United States Department of the Interior

FISH AND WILDLIFE SERVICE

Oregon Coast National Wildlife Refuge Complex
2127 SE Marine Science Drive
Newport, Oregon 97365-5258

April 20, 2009

Subject: Draft Environmental Assessment for the Ni-les'tun Unit of the Bandon Marsh National Wildlife Refuge Wetland Restoration and North Bank Lane Improvement Project.

Dear Interested Parties:

The U.S. Fish and Wildlife Service in cooperation with the Federal Highway Administration (FHWA) are pleased to provide you with a copy of the draft Environmental Assessment (EA) for the Ni-les'tun Unit of the Bandon Marsh National Wildlife Refuge Wetland Restoration and North Bank Lane Improvement Project. The proposed project has two main parts. The first involves the restoration of over 400 acres of tidal marsh at the Ni-les'tun Unit of the Bandon Marsh National Wildlife Refuge (Refuge). The restoration project would be accomplished by removing dikes, filling drainage ditches, and reconstructing tidal channels. The second part of the proposed project is improvements to North Bank Lane between US Highway101 and Randolph Road that would include raising the road and installing fish-friendly culverts at Fahys Creek and Redd Creek.

The purpose of this introductory letter is to announce the availability of the EA and also a Section 4(f) *de minimis* evaluation for public review and comment. The Section 4(f) *de minimis* evaluation pertains to the North Bank Lane improvements, which would impact Refuge lands, a Section 4(f) resource under the Department of Transportation Act of 1966. Because impacts to the Refuge would be minor in nature, the FHWA intends to make a finding of *de minimis* impact to this resource.

You are invited to participate by providing comments and information on the draft EA. Public input will help the U.S. Fish and Wildlife Service decide the best way to restore fish and wildlife habitat at Bandon Marsh NWR. The public is encouraged to comment on this project and draft EA. Written comments must be postmarked by May 13, 2009, and submitted to the below address or they can be submitted via electronic mail to oregoncoast@fws.gov.

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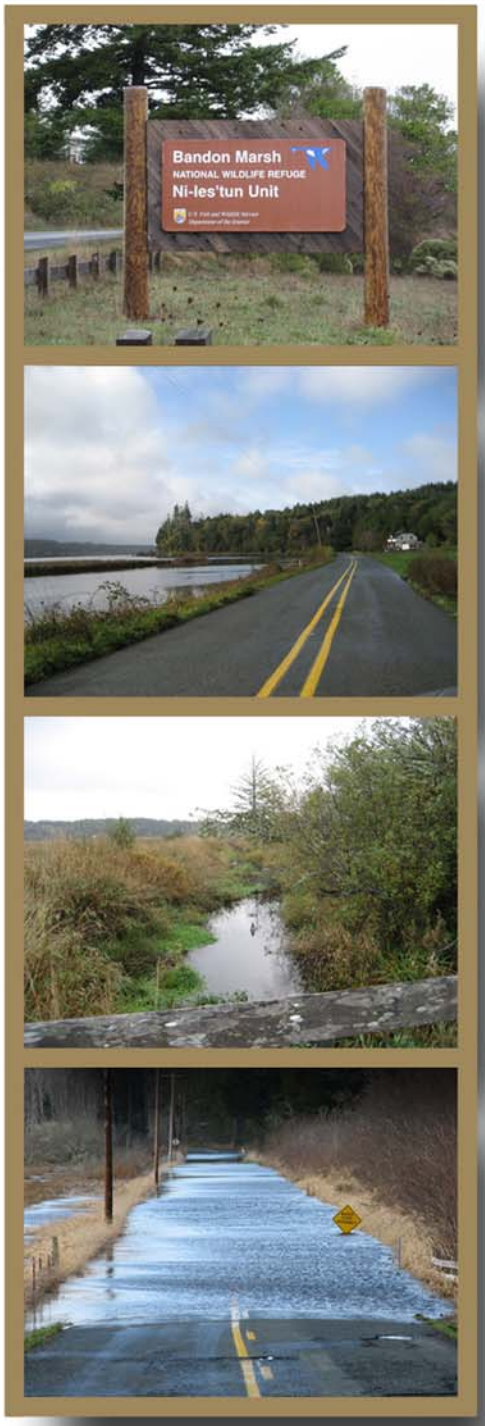
Thank you for your interest in this draft EA.

Sincerely,

Roy W. Lowe

Draft Environmental Assessment for the Ni-les'tun Unit of the Bandon Marsh National Wildlife Refuge Wetland Restoration and North Bank Lane Improvement Project



Prepared by:

U.S. Fish and Wildlife Service

and

Federal Highway Administration
Western Federal Lands Highway Division

April 2009

Prepared pursuant to:
42 U.S.C. 4332(2)(c) and 49 U.S.C. 303

Acronyms and Abbreviations

AASHTO	American Association of State Highway Transportation Officials
BMP	Best Management Practice
BP	Before Present
CCP	Comprehensive Conservation Plan
cfs	Cubic feet per second
CMP	Conceptual Management Plan
Corps	U.S. Army Corps of Engineers
CFR	Code of Federal Regulations
CZMA	Coastal Zone Management Act
DLCD	Oregon Department of Land Conservation and Development
DSL	Oregon Department of State Lands
EA	Environmental Assessment
EFH	Essential Fish Habitat
EO	Executive Order
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
FHWA	Federal Highway Administration (Western Federal Lands)
FR	Federal Register
HEC-RAS	Hydrologic Engineering Centers River Analysis System
LWD	Large Woody Debris
MHHW	Mean Higher High Water
MSA	Magnuson-Stevens Fisheries Conservation and Management Reauthorization Act
NAVD	North American Vertical Datum
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NRHP	National Register of Historic Places
ODEQ	Oregon Department of Environmental Quality
ODFW	Oregon Department of Fish and Wildlife
ODOT	Oregon Department of Transportation
ONHP	Oregon Natural Heritage Program
PCE	Primary Constituent Element
Refuge	Bandon Marsh National Wildlife Refuge
ROW	Right-of-Way
SHPO	State Historic Preservation Office
SLOPES	Standard Local Operating Procedures for Endangered Species
USC	United States Code
USFWS	U.S. Fish and Wildlife Service

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April 2009

Prepared by:

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Federal Highway Administration, Western Federal Lands Division

Prepared pursuant to:

42 U.S.C. 4332(2)(c) and 49 U.S.C. 303

Abstract

In accordance with the National Environmental Policy Act, this environmental assessment discloses the effects of alternatives for the proposed Ni-les'tun Unit of the Bandon Marsh National Wildlife Refuge Wetland Restoration and North Bank Lane Improvement Project in the Bandon Marsh National Wildlife Refuge (Refuge). The Refuge is located along the Coquille River north of the town of Bandon in Coos County, Oregon.

The need for the project is derived from the U.S. Fish and Wildlife Service mission and Refuge-specific goals and objectives to conserve migratory birds, fish, and federally listed endangered and threatened plant and animal species. The purpose of the proposed project to restore wetlands in the Ni-les'tun Unit of the Refuge directly addresses these needs. The proposed project would fully restore more than 400 acres of intertidal marsh, freshwater marsh, and riparian habitat. The existing human-created pasturelands function as unnatural seasonal freshwater wetlands and support a variety of non-native plants. Fully restoring these areas would return historic tidal influence and provide foraging, roosting, and rearing habitat for a suite of wildlife including migratory shorebirds, waterfowl, and anadromous and resident fishes.

North Bank Lane is a two-lane road that bisects the Ni-les'tun Unit and provides access to local residences, businesses, Refuge headquarters, a Refuge scenic overlook, Coos County boat ramp, and other local roads. The need for improvements to North Bank Lane arises because the road floods and becomes impassable at Fahys and Redd creeks when tides or runoff are high.

The purpose of the proposed improvements is to reduce road flooding at Fahys and Redd creeks, permit full implementation of the wetland restoration project, improve the pavement surface, and better accommodate the mixed (bicycle and vehicle) use of the roadway.

The Preferred Alternative would restore full tidal influence to the existing degraded pastures by removing the artificial levees, approximately 15 miles of interior drainage ditches, and three tide gates. The Preferred Alternative would reconstruct creek channels for Fahys, Redd, and No Name creeks. Work on North Bank Lane would include installing fish-friendly culverts at Fahys and Redd creeks and raising the roadway height at both of these locations to lessen flooding. The entire surface from U.S. Highway 101 to Randolph Road would be resurfaced.

The Ni-les'tun Unit is currently leveed and drained pasture that supports a variety of introduced and native plant species. Sensitive resources found in the project area include wetlands, federally threatened Oregon Coast coho salmon, and cultural resources. Degraded wetlands are found throughout the pasture and along North Bank Lane. Adult coho salmon are found in the Coquille River, and juvenile coho salmon rear in both Fahys and Redd creeks. The site has been used for thousands of years by the ancestors of the Coquille Indian Tribe and the Confederated Tribes of the Siletz Indians, and cultural resource sites are within the project area.

The Preferred Alternative is anticipated to have less-than-significant, long-term beneficial impacts to most resources (soil, air, water quality, vegetation, wetlands, and threatened and endangered species). The Preferred Alternative would have less-than-significant short-term adverse impacts to threatened and endangered species. These adverse impacts would occur during construction and be minimized through the implementation of best management practices

and other measures. The Preferred Alternative would have no adverse effects to cultural resources with the implementation of preconstruction cultural resource investigations, short-term construction monitoring, and long-term post construction monitoring. In the context of historic losses of tidal wetland habitat along the Coquille River and continuing habitat loss and degradation resulting from human activities in the area, the beneficial effects associated with the Preferred Alternative are not considered to represent a significant impact.

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Introduction

In accordance with the National Environmental Policy Act (NEPA), this environmental assessment (EA) discloses the effects of alternatives for the proposed Ni-les'tun Unit of the Bandon Marsh National Wildlife Refuge Wetland Restoration and North Bank Lane Improvement Project in the Bandon Marsh National Wildlife Refuge (Refuge). The project is proposed by the U.S. Fish and Wildlife Service (USFWS) in cooperation with the Federal Highway Administration (FHWA)Western Federal Lands Highway Division.

Bandon National Wildlife Refuge–The Ni-les'tun Unit

The Refuge was established in 1983 through Congressional legislation and is managed by the USFWS. The 582-acre Ni-les'tun Unit was acquired by the USFWS between 2000 and 2004 and is located upstream (northeast) of the 307-acre Bandon Marsh Unit of the Refuge (Figure 1). The Ni-les'tun Unit is situated along the northern edge of the Coquille River, east of U.S. Highway 101 (U.S. 101) in Coos County, Oregon. This Refuge Unit extends north of North Bank Lane on the eastern side of U.S. 101 and includes approximately 8 acres of abandoned cranberry bogs adjacent to Fahys Creek and U.S. 101.

The Ni-les'tun Unit was historically a tidal wetland. It was leveed and drained for agricultural purposes in the late 19th or early 20th century. Currently, approximately 70 percent (more than 400 acres) of the Unit consists of degraded leveed pasture. The remaining 30 percent of the Unit is intertidal marsh, forested wetlands, upland forest, upland pasture, and abandoned cranberry bogs (Figure 2). The USFWS purchased this land for the purposes of restoring the tidal wetlands for anadromous fish and migratory birds and providing opportunities for wildlife-dependent public uses. Public access to the Ni-les'tun Unit is provided at the Ni-les'tun Unit scenic overlook off of North Bank Lane.

The National Wildlife Refuge System Administration Act of 1966 as amended by the National Wildlife Refuge System Improvement Act of 1997 requires that a Comprehensive Conservation Plan (CCP) be prepared for all National Wildlife Refuges. The CCP for the Refuge is scheduled for completion in 2012. The planning process for the CCP will include consideration and analysis of public access and authorized recreation on the Ni-les'tun Unit. Until then, the Conceptual Management Plan (CMP) (USFWS 1999a) provides an interim guide for managing the Ni-les'tun Unit. The CMP was developed in 1999 and provides the framework for managing the Ni-les'tun Unit, including fish and wildlife and their habitats, public use, facilities, public outreach, and law enforcement. One of the primary goals of the CMP is to protect, restore, and develop habitat for fish, migratory birds, wildlife, and plants. In addition, the CMP establishes goals to protect, restore, and develop habitat that would support the recovery of species listed as federally threatened and endangered under the Endangered Species Act (ESA), particularly the protection and restoration of habitat for anadromous fish. Finally, the CMP establishes a goal to provide wildlife-dependent recreational opportunities for the public.

North Bank Lane

Access to the Ni-les'tun Unit is provided by North Bank Lane. Randolph Road accesses the general Refuge area from the north, but only North Bank Lane accesses the Refuge

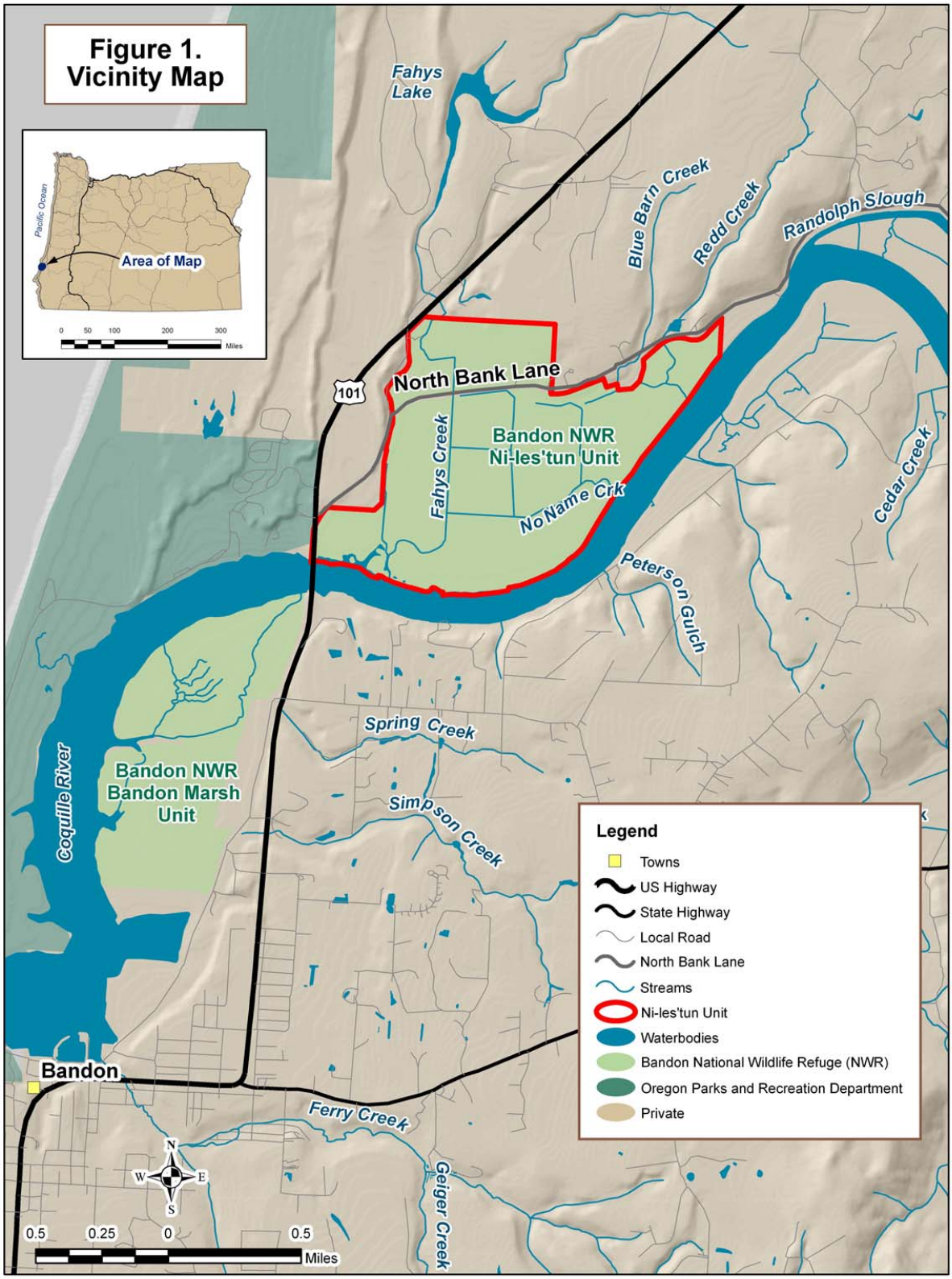
Figure 1.
Vicinity Map
Pacific Ocean
Area of Map
0 50 100 200 300
Miles
Fahys Lake
Blue Barn Creek
Redd Creek
Randolph Slough
North Bank Lane
101
Bandon NWR
Ni-les'tun Unit
Fahys Creek
No Name Crk
Cedar Creek
Peterson Gulch
Spring Creek
Simpson Creek
Coquille River
Bandon NWR
Bandon Marsh
Unit
Bandon
Ferry Creek
Geiger Creek
N
W
E
S
0.5 0.25 0 0.5
Miles
Legend
Towns
US Highway
State Highway
Local Road
North Bank Lane
Streams
Ni-les'tun Unit
Waterbodies
Bandon National Wildlife Refuge (NWR)
Oregon Parks and Recreation Department
Private

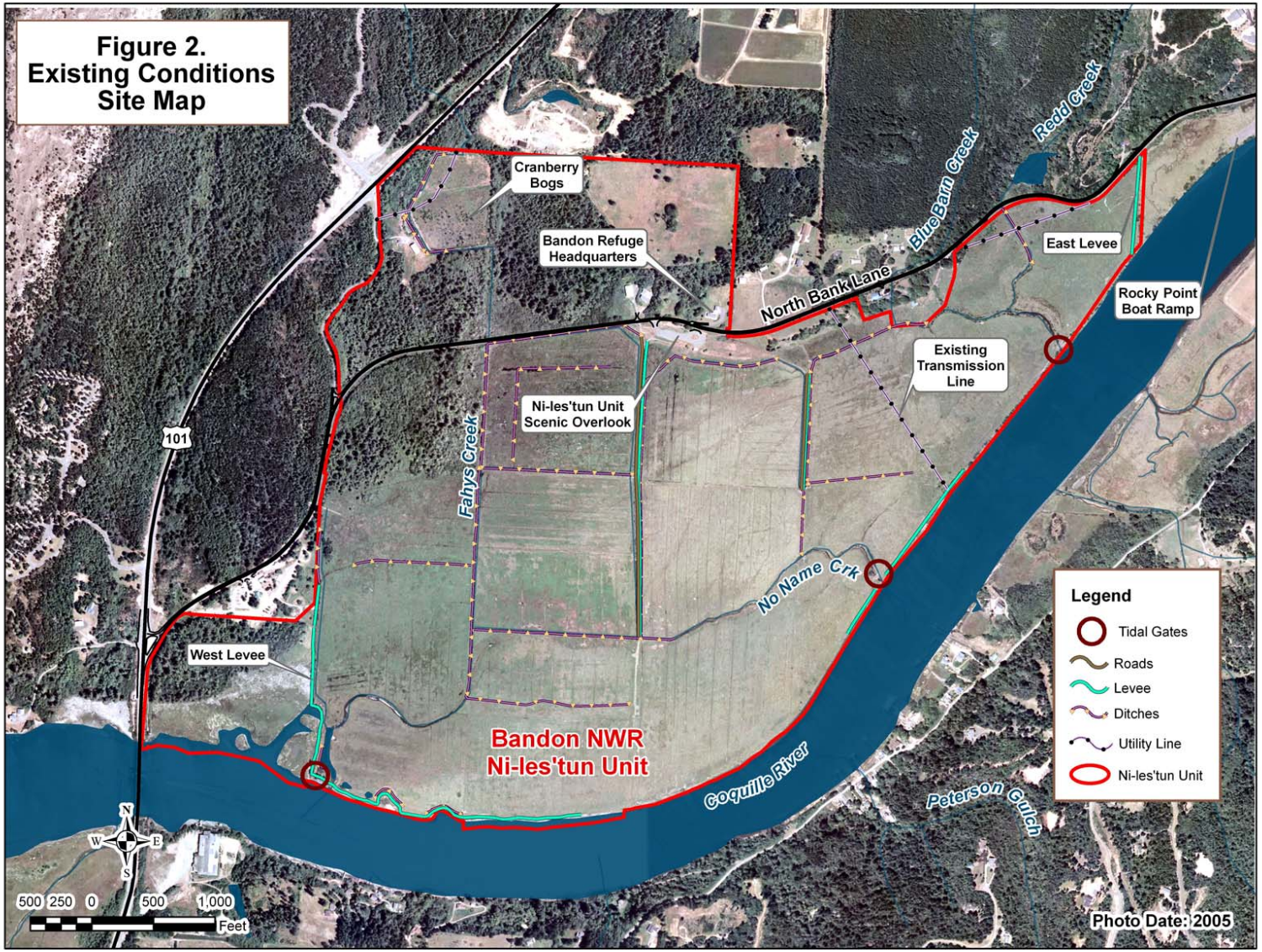
Figure 2.
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Cranberry Bogs
Bandon Refuge Headquarters
North Bank Lane
Blue Barn Creek
Redd Creek
East Levee
Rocky Point Boat Ramp
Existing Transmission Line
Ni-les'tun Unit Scenic Overlook
Fahys Creek
101
No Name Crk
West Levee
Bandon NWR
Ni-les'tun Unit
Coquille River
Peterson Gulch
Legend
Tidal Gates
Roads
Levee
Ditches
Utility Line
Ni-les'tun Unit
N
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500 250 0 500 1,000
Feet
Photo Date: 2005

administrative facilities and scenic overlook. North Bank Lane extends from U.S. 101 along a portion of the north bank of the Coquille River (Figure 2). The road is classified as a rural collector and is owned and maintained by Coos County. Within the Ni-les'tun Unit, North Bank Lane crosses Redd and Fahys creeks, over hydraulically undersized culverts, and periodically floods at these locations during winter storms and other flooding events caused by high tide and river levels.

Chapter 1
Need for and Purpose of Action

This chapter describes the need for and purpose of the project. It also discusses the state, federal, local, and tribal agencies or organizations with regulatory or coordination authority over the project.

1.1 Need and Purpose

1.1.1 Ni-les'tun Unit Wetland Restoration

The need for the project is generated by the mission of the USFWS and by Refuge-specific goals and objectives. The mission of the National Wildlife Refuge System is to preserve a network of lands and waters for the conservation and management of fish, wildlife, and plant resources of the United States for the benefit of present and future generations. The USFWS is the primary federal agency responsible for migratory birds, endangered plants and animals, certain marine mammals, and anadromous fish. The goals for the Refuge, set forth in Public Law 97-137, are directly linked to the overall USFWS mission and include:

- Preserve and enhance highly significant wildlife habitat
- Protect migratory waterfowl, shorebirds, and fish
- Provide opportunities for wildlife-oriented recreation and nature study (USFWS 1999a)

These specific goals are reflected in the Ni-les'tun Unit's CMP, which requires actions to support the recovery of federally listed species, to improve habitat for migratory birds, to improve habitat for anadromous and resident fish, and to provide the public with high-quality wildlife-dependent recreational opportunities (USFWS 1999a).

