97141

Table 4-3. EA Interested Parties Distribution List (provided by email)

Organization/Agency	Contact
USFWS	Joe Zisa (ESA) Kevin Maurice (ESA) Rebecca Chuck (Refuge contact)
National Marine Fisheries Service	Ken Phippen, Oregon Coast Branch Lead
U.S. Army Corps of Engineers	Brad Johnson
Oregon DSL	Mike DeBlasi
Oregon DEQ	Amy Simpson
DLCD	Elizabeth Ruther
SHPO	Matt Diederich
Confederated Tribes of Siletz Indians	Chairperson Delores Pigsley
Confederated Tribes of Grand Ronde	Council Chair Reyn Leno
Oregon State Parks	Kirk Barham
OWD	Alan Tuckey
Oceanside Community Association	Judson Randall
Netarts Community Association	Donna Miller Jim Young
Cape Meares Community Association	Charles Ansoerge





Chapter 5 Permits and Approvals Needed

Required permits and approvals would be obtained prior to construction. The following permits and approvals are expected to be required for implementation of any of the build alternatives:

- NEPA approval
- National Historic Preservation Act and Section 106 approval
- ESA Section 7 Consultation and USFWS Biological Opinion
- Uniform Relocation Assistance and Real Property Acquisitions Policies Act
- U.S. Army Corps of Engineers Section 404 Permit, including the coastal zone consistency review by DLCD
- Oregon DSL Section 404 Removal-Fill Permit
- Section 401 Water Quality Certification
- Section 402 NPDES General Construction Stormwater Permit
- Oregon Statewide Goal 4 Exception
- Tillamook County permits, including the Coastal Zone Management Act certification



Chapter 6 Project Commitments and Conservation Measures

For each resource that was discussed in Chapter 3, Table 6-1 provides a list of the commitments and conservation measures that would be a part of the Preferred Alternative to further avoid, minimize or mitigate for potential impacts.

Table 6-1. List of Project Commitments and Conservation Measures

Resource	Commitment and/or Conservation Measure
Transportation	<ul style="list-style-type: none"> • Construct the Preferred Alternative to Tillamook County roadway standards for a county collector road. • Coordinate and communicate the construction schedule with the Refuge, the Scenic Viewpoint, Cape Meares, and Oceanside so they can post alerts on their preferred communication channel of construction activities that may impact travelers in the area. • Use traffic safety signs and flaggers to inform motorists, bicyclists, and pedestrians and manage traffic on affected roads during construction activities. • Prepare a notice about construction activities and a proposed schedule for posting on ODOT’s traffic advisory web site called Trip Check (http://www.tripcheck.com). • Install new wayfinding signage to direct travelers to the Refuge, the Scenic Viewpoint, Cape Meares, Oceanside, Oregon Coast Trail, and Oregon Coast Bike Route.
Land Use, Farmland, Forestland and Utilities	<ul style="list-style-type: none"> • During final design continue to minimize impacts to private property. • Where property acquisition is unavoidable, the project would provide just compensation, per the Uniform Act. Tillamook County is responsible for property acquisitions and will follow all requirements of the Uniform Act. • Install new wayfinding signage to direct travelers to the Refuge, Scenic Viewpoint, Cape Meares, Oceanside, Oregon Coast Trail, and Oregon Coast Bike Route. • Provide a construction schedule and notifications to all potentially affected landowners, utility providers, and nearby recreation facilities. • If OWD relocates their intake system upstream of the Preferred Alternative (described in Section 2.2.2), coordinate with OWD to install pipe along the project corridor that would serve the new intake. • During construction, maintain existing access to properties. • During construction, work closely with the utility owners to minimize service outages and to provide advance notice of outages to affected parties.