This mission and the accompanying goals and objectives drive the purpose for the proposed project, which is to restore the wetlands in the Ni-les'tun Unit of the Refuge. Though historically a tidal marsh, the Ni-les'tun Unit currently consists of degraded wetlands and pasture separated from the Coquille River by levees and drained by approximately 15 miles of ditches (Figure 2). No functioning tidal channel network exists on this Unit of the Refuge. The proposed project would fully restore intertidal marsh, freshwater marsh, and riparian habitat values and functions lost when the site was converted to pasture. The restored marsh and riparian areas would provide:

- Foraging and roosting habitat for migratory and resident birds
- Foraging and nursery habitat for anadromous and estuarine dependent marine fishes
- Increased future compatible wildlife-dependent recreational opportunities for the public

1.1.2 North Bank Lane Improvements

A number of problems associated with North Bank Lane drive the need for the road portion of the proposed project. First, North Bank Lane floods at least annually at the low elevation crossings of Fahys and Redd creeks during winter storms.[1] Flooding events are especially severe when combined with winter high tides during which North Bank Lane can remain submerged for

[1] Flooding of North Bank Lane also occurs near Randolph Road, but is not addressed by the proposed project.

days at a time. Associated concerns are pollution caused by floodwaters carrying contaminant-laden water from the roadway. Road flooding also results in public safety issues by impeding access to Refuge facilities, private businesses, and homes on North Bank Lane. Motorists attempting to drive through the flooded areas may misjudge the roadway edge and drive into deeper waters. A submerged roadway affects the integrity of the road fill and road surface. The water leaches out subgrade materials and causes the road to settle unevenly, creating sunken grades. This uneven road surface is further compounded by the existing deteriorating pavement. As the roadbed settles, accelerating the deterioration of the road surface, more potholes and pavement raveling will occur. This poor road surface condition and uneven roadbed results in unsafe driving conditions.

Second, there is concern that North Bank Lane flooding at Fahys and Redd creeks may become more frequent or severe once the levees along the Coquille River are removed for tidal wetland restoration. The road elevation at Fahys and Redd creeks is 9.7 feet and 10.8 feet, respectively, and the levees along the Coquille River are 9.0 feet to 12.5 feet. The levees do not directly protect the roadway from flooding because portions of the levees are lower in elevation than the lowest sections of road that experience flooding; however, the levees have a “muting” effect, meaning that they slow or reduce the severity of roadway flooding. The removal of the levees for wetland restoration would increase the speed of the water reaching the roadway, especially during high tides combined with high river levels.

Third, on the current North Bank Lane, it is difficult to accommodate the mix of motorized and non-motorized vehicular uses. Cars, trucks, vehicles towing boats, motorcyclists, bicyclists, and pedestrians all use the road, which is designated as part of the Charleston to Bandon State Scenic Tour Route. In its current condition, in some sections the narrow road is without shoulders for bicycle or pedestrian use.

Fourth, and importantly for wildlife, the roadway culverts at Fahys and Redd creeks are hydraulically too small and limit fish passage. The culvert diameters restrict flows during high freshwater input caused by winter storms and results in road flooding that impacts the safety of motorists and causes further deterioration of the roadbed. The small-diameter culverts mute high tide flows to the north side of the road, thus reducing the amount of tidally influenced habitat available for fish and wildlife. The small-diameter culverts are also frequently impacted by beavers building dams, further restricting the flow and increasing road flooding.

Based on the safety, structural, and fish passage issues associated with North Bank Lane, the purposes of the proposed roadway improvements are to reduce the severity and frequency of flooding at Fahys Creek and Redd Creek; improve the pavement surface; more safely accommodate motorized and non-motorized uses on the roadway; and improve fish passage at Fahys and Redd creeks. The wildlife benefits associated with road improvements will be increased fish passage for anadromous species and the restoration of tidally influenced habitat for both fish and wildlife.

1.2 Agencies with Jurisdiction and Coordination Requirements

The USFWS and FHWA are required to coordinate and consult with a number of local, state, and federal agencies, and Tribes (Table 1). Coordination and consultation is underway, and numerous discussions and meetings have included the following agencies, Tribes, and organizations: Coos County Commissioners, Department of Public Works, U.S. Army Corps of

Engineers (Corps), Oregon Department of Environmental Quality (DEQ), National Marine Fisheries Service (NMFS), Oregon Department of State Lands (DSL), Oregon State Historic Preservation Office (SHPO), Oregon Department of Fish and Wildlife (ODFW), the Coquille Indian Tribe, Confederated Tribes of the Siletz Indians, Coos-Curry Electric Cooperative, Pacific Power and Electric, and Verizon Telephone. Details of the coordination and consultation process and status are in Chapter 5.

Table 1. Agencies and Organizations with Permitting or Consultation Requirements

Organization	Permit or Required Consultation
Corps	Clean Water Act Section 404 Permit Rivers and Harbors Act Section 10 Permit
Oregon DSL	Removal-Fill Permit
Oregon DEQ	Clean Water Act Section 401 Certification Clean Water Act Section 402 National Pollution Discharge Elimination System Permit
Coquille Indian Tribe	Consultation on impacts to resources of interest to Tribe
Confederated Tribes of the Siletz Indians	Consultation on impacts to resources of interest to Tribe
Coos-Curry Electric Cooperative	Relocation of utilities within the project area
Coos County Department of Public Works	Acceptance of right-of-way (ROW) easement on Refuge
SHPO	Consultation on potential impacts to historic properties
NMFS	ESA Section 7 Consultation
Oregon Department of Land Conservation and Development	Coastal Zone Certification
USFWS Ecological Services Division	ESA Section 7 Consultation
USFWS Refuges Division	ROW Issuance
Verizon Telephone/Pacific Power and Electric	Relocation of utilities along North Bank Lane

Chapter 2
Alternatives, Including the Preferred Alternative

This chapter describes the alternatives considered for the project; these include No Action Alternative, the Preferred Alternative, and Alternatives Considered But Not Forwarded for Detailed Analysis. The No Action and Preferred alternatives are carried forward for further analysis in Chapters 3 and 4. NEPA requires analysis of the No Action Alternative to provide the reader an understanding of baseline conditions without the proposed federal action and how these compare to the effects resulting from the federal action. Section 2.3 describes other alternatives that were considered to meet the need and purpose described in Chapter 1 and the reasons they were not carried forward for further detailed analysis in Chapter 3.

2.1 No Action Alternative

2.1.1 Wetland Restoration

Under the No Action Alternative, the USFWS would not restore 400 acres of tidal wetlands as detailed in the EA and Land Protection Plan (USFWS 1999b) for the acquisition of the Ni-les'tun Unit of the Bandon Marsh National Wildlife Refuge. This Unit of the Refuge would remain as converted tidal wetlands that are currently degraded leveed pasture and provide limited habitat for fish and wildlife (Figure 2). The lack of restoration would not assist the USFWS in meeting its publicly mandated missions to assist in the recovery of threatened and endangered species and preserve and enhance wildlife habitat.

The irrigation ditches would remain on the project area and would continue to convey water from Fahys and Redd creeks, drain wetland habitat, and provide limited nursery habitat for resident and migratory fish and wildlife. Levees and tide gates on small channels and Fahys and Redd creeks would continue to isolate the project area from tidal inundation by the Coquille River, thus restricting fish and wildlife use of nearly 400 acres of historically available salt marsh.

The flow of water within culverts under North Bank Lane at Fahys and Redd creeks would remain impacted by beaver activity, and fish passage conditions would remain inadequate. Plugged culverts would continue to impede fish passage to the limited available habitats upstream of the road and necessitate ongoing management to control beaver populations to reduce their impact to North Bank Lane. North Bank Lane at Fahys Creek would continue to erode as the culvert fails, creating safety hazards for motorists and eventually requiring Coos County to undertake emergency repairs to keep the road open.

2.1.2 Roadway

Under the No Action Alternative, North Bank Lane would remain at its current elevation and would continue to be subject to routine flooding, creating safety concerns for motorists. The culverts under North Bank Lane that convey flow from Fahys and Redd creeks would remain undersized, would be impacted by beaver activity, and would continue to exacerbate flooding of North Bank Lane during high rainfall events and during high river levels. Stormwater would continue to carry contaminant-laden waste from the roadway into local streams and wetlands, degrading water and habitat quality. As the roadway and culverts go untreated, the condition of North Bank Lane's pavement and subgrade will continue to deteriorate from routine flooding,

resulting in increasing maintenance costs for Coos County and reduced safety for roadway users. The mix of roadway users will continue to be a concern, with pedestrians and bicyclists continuing to use the travel ways because no shoulders are available. By not addressing the roadway culverts, the USFWS will be unable to fully implement its restoration plan and fulfill the goals for the Refuge set forth in the legislation that created the Ni-les'tun Unit of the Refuge.

2.2 Preferred Alternative

The Preferred Alternative has two major components, which discussed in detail in the sections below. These components are (1) the restoration of more than 400 acres of tidal wetlands on the Ni-les'tun Unit, and (2) the improvement of North Bank Lane from its intersection with U.S. 101 to Randolph Road (Figure 3). The road improvements are proposed concurrently with the wetland restoration because the proposed removal of the levees would remove the muting effect on flooding of North Bank Lane, thus necessitating concurrent improvements to North Bank Lane.

2.2.1 Wetland Restoration

The wetland restoration project would occur in two phases, tentatively scheduled to be implemented in 2009 and 2010. In Phase I, the USFWS would work almost exclusively on the interior side of the levees to prepare the site, remove existing irrigation ditches, and create new tidal channels (Figure 3). In Phase II, the levees currently separating the Refuge lands from the Coquille River would be removed, channels would be connected to the river to allow for tidal inundation, levees that protect private property would be improved, tide gates would be removed, and restoration activities at the abandoned cranberry bogs would be completed (Figure 3). The discussion below details the work to be conducted during each phase.

Phase I

Phase I is anticipated to be completed in 1 year and would occur primarily behind the north side of the levees. Restoration of high-quality estuarine habitat would require filling or removing 15 miles of interior drainage ditches. Minor ditches would be removed by discing, and larger channels would be manipulated as needed to maintain drainage until Phase II. Some of the new tidal channels for Fahys, Redd, and No Name creeks would be constructed to facilitate full tidal function of the site after restoration is complete.

Aside from minor changes to tide gate operations, no work on the Coquille River side of the levees would occur under Phase I. All restoration work required for Phase I would occur in drained or ditched locations behind the levees. The sections below describe the specific work to be conducted during Phase I.

Pre-construction: Pre-construction activities would include mobilization of crews, equipment, and supplies. Preliminary erosion control measures would be established, and construction staking installed. Cattle grazing, currently used to control vegetation, would be followed by mowing after cattle are removed from the site.

Site Preparation: Site preparation would focus on maintaining and enhancing the isolation of the interior from the effects of tidal influence to allow restoration work to proceed under relatively dry conditions. To do this, crews would maintain selected ditches to allow for continued drainage of the site, install three temporary crossings on drainage ditches and ditched portions of Fahys

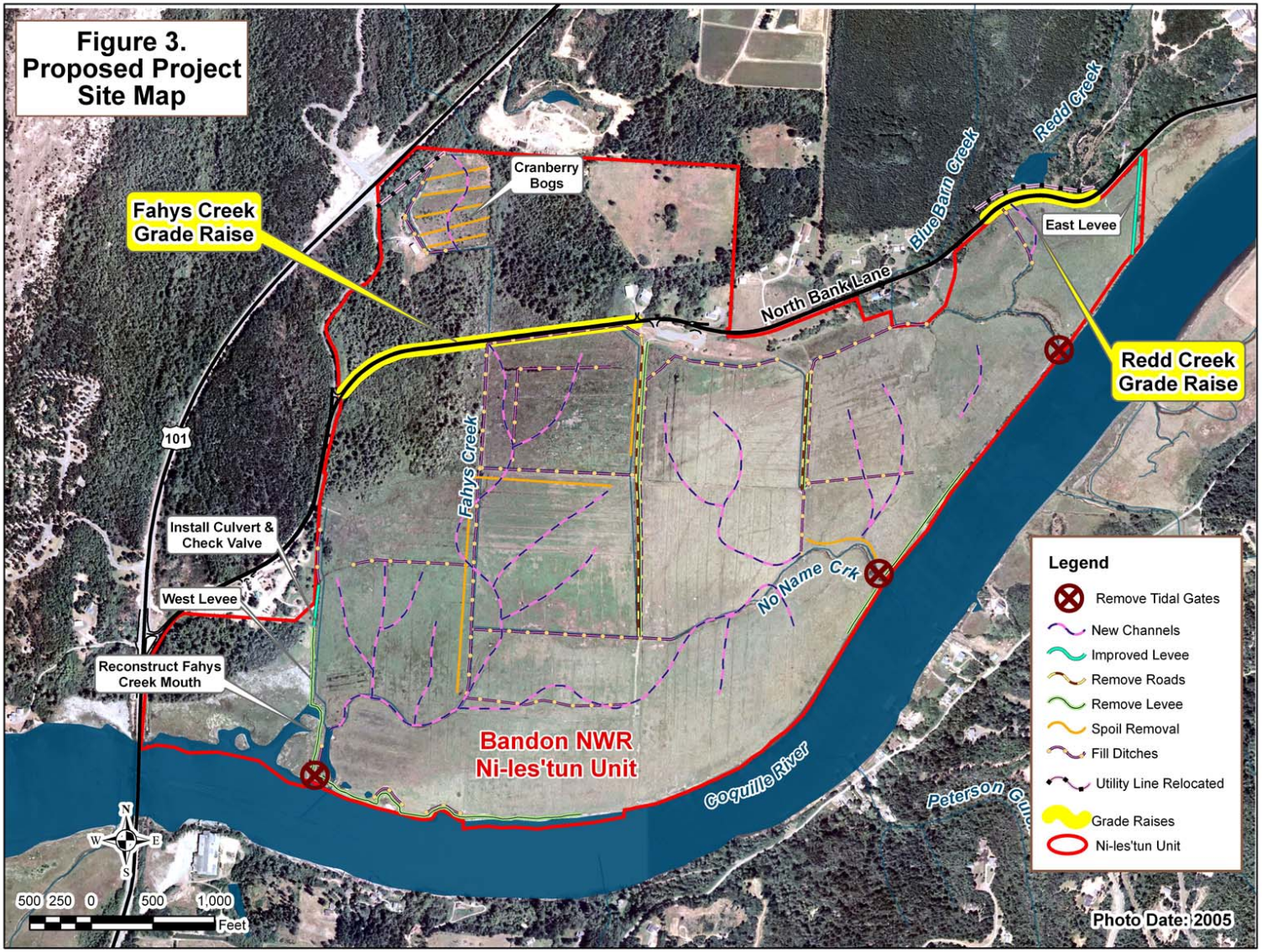


Figure 3.
Proposed Project
Site Map
Fahys Creek
Grade Raise
Cranberry
Bogs
Redd Creek
Blue Barn Creek
East Levee
North Bank Lane
Redd Creek
Grade Raise
101
Fahys Creek
Install Culvert &
Check Valve
West Levee
No Name Crk
Reconstruct Fahys
Creek Mouth
Bandon NWR
Ni-les'tun Unit
Coquille River
Peterson Gu
Legend
Remove Tidal Gates
New Channels
Improved Levee
Remove Roads
Remove Levee
Spoil Removal
Fill Ditches
Utility Line Relocated
Grade Raises
Ni-les'tun Unit
N
W
E
S
500 250 0 500 1,000
Feet
Photo Date: 2005

Creek, close the tide gate on Fahys Creek and the fish flap[2] on Redd Creek tide gate, re-install a temporary tide gate on No Name Creek, plug minor ditches, and create a construction access from North Bank Lane at the northwest pasture. Fish relocation would occur at all sites before dewatering. Crews would remove existing fencing and irrigation pipes.

Discing: Using a tractor-pulled disc, crews would disc the pasture areas diagonally to remove approximately 11.2 miles of the small interior ditches. Some wet areas may not be accessible to heavy equipment.

Earthwork: In areas too wet to disc, ditches would be filled with soil obtained on site. The major perimeter ditch drainage system would be maintained until Phase II to allow for normal site drainage over the intervening winter. Selected new tidal channels would be excavated during dry conditions and connected to major channels as they are completed. Completing the new channel without flooding it during construction would prevent fish entrapment, thus eliminating the chance of direct construction-related fish mortality. Other earthwork would involve repair or fill of areas where material was borrowed to create the existing river levees.

Demobilization: Demobilization for Phase I includes final grading, cleanup, seeding of disced areas with native plants and cover crops to allow vegetation establishment before full restoration and to reduce erosion, and opening all tide gates and water control structures.

Phase II

Phase II work is anticipated to be completed in 1 year and would involve final ditch filling, tidal channel excavation, and the removal of artificial river levees, all tide gates, and water control structures on the Coquille River, and unpaved roads. The mouth of Fahys Creek would be reconfigured to connect the creek to the Coquille River in what is believed to be its historical location. Levees would be enhanced on the east and west ends of the project site to protect against flooding of private property adjacent to the Refuge. The other major element that would occur under Phase II is the complete restoration of the abandoned cranberry bogs north of North Bank Lane; this element would also include the construction of new creek channels. The sections below describe the specific work to be conducted during Phase II.

Pre-construction: Pre-construction activities for Phase II would include coordinating with the FHWA on the road reconstruction schedule (Section 2.2.2), mobilizing equipment and crews, establishing erosion and traffic control measures, installing final construction staking, and removing fish from remaining ditches, if necessary. Large woody debris (LWD) would be hauled to the project area and stockpiled and Refuge boundaries demarcated.

Site Preparation: Site preparation for Phase II would involve closing all tide gates and water control structures on the Coquille River.

Interior Work: All interior work would be completed before the perimeter levee is removed. This work would include installing three additional temporary crossings over major ditches as required to move crews and equipment over the ditches and installing construction access at two additional locations. When new tidal channels have been created, LWD would be placed in the channels to create structural habitat complexity for fish and other wildlife.

[2] A fish flap is a secondary opening in the tide gate that is designed to facilitate passage of fish through the tide gate over a wide range of tidal conditions.

Ditches and Tidal Channels: Activities related to the tidal channels would include excavating new tidal channels and the new north Redd Creek channel to connect the upland watershed drainage. Tidal channel geometry and layout design are based on a study of reference wetlands in four Oregon estuaries (So et al. 2009 in prep). Design parameters for tidal channels included channel length, width, depth, sinuosity, placement within the drainage network (or channel order), and drainage basin area. LWD would be installed in restored channels to add physical complexity to fish and wildlife habitat. Two ground surface elevation watershed divides would be installed to delineate tidal drainage basins and maintain tidal channel functions.

Adjacent Property Protection: Degraded levees existing at the east and west boundaries of the Refuge would be enhanced to protect adjacent private property. On the west boundary levee, a culvert with a check valve would be placed on a small non-fish bearing drainage ditch to protect adjacent private property.

Utility Relocation: The power and phone lines that parallel North Bank Lane extend into the Refuge in several locations. All of these lines would be relocated to within the Coos County-maintained North Bank Lane ROW. The major transmission line that spans the Coquille River and crosses the Ni-les'tun Unit would be buried below the river and the restoration site. The buried line would remain within the existing transmission line ROW.

Fahys Creek: Activities to be conducted in the ditched portion of Fahys Creek would include removing the tide gate and replacing it with an earthen plug capped with riprap at the existing mouth, and excavating the new Fahys Creek channel in what is believed to be the location of the historical channel. Fish would then be removed from the existing plugged ditch and the flow diverted from the ditch to the new creek channel. After dewatering, the ditch would be filled with onsite soils. Large woody debris would be installed in the restored creek channel for fish and wildlife habitat complexity.

Miscellaneous Removals: All fences, irrigation pipes, interior culverts, debris, and pilings would be removed from the site.

Final Removals: Restoration would be completed by removing unpaved roads, artificial river levees, tide gates, water control structures, and temporary ditch crossings. Levees and tide gates would be removed in stages relative to the monthly tidal cycle to maintain dry working conditions. The bulk of the levee material would be removed first, leaving enough of a levee lip to protect the site from the current tidal level; this lip would then be removed during the low tide cycle of the month. Any in-water work would be performed during low incoming tide to reduce sedimentation and to be in compliance with the State of Oregon's in-water work period for estuaries (ODFW 2008). The existing tide gates would be salvaged.

Access Improvements: To provide opportunity for the USFWS access to the restored area, a short portion of the existing gravel road would be re-sculpted adjacent to a restored tidal channel. No additional fill would be needed to re-sculpt the road.

Demobilization: Demobilization would include removing temporary crossings, final grading, site cleanup, and seeding of non-tidal areas. Demobilization would also include removing access sites and restoring staging areas to pre-project conditions.

Cranberry Bogs: The abandoned cranberry bogs site (Figure 3) is separated from the main restoration area on the Ni-les'tun Unit by North Bank Lane. Fahys Creek crosses under North Bank Lane and flows through a ditch on the perimeter of the bogs. Work on this project element

would occur simultaneously with Phase II work. Activities at the cranberry bogs would proceed in three steps. Step 1, site preparation, would include clearing brush, relocating utilities, salvaging willows and sedges from existing abandoned bogs, and removing pipes and watering system structures. Utility road access to pole locations would be provided, and utility lines currently running through the bogs would be moved to the west, outside of the bogs perimeter. Step 2 would include grading the bogs to a more natural wetland contour, filling the west irrigation ditches and water storage pond, excavating a new channel for Fahys Creek, installing grade control rock, and installing LWD. Step 3 would include planting salvaged willow and sedge clumps on channel banks, diverting flow from the ditch to the new meandering creek channel, and plugging the upper end of the old ditch.

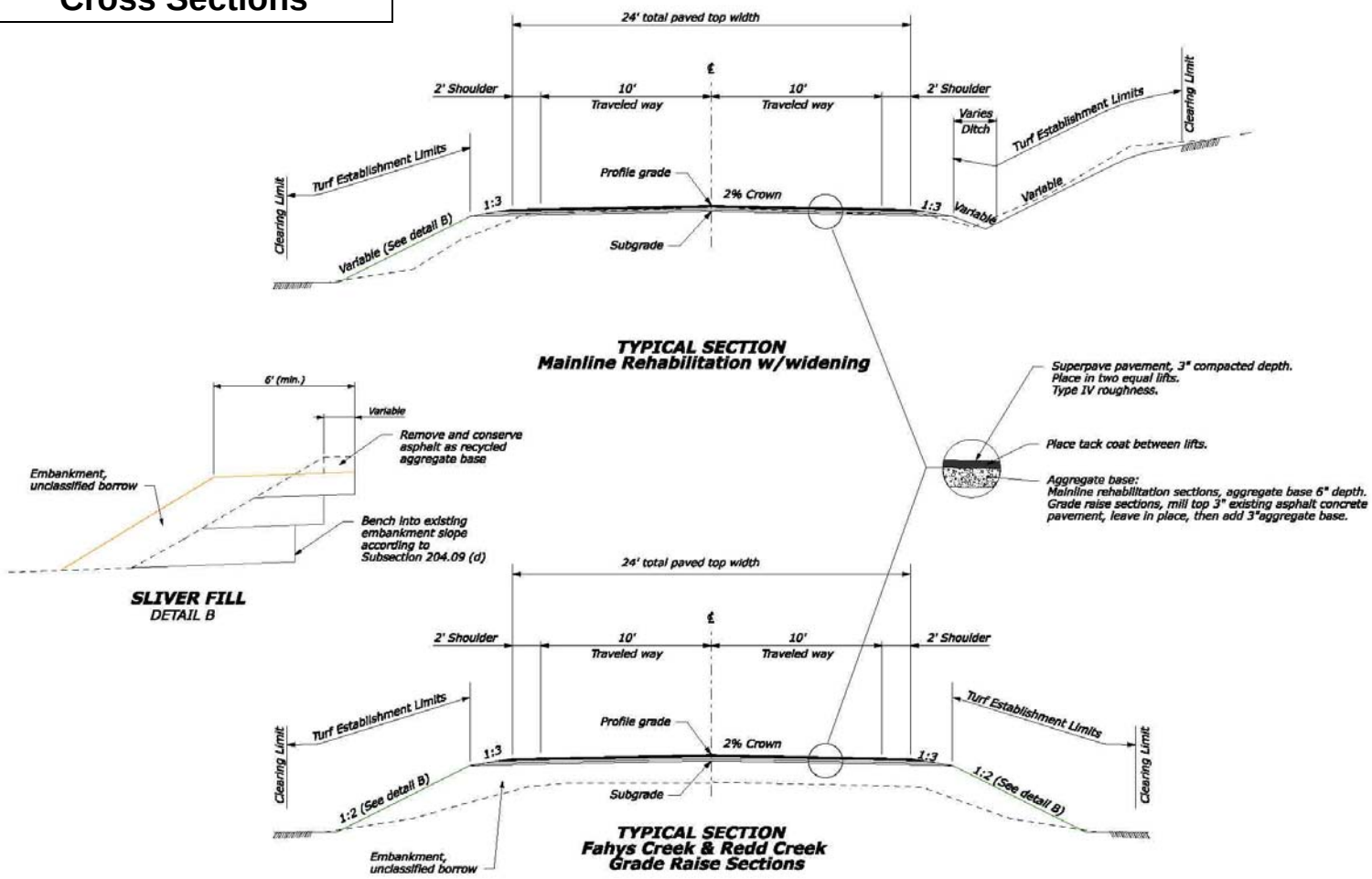
2.2.2 Roadway

Construction work on North Bank Lane would occur in 2010 and 2011 and would include work from the intersection of North Bank Lane and U.S. 101 to the intersection of Randolph Road and North Bank Lane, a distance of about 2.5 miles. The proposed work would involve minor road widening to meet American Association of State Highway Transportation Officials (AASHTO) recommended standards, improving the road surface, raising the road elevation to reduce roadway flooding at Fahys and Redd creeks, replacing culverts at the two creeks, relocating utilities that are impacted by the work to within the ROW, and improving drainage. The resulting roadway from the intersection of North Bank Lane and U.S. 101 to the County boat ramp would have a total paved width of 22 to 24 feet with 10-foot-wide travel lanes and 1- to 2-foot-wide shoulders (Figure 4). These dimensions fit on the existing roadway bench because the existing bench in many locations is at a maximum of 26 feet. From the County boat ramp to the intersection of Randolph Road and North Bank Lane, a pavement overlay would be applied to match the existing roadway width. Because the roadway design fits well within the existing bench, the need for cutting and filling would be minimized. The exception is at Fahys Creek and Redd Creek where the need for fill is generated not from the horizontal width of the roadway but from the vertical rise needed to elevate the road to reduce flooding (Figure 3). All road construction activities would occur within County ROW or on easements granted by the USFWS across Refuge lands. Acquisition of private property for a road ROW would not be required.

Work is anticipated to begin in the spring of 2010 and continue through the fall, with final paving occurring during the summer of 2011. To minimize fish mortality, work within the active stream channels would occur during the in-water work window as specified by the ODFW (2008) (July 1 through September 30). Elevation of these two areas of North Bank Lane and replacement of the culverts would need to occur before the tide gates and levees are removed to complete the Phase II restoration activities discussed above.

The Fahys Creek grade raise would extend a distance of approximately 2,650 feet, beginning about 0.68 mile east of the U.S. 101 intersection. This grade raise would be between 2 feet to 7 feet above the current grade. This effort would include installing a 15-foot by 10-foot-diameter arch culvert countersunk approximately 3.5 feet. This culvert would be sized to pass flows of up to 700 cubic feet per second (cfs) and improve fish passage. The culvert would be embedded in the stream channel to provide a natural bottom. During construction, a temporary diversion would be put in place to maintain stream flows. It would be necessary to close North Bank Lane at Fahys Creek for up to three weeks during construction. This closure would be coordinated

Figure 4.
Typical Roadway
Cross Sections



with Coos County, and access to local residences and businesses would be maintained through Randolph Road and the eastern portions of North Bank Lane.

The Redd Creek grade raise would extend a distance of approximately 900 feet beginning 1.8 miles east of the U.S. 101 intersection. This effort would include installing a 10-foot-diameter arch culvert. The culvert would be installed in what is believed to be the historic Redd Creek channel about 110 feet east of the current culvert. A new stream channel would be reconstructed on the north and south sides of the road to meet the new culvert crossing. This culvert would be sized to improve fish passage and pass flows of up to 280 cfs. Like Fahys Creek, the culvert would be embedded in the stream channel to provide a natural bottom. A temporary road closure at Redd Creek for up to two weeks may be needed to install the culvert at Redd Creek.

The entire length of North Bank Lane from the intersection with U.S. 101 east to the intersection of Randolph Road would be re-surfaced with asphalt concrete pavement and striped. The primary staging area for most of this work would be the USFWS Refuge office parking area, the existing scenic overlook parking area, or the staging areas used for the restoration activities. Staging areas would be restored either by the FHWA or the USFWS to pre-project conditions after completion of the project's roadway portion.

Minor cross drain culverts would be cleaned or replaced and extended where needed. The easternmost of the existing cattle underpasses would be removed. The second western underpass, adjacent to the scenic overlook, may be improved for potential future use as a pedestrian underpass. Permanent stormwater treatment would be incorporated into the project and would consist of vegetated swales, filter strips, and natural sand infiltration. Roadway widening and grade raising would require relocating approximately 17 utility poles and may require temporary relocation of underground telephone lines. Relocation of the utility poles would need to occur before the roadway reconstruction. Roadway widening and culvert replacement may require relocating junction pedestals and cabinets for existing fiber optic and copper cables. Relocating these underground utilities would require coordinating with roadway reconstruction activities. Except for the road closure at Fahys and possibly Redd creeks, public use of the road would be maintained with up to 30-minute delays.

2.3 Alternatives Considered But Not Forwarded for Detailed Analysis

2.3.1 Wetland Restoration

Several options were considered during the development of the proposed restoration project. The discussion below summarizes alternatives that were considered but dismissed. Because the restoration project is complex, the alternatives are separated by major restoration element (tidal wetlands, ditches, and tidal channel formation).

Tidal Wetland Restoration

Tidal Restoration Alternative 1: Construct Freshwater Wetlands. This alternative was not forwarded for detailed analysis because freshwater wetlands did not historically occur within the proposed tidal restoration project area. Before construction of the levees that separate the site from the Coquille River, the area was tidal salt marsh and mudflat habitat. Construction of freshwater wetlands would involve water control structures, active management, and possible fish passage and entrapment issues. Most importantly, the creation of freshwater wetlands would

not meet the primary mission of the USFWS to restore wildlife habitat because this type of degraded habitat would not meet wildlife requirements for migratory waterfowl, shorebirds, or anadromous fish within the Ni-les'tun Unit. This alternative, therefore, would not meet the need and purpose of the project.

Ditch Alteration

Ditch Alteration Alternative 1: Fill Ditches. Under this alternative, the ditches within the project area would be completely filled and no site drainage would be created. This alternative was not forwarded for detailed analysis because the costs would be prohibitive and because it would create additional impacts compared to the Preferred Alternative. Importing non-native material to fill the ditches could transport invasive species; soil contamination is also a concern. Additionally, procuring appropriate soils capable of supporting wetland plants in continually saturated conditions would be difficult. This alternative was removed from further consideration because it is not practicable.

Ditch Alteration Alternative 2: Plug Ditch Mouths. This alternative would plug the ditch mouths, but leave the ditches open (not filled). This alternative would likely result in adverse impacts to fish by trapping them in the open ditches during routine tidal inundation of the site. If trapped fish are not promptly removed, they die. Additionally, ditch plugs could fail and the marsh could be drained. These resulting effects undermine the USFWS mission to provide habitat that protects waterfowl, shorebirds, or fish. This alternative would not meet the need and purpose of the project and, therefore, was not forwarded for detailed analysis.

Tidal Channels

Tidal Channel Alternative 1: Excavate Tidal Channels. Under this alternative, a complete complex network of tidal channels would be excavated on the project site. This alternative was not forwarded for detailed analysis because excavating full tidal channels is cost prohibitive. The Preferred Alternative would excavate tidal channels, but only the larger main channels in the restored marsh. The fine dendritic network of small first and second order channels that typify a mudflat or salt marsh are not practical to accurately design or excavate. A substantial amount of material would be generated by the excavation, which would, in turn, generate trucking and disposal costs. Technically, this alternative would meet the need and purpose of the project, but it would not be practicable, either from an economic or engineering aspect.

Tidal Channel Alternative 2: Natural Erosion of Tidal Channels. Under this alternative, the levees would be removed and natural processes would be allowed to form the tidal channel network. This alternative was considered but not forwarded for detailed analysis for two reasons. First, natural tidal channels are formed more from accretion than erosion. The estuary is a low-energy environment, and the time frame for natural tidal channel erosion or accretion to occur is too long to benefit fish and wildlife habitat needs in the short term. Second, the extensive ditch system provides a basis to re-establish an undesirable rectilinear pattern within the project area. Linear features concentrate the limited erosive forces present and would perpetuate an unnatural channel system. For these reasons, this alternative would not meet the need and purpose of the project .

2.3.2 Road Reconstruction

Road reconstruction alternatives range from moving the road out of the existing floodplain to constructing levees or floodwalls along the road. These alternatives would generally increase impacts to sensitive natural and cultural resources, would require acquiring new ROW, or were not feasible for other reasons.

Road Reconstruction Alternative 1: Relocate to the North. This alternative would move North Bank Lane from its existing alignment to higher ground to the north. Relocating North Bank Lane would require constructing new access roads for adjacent private property owners and the Refuge. New road construction would result in greater environmental impacts to natural and cultural resources than those described in the Preferred Alternative. Additionally, relocating the road would add considerable cost to the project and would require a new ROW on private property. Because of the additional resource impacts and costs, this alternative was removed from further analysis.

Road Reconstruction Alternative 2: Close and Remove Road from Fahys Creek to Redd Creek. This alternative would remove the road section from Fahys Creek to Redd Creek to eliminate concerns about continued flooding. This alternative was not forwarded for detailed analysis because it would eliminate existing access for many private residents, a business, and the USFWS facilities along North Bank Lane. Access for public services such as emergency vehicles, garbage trucks, utilities, and school buses would be greatly impacted. Additionally, the USFWS has no authority to close a county road. This alternative, therefore, would not meet the need and purpose of the project.

Road Reconstruction Alternative 3: Construct Designated Bicycle Lanes. Consideration was given to incorporating designated bicycle lanes into the roadway design. Designated bicycle lanes are, at a minimum, 4 feet wide. If the travel lane remains at 10 feet, this would result in a total roadway width of 28 feet. At 28 feet wide, the design would no longer fit within the existing roadway bench, resulting in more cutting, filling and impacts to Refuge resources. Additional ROW would also need to be purchased. Because of the impacts and costs associated with 4-foot-wide bicycle lanes, this alternative was not forwarded for detailed analysis.

Road Reconstruction Alternative 4: 100 percent Stormwater Treatment. Stormwater quality is of particular concern in the Pacific Northwest where dissolved metals and petroleum products have been demonstrated to adversely affect fish and amphibian species. Treatment involves filtering and removing these pollutants using, for example, vegetation buffers or containment ponds. During the development of the stormwater plan for the roadway work, the FHWA considered design options that allowed for 100 percent treatment of stormwater generated from North Bank Lane. In many locations along North Bank Lane, however, treatment options extended the impacts of the roadway construction well beyond the existing roadway bench and ROW and resulted in filling a greater acreage of wetlands than does the Preferred Alternative. These additional impacts also increased the project cost because they required additional construction and ROW acquisition. Because the project purpose is to restore tidal wetlands that function as natural filters for stormwater, it was determined that treating 100 percent of the runoff was not necessary. As a result, while stormwater treatment measures would be applied in the Preferred Alternative where feasible, the provision of 100 percent treatment was not forwarded for further analysis because it was determined to be not practicable.

Road Reconstruction Alternative 5: Construct Levees of Floodwalls. It would be possible to construct levees along both sides of North Bank Lane in the areas where it regularly floods. Such flood-control structures would need to be several feet tall and properly engineered with clay cores and seepage berms to withstand the forces of water. Constructing an 8-foot-high levee with two-to-one slopes (horizontal to vertical) would create a 32-foot-wide footprint outside the existing ROW. Construction of such a levee on both sides of North Bank Lane would be required to keep the road passable under all high water conditions. The two levees would require acquiring substantial amounts of ROW. They would also require placing many acres of fill in wetlands, would impair visual resources, and would conflict with the USFWS management goals for the Refuge. As in the Preferred Alternative, replacing culverts at Fahys and Redd creeks would still be needed to improve fish passage and accommodate high flows within those drainages, thus requiring an elevated roadway to accommodate the larger culverts. Because of the impacts associated with this alternative, it was removed from further analysis.

Road Reconstruction Alternative 6: Design for 25-year Flow. This alternative would raise the road so that it is not overtopped in the event of a 25-year flood flow. This design elevation would require raising the road by 10 to 11 feet. This alternative would require placing a large amount of fill, acquiring ROW, and reconstructing the road, and it would create extensive adverse impacts to natural resources. As a result, this alternative was removed from further analysis.

Chapter 3
Environmental Consequences

This chapter describes the existing environment and environmental consequences of both the No Action Alternative and the Preferred Alternative.

3.1 Soils and Geology

3.1.1 Existing Environment

The project area is an historic tidal wetland in the lower Coquille River watershed, which was separated from the river by levee construction and drained for agricultural purposes in the late 19th or early 20th century. Soil characteristics are typical of pasture and degraded wetlands that have not experienced daily tidal flood events for approximately 100 years. Before its agricultural conversion, the project area was shaped by periodic earthquakes and tsunamis within the Cascadian subduction zone and the daily tidal processes associated with the Coquille River. Twelve subduction earthquakes between 6,500 and 6,720 years before present (BP) dropped the Coquille River estuary to tidal flat elevations (Witter et al. 2003). Each of these events reduced local elevations and resulted in more flooding of the site. Over time, accretion of fine sediments resulted in the formation of a classic tidal mudflat and marsh system (Bryam and Witter 1999).

The soils of the Ni-les'tun Unit vary widely between the leveed pasture environment, seasonally wet prairie, and the forested wetlands located on the northwest portion of the Unit (Green Point Consulting 2005). The Natural Resources Conservation Service (NRCS)-mapped soils on the leveed pasture and wet prairie in the project area include Clatsop mucky peat, Coquille silt loam, and Willanch fine sandy loam. Soils within forested wetlands include Wintley silt loam, Brallier mucky peat, Clatsop mucky peat, and Haceta fine sand (Green Point Consulting 2005; NRCS 2008). None of these soil types are designated as prime, unique, or important farmland soils.

3.1.2 Environmental Consequences

Alternative A: No Action Alternative

The continued degradation of tidal wetland soils would be expected under the No Action Alternative. Sediment would continue to be deposited at an unnatural rate when project area lands are inundated during flood events. Agriculturally induced subsidence associated with the draining of organic soils and compaction by grazing animals and farm equipment would continue, impacting the establishment of native fish and wildlife habitat. The No Action Alternative would not assist the USFWS in meeting its publicly mandated missions to assist in the recovery of threatened and endangered species (e.g., coho salmon), preserve and enhance wildlife habitat, and provide opportunities for wildlife-oriented public uses.

Alternative B: Preferred Alternative

There would be beneficial effects to restoring the natural process of sediment deposition within the project area as a result of the Preferred Alternative. Restoration and creation of natural channels and re-meandering of straight-line ditches would allow unimpaired conveyance of sediment from the project area to the Coquille River. Tidal sediment deposition onto the project area would occur as a result of the restoration of the full tidal process of the Coquille River onto

the Ni-les'tun Unit. The increase in tidal sediment deposition and the likelihood of increased inundation would cause an eventual rise in land elevation and a return to anoxic soil conditions, which would promote the formation of productive wetlands and mudflats and, therefore, productive fish and wildlife habitat. Short-term soil disturbance would occur during the tasks associated with the wetland restoration and road reconstruction; however, construction areas would be re-seeded, replanted, and graded to avoid long-term impacts to soils. Short-term effects of the Preferred Alternative are considered a less-than-significant adverse impact on soil resources. Overall, the Preferred Alternative would have a long-term beneficial effect on the natural soil processes of the site.

3.2 Water Resources

3.2.1 Existing Environment

The project area is bounded on the south and east by the Coquille River. Except for the higher elevation areas just east of the cranberry bogs, including the Refuge administrative sites, the majority of the Ni-les'tun Unit lies within the boundary of the 100-year floodplain (FEMA 1984). Four degraded and agriculturally impacted stream courses run through the project area: Fahys Creek, Redd Creek, Blue Barn Creek, and No Name Creek. Three of these creeks (Fahys, Redd, and No Name) are primary drainage ditches that dewater the historic tidal and forested wetlands for agricultural purposes.

Fahys Creek enters the western side of the project area at U.S. 101 where it crosses under the road through a 36-inch-diameter culvert and is routed into a straight-line agricultural drainage ditch around the cranberry bogs. The creek's waters travel in the straight-line ditch through a 48-inch-diameter culvert under North Bank Lane then continue to the southwest corner of the project area and discharge into the Coquille River through a tide gate in the levee. Fahys Creek drains and dewaters the westernmost portion of the historic tidal wetlands, which, in turn, degrades nearly 200 acres of historic fish and wildlife habitat.

Both Redd Creek and Blue Barn Creek enter the project area from the northeast at North Bank Lane; they serve as the drainage mechanism for approximately 100 acres of historic tidal wetlands. Both of these creeks are in varying stages of degradation as a result of past agricultural efforts to control them for the purposes of wetland drainage. Redd Creek flows through a 48-inch-diameter culvert beneath North Bank Lane and is straight-line ditched for approximately 150 feet outside of its natural location. The lowland portion of Redd Creek, located in the degraded pastures, collects water from a diverse network of ditches on the project area. Blue Barn Creek flows through a culvert below North Bank Lane and joins Redd Creek approximately 600 feet south of North Bank Lane before discharging to the Coquille River through a tide gate.

No Name Creek drains the center of the historic salt marsh within the Ni-les'tun Unit. It originates on the northern side of the Unit and collects water primarily from interior ditches that drain approximately 100 acres of historic tidal wetlands. Some water comes from off-Refuge lands via a small forested drainage to the north of North Bank Lane, but most of the water originates on site through seeps and saturated soils near the toe of the adjacent marine terrace. The creek flows to the southeast and exits the Unit through a broken tide gate into the Coquille River.

Fahys, Redd, Blue Barn, and No Name creeks are not listed on the State of Oregon's 2004/2006 303(d) list of impaired streams, whereas the Coquille River is listed (ODEQ 2006). Many

parameters and beneficial uses are impaired on the Coquille River. Significant impairments include chlorophyll a, dissolved oxygen, fecal coliform, and temperature. These impairments affect the beneficial uses of aesthetics, water contact recreation, cold-water aquatic life, trout spawning, shellfish growing, anadromous fish passage, and salmonid fish rearing (ODEQ 2006). While not State-listed, the local creeks likely collect waste products from the cattle that graze the pasture lands. These nutrient loads would be added to the existing loads within the Coquille River, potentially further degrading water quality.

According to a hydrogeologic characterization of the Ni-les'tun Unit performed in 2005 (Kocourek 2006), the shallow groundwater on the Ni-les'tun Unit fluctuates between approximately 4 feet below the ground surface during late summer and early fall to 0.5 feet above the ground surface during wet winter months. The average depth to groundwater was between 1 and 2 feet below the ground surface (Kocourek 2006). The site is currently separated from the river by constructed levees, a natural river levee, and three tide gates. The tops of the constructed levees range from elevations of 9.0 feet to 12.5 feet NAVD88, and the top of the natural river levee ranges from 8.0 feet to 9.5 feet NAVD88. Small breaches in the levees are as low as 6.0 feet NAVD88. The artificial levees and tide gates currently mute tidal levels by a range of 2 feet to 4 feet, keeping much of the site dry and drained most of the time. During high water periods on the Coquille River, portions of the artificial levees are overtopped and the entire site may flood. If river levels remain high long enough, the levees have no muting effect, and water levels on the site would match the water level on the adjacent Coquille River.

U.S. Geological Survey tidal data for Bandon, Oregon, on the Coquille River for the 1983–2001 period (NOAA 2008) are as follows:[3]

Mean higher high water (MHHW):	7.0 feet
Mean high water:	6.3 feet
Mean sea level:	3.7 feet
Mean low water:	1.1 feet
Mean lower low water:	0.1 foot

In Coos Bay, the highest observed tide at the Charleston Station (Station 9432780) provides a reference for the maximum tidal elevations that may be observed at the mouth of the Coquille River. The highest tide measured was 10.6 feet NAVD88 on January 26, 1983; the highest tide of the month predicted for 2008 ranged from 7.5 feet to 8.8 feet NAVD88 (NOAA 2009).

The site is bounded by a marine-deposited terrace on the north and slopes to the south from high ground located along North Bank Lane and the Refuge headquarters. Normal ground elevation of the site ranges from 7 feet NAVD88 at the eastern end to 5 feet NAVD88 at the western end. Eighty percent of the site is below 7.0 feet NAVD88 (MHHW). The natural levee along the river ranges from 9 feet NAVD88 at the east (upstream) end to 8 feet NAVD88 at the west (downstream) end.

[3] Epoch adjusted to the topographic map datum of NAVD88.

3.2.2 Environmental Consequences

Alternative A: No Action Alternative

Agriculturally induced unnatural water levels and poor water quality would continue as a result of the No Action Alternative. Groundwater would continue to be below levels that would create saturated soils needed to establish habitat for fish and wildlife. Flooding would occur several times per year during high precipitation or high river flow events rather than fluctuate with the natural tidal cycle. The tide gates and levees would continue to mute tidal action, thus limiting full tidal function. Stormwater flowing untreated into the adjacent waterways would remain untreated. The No Action Alternative would not assist the USFWS in meeting its publicly mandated missions to assist with the recovery of threatened and endangered species, to preserve and enhance wildlife habitat, and to provide opportunities for wildlife-oriented public uses.

Alternative B: Preferred Alternative

The constructed levees and tide gates would be removed to allow normal tidal inundation of the site, promoting water and vegetation conditions needed to re-establish fish and wildlife habitat. After the restoration, normal tidal regime on the site would essentially match the tidal water level on the adjacent Coquille River. The restored tidal water levels would flood a large portion of the site daily and the entire site one or more times a month. At MHHW (7.0 feet), groundwater depths are predicted to be approximately 2 feet above ground surface on the west end of the project area, and soils would be saturated on the higher east end of the project area. At the high monthly tide of 8.8 feet, the entire site would flood from the base of the marine terrace to the river, with the exception of the higher eastern end of the natural river levee. Flooding of North Bank Lane would be reduced under the Preferred Alternative because the roadway would be elevated at Fahys Creek to an elevation of 12.1 feet NAVD88 and at Redd Creek to an elevation of 13.3 feet NAVD88.