Resource	Commitment and/or Conservation Measure
Social/Economic Changes and Environmental Justice	<ul style="list-style-type: none"> • Continue holding periodic meetings with interested stakeholders to provide project updates, address community questions or concerns, and receive feedback about the project. • Regularly post construction schedules and information in Cape Meares and Oceanside community centers and in the Headlight Herald. • Though data does not suggest there is a non-English speaking population in the project area, provide the option for stakeholders to request project information materials in a language other than English.
Air Quality/Noise/Energy	<ul style="list-style-type: none"> • Use water or chemicals, where possible, to control dust in the clearing of land and road grading. • Apply oil, water, or other suitable chemicals on unpaved roads, material stockpiles, and other surfaces which can create airborne dusts. • Fully or partially enclosure material stockpiles in cases where application of oil, water, or chemicals are not sufficient to prevent PM from becoming airborne. • Cover open-bodied trucks transporting materials likely to become airborne when in motion. • Promptly remove materials from paved streets that does or may become airborne.
Soils and Geology	<ul style="list-style-type: none"> • Plan the clearing of vegetation and logging of forested areas to occur in the drier months of the year to limit slope erosion. If planned to occur during the wet season use proper slope protection, erosion, surface water drainage, sediment containment and construction hauling techniques. • Re-plant disturbed areas with native plants in a manner that enhances regrowth and provides slope stability adjacent to the roadway corridor. • Design and implement erosion and sediment control measures prior to beginning construction. Maintain these erosion and sediment control measures throughout the entire construction phase, regardless of season.
Water Resources, Water Quality, and Floodplains	<ul style="list-style-type: none"> • During construction, implement soil erosion and sediment control BMPs, such as isolating construction work areas at each stream crossing location to prevent runoff from flowing across disturbed areas and to minimize sediment-laden runoff from leaving the construction area. • Stabilize and re-vegetate disturbed areas after work is completed. • Implement stormwater runoff BMPs where runoff has the potential to cause erosion and carry sediment into streams. • Maintain vegetated stream buffers. • Prepare and implement a SWPPP.

Resource	Commitment and/or Conservation Measure
	<ul style="list-style-type: none"> • Maintain OWD’s water source and incorporate measures to protect the water’s quality.
Wetlands and Non-Wetland Waters	<p>Wetlands</p> <ul style="list-style-type: none"> • Prepare a Wetland and Stream Delineation Report and obtain concurrence from DSL for the removal-fill activities proposed within jurisdictional features. • Obtain a Joint Permit Application for the DSL wetland removal/fill permit and a USACE Clean Water Act Section 404 permit. • Provide payment to an ILF program to compensate for unavoidable wetland losses. If the ILF program is not available for use, consider on-site mitigation. <p>Non-Wetland Waters</p> <ul style="list-style-type: none"> • Design culverts to meet the FHWA 100-year design criteria.
Vegetation and Wildlife	<p>Vegetation</p> <ul style="list-style-type: none"> • Locate staging areas in existing cleared upland areas where possible. • Following construction, revegetate all disturbed areas with native vegetation. • Install appropriate sediment and erosion control BMPs before construction begins and maintain them in working order throughout the construction period and until vegetation is established. Inspect and repair all BMPs according to the stipulations of applicable permits to maintain the continued effectiveness of the controls. • Ensure fueling or storage of petroleum products complies with permit requirements. Within 100 feet of wetlands or waterbodies do not store fuel, refuel vehicles, or conduct other maintenance activities. • Prior to construction, prepare a hazardous materials spill plan to identify actions to take in the event of a spill. Incorporate preventative measures such as the placement of refueling facilities and the storage and handling of hazardous materials. Prepare an emergency spill plan and keep a spill containment kit on-site at all times to help prevent petroleum products and other chemicals from entering wetlands or water bodies during construction. • Develop a temporary erosion sediment control plan and SWPPP, describing BMPs that would be implemented during construction to minimize construction site erosion and sedimentation into wetlands and waterbodies. • Establish a dewatering and diversion plan for proposed in-water work. • Use gravel or material source sites for road construction or rehabilitation that are free of new weed invader species. Suitable material source sites must be either state-certified as “weed free” or be routinely treated for weed control at least twice during the ideal treatment season when weeds are readily identifiable but before they have gone to seed (July through late August). • Where feasible, conduct weed treatment of all immediately adjacent or affected roads prior to ground-disturbing activities. If the timing of ground-disturbing