The effects of the proposed roadway fill on the Coquille River 100-year floodplain were evaluated by using the Corps Hydrologic Engineering Centers River Analysis System (HEC-RAS) modeling. Modeling results revealed that the proposed road design would result in minimal to no rise in the Coquille River water surface elevations.

Beneficial long-term changes to water quality would result from the Preferred Alternative. Sediment would be conveyed more effectively from the creeks on the project area through natural channels and appropriately sized culverts beneath North Bank Lane. The reconstruction of North Bank Lane would include stormwater treatment best management practices (BMP) (e.g., vegetated swales, natural infiltration, and vegetated slopes) that are anticipated to treat, at a minimum, 70 percent of the runoff from the road. While not 100 percent treatment, this would be an improvement over the existing condition. As mitigation for not treating 100 percent of site-specific runoff, stormwater treatment elements would be installed at the scenic overlook. With this mitigation, the percentage treatment of stormwater rises to 81 percent. Overall, the restoration work and improvements to North Bank Lane are expected to have a less-than-significant beneficial impact to water quality within the local creeks, the Coquille River, and the estuary.

Temporary impacts to water quality could result from exposure of soils along North Bank Lane and within the Ni-les’tun Unit. Exposed soils could erode at higher rates than under current conditions. The Ni-les’tun Unit would be re-seeded after completion of the Phase I restoration

work and the grade raise of the road. Because of this and because the site is relatively flat, surface runoff after completion would be low energy, and onsite erosion would be minimal. Therefore, the contribution of sediment to the local stream channels and the estuary from the proposed project are expected to be a less-than-significant adverse impact.

Construction activities would require the use of heavy equipment to move earth, disc the site, excavate the new culvert crossings and channels, and resurface the road. These activities pose the risk of water contamination from petroleum products. Implementation of BMPs and other measures associated with all construction activities, including working during the dry season, would reduce the likelihood of contamination (see Chapter 6).

3.3 Air Quality

3.3.1 Existing Environment

The project area is not located within a Class I airshed, nonattainment area; or maintenance area (EPA 2008). Air pollution sources include forestry slash burning and vehicle traffic on U.S. 101, North Bank Lane, and at the Ni-les'tun Unit Scenic Overlook parking lot.

3.3.2 Environmental Consequences

Alternative A: No Action Alternative

There would be no affect on air quality as a result of the No Action Alternative.

Alternative B: Preferred Alternative

The use of heavy equipment would create limited, short-term adverse impacts to air quality during wetland and road construction activities. Most of the soil disturbing activities would occur in moist or wet soils and would therefore not generate significant airborne dust. Heavy equipment would generate diesel fumes, but these impacts would dissipate quickly and would not occur after the conclusion of restoration and road reconstruction activities.

Additional long-term adverse impacts to air quality as a result of vehicle traffic would be commensurate with any potential increase in vehicles using the Bandon to Charleston State Scenic Byway, which bisects the Ni-les'tun Unit. The minor potential increase in visitor use to the Ni-les'tun Unit's scenic overlook facilities is not expected to generate noticeable declines in air quality. These short- and long-term adverse impacts are anticipated to be less than significant.

3.4 Vegetation and Wetlands

3.4.1 Existing Environment

Vegetation. The Ni-les'tun Unit is a mixture of native and non-native plants that exist in a disturbed unnatural ecological regime and habitat. Artificial levees and ditches were constructed in the late 19th or early 20th century for the purpose of creating dry agricultural pastures from tidally influenced wetland. Non-native plants for dairy and cattle forage were planted; hence, the current degraded wetlands, un-maintained pastures, and ditches support a mix of native and non-native plants that are of limited use to fish and wildlife.

Vegetation mapping has determined that vegetative communities in the western portion of the restoration area include Sitka spruce swamp and shore pine forest and are dominated by native species (Green Point Consulting 2005). Species commonly found there include Sitka spruce (*Picea spectabilis*), shore pine (*Pinus contorta*), red alder (*Alnus rubra*), Hooker's willow (*Salix hookeriana*), Oregon crabapple (*Malus fusca*), and slough sedge (*Carex obnupta*) (DEA 2007). These tree-dominated wetlands transition into shrub and emergent wetland habitats closer to the Coquille River. These habitats support slough sedge, Pacific silverweed (*Argentina egedii*), and Baltic rush (*Juncus balticus*). Within the larger degraded pasture these native wetland plants are mixed with non-native species including creeping bentgrass (*Agrostis palustris*), tall fescue (*Festuca arundinacea*), and reed canarygrass (*Phalaris arundinacea*). These non-native species out compete native species in many areas and provide little value to fish or wildlife.

Further east, non-native grasses and shrubs can be found near the scenic overlook and in areas of higher elevation. As the road drops into the Redd Creek area, willow swamp becomes more common on the north side of the road.

Wetlands. In the mid 19th century, up to 25,000 acres of the Lower Coquille River Basin floodplain was estimated to be wetland (Ecotrust 1997). Up to 70 percent of these wetlands was thought to be timbered swamp or wooded bottom lands. It is estimated that just less than 40 percent (9,500 acres) of these wetlands has been converted into uplands and, of the remaining wetlands, 90 percent has been converted into scrub/shrub wetlands. This means that approximately 22,500 acres (90 percent) of the original 25,000 acres have either been converted to upland or modified from its original type. The project area is an example of historic wetlands that have been converted to another type of wetland.

Historically, much of this area was subject to the ebb and flood of the tide, providing habitat to myriad fish and wildlife species. The Unit is separated from the river by natural and artificial levees, and the groundwater is close to or above the surface. Although a wetlands delineation has not been conducted for most of the Unit, it is likely that conditions necessary to classify much of the area as a wetland subject to the Corps jurisdiction are met. The area would be classified as palustrine emergent seasonally flooded diked wetland (Cowardin et al. 1979). Vegetation sampling in a small portion of the pasture indicated that wetland plant species are relatively common (Green Point Consulting 2005). The National Wetland Inventory maps the entire unit as freshwater emergent wetland. Regardless of classification, the habitat quality of these freshwater wetlands has been degraded by more than 100 years of grazing and dewatering, and a preponderance of invasive species.

A wetland delineation was conducted for a 50-foot-wide buffer along both sides of North Bank Lane (DEA 2007). Four main areas were identified that are likely subject to the jurisdiction of the Corps under Section 404 of the Clean Water Act. These wetland features are associated with the diked floodplain of the Coquille River, tidal fringe wetlands, backwaters on the upstream side of North Bank Lane at Fahys and Redd creeks, and seeps found at the base of cut slopes and in ravine bottoms. Other non-wetland waters subject to the Corps jurisdiction that were identified include Fahys Creek, Redd Creek, and numerous roadside ditches that connect to the creeks or the Coquille River.

3.4.2 Environmental Consequences

Alternative A: No Action Alternative

Under the No Action Alternative, the Ni-les'tun Unit would remain a degraded freshwater wetland separated from the Coquille River by artificial levees and tide gates. These areas are historic tidally influenced wetlands that have been converted to pasture by the establishment of levees separating them from the river and by the construction of approximately 15 miles of drainage ditches. Limited flooding events would continue to occur under certain seasonal hydrologic conditions. The existing vegetation adjacent to the roadway and within the pastures would remain essentially unchanged. These areas are transitioning from native to invasive non-native plant species. The invasive species found along the road, such as reed canarygrass, would continue to invade the pastures and eventually displace native wetland plants. The invasion by reed canarygrass could eventually lead to monotypic pastures of non-native species that would add to the degradation of the Ni-les'tun Unit for fish and wildlife species. Wetlands would continue to be present in a degraded condition with seasonal drying from outflow through drainage ditches and tide gates. Seasonal flooding and high groundwater levels would maintain the low-quality wetlands found along the creeks and in the degraded pastures.

Alternative B: Preferred Alternative

Restoration

The Preferred Alternative would restore the site to a regularly flooded estuarine intertidal and emergent wetland. Plant communities indicative of tidal wetland and expected to become re-established in the project area are: seashore saltgrass (*Distichlis spicata*), Pacific silverweed, and tufted hairgrass (*Deschampsia cespitosa*). The restoration actions would require discing of the site to fill about 11.2 miles of shallower and smaller existing interior drainage ditches. About 3.8 miles of larger irrigation ditches would be directly filled using soil obtained from elsewhere on the site, and approximately 4.7 miles of new tidal channels would be constructed. The removal of the levees and tide gates in Phase II of the restoration project would result in the regular tidal inundation of the Ni-les'tun Unit and would start the restoration of habitat for fish and wildlife. Overall, this action would result in the restoration of more than 400 acres of historic tidal wetlands formerly converted to agricultural pastures. The conversion from pasture to tidal marsh would impact the existing vegetation within the degraded pastures; however, the bulk of these are non-native species and not considered sensitive resources. Therefore, the adverse impacts to vegetation resources resulting from the restoration actions are anticipated to be less than significant.

No sensitive plant species are known to occur within the restoration area; therefore, the Preferred Alternative would result in no effect to this resource.

Activities to restore historic riparian and forested wetland habitat at the abandoned cranberry bogs would result in fill of 0.02 acres of degraded wetlands. The primary impact to wetlands would occur when Fahys Creek, which has been ditched around the site, is plugged and diverted to a new restored stream channel that would meander through the re-graded bogs. A portion of the remaining ditch would not be filled and would be connected at the bottom end to the existing natural channel to provide off-channel fish and wildlife habitat. All other work would occur in the constructed and abandoned cranberry bogs and uplands. The newly created stream and

riparian habitat would be planted with native vegetation such as willows, sedges, and other forested wetland species. The restoration of the cranberry bogs site along with the reconstruction of the Fahys Creek channel is expected to result in a net gain of 9 acres of wetland, fish, and wildlife habitat.

North Bank Lane

As discussed above, no sensitive plant species are known to exist within the project area; therefore, reconstruction of North Bank Lane would affect no sensitive plant species.

Construction of the improvements to North Bank Lane would require fill of wetland habitat. Material would be placed within the degraded emergent freshwater wetlands along the roadway in the vicinity of Fahys Creek and Redd Creek. Overall, this would result in the fill of about 0.94 acres of wetlands.

Conclusion

Estuarine and freshwater wetlands have declined by approximately 90 percent in the Coquille Watershed. Restoration of the Ni-les'tun Unit would result in a more than 400-acre net increase in tidal wetland habitat in the Coquille Estuary. Whereas this increase is locally beneficial, it amounts to about 1.6 percent of the historically present wetlands and is therefore anticipated to be a less-than-significant beneficial impact on wetland resources and vegetation communities.

3.5 Wildlife and Fish

3.5.1 Existing Environment

Birds. The Coquille River Estuary supports large populations of shorebirds, ducks, migratory songbirds, and wading birds (USFWS 1999b). The lower 25 miles of the Coquille River is one of the major stopover and wintering areas for dabbling ducks between the Columbia River and San Francisco Bay. Avian surveys between August 1983 and May 1984 resulted in observations of 115 species at the Bandon Marsh Unit just downstream of the project area (Hodder and Graybill 1984). This Refuge Unit provides an important staging area in both fall and spring bird migrations. Tens of thousands of migrating sandpipers have been observed on the Bandon Marsh Unit each year. Subsequent to the final acquisition of the Ni-les'tun Unit in 2004, the USFWS conducted routine surveys of bird use to generate baseline data (Castelein and Lauten 2007). Standardized avian habitat use surveys resulted in observations of 156 species between October 2004 and November 2006. This high level of seasonal bird use data supports the importance of the Coquille River Estuary for migratory birds. This study also resulted in observations of black turnstones (*Arenaria melanocephala*) and black-bellied plovers (*Pluvialis squatarola*) roosting on floating logs in the Ni-les'tun Unit during flood conditions where mudflat habitat was unavailable (Castelein and Lauten 2007). The studies also indicated that bird abundance increased on the Ni-les'tun Unit as seasonal rains created more wetlands (Castelein and Lauten 2007). Large concentrations (e.g., more than 50,000 individuals) of shorebirds provide forage for numerous raptor species including peregrine falcon (*Falco peregrinus*), merlin (*Falco columbarius*), and sharp-shinned (*Accipiter striatus*) and Cooper's hawks (*Accipiter cooperii*).

Two electrical utility lines and associated series of poles cross the Ni-les'tun Unit. One is a larger transmission line that spans the Coquille River and the eastern portion of the Refuge running generally north-south. The other is a smaller local transmission utility line that parallels

North Bank Lane but crosses into the Refuge itself near Redd Creek. Both power lines that cross the Refuge create a collision risk for migrating and resident birds. Birds often fly into utility lines during periods of low visibility, which can lead to injury or death (NWCC 2001). Because of the large number of migratory birds using the Refuge, lines that cross wetland habitats on the Refuge are likely to generate relatively higher bird-strike mortality than lines located away from these important foraging and flight areas.

Bald eagles and ospreys (*Pandion haliaetus*) have been documented foraging and nesting in the lower Coquille River estuary. Osprey nest on two of the transmission towers in the project area. Large raptors (e.g., eagles, osprey, hawks, and falcons) are susceptible to injury or death from wire strikes and electrocution problems with power lines. Raptors are electrocuted by power lines because of two seemingly unrelated factors: (1) the distribution, size, behavior, and other biological aspects of raptors, and (2) the design of electric industry hardware, which places electrical wires close enough together that raptors can simultaneously touch two or more of them with their wings or other body parts. Concurrent with large raptor electrocution is the potential for wildlife-caused power outages that can cause thousands of dollars worth of damage to electrical and public facilities. One transmission tower in the project area was modified by Pacific Power and Electric to reduce electrocution and power outage issues with the nesting osprey. The majority of transmission lines in the project area (including power lines within the wetlands) were built before the knowledge of the causes, magnitude, or importance of avian wire strikes and electrocution and without considering these mortality issues in site location and line design.

Mammals. Thirty-one species of mammals have been observed within the Refuge (USFWS unpublished data). The Ni-les'tun Unit supports black-tailed deer (*Odocolileus hemionus columbianus*), beaver (*Castor canadensis*), river otter (*Lutra canadensis*), and harbor seal (*Phoca vitulina*) within the adjacent Coquille River (Hodder and Graybill 1984). Beavers are common in the project area and are especially active on Fahys Creek, both near the cranberry bogs restoration site and other areas north of North Bank Lane.

Reptiles and Amphibians. Twelve species of reptiles and amphibians have been observed on the Refuge (USFWS unpublished data). These range from common frogs such as the Pacific treefrog (*Pseudacris regilla*) to less common species such as the Pacific giant salamander (*Dicamptodon tenebrosus*) and the northern red-legged frog (*Rana aurora aurora*). Because they have a low tolerance for saltwater, amphibians are typically associated with freshwater features such as Fahys and Redd creeks, seasonal wetlands, and beaver ponds. These areas are used for breeding, egg incubation, and larval development. Adults of some species such as the Pacific giant salamander are relatively terrestrial while others spend the entire year in or immediately adjacent to water.

Fish. The Coquille River watershed covers about 1,060 square miles of land and is the largest watershed entirely bounded by the Coast Range (CWA 2009). The 760-acre estuary is a small relic of its former historic size (CWA 2009). Historical tidal influence reached as far as 40 miles upstream (Benner 1991), but today is limited by channel sedimentation. Much of the tidally affected reach is freshwater outflow that backs up the river during high tides. Historically, the Coquille River supported substantial runs of salmon including Chinook (*Oncorhynchus tshawytscha*) and coho salmon (*Oncorhynchus kisutch*). Coho salmon appear to have been the more common species caught for the commercial fishery, with tens of thousands of pounds being canned each year between 1892 and 1922 (Benner 1991). In addition to supporting a commercial

salmon fishery, the estuary also provides important spawning or rearing habitat for several species of marine fish including flounders, sole, and perch.

Estuaries are extremely productive habitat. The abundance of nutrients contributes to production of invertebrate life, which in turn provides forage for fish. Major estuarine systems on the west coast are known to provide important rearing habitat for native anadromous and resident fishes (Moyle 2002). The Coquille River estuary, although greatly reduced in size, remains productive. The current fish species composition in the river is similar to that of 100 years ago. The Coquille River supports reduced populations of Chinook and coho salmon (coho are discussed in detail in Section 3.6), coastal cutthroat trout (*Oncorhynchus clarkii clarkii*), steelhead (*Oncorhynchus mykiss*), sculpin (*Cottus* spp), and three-spine stickleback (*Gasterosteus aculeatus*) (USFWS unpublished data).

Fish sampling conducted from 2004 to 2008 revealed a wide array of species using the lower tidally influenced ditched portions of Fahys Creek, these include salmonids, sculpin, larval ocean fish, and a suite of estuary-dependent invertebrates including shrimp, clams, and mussels (Confederated Tribes of Siletz Indians and USFWS, unpublished data). In the more freshwater habitats found upstream of North Bank Lane, coastal cutthroat trout, juvenile coho salmon, and juvenile steelhead were found in low numbers. On Fahys Creek, fish access to areas west of U.S. 101 is blocked by a 3- to 6-foot-high drop from a 36-inch-diameter culvert on the east side of the highway. Non-native species, including the western mosquito fish (*Gambusia affinis*) and smallmouth bass (*Micropterus dolomieu*) were documented in Fahys Creek and may have originated from Fahys Lake located west (upstream) of U.S. 101 (USFWS unpublished data). The species distribution and composition in Redd Creek is similar to Fahys Creek (USFWS unpublished data). Pacific lamprey (*Lampetra tridentata*) have not been observed in either creek, but are suspected of using the limited available habitat. Both Fahys and Redd creeks downstream of North Bank Lane have been ditched and straightened over the years. Neither of these ditches supports a diversity of aquatic habitat (riffles, runs, pools) or instream structure (beaver ponds, LWD) that would qualify them as good or high-quality fish habitat.

3.5.2 Environmental Consequences

Alternative A: No Action Alternative

Under the No Action Alternative, the restoration project would not proceed and North Bank Lane would not be repaired or improved. At some point, the levees would fail and the pastures would be subject to some level of tidal action. This would likely result in habitat changes as the area floods, but the 15 miles of existing drainage channels would quickly drain the area and preclude the return of a productive tidal salt marsh or mudflat habitat suitable for use by fish and wildlife.

Under the No Action Alternative, waterfowl would continue to use the limited wetland habitat on the Ni-les’tun Unit seasonally. This habitat occurs primarily during the wet winter season in flooded portions of the degraded pastures or in the limited open water after substantial rainfall. Habitat for shorebirds and wading birds would exist only along the narrow margins on the outside of the levees adjacent to the Coquille River and along some of the drainage channels within the Ni-les’tun Unit. Habitat for other wildlife (mammals, reptiles, and amphibians) would remain essentially unchanged from existing conditions.

The utility lines would remain in place and would continue to generate some level of bird mortality and injury. The presence of the overhead transmission lines on the Refuge conflicts with the USFWS mission to preserve and protect birds.

Adult salmonids would continue to spawn above the project area in the river and tributaries, and juvenile fish would continue to rear in the adjacent Bandon Marsh Unit. In the Ni-les'tun Unit, small numbers of juvenile fish would continue to use the limited available habitat in the ditched portions of Fahys and Redd creeks to which they have access via fish-friendly tide gates. The suitability of these rearing habitats would remain sub-optimal. Similarly, nursery habitat in these disturbed and tide-gated creeks for marine fish that spawn or rear in the Ni-les'tun Unit would remain limited and of poor quality.

Alternative B: Preferred Alternative

Under the Preferred Alternative, removal of the levees would create a large expanse of tidal mudflat and salt marsh that would improve the amount of foraging habitat available for raptors, waterfowl, shorebirds, and wading birds. These areas, subject to the regular ebb and flood of the tide, would become colonized by clams, mussels, shrimp, small invertebrates, and other forage items upon which many species of birds and mammals rely. The improved tidal channels and salt marsh wetlands would provide perching and shelter areas above typical high tide levels and offer cover to small birds and mammals along with foraging habitat for rails, egrets, herons, ducks, and other species.

The power lines would be relocated out of the Refuge as part of the Preferred Alternative (see Section 3.12). The utility line that parallels North Bank Lane would be moved so that the entire alignment is within the road ROW. While not eliminating bird strikes, moving the line out of the Refuge is expected to reduce the collision risk. The larger regional transmission line that bisects the Refuge would be buried below the Coquille River and the Refuge, thus completely removing the collision, electrocution, and power outage risk for this line. Removal of the poles would also result in the loss of an osprey nest site, but because of the generally forested environment and large number of snags adjacent to the marsh, replacement perching and nesting sites are abundant.

Wildlife species currently using the Ni-les'tun Unit are expected to be minimally affected by the proposed project. Common species such as black-tailed deer would face a reduction in foraging habitat as the pasture edges are converted to salt marsh, but foraging habitat is not limited in the area. It is expected that other mammals would face similar alterations in available habitat. Beavers would likely benefit from the restoration project, which would create new stream channels more suitable for beaver activity.

Most species of amphibians are relatively intolerant of elevated salinity levels. The existing pastures provide some marginal habitat for common species of amphibians during the brief period when they are flooded by freshwater during the wet season. Under the Preferred Alternative, the existing degraded emergent freshwater wetlands would be converted to tidal salt marsh and mudflats. Whereas these habitats would not be suitable for amphibians, amphibian habitat within the restored creek channels and cranberry bogs would be improved.

Reconnection of Fahys Creek to the tidal channel without the restriction of the tide gate, coupled with re-contouring of the creek, would provide improved access and rearing habitat for resident and anadromous fish. The reconstructed creek mouth and removal of the tide gate would allow

for unrestricted movement of adult and juvenile fish into and out of Fahys Creek and the newly created tidal channels. Replacement of the culvert under North Bank Lane with an arch culvert would create a more natural tidally influenced streambed crossing for fish, amphibians, and aquatic resource-dependent mammals. Work done to recontour the creek channel and install habitat elements such as large wood would improve overall rearing habitat for fish and invertebrates. The current limited fish habitat in Redd Creek would also be improved by the removal of the tide gate, new and improved channel conditions and meanders, and facilitated passage via a larger arched culvert below North Bank Lane. Similarly, the removal of the tide gate and the construction of new tidal channels on No Name Creek would also provide improved access and rearing habitat for resident and anadromous fish.

The restoration of the cranberry bogs would improve rearing habitat for coho salmon, steelhead, and coastal cutthroat trout. These fish would rear in the newly created creek meanders that would provide fish habitat in what is now an abandoned, overgrown cranberry bog. Beavers are expected to rapidly move into this new channel and their dams would create long-term, larger ponds, with an abundance of woody debris and habitat complexity favored by these fish species.

Construction activities would be phased so that the bulk of the earthmoving activities would occur during the dry season and flows would be maintained in the major creek channels (Fahys and Redd creeks). New stream and tidal channels would be constructed under dry conditions and connected to active stream or river flows when construction is complete. To minimize effects to fish, all in-water work would occur during the ODFW-established in-water work window (July 1 to September 30) (ODFW 2008). Additionally, all fish present would be captured and relocated (Section 6.2), and all in-water work areas would be isolated from the active stream or river channels. In-water work is expected to be relatively short in duration. Working during the summer months would also minimize disturbance to birds because few migrating waterfowl and shorebirds use the degraded pastures and drainage ditches at that time.

As discussed in Section 3.4, estuarine and freshwater wetlands have declined in quality and abundance along the Oregon Coast and by about 90 percent in the Coquille watershed. While the Preferred Alternative would result in the restoration of more than 400 acres of habitat for fish and wildlife use, this increase is not considered beneficially significant in the context of ongoing and historic wetland loss and degradation within the watershed. On a local scale, however, implementation of the Preferred Alternative would benefit estuarine-associated species within the lower Coquille River watershed and is anticipated to have a less-than-significant beneficial effect on fish and wildlife resources.

3.6 Threatened and Endangered Species

3.6.1 Existing Environment

Wildlife

The USFWS reviewed a list of federally threatened and endangered wildlife species known to occur in Coos County (USFWS 2008). The USFWS determined that no listed species under their jurisdiction occur within the project area.

Fish

The only federally listed fish species found in the Coquille River is coho salmon. The coho salmon found in the Coquille River belong to the NMFS-designated Oregon Coast Evolutionarily Significant Unit[4] (ESU) and were listed as a federally threatened species on February 11, 2008 (73 FR 7816). Adult coho salmon migrate from the ocean to coastal rivers and swim upstream to spawn. They are found migrating into the estuary and lower Coquille River beginning in August of most years. Spawning occurs in the upper basin of the Coquille River watershed in gravel riffles where there is abundant cool water flow to oxygenate and remove waste from the eggs. Juvenile coho salmon spend 1 to 2 years in freshwater or estuarine brackish water before migrating to the ocean as juveniles. Preferred habitats for juveniles are pools and backwater areas of freshwater streams or brackish estuary waters where abundant vegetation and large in-water wood provide cover and foraging habitat. The population of coho salmon in the Coquille River is one of the larger populations in southern Oregon. Population estimates ranged from more than 2,000 spawning adults in 1995 to more than 28,500 spawning adults in 2006 (ODFW 2009). The number of adults returning to spawn is a direct result of the number of juveniles that migrate into the ocean. Estimates of juvenile production for three brood years in the late 1990s indicate that total juvenile production for the Coquille River was between about 120,000 and 300,000 individuals. Spawning adult population associated with these estimates was about 3,000 to 5,700 fish.

Within the project area, small numbers of juvenile coho salmon have been observed in Fahys Creek and in Redd Creek east of U.S. 101 (number observed ranges from 22 to 108 individuals) (USFWS unpublished data). No spawning habitat is within the drainage ditches or creeks within the Ni-les'tun Unit. A 2005 survey of Fahys Creek downstream of North Bank Lane documented the year-round presence of juvenile coho salmon (USFWS unpublished data), and other surveys support the occurrence of juvenile coho throughout the proposed restoration area in the fall and spring. An August 2007 survey of Fahys Creek from the cranberry bogs downstream to below North Bank Lane found about 40 juvenile coho salmon (USFWS unpublished data).

Critical habitat was designated for the Oregon Coast coho salmon ESU at the time they were federally listed as a threatened species (73 FR 7816). The definition of critical habitat is that area necessary for the survival and persistence of a species. Critical habitat is categorized by primary constituent elements (PCE) that describe the habitats required by the species. The PCEs for coho salmon include freshwater spawning sites, freshwater rearing sites, freshwater migration corridors, estuarine areas, and near shore marine habitats (73 FR 7816). The Coquille River is considered critical habitat; the PCEs within the Coquille are freshwater rearing areas, freshwater migration corridors, and estuarine areas. Freshwater rearing habitat within the project area is limited to the unnatural drainage ditches of Fahys and Redd creeks above tidal influence. The freshwater migration corridor PCE that links the ocean and spawning areas is the Coquille River. Most of the aquatic habitat in the area of the lower Coquille River would be considered estuarine habitat. The important elements within an estuary for rearing salmonids are salinity and water quality conditions that support both adult and juvenile life stages. These habitats support juvenile coho salmon as they undergo the physiological transformation that allows them to survive in salt water. Small numbers of juvenile coho salmon have been documented in the tidally influenced areas within the ditched portions of Fahys and Redd creeks both above and below North Bank Lane (USFWS unpublished data).

[4] An ESU is a meta-population unit of relatively closely related animals.

Plants

According to the Oregon Natural Heritage Program (ONHP), only two species of federally listed plants occur in the south coast drainages of the state: Western lily (*Lilium occidentale*) and Red Mountain rockcress (*Arabis macdonaldiana*) (ONHP 2009). The only species known from Coos County is western lily (USFWS 2008). Western lily occurs in shrubby forest habitats, often along margins of streams or ponds (ONHP 2009). The records for Coos County show an extremely limited distribution in the southern part of the County and nearby Curry County (ONHP 2009). The Western lily has neither been observed on the Refuge nor does suitable habitat exist (David Ledig, Refuge Manager, personal communication).

3.6.2 Environmental Consequences

Alternative A: No Action Alternative

Wildlife

Because no listed wildlife species occur in the project area, the No Action Alternative would have no effect.

Fish

Under the No Action Alternative, coho salmon would continue to migrate upstream and spawn in suitable habitat within the Coquille River above the project area. Small numbers of juvenile coho salmon would continue to use the limited, ditched habitat in Fahys and Redd creeks as rearing habitat. The culvert for Fahys Creek under North Bank Lane would continue to restrict passage of fish at times, especially during periods of high flows or when beavers build structures that block the culvert. The tide gate on Fahys Creek limits movement of fish to periods when the gate is open, and mutes tidal flow. It is expected that if no action were taken, that small numbers of coho salmon would continue to pass through the tide gate when possible. Overall, conditions are not optimum for rearing juvenile coho salmon or other estuary-dependent fish, and these conditions would be expected to persist into the future under the No Action Alternative.

Plants

Because no listed plant species occur in the project area, the No Action Alternative would have no effect.

Alternative B: Preferred Alternative

Wildlife

Because no listed wildlife species occur in the project area, the Preferred Alternative would have no effect.

Fish

Effects to coho salmon under the Preferred Alternative would be short-term (associated with construction) and long-term (associated with fish habitat restoration and roadway operation). Short-term construction activities would include all in-water work such as replacing the two culverts, removing tide gates, reconstructing streams, and filling ditches. Positive effects are

associated with overall changes in habitat availability, improved ease of access, and improvements to water quality.

Construction

Restoration Direct. The creation of new channels would be completed before connecting them to existing streams or the Coquille River. Filling existing ditches that may support coho salmon would not occur until the fish are removed and relocated following the terms and conditions provided by the NMFS (Section 6.2). Therefore, effects resulting from dewatering of these areas would be minimal.

Removing the tide gates and water control structures at Fahys Redd, and No Name creeks would necessitate work on the north bank of the Coquille River, potentially impacting coho salmon in the river channel: however, fish would be expected to move away from the disturbance.

Restoration Indirect. The Preferred Alternative could have indirect effects on coho salmon by impacting water quality through sedimentation caused by discing and excavation. However, the Ni-les'tun Unit is a relatively low-energy environment, and erosion is expected to be minor. The project area would be seeded after the completion of Phase I and vegetation allowed to re-establish for a full year prior to the levee removal in Phase II, further minimizing sedimentation. Other factors that could affect water quality include the accidental discharge of pollutants such as oil or grease from equipment. These water quality issues would essentially be eliminated through implementation of BMPs (Chapter 6).

Direct Effects of Roadway Construction. Replacing the undersized culvert below North Bank Lane at Fahys Creek would require that the existing ditched creek be temporarily diverted through another culvert during construction. This temporary diversion would require that a new ditch be dug and connected to the existing ditched creek. When the new culvert is in place, it would be reconnected to the Fahys Creek channel, and the temporary diversion culvert and ditch would be removed. Because limited numbers of juvenile coho salmon have been captured above and below the North Bank Lane crossing in all months of the year, fish may be present during the replacement of the Fahys culvert.

At Redd Creek, a new, larger culvert would be installed in an upland area that is not currently connected to the creek. Restoration would connect Redd Creek to this new culvert after constructing a more natural meandering channel upstream and downstream of the new culvert. When the new culvert is connected to the new creek channel, the existing undersized and poorly located culvert would be removed. Work on the existing culvert would occur after the new crossing has been completed and the existing culvert channel has been dewatered. In this manner, all work on the new culvert would occur in dry conditions away from the existing active and ditched creek. Juvenile coho salmon may be present is small numbers in Redd Creek and thus may be affected by this activity.

To minimize potential effects to fish, all in-water work would occur only during the approved ODFW in-water work window of July 1 to September 30. All areas where in-water construction is required would be dewatered and any fish remaining in these work areas would be captured and removed from the construction sites. Fish capture and transport would be conducted by appropriately trained staff in accordance with the terms and conditions provided by the NMFS (Section 6.2).

Indirect Effects of Roadway Construction. Indirect effects to coho salmon could occur through construction-generated sediments that would be suspended in the water column during construction. Such sedimentation from construction at Fahys and Redd creeks is expected to be relatively minor and short in duration. Other factors that could affect water quality include the accidental discharge of pollutants such as oil or grease from equipment. These water quality concerns would essentially be eliminated through implementation of BMPs and other measures (Chapter 6).

Operation

Restoration. The Preferred Alternative would positively affect coho salmon through an overall improvement to habitat availability and quality, and by providing fish access to better quality habitat. Estuarine habitat would be increased because the project would restore full tidal action to more than 400 acres of historic tidal marsh; this would substantially increase rearing habitat for juvenile coho salmon. The re-establishment of historic ecological conditions to the area, when combined with improved and more natural access to lower and upper Fahys and Redd creeks facilitated by the removal of the tide gates and installation of arch culverts, would increase high-flow refugia for adult and juvenile coho salmon. The improvements to habitat created by the installation of large wood and riparian plantings along new meandering channels would improve overall freshwater habitat for rearing juvenile coho salmon.

Roadway. Part of the North Bank Lane improvement project would involve installing stormwater treatment BMPs that would help protect coho salmon and other wildlife from possible sources of pollution. These BMPs are designed to intercept and treat road runoff before it enters adjacent water bodies, thus benefiting coho salmon and other aquatic-dependent wildlife species by improving water quality. Currently, runoff from the surface of North Bank Lane directly enters into creeks or wetlands associated with the Refuge. The stormwater BMPs would improve the water quality of the stormwater that ultimately drains into the Coquille River.

Conclusion

Construction of the Preferred Alternative would have the potential to directly and indirectly negatively impact coho salmon and its designated critical habitat. Short-term direct negative effects to individual fish would be minimized by fish removal procedures and the use of BMPs. Other measures to reduce sedimentation and contamination would minimize indirect effects associated with degraded water quality. Incidental take of individual juvenile coho that may occur would be offset by the sheer number of juvenile coho salmon produced in the Coquille River in most years and the anticipated increase in juvenile production as a result of the restoration. Thus, the loss of a small number of salmon would be considered a less-than-significant adverse effect of the Preferred Alternative.

Construction activities within Fahys and Redd creeks would alter designated coho salmon critical habitat by affecting freshwater rearing areas, freshwater migration corridors, and estuarine area PCEs. Long-term effects would be beneficial because all PCEs would be enhanced by restoration activities. Short-term adverse effects may occur during construction as discussed above. Because of the overall net beneficial impacts, the Preferred Alternative would result in no adverse modification to designated critical habitat. While the Preferred Alternative would increase and enhance critical habitat, this increase is not considered significant in the context of ongoing and

historic degradation of salmon habitat within the Coquille River watershed and on the Oregon coast.

To summarize, the Preferred Alternative is anticipated to have a less-than-significant, short-term adverse impact on coho salmon during construction and a less-than-significant long-term beneficial impact as a result of the restoration.

Plants

Because no listed plant species occur on the project area, the Preferred Alternative would have no effect.

3.7 Cultural Resources

3.7.1 Existing Environment

Because it contains a number of cultural sites, the Ni-les'tun Unit is an important cultural resource area for the Coquille Indian Tribe and the Confederated Tribes of the Siletz Indians. Decades-long archaeological research performed by the Tribes, numerous educational institutions, the USFWS, the Bureau of Land Management, and others have documented the Tribes' occupation of this area and made it one of the most researched areas of pre-European history on the Oregon coast. Since the 1990s, the USFWS has been consulting with the Coquille Indian Tribe and the Confederated Tribe of the Siletz Indians to investigate, protect, and restore the cultural values and natural ecological processes along the shores of the lower Coquille River in the vicinity of the Refuge.

The pre-European landscape of the Ni-les'tun Unit was an intertidal area rich in wildlife, fish, shellfish, and plants. Native American use was focused on the river banks for the harvesting of food. Numerous fishing sites and camps were established along the banks of the Coquille River. These fishing locations were reliable to the extent that permanent and seasonal settlements were often located adjacent to them (Byram and Witter 1999). Archaeological studies performed on the Ni-les'tun Unit since the 1970s indicate that the project area was occupied from approximately 4,120 years BP up to as recently as 100 years BP (CIT 1999; Tveskov and Cohen 2007).

The development of artificial levees and water control structures over a century ago in the Ni-les'tun Unit to convert the tidal marsh to grass pasture has negatively impacted the site's archaeological resources. Artificial levees confine the active floodplain, resulting in increased river velocities that undercut and erode the adjacent river banks, slowly destroying the cultural sites. Also, by creating unnaturally dry conditions, the cultural sites suffer from increased exposure to the effects of sun and wind.

A number of recorded archaeological sites are within the project area (CIT 1999; CIT 2007). Many of the sites are within the wetland restoration area, and a few are within the vicinity of the North Bank Lane road project. Of these cultural resource sites, some are listed on the National Register of Historic Places (NHRP). In addition, traditional plants used by the Tribes, including horsetail (*Equisetum arvense*) and cattail (*Typha latifolia*) have been identified within the project area.

3.7.2 Environmental Consequences

Alternative A: No Action Alternative

Under the No Action Alternative, current river velocities would continue to expose, erode, and degrade cultural sites. The sites would remain vulnerable to human-induced (illegal archeological artifact collection) impacts. Data recovery would be limited and artifacts lost. The project site would continue to provide limited and degraded fish and wildlife habitat and values that are important to the Tribes' culture.

Alternative B: Preferred Alternative

The Preferred Alternative would restore the natural hydrological and biological processes in the Ni-les'tun Unit. None of the restoration construction activities are anticipated to affect known cultural sites. Removal of the levees would occur above the identified boundary of the known sites. Removal of the irrigation pipe, discing of the smaller ditches, and excavation of the tide channels, all have the potential to discover unidentified cultural resources. There is also the possibility that restoration of the natural tidal and riverine hydrology to the Ni-les'tun Unit could result in indirect effects to cultural resources. However, it is anticipated that the proposed restoration would more likely result in beneficial effects to the known cultural resources in that (1) unnatural deposition rates and accumulation of sediment at cultural sites would be restored to natural physical processes, (2) inundation by tidal waters would favor greater protection and preservation of cultural resources because it would reduce exposure and return anoxic conditions that preserve cultural features, (3) removal of the levee overburden would reduce calving of the river bank, and (4) expansion of the floodplain would reduce unnatural river velocities and localized erosive forces on cultural sites by permitting tidal and stormwaters to sheet flow across the tidal plain.

Implementation of the Preferred Alternative would have no adverse effect on the cultural sites in the vicinity of the North Bank Lane construction activities. The potential impact of the roadway project on traditionally important plants would be minimized to the extent practicable through relocation of individual plants or by direct use of the plants for cultural purposes (Section 6.3).

The Coquille Indian Tribe and the Confederated Tribes of the Siletz Indians have concluded that the existing condition of the Ni-les'tun Unit has negatively impacted cultural sites and has led to the loss of historic practices associated with the degradation of the region's fish and wildlife populations. The perpetuation of this artificial condition would continue under the No Action Alternative. As a result, the Tribes consider the proposed restoration project to be in the best interest of the Tribes and the cultural sites located within the Ni-les'tun Unit. The Tribes agree that the restoration efforts would have a beneficial effect on the cultural sites by protecting and preserving them in a fully functioning, tidally influenced wetland with restored natural hydrological and biological processes.

To avoid adversely affecting previously unidentified cultural resources in the project area, a combination of preconstruction cultural resource investigations and construction monitoring will be implemented to ensure that no adverse effect will occur. In addition, once the construction activities are complete, a long term monitoring plan would be implemented to ensure that any cultural resources that may be indirectly effected or discovered with the restoration of the natural tidal and riverine hydrology, is recorded. Finally, the Tribes and the USFWS would develop a plan for the curation, storage, and interpretation of recovered cultural artifacts, and, after the

restoration project, would develop a long-term intergovernmental agreement for the management of these resources.

In summary, implementation of the Preferred Alternative on cultural sites would be beneficial but less than significant.

3.8 Transportation and Right-of-Way

3.8.1 Existing Environment

The project area is accessed by North Bank Lane. North Bank Lane is a Coos County-managed road, is classified as a rural collector, and has a 60-foot ROW. The road surface is generally in fair condition; however, the roadbed at the Fahys Creek crossing is failing and has numerous surface cracks. Some sunken grade issues and cracks are present in the surface at the Redd Creek culvert, an indicator that the culvert may be failing below the road surface.

Periods of high precipitation, high-river flow events, or when the culverts are blocked by beaver activity cause North Bank Lane to floods on average once or twice a year; this is made worse because of undersized culverts and low road elevations at the Fahys and Redd Creek crossings. When these high-flow events correspond with a high tide in the Coquille River, more extreme flooding of North Bank Lane occurs. When both Fahys and Redd creeks flood at the same time, access to the Refuge scenic overlook and headquarters and private residences and businesses along North Bank Lane is blocked.

The County boat ramp at Rocky Point is located east of the Ni-les'tun Unit and west of the intersection of Randolph Road and North Bank Lane. This facility would not be modified by the Preferred Alternative, and access to the ramp would be available at all times during project construction.

3.8.2 Environmental Consequences

Alternative A: No Action Alternative

The road would remain in its current configuration and condition. The road surfacing would continue to deteriorate, and the roadbed at Fahys and Redd creeks would continue to fail above the culverts. At some point, it would be necessary to replace these culverts, potentially under emergency conditions, which may not allow time for a comprehensive repair including protection or enhancement of natural resources. North Bank Lane would continue to flood during periods of high precipitation, river flows, and tides. These events would continue to limit and adversely affect access to the Refuge headquarters and scenic overlook, private residences, the County boat ramp, and businesses along North Bank Lane.

Alternative B: Preferred Alternative

Under the Preferred Alternative, the USFWS would restore the currently limited fish and wildlife habitat of the project area to historic full tidal wetland conditions by removing the constructed levees and tide gates, and re-establishing natural creek channels for Redd and Fahys creeks. After the restoration, tidal water levels on the site would match the tidal water level in the adjacent Coquille River. The restored tidal water levels would flood a large portion of the site daily. At the highest monthly tides, the entire site would flood from the toe of the south slope of

North Bank Lane to the river, with the exception of the east end of the natural river levee, which is higher in elevation.

The Preferred Alternative would raise the level of North Bank Lane at Fahys and Redd creeks above the elevation at which it currently floods. This would improve connectivity between U.S. 101, local residences, businesses, and the Refuge by providing safe and reliable access. It would also reduce the frequency of events that result in the isolation of the Refuge and residences. During extreme flooding events, however, the road would be subject to flooding and closures. The replacement of the two road culverts would allow reconstruction of the failing road in these locations, which, when coupled with widening and repaving, would create a wider and safer roadway. The grade raise work would require larger ROW on which the fill would be placed. Additional County road ROW would be needed across Refuge lands to construct the elevated roadway. No private property would be impacted. Construction at Fahys Creek would require a road closure at this location for approximately 3 weeks to install the new culvert and raise the road. Construction at Redd Creek may also require a road closure, but work on the two culverts would be staggered for the public's convenience and access. Both of these disruptions would be temporary and minor.

It is not expected that the Preferred Alternative would result in an increase in vehicle traffic on North Bank Lane. Overall, the Preferred Alternative is anticipated to have a less-than-significant beneficial impact on transportation and ROW.

3.9 Economics

3.9.1 Existing Environment

The project area is located approximately 2 miles north of the City of Bandon in Coos County, Oregon. In 2007 the population of Bandon was estimated at 3,235 (PRC 2007), and the population of Coos County was estimated at 63,000 (OECDD 2007). From 1995 to 2005, the County population increased by 1.6 percent, employment increased by 17.4 percent, and per capita income increased by 13.7 percent (Carver and Caudill 2007).

Approximately 144,077 acres of Coos County were classified as farmland in 2007, a 13 percent decrease from 1997 (COA 2002). In accordance with provisions of the Refuge Revenue Sharing Act, the USFWS makes annual payments in lieu of taxes to Coos County based on the appraised value of Refuge lands and facilities. In 2007 the Refuge payment to Coos County was $5,480. In 2006 more than 4,000 visits to the Refuge (including both the Ni-les'tun and Bandon Marsh Units), and it was estimated that these users spent about $46,000 in the local community (Carver and Caudill 2007). Most of this revenue was generated by non-residents and was estimated to provide the equivalent of local employment for one person (Carver and Caudill 2007).

The site was historically used as a dairy farm and converted to a beef cattle operation in the early 1990s. In 2004 the Ni-les'tun Unit was purchased in fee title by the USFWS and managed for fish and wildlife habitat. The Refuge pastures are currently grazed by beef cattle under provisions of a Cooperative Land Management Agreement for habitat management purposes. The number of grazing animals on the project area varies depending on the season, with more animals present in the spring and summer months to reduce vegetation for wildlife management and pre-restoration purposes.

3.9.2 Environmental Consequences

Alternative A: No Action Alternative

The No Action Alternative would result in no effect to the local economy. Under the No Action Alternative, the USFWS would continue to make annual payments to the County, grazing would likely continue for wildlife management purposes, and the number of visitors and recreational activities would not change.

Alternative B: Preferred Alternative

Construction of the restoration and roadway elements of the Preferred Alternative would require construction crews, logistical support (such as food and lodging), materials, and other products. Sourcing has yet to be determined, but some crews and materials would be from local sources, thus increasing local revenue generation. Out-of-town staffing would require local support services, also increasing local revenue. The restoration of the current degraded pastures to tidal salt marsh would require that current grazing for wildlife management purposes would cease.

If future Refuge planning efforts result in an increase in public access and recreational opportunities, there could be a greater attraction to the Ni-les'tun Unit by individuals seeking wildlife-dependent recreational opportunities not currently available. These additional visitors could potentially generate additional revenue to the local economy. This analysis will be included in the development of the upcoming CCP and is beyond the scope of this analysis. Overall, the Preferred Alternative is anticipated to have a less-than-significant beneficial effect on the local economy.

3.10 Land Use

3.10.1 Existing Environment

The lands within the restoration area are held in fee title by the USFWS. The site is zoned for agriculture by Coos County. A large portion of the Ni-les'tun Unit is currently degraded leveed pasture that is managed for fish and wildlife, and no public use is allowed except at the scenic overlook. The Ni-les'tun Unit is grazed for wildlife management purposes, an activity that would end in 2009 before implementation of the Preferred Alternative.

3.10.2 Environmental Consequences

Alternative A: No Action Alternative

The No Action Alternative would result in no effect on land use; the Ni-les'tun Unit would continue to be managed for fish and wildlife.

Alternative B: Preferred Alternative

Under the Preferred Alternative, the land use would be restored to historic tidal wetlands that were converted to pasture by levee and drainage ditch construction. The area encompassing the Ni-les'tun Unit was zoned as agricultural land before its acquisition by the USFWS. This designation conflicts with the mission and goals of the USFWS to enhance and protect fish and wildlife resources to the exclusion, if necessary, of other uses. Habitat restoration is the primary

purpose of the Ni-les'tun project. Detailed planning for compatible recreational use will occur as part of the Refuge's CCP slated for completion in 2012.