Resource	Commitment and/or Conservation Measure
	<p>activities would not allow weed treatment to occur when it would be most effective, complete it in the next treatment season following the disturbance.</p> <ul style="list-style-type: none"> • Clean all road maintenance and off-road equipment prior to entry onto the study area. If operations occur in areas infested with new invaders, clean all equipment prior to moving to new sites. • Seed disturbed areas (including project disturbed cut/fill slopes), with the most current ODOT native, moist site, locally adapted, certified, weed-free seed mix upon activity completion. To comply with ODOT's OAR 603-052-1200 revegetation species used should be source-identified, site-appropriate, and genetically adapted to the study area, when feasible. When reseeding is necessary, seeding would occur during an appropriate season (spring or fall) or weather conditions (at least 2 weeks prior to forecasted cooler, wetter weather) to ensure the most effective germination/establishment. • Use certified weed-free straw for mulching and erosion control. Preferably, local native materials or wood mulch would be used. <p>Wildlife</p> <ul style="list-style-type: none"> • During culvert replacement/installation conduct work in a manner to reduce turbidity and erosion impacts in the project's study area seeps and streams. • Consider installing wildlife signage at areas that may concentrate big-game road crossings (such as the bottom of a drainage, migration or movement route, or well-worn game travel pathway) To alert motorists of the possibility of wildlife on the road at these locations. • Avoid using high-quality big-game forage species (such as buckwheat, timothy, oats, chicory, annual ryegrass, red clover, white clover, perennial ryegrass and crimson clover [Oregon Forest Resources Institute 2013]) to revegetate the road edge so big-game are not attracted to the roadways. • Where possible, locate roads away from streams, lakes, open water wetlands, wetland inclusions, seasonal ponds, seeps and springs whenever possible. • Avoid locating roads below the high water mark of streams, lakes, wetlands, and seasonal ponds whenever possible.
Cultural Resources	<ul style="list-style-type: none"> • After geotechnical drilling, conduct a post-disturbance survey at the drill locations to identify potential buried cultural resources exposed. • Avoid the concrete dam and vault located just outside the APE.
Recreation	<ul style="list-style-type: none"> • Coordinate the construction schedule with OPRD, USFWS, and Tillamook County recreation specialists to post alerts for construction activities that may impact users of recreational facilities. • Use traffic safety signs and flaggers to inform motorists, bicyclists, and pedestrians and to manage traffic during construction activities on affected roads. • Prepare a notice about construction activities and a proposed schedule for posting on ODOT's traffic advisory web site called Trip Check (http://www.tripcheck.com).

Resource	Commitment and/or Conservation Measure
	<ul style="list-style-type: none"> • Install new wayfinding signage to direct travelers to the Refuge, Scenic Viewpoint, Cape Meares, Oceanside, Oregon Coast Trail, and Oregon Coast Bike Route.
Hazardous Materials	<ul style="list-style-type: none"> • Develop procedures for identifying, characterizing, managing, handling, storing, and disposing of contaminated soil and groundwater encountered that would cover all project improvement areas during construction activities. • Dispose contaminated material generated during construction at a facility permitted to accept the material and follow the facility’s applicable guidance. • Develop health and safety plans, to be prepared by the construction contractor, for construction activities. The health and safety plans should be read and signed by all onsite workers accessing the site before each work day. The health and safety plan would identify potential contaminants of concern, required personal protective equipment, and emergency response procedures.
Visual Quality	<ul style="list-style-type: none"> • Following construction, revegetate all disturbed areas with native vegetation.



Chapter 7 References

In-text Citation	Reference
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