Under the Preferred Alternative, the tidal marsh habitat would no longer be grazed for wildlife management purposes (e.g., vegetation management). It would be restored to its historic ecological regime and function to support a variety of improved habitat conditions for fish and wildlife and thus support ecological and economic components vital to the southern coast of Oregon. After a century of wetland conversion for agricultural use in the Coquille River floodplain, tidal wetlands are now a rare habitat type in the basin. Given the sheer number of acres of wetland habitats lost to conversion, the Preferred Alternative would result in a less-than-significant but positive effect and is not anticipated to adversely affect local land use.

3.11 Soundscape

3.11.1 Existing Environment

The project area is rural in nature and is outside of the Urban Growth Boundary of the City of Bandon. No large-scale industrial operations or large-point sources of human-generated sound are near or within the project area. Human sources of sound include traffic on U.S. 101 and North Bank Lane, motorized boat traffic on the Coquille River, and occasional target or waterfowl shooting. To assess the effects of sounds that are above ambient levels, resources that would be disturbed by project-generated sounds are identified. These resources include wildlife and private residences along the north and south side of the Coquille River in the relatively nearby vicinity of the project area.

3.11.2 Environmental Consequences

Alternative A: No Action Alternative

Under the No Action Alternative, no changes to the soundscape on or near the project area would occur.

Alternative B: Preferred Alternative

The Preferred Alternative would result in a short-term impact to the local soundscape from construction activities involving heavy equipment; however, work would be seasonal and confined to average weekday work hours. Because there would be no change in visitor facilities or public access, local traffic on North Bank Lane is not expected to change as a result of improvements to the roadway; therefore, traffic sounds would not increase. The Preferred Alternative is anticipated have a less-than-significant effect on the soundscape on or near the project area.

3.12 Utilities

3.12.1 Existing Environment

Coos-Curry Electric Cooperative owns and maintains a 25-kilovolt regional transmission line that crosses the Coquille River and the Ni-les'tun Unit east of the Ni-les'tun Unit scenic overlook. This line is supported by a set of wooden H-poles near the river bank and two single wooden poles within the degraded pastures. Access to these poles occurs on an easement held by

Coos-Curry Electric Cooperative which includes a degraded access road adjacent to the transmission line within the pasture. The access road and pastures are wet during the winter and spring months, thus limiting maintenance access at these times.

Coos-Curry Electric Cooperative also owns a smaller local transmission line service that crosses the cranberry bogs restoration area and provides electricity to Refuge facilities and the adjacent Bandon Dunes Golf Resort to the north.

Pacific Power owns and maintains a local service utility line along North Bank Lane. This line is both within and outside of the existing North Bank Lane ROW and spans seasonally wet soils or standing water within the degraded pasture. A buried Verizon telephone line parallels North Bank Lane from U.S. 101 along the entire project area.

All power lines that cross the Refuge create an electrocution risk to large raptors and a collision risk to birds. Birds often fly into utility lines during periods of low visibility and are injured or killed (NWCC 2001). Because of the magnitude of bird use on the Refuge, lines that cross the Refuge are likely to generate relatively higher bird-strike mortality than lines located away from the Refuge (see Section 3.5).

3.12.2 Environmental Consequences

Alternative A: No Action Alternative

The soil and water conditions limiting access to the 25-kilovolt transmission line and the smaller local utility lines in the degraded pasture and cranberry bogs would continue to limit access to the area for routine maintenance or emergency repairs. All power lines that cross the Refuge would continue to create an electrocution risk to large raptors and a collision risk to birds.

Alternative B: Preferred Alternative

Discussions with Coos-Curry Electric Cooperative about the 25-kilovolt transmission lines that cross the Ni-les'tun Unit are ongoing. Because this is the only regional transmission line that crosses the Coquille River and ties into the electrical grid to the north, Coos-Curry Electric Cooperative requires either year-round access or maintenance-free conditions for this line. Access to the existing utility easement and poles and the transmission line would be impaired under the Preferred Alternative. Daily tidal flooding would block equipment and vehicle access to the poles at a frequency much greater than current conditions, which limit access to the dry summer months. If the transmission line remains in place, the Preferred Alternative would have a potentially significant impact on the ability of Coos-Curry Electric Cooperative to maintain this regional transmission line. Because of the Preferred Alternative's effects on the transmission ROW and on birds, the USFWS is proposing to replace the aboveground line by relocating the transmission line underground. Maintenance requirements for the underground utility would be minimal; removing the supporting overhead lines would eliminate bird strikes and electrocution risks, and the Unit's aesthetics would be improved.

To accommodate the road reconstruction, the local service line owned by Pacific Power and the buried Verizon telephone line along North Bank Lane may need to be relocated in some locations. Where the road grade would be raised at Fahys and Redd creeks, the wider fill slopes would require relocating the utilities to along the base of the new fill and out of the proposed tidal wetlands restoration area. Upon completion of the Preferred Alternative, relocated local distribution lines would be within the North Bank Lane ROW.

The local supply line owned by Coos-Curry Electric Cooperative at the cranberry bogs would be moved slightly to the west and out of the restoration site, but would remain within their easement. Relocation of these lines will be coordinated with Coos-Curry Electric Cooperative to ensure continued service.

Because most utilities can be easily relocated, and outages are not expected, adverse impacts to utilities are considered to be less than significant. Relocation of the 25-kilovolt line is feasible and in accordance with the USFWS mission and goals for the Refuge.

3.13 Cumulative Effects

3.13.1 Existing Environment

Cumulative effects result from the incremental impact of the Preferred Alternative when added to other "past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions" (40 CFR 1508.7). The effects of an action may be insignificant when evaluated individually, but when added to other actions outside of the immediate project area may contribute cumulatively to measurable environmental change. The scope for analysis of cumulative impacts is therefore larger than the immediate project area to more broadly consider the effects of other activities occurring within the adjacent landscape.

The area considered in the evaluation of the Preferred Alternative's contribution to cumulative impacts is the Lower Coquille River basin (Figure 5). This area is generally rural in nature with limited urban development. The natural resources of the area are diverse, ranging from mountain forests to coastal beaches. Towns are relatively small and the economic base generally does not support large-scale urbanization found in other areas of the state. The primary industries in the basin include fishing, forestry, livestock and cranberry production, and tourism. Tourism is growing due to the scenic nature of the Oregon coast and is supported by numerous state and county parks, public beaches, and recreational opportunities.

Beginning with Native American settlement and the construction of fishing weirs, historical activities modified the Lower Coquille Basin, especially the tidal areas. The most significant changes occurred when levees were constructed to separate the river from its floodplain. In the late 19th or early 20th centuries these former floodplain areas were drained and converted to agricultural or industrial uses. In the upper basin, past and ongoing forestry practices have altered stream channels, water quality, and flow patterns.

Reasonably foreseeable future activities are those that are included in planning documents and have allocated funding. Such activities can be identified by reviewing the local land management plans, state transportation plans, and local government budgets, and by interviewing local government officials. The Coos County Planning Department indicated no known projects in the Bandon area or in the Lower Coquille River Basin that are at this stage of development. Reasonably foreseeable activities within the project vicinity include the preparation of the CCP for the Refuge and some roadway work. The CCP will guide Refuge management and will include plans for compatible wildlife-dependent recreational use. Because the CCP has yet to be developed, it is not possible to anticipate the type of recreational use and its resulting cumulative effects in the basin.

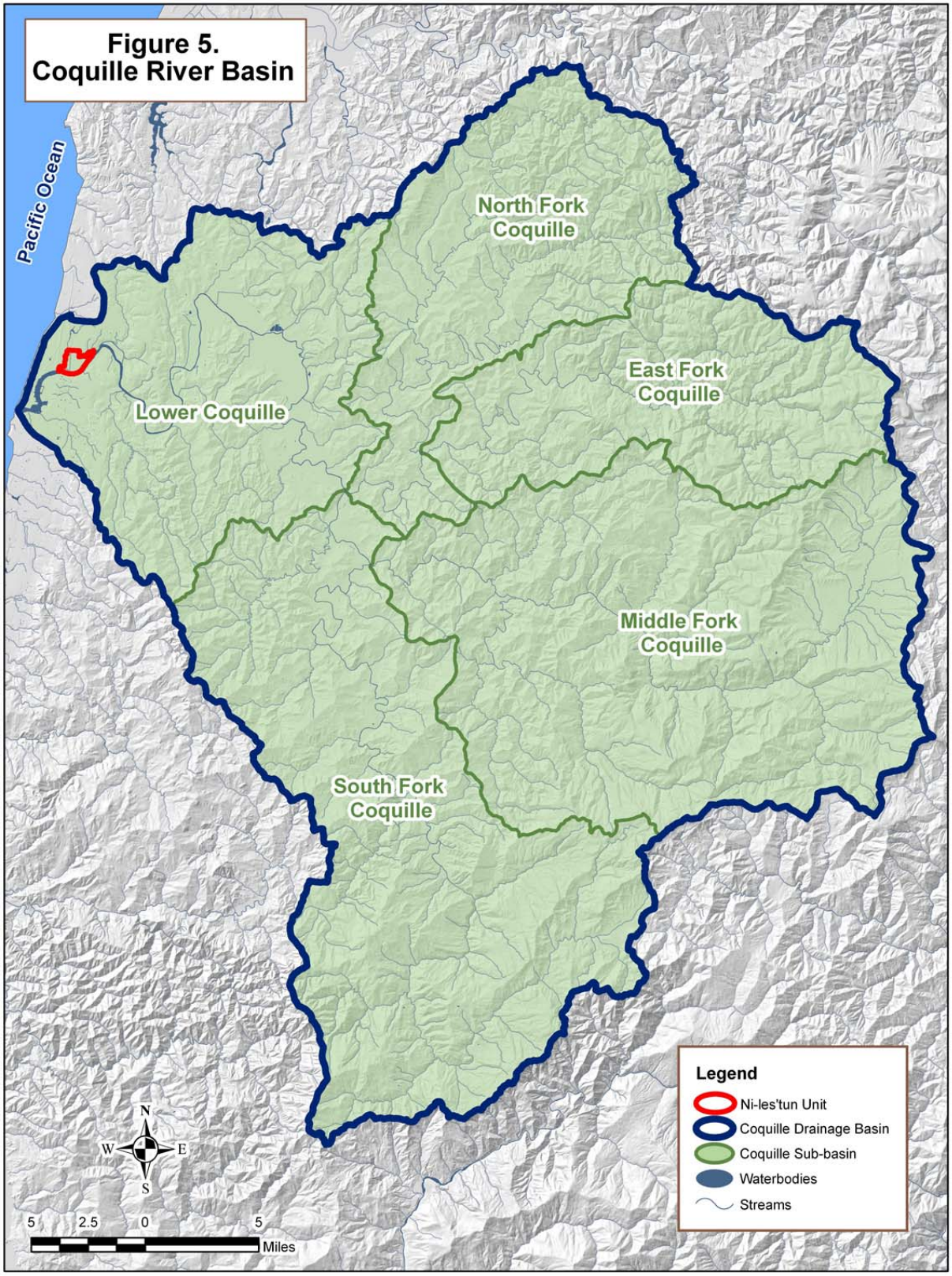


Figure 5.
Coquille River Basin
Pacific Ocean
North Fork Coquille
East Fork Coquille
Lower Coquille
Middle Fork Coquille
South Fork Coquille
Legend
Ni-les'tun Unit
Coquille Drainage Basin
Coquille Sub-basin
Waterbodies
Streams
N
W
E
S
5
2.5
0
5
Miles

The Oregon Department of Transportation (ODOT) Draft Statewide Transportation Improvement Plan (October 2008) identified two roadway projects in the lower basin: minor roadway work in Bandon and a bridge replacement at the Beaver Creek Bridge on upper North Bank Lane.

3.13.2 Environmental Consequences

Alternative B: Preferred Alternative

Soils and Geology

The Preferred Alternative, in combination with past, present, and reasonably foreseeable future activities, would have no cumulative effect on soils and geology. BMPs would be required to minimize impacts from all road projects.

Air Quality

The Preferred Alternative, in combination with past, present, and reasonably foreseeable future activities, would have no cumulative effect on air quality. Neither the Preferred Alternative nor the other roadway projects would increase capacity; therefore, there is no anticipated increase in traffic-generated pollution.

Water Resources, Vegetation and Wetlands, Fish and Wildlife, Threatened and Endangered Species

Because the cumulative effects to these resources are similar, they are discussed in this one section. The Preferred Alternative, in combination with past, present and reasonably foreseeable future action, would result in a cumulative effect on these resources. The Preferred Alternative would result in the restoration of more than 400 acres of tidal salt marsh, currently the largest restoration project of its kind in Oregon. As discussed in Section 3.4, the restoration of 400 acres would be less than 2 percent of the historic wetlands that have been converted to either uplands or scrub/shrub wetlands in the Lower Coquille River basin watershed.

The other roadway projects may result in similar effects resulting from the North Bank Lane component of the Preferred Alternative; these effects could be improvements to riparian and fish passage but also additional disturbance resulting from cut and fill activities. At this point, the extent of the effects from the other projects is speculative and not reasonably foreseeable given that such effects are dependent upon road designs that have yet to be developed. Regardless of the design, FHWA and ODOT would be required to comply with all applicable environmental laws and to obtain all necessary permits. Compliance with these laws and permitting requirements will require consideration of cumulative effects and the mitigation of adverse impacts to floodplains, water quality, wetlands, and threatened and endangered species.

Overall, the incremental effect this project is anticipated to have on water resources, vegetation and wetlands, and fish and wildlife species is beneficial but, in the context of past impacts, less than significant.

Cultural Resources

The Preferred Alternative, in combination with past, present, and reasonably foreseeable future activities, would have a beneficial cumulative effect on cultural resources. Past roadway

construction and levee construction along the Coquille River has impacted cultural resource sites. Residential and commercial development, and agricultural practices, have also likely adversely impacted cultural resources in the Lower Coquille River Basin, though it is not possible to determine to what extent. The Preferred Alternative would have no adverse effects to cultural resources and would likely benefit such resources for the long term. The Tribes support the Preferred Alternative as it would restore the natural ecological conditions and permit the collection and dissemination of information that would otherwise be lost (Metcalf 2009). The Preferred Alternative would have a beneficial effect on cultural resources but, given the context and setting, is anticipated to be less than significant.

Transportation and Right-of-Way

The Preferred Alternative, in combination with past, present, and reasonably foreseeable future activities, would have a cumulative effect on transportation resources. The roadway projects, including the North Bank Lane component of the Preferred Alternative, would improve the reliability of the transportation system; however, these improvements are minor in that they are not anticipated to change roadway capacity. As a result, the incremental effect this project is anticipated to have on transportation facilities is beneficial but less than significant.

Because the Preferred Alternative would require no ROW acquisition from private property owners, it would have no incremental cumulative effect in combination with other ROW actions in the lower basin.

Economics

The Preferred Alternative, in combination with past, present, and reasonably foreseeable future activities, particularly the roadway projects, would likely result in an increase in demand of goods and services in the Lower Coquille River Basin, particularly in Bandon; however, this demand would be temporary, lasting only for the duration of the roadway construction. Because the effects from construction are temporary and none of the road projects are intended to increase capacity, it is anticipated the Preferred Alternative would have no long-term cumulative effect on the area economies.

Land Use

The Preferred Alternative, in combination with past, present, and reasonably foreseeable future activities in the Lower Coquille River Basin, would have no cumulative effect on current land use because the area is currently managed for fish and wildlife.

Soundscape

The Preferred Alternative, in combination with past, present, and reasonably foreseeable future activities in the Lower Coquille River basin, would have no cumulative effect on the soundscape. There would be a localized temporary increase in sound due to construction activities, but because the Preferred Alternatives and the other identified activities are distant from each other, would occur in different years, and would not increase vehicular capacity, no cumulative impacts would occur.

Utilities

The Preferred Alternative, in combination with past, present, and reasonably foreseeable future activities in the Lower Coquille River basin, would have no cumulative effect on utilities. No interruption in service is anticipated from the relocation of utility lines.

3.14 Environmental Consequences Summary

This EA was prepared to "provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement…or a finding of no significant impact" (40 CFR Part 1508.9). The analysis is intended to determine whether a significant impact could occur as a result of implementing the proposed action. The term "significant impact" is broadly defined, allowing for impact evaluations to vary by affected resource and context (i.e., at the project or regional scale). The process for choosing the appropriate context is discussed in Section 3.13.

The implementation of the Preferred Alternative for the restoration of estuarine habitat for fish and wildlife on the Ni-les'tun Unit and improvements to North Bank Lane were found to have less-than-significant impacts to all the evaluated resources. Where adverse impacts were found, they would be of too short a duration to be considered adverse. Limited to construction activities, these impacts would be minimized through the use of BMPs (see Chapter 6) and would be generally short-term and limited to construction activities.

Overall, implementation of the Preferred Alternative is expected to have beneficial impacts to natural resources, mainly fish and wildlife resources, but also to cultural resources and economic opportunities. However, in the context of historic losses of tidal wetland habitat along the Coquille River and continuing habitat loss and degradation resulting from human activities in the area, the beneficial effects associated with the Preferred Alternative are not considered to represent a significant impact.

Chapter 4
De Minimis Section 4(f)

The intent of the Section 4(f) Statute,49 U.S.C Section 303, and the policy of the FHWA, is to avoid transportation use of historic sites and publicly owned recreational areas, parks, and wildlife and waterfowl refuges. If the FHWA determines that a transportation use of these types of properties, also known as Section 4(f) properties, results in a *de minimis* impact on the property, an analysis of avoidance alternatives is not required, and the Section 4(f) evaluation process is complete. *De minimis* impacts on historic sites are defined as those that result in a "no adverse effect" or "no historic properties affected" determination with the concurrence of the SHPO. *De minimis* impacts on publicly owned parks, recreation areas, and wildlife and waterfowl refuges are defined as those that do not "adversely affect the activities, features and attributes" of the Section 4(f) resource.

Because Section 4(f) applies only to transportation use, this *de minimis* evaluation is performed only for the North Bank Lane roadway component of the project.

4.1 Existing Environment

Four Section 4(f) properties are in the project area of North Bank Lane: the Refuge and three cultural sites. Though no official eligibility determination has been made for the cultural resources, for purposes of this evaluation, the three cultural sites have been assumed to be eligible for listing on the National Register of Historic Places. Figure 1 shows the Refuge boundaries. The cultural sites are archaeological in nature and, to protect them from human-induced (illegal archeological artifact collection) impacts, their locations are not disclosed.

4.2. Environmental Consequences

No Action Alternative

Under the No Action Alternative, no Section 4(f) impacts would occur.

Preferred Alternative

As discussed in Section 3.7, because the proposed roadway construction would occur within previously disturbed areas, there would be no adverse effect to the cultural sites. The FHWA and the USFWS have consulted with the Coquille Indian Tribe and the Confederated Tribes of the Siletz Indians regarding this work, and neither has expressed concern about the effects of roadway construction on these cultural sites. The Tribes request only that construction in the vicinity of these sites be monitored, a request that the FHWA has agreed to. The FHWA and the USFWS agree that the proposed project would have no adverse effect to these sites. Concurrence from the SHPO regarding this determination is currently being sought.

The proposed roadway construction would require the acquisition of approximately 0.74 acres of Refuge land for county ROW, primarily in the vicinity of Fahys and Redd creeks. This additional ROW is needed to raise the road to minimize periodic flooding and also to permit the installation of larger fish-friendly culverts. Raising the road would reduce the flooding frequency and provide homeowners and Refuge staff with more reliable access. Installing larger culverts will help the Refuge to implement their wetland restoration effort by improving fish passage and habitat and by providing better tidal flows.

4.3. De Minimis Finding

The Preferred Alternative would have a *de minimis* impact on the cultural sites in the road improvement project area because the construction would create no new disturbance to those sites. Construction activities in the vicinity of those sites will be monitored. The Preferred Alternative would have a *de minimis* impact on the Refuge because it does not adversely affect the activities, features, and attributes that qualify the resource for protection under Section 4(f). Instead, the construction work proposed for North Bank Lane would assist the Refuge in meeting its management objectives in that it would provide Refuge staff safe and reliable access to their headquarters and assist the Refuge in restoring tidal wetlands in the Ni-les'tun Unit.

Chapter 5
Communication, Consultation, and Coordination

This chapter summarizes the USFWS and FHWA efforts to involve the public, other agencies, and local, state, and tribal governments in the EA process. This chapter also summarizes the project's adherence to applicable state and federal laws.

5.1 Public Involvement

Public comment for this project was solicited on an individual basis by the Refuge Project Leader, at an open house meeting, and during a formal scoping period. The public open house was held for the North Bank Lane component of the project at the Bandon Public Library on May 13, 2008. Thirteen members of the public attended, and three comments were received (Chapter 7).

A formal scoping period for both the restoration and North Bank Lane components was held from November 5 through December 5, 2008, and included:

- Posting of a notification on the USFWS Web site at http://www.fws.gov/oregoncoast/
- A letter submitted to the Coos Bay *The World* newspaper (not published) and the *Bandon Western World* newspaper (published November 20, 2008)
- A scoping letter mailed on November 5, 2008, to 102 adjacent landowners, interested individuals, organizations and agencies

Eight comments were received during the scoping period (Chapter 7).

5.2 Tribal Coordination

The Ni-les'tun Unit is an important area to the Coquille Indian Tribe and the Confederated Tribes of the Siletz Indians who used it for thousands of years while in its historic estuarine condition. Because of the importance of the area to the Tribe, the USFWS in June 1998 asked the Coquille Indian Tribal Council to name the new unit of Bandon Marsh. They selected Ni-les'tun, meaning "small dam in the river," to acknowledge the extensive network of historic fish weir sites along the Coquille River. Since planning for the acquisition of the Ni-les'tun Unit began in 1997, the USFWS has continued to coordinate with the Tribes on the management and restoration plans of these important ancestral lands. Tribal consultation for this project includes:

- 1998–2008: Assistance with site-specific archaeological investigations within the Ni-les'tun Unit that inventoried, mapped, and cataloged resources (CIT 1999; Tveskov and Cohen 2007)
- Preparation of the Archaeological Pedestrian Survey of North Bank Lane: Federal Highways Road Project and Bandon Marsh National Wildlife Refuge–Ni-les'tun Unit Restoration by the Coquille Indian Tribe for the USFWS (CIT 2007)
- December 9, 2008: Meeting among the USFWS, the Coquille Indian Tribe, and the Confederated Tribes of Siletz Indians
- Submittal on January 12, 2009, of a request to the SHPO for Section 106 compliance

- Submittal on March 18, 2009, of an administrative draft of this environmental assessment for review and comment
- April 11, 2009 – Meeting among the Coquille Indian Tribe, SHPO, USFWS, and FHWA

5.3 Interagency Coordination

The Preferred Alternative has been discussed with many state and federal agencies since its inception. Because of the wide scope of the project, numerous agencies with various jurisdictions are involved. The discussion below describes the current status of agency coordination. The USFWS will maintain open communication with involved agencies throughout the life of the project.

5.3.1 U.S. Army Corps of Engineers

The Corps has the regulatory authority under Section 404 of the Clean Water Act to permit fill of wetlands considered to be Waters of the U.S. The Corps also regulates the placement of structures in navigable waters through Section 10 of the Rivers and Harbors Act. The proposed project involves the placement of fill into jurisdictional wetlands from both the improvements to North Bank Lane and the restoration of the historic wetlands of the Ni-les'tun Unit of the Refuge. In addition, a Section 10 permit may be required for levee removal and alteration. The USFWS and FHWA entered into discussions with the Corps in the spring of 2008 to clarify the permitting process, and applications are under development. Two meetings and multiple conference calls with Corps staff have occurred, during which the project and permitting requirements were discussed. Permit applications were submitted on March 30, 2009.

5.3.2 National Marine Fisheries Service

The NMFS conserves and protects marine resources, including federally listed anadromous fish. Because the Oregon Coast coho salmon is listed as threatened under the ESA and is present, along with its designated critical habitat, in the project area, the USFWS, the FHWA, and the Corps are required to consult with NMFS to avoid or minimize adverse effects to this species and its critical habitat during project implementation. The agencies must also comply with the Magnuson-Stevens Fisheries Conservation and Management Act (MSA) (Public Law 94-264) as amended and reauthorized by the Magnuson-Stevens Fisheries Conservation and Management Reauthorization Act (Public Law 109-479), also under the authority of NMFS. This Act protects Essential Fish Habitat (EFH), a term used to describe aquatic habitat essential for continued existence of commercially important species. It is defined in the MSA as "...those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 USC 1802 MSA sec 3[10]).

Contact with NMFS regarding this project was initiated by the USFWS in 2008. A determination was made by NMFS that the proposed improvements to North Bank Lane and the restoration of the historic wetlands of the Ni-les'tun Unit were covered programmatically by two of its biological opinions issued to the Corps in 2008:

(1) Programmatic Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for Revisions to Standard Local Operating Procedures for Endangered Species to Administer Maintenance or Improvement of Road, Culvert, Bridge and Utility Line Actions Authorized or Carried

Out by the U.S. Army Corps of Engineers in Oregon (SLOPES IV Roads, Culverts, Bridges, and Utility Lines)

(2) Endangered Species Act Section 7 Formal and Informal Programmatic Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for Revisions to Standard Local Operating Procedures for Endangered Species to Administer Stream Restoration and Fish Passage Improvement Actions Authorized or Carried Out by the U.S. Army Corps of Engineers in Oregon (SLOPES IV Restoration).

In these opinions, the NMFS concluded that the proposed actions (i.e., implementation of the Preferred Alternative) are not likely to jeopardize the continued existence of Oregon Coast coho salmon. As required by Section 7 of the ESA, these opinions include reasonable and prudent measures with non-discretionary terms and conditions that are necessary to minimize the impact of incidental take associated with the project. The USFWS and the FHWA must comply with these terms and conditions as well as with conservation recommendations to avoid, minimize, or otherwise offset likely adverse effects to EFH. Terms and conditions reflect BMPs and other measures to reduce impacts to coho salmon, their critical habitat, and EFH, and would become an integral part of the proposed project's operating procedures (Chapter 6).

5.3.3 Oregon Department of Environmental Quality

The ODEQ is charged with implementing Section 401 of the Clean Water Act, which regulates water quality through a Water Quality Certification. This certification is required by the Corps prior to issuance of a Section 404 permit. Discussions with the ODEQ were initiated in 2008. The ODEQ participated in a meeting on January 21, 2009, during which the stormwater management plan prepared by FHWA for the roadway project was discussed. The certification process is triggered by the receipt of a joint permit application to the Corps and DSL (see below).

5.3.4 Oregon Department of State Lands

The Oregon DSL is charged with verifying the delineation of wetlands within Oregon and regulating the removal or placement of fill into wetlands (Oregon Revised Statutes 196.800 et seq. and Oregon Administrative Record 141-090-0005 et seq.). The DSL and Corps permitting processes are concurrent through a joint permit application form. A wetland delineation was conducted for North Bank Lane in 2007 (DEA 2007) and will be submitted with the permit application to DSL.

5.3.5 State Historic Preservation Officer, Section 106

The Oregon SHPO is charged with protecting and preserving the historic resources of the State of Oregon. The USFWS initiated consultation with the SHPO on January 12, 2009. The SHPO participated in an on-site meeting on April 11, 2009.

5.3.6 Oregon Department of Fish and Wildlife

The ODFW is responsible for managing the State's fish and wildlife resources. Implementation of the Preferred Alternative would follow ODFW guidelines for in-water work periods to minimize impacts to fish during construction. The fish passage criteria developed by ODFW will be satisfied by NMFS terms and conditions for culvert sizing at Fahys and Redd creeks.

5.4 Department of Land Conservation and Development

The DLCD administers the Coastal Zone Management Act of 1972, as amended (CZMA) (Public Law 109-58). The CZMA charges coastal states to manage coastal resources for the benefit of the nation. The coastal zone extends from the ocean to the crest of the Coast Range. The DLCD determines the consistency of federal coastal zone projects in relation to 19 CZMA goals focusing on land use planning and natural resource conservation issues.

The goals that specifically relate to natural and cultural resources (Goal 5) and estuarine resources (Goal 16) are the most directly related to the project (Table 2). Goal 5 relates to the protection and preservation of scenic, cultural, historic, and natural resources. The goal establishes a process for resource inventory and project plan development and implementation. The USFWS follows established policies, laws, and regulations regarding resource inventories and management planning. The Refuge is currently under an interim Conservation Management Plan until it completes a CCP for the Refuge in 2012. The proposed project provides protection to natural resources by improving habitat conditions for birds, fish, and other wildlife (Sections 3.5 and 3.6). Cultural resources exist on the site (Section 3.7), and the Coquille Indian Tribe and the Confederated Tribes of the Siletz Indians have been consulted regarding this project and are in support (Section 5.2).

Goal 16 relates to the protection of estuaries along the Oregon Coast. The Coquille River estuary is designated as a shallow-draft estuary[5] in the Oregon Estuary Plan Book (DLCD No Date). This designation was made because the Corps has built and maintains breakwater jetties at the river mouth and maintains a dredged navigation channel to facilitate boat access. The Oregon Estuary Plan Book includes designation of management units within the estuary that are intended to guide resource management. The actual designations for the Coquille River estuary are unclear, but appear to be primarily associated with conservation of natural resources and agriculture. The proposed project would increase the area of the estuary subject to tidal action by more than 400 acres, greatly improving the overall natural functions of the Coquille River estuary.

The DLCD will make a final determination as to the consistency of the project with the CZMA as part of the 404 permitting process.

5.5 Executive Orders

Executive orders (EO) are issued by the President of the United States to address specific policy issues. Six executive orders are applicable to the proposed project (Table 3). These EOs cover topics ranging from floodplain management (EO 11988), to environmental justice (EO 12898), to tribal consultation (EO 13175). The proposed project to restore the Ni-les'tun Unit and improve North Bank Lane is consistent with applicable executive orders.

5.6 Endangered Species Act

Projects that are likely to adversely affect any federally listed threatened or endangered animal species are required to obtain a take permit from the NMFS or the USFWS through an interagency consultation under Section 7 of the ESA. The permit includes nondiscretionary terms

[5] Shallow-draft refers to the size of vessels that can access the area. Shallow-draft boats include most recreational craft as well as some smaller commercial fishing vessels.

and conditions that must be followed to avoid jeopardizing the continued existence of a listed species and to avoid adverse modification of its designated critical habitat.

For the proposed project, the USFWS made a determination that the Preferred Alternative would have no effect on any of the federally listed plants or animals over which it has authority (USFWS internal memo). The NMFS has authority over the Oregon Coast coho salmon, the only federally listed species of fish found within the project area. The NMFS has determined that the Preferred Alternative would not jeopardize the continued existence of Oregon Coast coho salmon or adversely modify their critical habitat (Section 5.3).

Table 2. Preliminary Coastal Zone Management Act Goals and Consistency Determination

	Goal	Summary	Preferred Alternative	Preliminary Determination
1.	Citizen Involvement	Provide opportunities for citizen involvement in the planning process.	Scoping period held and comments accepted. Public comment on EA accepted.	Consistent
2.	Land Use Planning	Make land use planning decisions based on a comprehensive plan based on factual information.	The Preferred Alternative has no land use planning component. The Refuge management plan for the Ni-les'tun Unit would be developed after completion of restoration and would be consistent with the USFWS mission and goals for the Refuge.	Consistent
3.	Agricultural Lands	Requires inventory and zoning of farmlands to preserve and maintain them.	Action would restore historic tidal wetlands and convert locally zoned agricultural lands. The USFWS is not bound by local zoning.	Not applicable
4.	Forest Lands	Requires conservation and protection of forest lands and forest land uses.	Not applicable.	Not applicable
5.	Open Space	Incorporate open space needs in planning documents. Determine values consistent with open space uses. Focus development to preserve open space .	Action would restore degraded historic tidal wetlands that would be preserved open space.	Consistent
	Scenic and Historic Areas	Inventory and designate historic resources in accordance with NHRP and State Advisory Committee on Historic Preservation. Provide for preservation of those areas considered important.	Action would restore historic ecological conditions at historic cultural sites. The Coquille and Siletz Indian tribes have assisted in the project's development and are in support.	Consistent
	Natural Resources	Manage fish and wildlife in accordance with state plans. Provide streamflows and water levels adequate to protect fish and wildlife, minimize pollution, and maximize agriculture, aesthetics. and recreation.	Action would restore historic fish and wildlife habitat in three creeks and to more than 400 acres of historic tidal marsh.	Consistent

Table 2. Preliminary Coastal Zone Management Act Goals and Consistency Determination

Goal	Summary	Preferred Alternative	Preliminary Determination
6. Air, Water, Land, and Resource Quality	Requires that local regulations be consistent with federal regulations relating to water quality.	Action would comply with state and federal regulations relating to protection and preservation of water quality.	Consistent
7. Natural Disasters and Hazards	Relates to development in areas subject to natural hazards (e.g., flooding) and requires appropriate safeguards.	Restoration action is not considered development. Improvements to North Bank Lane are designed to eliminate road flooding.	Consistent
8. Recreation	Requires evaluation of need and planning for recreational facilities.	No changes in existing recreational use are part of this action. The USFWS will undertake planning to address recreation.	Consistent
9. State Economy	Relates to diversification of the state economy. Primarily focuses on business-related needs.	Project would provide employment during construction.	Consistent
10. Housing	Requires planning for a variety of housing types.	Not applicable.	Not applicable
11. Public Services	Relates to the provision of public services such as fire and law enforcement, water, and sewer services.	Not applicable.	Not applicable
12. Transportation	Relates to the provision of safe and economic transportation systems.	Improvements to North Bank Lane would reduce flood risk and improve public safety.	Consistent
13. Energy	Requires that development of land be done in the most energy-efficient way possible.	Not applicable.	Not applicable
14. Urbanization	Requires estimates of future growth and establishment of urban growth boundaries.	Not applicable.	Not applicable
15. Willamette Greenway	Establishes management of the Willamette Greenway.	Not applicable.	Not applicable

Table 2. Preliminary Coastal Zone Management Act Goals and Consistency Determination

Goal	Summary	Preferred Alternative	Preliminary Determination
16. Estuarine Resources	The Coquille River is classified as a shallow-draft estuary in the Oregon Estuary Plan Book (DLCD No Date); this means that it has a maintained jetty and shallow-water channel (less than 22 feet deep). Management units within the estuary appear to be natural resources conservation areas or agricultural.	Action would restore tidal marsh to historic areas. Although a portion of the project area appears to be designated as an exclusive agricultural management unit, the primary objective of Goal 16 is to maintain the integrity of the ecosystem. The action would greatly enhance the integrity of the Coquille River estuary.	Consistent
17. Coastal Shorelands	Applies only to the area between the beach on the west and U.S. 101 on the east.	Not applicable.	Not applicable
18. Beaches and Dunes	Sets planning standards for development on beaches and active dune systems.	No dune habitat exists within the project area.	Not applicable
19. Ocean Resources	Requires conservation and protection of marine resources.	Not applicable.	Not applicable

Source: *DLCD No Date: Oregon Estuary Plan Book. Available online at: http://www.inforain.org/oregonestuary/index.html. Accessed January 22, 2009.*

Table 3. Executive Orders Pertinent to the Ni-les'tun Unit Restoration Project and Preliminary Consistency Determination

Executive Order	Summary	Preferred Alternative	Preliminary Determination
11988 Floodplain Management (May 24, 1977)	Requires federal agencies to take actions that reduce the risk of flooding and minimize the flooding impacts on human health and safety. Also requires federal agencies to restore and preserve beneficial uses provided by natural floodplain function.	The action would reconnect the Coquille River to its historic floodplain and remove North Bank Lane from the floodplain. The action would restore the floodplain for natural resources and reduce flood impacts to public safety.	Consistent
11990 Protection of Wetlands (May 24, 1977)	Requires federal agencies to take actions that minimize destruction, loss, or degradation of wetlands.	The restoration portion of the project would restore more than 400 acres of historic tidal wetlands that were converted to pasture. The North Bank Lane portion of the project has been designed to minimize impacts to wetlands.	Consistent
12898 Environmental Justice (February 11, 1994)	Requires federal agencies to ensure that actions they take do not disproportionately affect minority or low-income populations through the creation of human or environmental health issues.	The Preferred Alternative would generate no human or environmental health issues.	Consistent
13112 Invasive Species (February 3, 1999)	Requires federal agencies to not authorize, fund, or carry out actions that promote the introduction of invasive species. In addition, agencies are required to take necessary actions to minimize the introduction of invasive species, monitor and control populations of invasive species, restore native species, provide research opportunities, and educate the public on invasive species.	The action would result in restoration of a large tidal marsh, thereby eliminating non-native pasture grass species and other invasive species along North Bank Lane. The USFWS would control invasive species as they occur within the restoration area following project completion. Additionally, equipment entering the site would be cleaned to minimize the introduction of additional invasive species (see Chapter 6).	Consistent
13175 Consultation and Coordination with Indian Tribal Governments (November 6, 2006)	Requires federal agencies to coordinate and consult with Tribes on any actions that have Tribal implications.	The Coquille Indian Tribe and the Confederated Tribes of the Siletz Indians were involved in project planning. They were consulted and support the Preferred Alternative (Section 5.2)	Consistent
13186 Responsibilities of Federal Agencies to Protect Migratory Birds (January 10, 2001)	Requires federal agencies to take action in consultation with the USFWS to protect, manage, and enhance populations of migratory birds.	The action would create more than 400 acres of tidal wetland habitat for use by migratory birds.	Consistent

Chapter 6
Environmental Commitments

A wide variety of measures are incorporated into the project's design to minimize adverse environmental and cultural impacts. The majority of these measures are nondiscretionary design criteria associated with terms and conditions from the two Standard Local Operating Procedures for Endangered Species (SLOPES) biological opinions issued by NMFS to the Corps to avoid jeopardizing the continued existence of Oregon Coast coho salmon in the project area or adversely modifying their designated critical habitat (See Chapter 5). These design criteria are BMPs that are separated into conditions that apply only to restoration activities and those that apply only to roadway activities. Following this discussion are the non-SLOPES BMPs that have been developed specifically to address issues associated with this project (see Section 6.3). Full reference information for the citations and acronym definitions in this section are available in the SLOPES biological opinions.

6.1 SLOPES Design Criteria

The following BMPs were taken from both the transportation and restoration biological opinions and are presented in their logical order of similar activities (e.g., pile driving) rather then in strict numeric order.

6.1.1 Restoration

Boulder Placement

31. Site selection. Boulder placement will be limited to stream reaches with the following features: (a) an intact, well-vegetated riparian area, including trees and shrubs where those species would naturally occur, or that are part of riparian area restoration action; and (b) a stream bed that consists predominantly of coarse gravel or larger sediments.

32. Installation. Boulders will be installed as follows: (a) The cross-sectional area of boulders may not exceed 25% of the cross-sectional area of the low flow channel, or be installed to shift the stream flow to a single flow pattern in the middle or to the side of the stream; (b) boulders will be machine-placed (no end dumping allowed); and (c) permanent anchoring, including rebar or cabling, may not be used.

Fish Passage Restoration

33. Step weir, fish ladder, and culvert replacement approval. The Corps will not issue a permit to install or improve a step weir or fish ladder, or to replace or improve a culvert, until the action has been reviewed and approved by NMFS for consistency with NMFS fish passage criteria (NMFS 2008, or most recent version). Fish passage actions that would not require prior approval must still complete a post-action report.

For additional information on design and methods for boulder placement, see "boulder clusters" in WDFW et al. (2004).

Large Wood Restoration

34. Large wood condition. Stabilizing of key pieces of large wood that will be relied on to provide streambank stability or redirect flows must be intact, hard, and undecayed to partly

decaying, and should have untrimmed root wads to provide functional refugia habitat for fish. Use of decayed or fragmented wood found lying on the ground or partially sunken in the ground is not acceptable.

Off- and Side-Channel Habitat Restoration

35. Off- and side-channel habitat approval. The Corps will not issue a permit for off- or side-channel habitat restoration until the action has been reviewed and approved by NMFS.

Piling Removal

36. Pile removal. The following steps will be used to minimize creosote release, sediment disturbance, and total suspended solids: (a) Install a floating surface boom to capture floating surface debris; (b) keep all equipment (e.g., bucket, steel cable, vibratory hammer) out of the water, grip piles above the waterline, and complete all work during low water and low current conditions; (c) dislodge the piling with a vibratory hammer, whenever feasible--never intentionally break a pile by twisting or bending; (d) slowly lift the pile from the sediment and through the water column; (e) place the pile in a containment basin on a barge deck, pier, or shoreline without attempting to clean or remove any adhering sediment (a containment basin for the removed piles and any adhering sediment may be constructed of durable plastic sheeting with sidewalls supported by hay bales or another support structure to contain all sediment, and return flow may be directed back to the waterway); (f) fill the holes left by each piling with clean, native sediments; and (g) dispose of all removed piles, floating surface debris, any sediment spilled on work surfaces, and all containment supplies at a permitted upland disposal site.

37. Broken piles. (a) If a pile breaks above the surface of uncontaminated sediment, or less than 2 feet below the surface, make every attempt short of excavation to remove it entirely. If the pile cannot be removed without excavation, saw the stump off at least 3 feet below the surface of the sediment. (b) If a pile breaks above contaminated sediment, saw the stump off at the sediment line; if a pile breaks within contaminated sediment, make no further effort to remove it and cover the hole with a cap of clean substrate appropriate for the site. (c) If dredging is likely in the area of piling removal, use a global positioning device (GPS) to note the location of all broken piles for future use in site debris characterization.

16. Piling installation. (A) Pilings may be replaced with concrete, steel round pile 24 inches in diameter or smaller, steel H-pile designated as HP24 or smaller, or untreated wood (an individual consultation and site-specific risk assessment are required for actions that propose the use of pilings made of treated wood, including chromated copper arsenate (CCA), ammoniacal copper zinc arsenate (ACZA), alkaline copper quat (ACQ-B and ACQ-D), ammoniacal copper citrate (CC), copper azole (CBA-A), copper dimethyldithiocarbamate (CDDC), borate preservatives, and oil-type wood preservatives, such as creosote, pentachlorophenol, and copper naphthenate.) (B) when possible, use a vibratory hammer for piling installation; and (C) when using an impact hammer to drive or proof steel piles, one of the following sound attenuation methods must be used to effectively dampen sound pressure waves in all areas to a single strike peak threshold of 206 decibels and, for cumulative strikes, a 187 decibel sound exposure level (SEL) in areas and times where fish are larger than 2 grams and a 183 decibel SEL in areas and times when fish are smaller than 2 grams: (i) Completely isolate the pile from flowing water by dewatering the area around the pile; (ii) if water velocity is 1.6 feet per second or less, surround the piling being driven by a confined or unconfined bubble curtain, as described in NMFS and USFWS (2006),

that will distribute small air bubbles around 100% of the piling perimeter for the full depth of the water column; and (iii) if water velocity is greater than 1.6 feet per second, surround the piling being driven by a confined bubble curtain (*e.g.*, a bubble ring surrounded by a fabric or nonmetallic sleeve) that will distribute air bubbles around 100% of the piling perimeter for the full depth of the water column.

For additional information on selection of large wood for restoration actions, see stream slope and width dimensions and minimum large wood piece diameters described in Figure 1 in Oregon Department of Forestry (ODF) and ODFW (1995, or the most recent version), and for anchoring and placement, see WDFW and Inter-Fluve (2006).

For additional information on methods and design considerations for off- and side-channel habitat restoration, see "side-channel/off-channel habitat restoration" in WDFW et al. (2004).

Set-back Existing Berm, Dike, and Levee

38. Set-back existing berm, dike, and levee approval. The Corps will not issue a permit for set-back of existing berms, dikes or levees until the action has been reviewed and approved by NMFS.

Spawning Gravel Restoration

39. Gravel placement. Gravel augmentation is limited to areas where the natural supply has been eliminated or significantly reduced through anthropogenic means.

40. Gravel source. Gravel to be placed in streams must be obtained from an upland source outside of the channel and riparian area (gravel from any instream source is prohibited), sized such that 50% of the gradation becomes mobile at the dominant discharge event, rounded and uncrushed (less than 25% fractured face), and washed before instream placement.

Streambank Restoration

41. Streambank shaping. Without changing the location of the bank toe, restore damaged streambanks to a natural slope, pattern, and profile suitable for establishment of permanent woody vegetation.

42. Soil reinforcement. Complete all soil reinforcement earthwork and excavation in the dry. Use soil layers or lifts that are strengthened with biodegradable fabrics and penetrable by plant roots.

43. Large Wood. Include large wood in each streambank restoration action to the maximum extent feasible. Large wood must be intact, hard, and undecayed to partly decaying, and should have untrimmed root wads to provide functional refugia habitat for fish. Use of decayed or fragmented wood found lying on the ground or partially sunken in the ground is not acceptable. Wood that is already within the stream or suspended over the stream may be repositioned to allow for greater interaction with the stream.

44. Use of Rock in Streambank Restoration. Rock may not be used for streambank restoration, except as ballast to stabilize large wood.

For additional information on methods and design considerations for levee removal and modification, see "levee removal and modification" in WDFW et al. (2004).

For additional information on gravel restoration methods and design, see "salmonid spawning gravel cleaning and placement" in WDFW et al. (2004).

For additional information on methods and design for bank shaping; installation of coir logs and soil reinforcements; anchoring and placement of large wood; woody plantings; and herbaceous cover, see WDFW and Inter-Fluve (2006), and "riparian restoration and management" in WDFW et al. (2004).

45. Planting or installing vegetation. Use a diverse assemblage of species native to the action area or region, including trees, shrubs, and herbaceous species. Do not use noxious or invasive species.

46. Fertilizer. Do not apply surface fertilizer within 50 feet of any stream channel.

47. Fencing. Install fencing as necessary to prevent access to revegetated sites by livestock or unauthorized persons.

Water Control Structure Removal

48. The Corps will not issue a permit for removal of any water control structure (including an earthen embankment, subsurface drainage feature, spillway system, tide gate, and an instream flow redirection structure, such as a drop structure, gabion, groin) that is used to control, discharge, or maintain water levels, until the action has been reviewed and approved by NMFS.

The NMFS relied on the foregoing description of the proposed action, including all proposed design criteria, to complete this consultation. However, unforeseen occurrences or changed circumstances encountered while carrying out the proposed action may require a significant change in the proposed design, construction methods, or other on-the-ground practices. These changes may, in turn, result in effects of the action which exceed the amount or extent of taking specified in the incidental take statement or otherwise affect listed species or designated critical habitat in ways not previously considered. Therefore, the action agency or other cooperating party must keep NMFS informed of any such changes to ensure that conclusions drawn during consultation remain valid.

6.1.2 Transportation

Streambank and Channel Stabilization

41. Streambank stabilization methods allowed. (A) The following streambank stabilization methods may be used individually or in combination: **(i)** Vegetated riprap with large wood; **(ii)** partially spanning porous weir, **(iii)** woody plantings; **(iv)** herbaceous cover, in areas where the native vegetation does not include trees or shrubs; **(v)** bank reshaping and slope grading; **(vi)** coir logs; **(vii)** deformable soil reinforcement; **(viii)** engineered log jams; **(ix)** floodplain flow spreaders; and **(x)** floodplain roughness; **(B)** other than woody and herbaceous plantings, streambank stabilization projects should be designed by a qualified engineer that is appropriately registered in the state where the work is performed; and **(C)** stream barbs, non-porous partially spanning weirs, full-spanning weirs and other instream flow control structures are not allowed under this Opinion.

42. Vegetated riprap with large wood. (A) Due to the poor aquatic-habitat value of riprap and the local and cumulative effects of riprap use on river morphology, vegetated riprap is only acceptable where necessary to prevent failure of a culvert, road or bridge foundation; **(B)** when

this method is necessary, limit installation to the areas identified as most highly erodible, with highest shear stress, or at greatest risk of mass-failure, and provide compensatory mitigation. The greatest risk of mass-failure will usually be at the toe of the slope and will not extend above ordinary high water elevation except in incised streams; **(C)** vegetated riprap with large wood must be installed as follows: **(i)** When present, use natural hard points, such as large, stable trees or rock outcrops, to begin or end the toe of the revetment; **(ii)** develop rock size gradations for elevation zones on the bank, especially if the rock will extend above ordinary high water – the largest rock should be placed at the toe of the slope, while small rock can be used higher in the bank where the shear stress is generally lower, most upper bank areas will not require the use of any rock but can depend on the vegetation for erosion protection; **(iii)** bank areas above ordinary high water where rock is still deemed necessary, mix rock with soil to provide a better growing medium for plants; **(iv)** develop an irregular toe and bank line to increase roughness and habitat value; **(v)** use large, irregular rock to create large interstitial spaces and small alcoves to create planting spaces and habitat to mitigate for flood-refuge impacts – do not use geotextile fabrics as filter behind the riprap whenever possible, if a filter is necessary to prevent sapping, use a graduated gravel filter; **(vi)** place large boulders in the channel to create roughness and pool habitat; **(vii)** include large wood as an integral component to create roughness, pools and cover (wood must be intact, hard and undecayed to partly decaying with untrimmed root wads; **(viii)** root woody vegetation in the joints between the rocks or using vegetated riprap to restore streambank vegetation; **(ix)** use terracing and leave, restore, or enhance habitat features on the upper bank; **(x)** when possible, create or enhance a vegetated riparian buffer; and **(D)** monitor vegetated riprap each year following installation by visual inspection during low flows to examine transitions between undisturbed and treated banks to ensure that native soils above and behind the riprap are not collapsing, sinking, or showing other evidence of piping loss or movement of rock materials; and the overall integrity of the riprap treatment, including: **(i)** loss of rock materials; **(ii)** survival rate of vegetation; **(iii)** anchoring success of large woody debris placed in the treatment; and **(iv)** any channel changes since construction.

43. Channel stabilization by filling local scour holes with rock. When a hole in the channel bed caused by local scour must be filled with rock to prevent damage to a culvert, road, or bridge foundation, the amount of rock must be limited to the minimum necessary to protect the integrity of the structure.

44. Slope stabilization with rock. When a footing, facing, head wall, or other protection must be constructed with rock to prevent scouring or downcutting of, or fill slope erosion or failure at, an existing culvert or bridge, the amount of rock used is limited to the minimum necessary to protect the integrity of the structure. Whenever feasible, include soil and woody vegetation as a covering and throughout the structure.

Maintenance, Rehabilitation and Replacement

45. Road, culvert and bridge maintenance. (A) Routine road surface, culvert and bridge maintenance activity will be completed in accordance with the Oregon Department of Transportation Routine Road Maintenance: Water Quality and Habitat Guide Best Management Practices (ODOT 2004, or the most recent version approved by NMFS), unless maintenance activities and practices in that manual conflict with design criteria in this Opinion; and **(B)** any conflict between ODOT (2004) and this Opinion (*e.g.*, stormwater management for maintenance yards, erosion repair related to use of riprap, dust abatement, and use of pesticides) will be resolved in favor of design criteria in this Opinion.

46. Permanent stream crossing replacement. (A) Demonstrate that a permanent stream crossing replacement that passes over a floodplain will not impair the physical and biological processes associated with a fully functional floodplain, and will restore any physical or biological process that was degraded by the previous crossing; **(B)** a crossing will be presumed to maintain or restore floodplain function if it: **(i)** Maintains the general scour prism, as a clear, unobstructed opening (i.e., free of any fill, embankment, scour countermeasure, or structural material); **(ii)** is a single span structure that maintains a clear, unobstructed opening above the general scour elevation that is at least as wide as 1.5 times the active channel width, and otherwise meet NMFS' fish passage criteria (NMFS 2008, or latest version); or **(iii)** is a multiple span structure that maintains a clear, unobstructed opening above the general scour elevation, except for piers or interior bents, that is at least as wide as 2.2 times the active channel width. This presumption will not apply to a crossing replacement in a tidally-influenced area, large river delta, or other area with a wide, expansive floodplain that is significantly larger than 2.2 times the active channel width – crossing replacements in those areas require individual consultation; **(C)** scour and stream stability countermeasures may be applied below the general scour elevation, however, except as described above in (B)(ii) and (iii), no scour countermeasure may be applied above the general scour elevation, including but not limited to bendways, channelization, grout, grout bags, rip rap, sheet piling, and sills – maintain clear, unobstructed openings in all stream crossings by using longer spans, altered pier shape and orientation, placing foundations at bents and piers into erosion resistant materials below the general scour elevation, or other integral design features to reduce or avoid problems due to contraction scour or stream instability; **(D)** ensure that all stream crossings are designed and placed to: **(i)** Avoid causing local scour of streambanks and reasonably likely spawning areas; **(ii)** allow the fluvial transport of large wood, up to a site potential tree height in size, through the project area without becoming stranded on the bridge structure; **(iii)** allow for likely channel migration patterns within the functional floodplain for the design life of the bridge; and **(iv)** otherwise align with well-defined, stable channels; **(E)** remove all other artificial constrictions within the functional floodplain of the project area as follows: **(i)** Remove existing roadway fill, embankment fill, approach fill, or other fills; **(ii)** install relief conduits through existing fill; **(iii)** remove vacant bridge supports below total scour depth, unless the vacant support is part of the rehabilitated or replacement stream crossing; and **(iv)** reshape exposed floodplains and streambanks to match upstream and downstream conditions; and **(F)** the electronic notification for each permanent stream crossing replacement must explain how the Corps or applicant will ensure that the new span will maintain or restore the physical and biological processes within the functional floodplain including: **(i)** Site sketches, drawings, aerial photographs, or other supporting specifications, calculations, or information that is commensurate with the scope of the action, that show the active channel, the 100-year floodplain, the functional floodplain, any artificial fill within the project area, the existing crossing to be replaced, and the proposed crossing; **(ii)** a completed scour and stream stability analysis for any crossing that includes scour or stream stability countermeasures within the crossing opening that shows the general scour elevation and the local scour elevation for any pier or interior bent; and **(iii)** the name, address, and telephone number of a person responsible for designing this part of the action that NMFS may contact if additional information is necessary to complete the effects analysis.

For guidance on how to complete bridge scour and stream stability analysis, see Lagasse et al. 2001a (HEC-20), Lagasse et al. 2001b (HEC-23), Richardson and Davis 2001 (HEC-18), ODOT 2005, and AASHTO 2007.

Utility Line Stream Crossings

47. Utility line stream crossings. (A) Design utility line stream crossings in the following priority: **(i)** Aerial lines, including lines hung from existing bridges; **(ii)** directional drilling, boring and jacking that spans the channel migration zone and any associated wetland; **(iii)** trenching – this method is restricted to intermittent streams and may only be used when the stream is naturally dry, all trenches must be backfilled below the ordinary high water line with native material and capped with clean gravel suitable for fish use in the project area; **(B)** align each crossing as perpendicular to the watercourse as possible, and for drilled, bored or jacked crossings, ensure that the line is below the total scour prism; **(C)** any large wood displaced by trenching or plowing must be returned as nearly as possible to its original position, or otherwise arranged to restore habitat functions; and **(D)** any action involving a stormwater outfall must meet the stormwater management criteria.

6.2 SLOPES General Construction Best Management Practices

15. Flagging sensitive areas. The action area will be flagged to identify sensitive resource areas, such as areas below ordinary high water and wetlands.

16. Temporary erosion controls. Temporary erosion controls will be in place before any significant alteration of the action site is allowed.

17. Temporary access roads. Temporary access roads will not be built on steep slopes, where grade, soil, or other features suggest a likelihood of excessive erosion or failure; will use existing ways whenever possible; and will minimize soil disturbance and compaction within 150 feet of a stream, waterbody, or wetland. All temporary access roads will be obliterated when the action is completed, the soil will be stabilized and the site will be revegetated. Temporary roads in wet or flooded areas will be restored by the end of the applicable in-water work period.

25. Temporary stream crossings. (A) When a temporary stream crossing is necessary, a fish biologist must be consulted to ensure that the proposed crossing will not interfere with spawning behavior, eggs or preemergent juveniles in an occupied redd, or native submerged aquatic vegetation; (B) if the crossing is a ford, it must be located and designed to provide for foreseeable risks, such as flooding and associated bedload and debris, to prevent the diversion of streamflow out of the channel and down the road if the crossing fails; (C) if vehicles and machinery must cross riparian areas and streams, cross perpendicular to the main channel wherever possible; and (D) when a crossing is no longer needed, block the area, obliterate the route, and restore the soils and vegetation.

29. Site preparation. (A) During site preparation, conserve native materials for restoration, including large wood, vegetation, topsoil and channel materials (gravel, cobble and boulders) displaced by construction; (B) when possible, leave native materials where they are found; and (C) in areas to be cleared, clip vegetation at ground level to retain root mass and encourage reestablishment of native vegetation.

18. Fish passage. Fish passage must be provided for any adult or juvenile fish present in the action area during construction, unless passage did not exist before construction. After construction, adult and juvenile passage that meets NMFS fish passage criteria must be provided for the life of the action (NMFS 2008, or most recent version).

19. In-water work period. All work within the wetted channel will be completed during periods of time listed in the Oregon Guidelines for Timing of In-water Work to Protect Fish and Wildlife Resources (ODFW 2000, or the most recent version), except that the winter work window is not approved for actions in the Willamette River below Willamette Falls. The timing guidelines are available from the Oregon Department of Fish and Wildlife, Wildlife Division, Salem, Oregon. Hydraulic and topographic measurements **[and encased geotechnical drilling]** as part of a restoration action, and large wood restoration, may be completed at any time, provided that the affected area is not occupied by adult fish congregating for spawning or an area where redds are occupied by eggs or pre-emergent alevins.

20. Work area isolation. A work area within the wetted channel will be completely isolated from the active stream whenever a fish is reasonably certain to be present, or if the work area is 300 feet or less upstream from spawning habitats, except for boulder and large wood restoration actions. When work area isolation is required, a work area isolation plan will be prepared and carried out, commensurate with the scope of the action, that includes the following information: (a) The name, phone number, an address of the person responsible for accomplishing each component of the plan; (b) an estimate of stream flows likely to occur during isolation; (c) a plan view of all isolation elements and fish release areas; (d) a list of equipment and materials necessary to complete the plan, including a fish screen that meets NMFS fish screen criteria (NMFS 1996) for any pump used to dewater the isolation area; (e) and the sequence and schedule of dewatering and rewatering activities. (B) the electronic notification for these actions must explain how the Corps or applicant will isolate the work area, including site sketches, drawings, specifications, calculations, or other information commensurate with the scope of the action; (C) the notification must also include the name, address, and telephone number of a person responsible for designing this part of the action that NMFS may contact if additional information is necessary to complete the effects analysis; and (D) describe practices that will be used to ensure the area will remain effectively isolated throughout the range of stream flows likely to occur during construction.

36. Actions that require stormwater management. (A) Any action that will expand, recondition, reconstruct, or replace pavement, replace a stream crossing, otherwise increase the contributing impervious area within the project area, or create a new stormwater conveyance or discharge facility, must meet stormwater pollution reduction and flow control requirements described below; actions that merely resurface pavement by placing a new surface, or overlay, directly on top of existing pavement with no intervening base course and no change in the subgrade shoulder points, are not subject to these stormwater requirements; (B) pollution reduction requirements apply to runoff produced by all contributing impervious area that is within or contiguous with the project area; flow control requirements apply to all stormwater discharges that do not flow directly into a large water body where the discharge is unlikely to increase stream erosion rates, *e.g.*, a mainstem river, estuary, or the ocean; (C) the electronic notification must explain how the Corps or applicant will manage stormwater runoff from all contributing impervious area that is within or contiguous with the project area using site sketches, drawings, specifications, calculations, or other information commensurate with the scope of the action; (D) describe the pollutants of concern, identify all contributing and noncontributing impervious areas that are within and contiguous with the project area, explain how the volume of stormwater to be treated was calculated, show the combination of treatment technologies that will be used to treat the identified pollutants of concern for the calculated volume of runoff, and the proposed maintenance activities and schedule; (E) include the name,

address, and telephone number of a person responsible for designing this part of the action that NMFS may contact if additional information is necessary to complete the effects analysis; (F) all stormwater quality treatment practices and facilities must be designed to accept 50% of the cumulative rainfall from the 2-year, 24-hour storm for that site, except as follows: climate zone 4 – 67%; climate zone 5 – 75%; and climate zone 9 – 67%. (ESA-listed salmon, steelhead, or southern green sturgeon are unlikely to occur in Zones 5 or 9.) A continuous rainfall/runoff model may be used instead of the above runoff depths to calculate water quality treatment depth; (G) for runoff that cannot be infiltrated or evaporated such that no discharge to surface or subsurface waters results, apply one or more of the following specific primary treatment practices, supplemented with appropriate soil amendments and, if possible, plantings of metals hyperaccumulating species, that will maximize treatment efficiency prior to discharge to surface or subsurface waters: (i) Bioretention; (ii) bioslope; (iii) infiltration pond; (iv) porous pavement; (v) constructed wetlands; or (vi) vegetated and soil amended swale designed for infiltration; (H) all stormwater flow control treatment practices and facilities must also be designed to ensure that no increase in sediment transporting flows occurs (*i.e.*, match the natural hydrology) between the bankfull event or the 10-year flow event (annual series), whichever is less; (I) when conveyance is necessary to discharge treated stormwater directly into surface water or a wetland, the following requirements apply: (i) Ensure that all runoff from the road or bridge is treated before commingling with any runoff from offsite for conveyance; (ii) maintain natural drainage patterns; (iii) where overland flow would concentrate causing erosion, use a conveyance system made entirely of manufactured elements (*e.g.*, pipes, ditches, outfall protection) that extends at least to ordinary high water of the receiving water; and (iv) stabilize any erodible elements of this system as necessary to prevent erosion; (J) for all structural stormwater facilities and conveyance systems, document completion of inspections and maintenance activities according to a regular schedule in a log that is available for inspection on request by the Corps or NMFS; and (K) sediment and liquid from any catch basin cleaning may only be disposed of in an approved facility.

21. Capture and release. Any fish that may be trapped within the isolated work area will be captured and released using a trap, seine, electrofishing, or other methods as prudent to minimize the risk of injury, then released at a safe release site. Capture and release will be supervised by a fishery biologist experienced with work area isolation and competent to ensure the safe handling of all fish.

22. Electrofishing. If electrofishing will be used to capture fish for salvage, NMFS' electrofishing guidelines will be followed (NMFS 2000). Those guidelines are available from the NMFS Northwest Region, Protected Resources Division, Portland, Oregon.

23. Construction water. Surface water may be diverted to meet construction needs only if developed sources are unavailable or inadequate, and diversions will not exceed 10% of the available flow rate.

22. Surface water diversion. (A) Streamflow may be diverted only if water from developed sources, *e.g.*, municipal supplies, small ponds, reservoirs, or tank trucks, are unavailable or inadequate; and (B) when surface water is diverted, the diversion shall be made as follows: (i) Water will be taken be from the alternative source with the greatest flow available; (ii) include a temporary fish screen that meets criteria below; and (iii) not to exceed 10% of the available flow at any given time. For streams with less than 5 cfs, drafting will not exceed 0.03 cfs (18,000 gallons per day).

24. Fish screens. NMFS must review and approve fish screens for surface water that is diverted by gravity or by pumping at a rate that exceeds 3 cfs. All other diversions must have a fish screen that meets the following specifications: (a) An automated cleaning device with a minimum effective surface area of 2.5 square feet per cfs, and a nominal maximum approach velocity of 0.4 feet per second (fps), or no automated cleaning device, a minimum effective surface area of 1 square foot per cfs, and a nominal maximum approach rate of 0.2 fps; and (b) a round or square screen mesh that is no larger than 2.38 mm (0.094") in the narrow dimension, or any other shape that is no larger than 1.75 mm (0.069") in the narrow dimension. Each fish screen must be installed, operated, and maintained according to NMFS= fish screen criteria (NMFS 2008, or most recent version).

25. Erosion and pollution control plan. A erosion and pollution control plan will be prepared and carried out, commensurate with the scope of the action, that includes the following information: (a) The name, phone number, an address of the person responsible for accomplishing the plan; (b) best management practices to confine vegetation and soil disturbance to the minimum area, and minimum length of time, as necessary to complete the action, and otherwise prevent or minimize erosion associated with the action; (c) best management practices to confine, remove, and dispose of construction waste, including every type of debris, discharge water, concrete, cement, grout, washout facility, welding slag, petroleum product, or other hazardous materials generated, used, or stored on-site; (d) procedures to contain and control a spill of any hazardous material generated, used or stored on-site, including notification of proper authorities; and (e) steps to cease work under high flows, except for efforts to avoid or minimize resource damage.

34. Actions that require pollution and erosion control. (A) Any action that will require the use of materials that are hazardous or toxic to aquatic life (such as motor fuel, oil, or drilling fluid), or that involves earthwork that is likely to increase soil erosion and cause runoff with visible sediment into surface water, must complete effective pollution and erosion control measures at the project site; (B) the electronic notification for any action that involves the use of hazardous material or earthwork must explain how the Corps or applicant will avoid or minimize pollution and erosion, including site sketches, drawings, specifications, calculations, or other information commensurate with the scope of the action; (C) include the name, address, and telephone number of a person responsible for designing this part of the action that NMFS may contact if additional information is necessary to complete the effects analysis; and (D) describe practices that will be used to: (i) Inventory, store, handle and monitor any hazardous products or materials that will be used as part of the action; (ii) contain and control a spill of those hazardous materials; (iii) confine, remove and dispose of excess concrete, cement, grout and other mortars or bonding agents, including washout facilities; (iv) avoid or minimize pollution and erosion at all roads, stream crossings, drilling sites, construction sites, borrow pits, equipment and material storage sites, fueling operations and staging areas; (v) prevent construction debris from dropping into any waterbody, and to remove any material that does drop with a minimum of disturbance; (vi) avoid or minimize resource damage if the action area is inundated by precipitation or high streamflow; and (vii) stabilize all disturbed soils following any break in work unless construction will resume within four days.

23. Construction discharge water. (A) All discharge water created by construction (*e.g.*, concrete washout, pumping for work area isolation, vehicle wash water, drilling fluids) must be treated using the best available technology applicable to site conditions to remove debris,

nutrients, sediment, petroleum products, metals and other pollutants likely to be present; and (B) do not allow pollutants such as green concrete, contaminated water, silt, welding slag, sandblasting abrasive, or grout cured less than 24 hours to contact any waterbody, wetland, or stream channel below ordinary high water.

26. Choice of equipment. Heavy equipment will be limited to that with the least adverse effects on the environment (e.g., minimally-sized, rubber-tired).

27. Vehicle staging and use. All vehicles and other heavy equipment will (a) be stored, fueled, and maintained in a vehicle staging area placed 150 feet or more from any stream, waterbody or wetland; (b) inspected daily for fluid leaks before leaving the vehicle staging area for operation within 50 feet of any stream, waterbody or wetland; (c) steam cleaned before operation below ordinary high water, and often as necessary during operation to remain grease free.

28. Stationary power equipment. Generators, cranes, and any other stationary equipment operated within 150 feet of any stream, waterbody or wetland, will be maintained as necessary to prevent leaks and spills from entering the water.

29. Work from top of bank. To the extent feasible, heavy equipment will work from the top of the bank, unless work from another location would result in less habitat disturbance.

30. Site restoration. Any large wood, native vegetation, topsoil, and native channel material displaced by construction will be stockpiled for use during site restoration. When construction is finished, all streambanks, soils, and vegetation will be cleaned up and restored as necessary to renew ecosystem processes that form and maintain productive fish habitats. Fencing will be installed as necessary to prevent access to revegetated sites by livestock or unauthorized persons.

37. Actions that require site restoration. (A) Any action that results in significant disturbance of riparian vegetation, soils, streambanks, or stream channel must clean up and restore those features after the action is complete. Although no single criterion is sufficient to measure restoration success, the intent is that the following features should be present in the upland parts of the project area, within reasonable limits of natural and management variation: (i) Human and livestock disturbance, if any, are confined to small areas necessary for access or other special management situations; (ii) areas with signs of significant past erosion are completely stabilized and healed, bare soil spaces are small and well-dispersed; (iii) soil movement, such as active rills and soil deposition around plants or in small basins, is absent or slight and local; (iv) native woody and herbaceous vegetation, and germination microsites, are present and well distributed across the site; (v) plants have normal, vigorous growth form, and a high probability of remaining vigorous, healthy and dominant over undesired competing vegetation; (vi) vegetation structure is resulting in rooting throughout the available soil profile; (vii) plant litter is well distributed and effective in protecting the soil with little or no litter accumulated against vegetation as a result of active sheet erosion ("litter dams"); (viii) a continuous corridor of shrubs and trees appropriate to the site are present to provide shade and other habitat functions for the entire streambank; and (ix) streambanks are stable, well vegetated, and protected at margins by roots that extend below baseflow elevation, or by coarse-grained alluvial debris; (B) the electronic notification for any action involving site preparation or construction that disturbs soil, vegetation, or channel substrate must explain how the Corps or applicant will complete site restoration, including site sketches, drawings, specifications, calculations, or other information commensurate with the scope of the action; (C) include the name, address, and telephone number of a person responsible for designing this part of the action that NMFS may contact if additional

information is necessary to complete the effects analysis; and (D) describe practices that will be used to: (i) Restore damaged streambanks to a natural slope, pattern and profile suitable for establishment of permanent woody vegetation; (ii) replant each area requiring revegetation before the first April 15 following construction with a diverse assemblage of species native to the project area or region, including grasses, forbs, shrubs and trees (noxious or invasive species may not be used); and (iii) when possible, reuse the large wood, vegetation, topsoil and channel materials conserved during site preparation.

38. Actions that require compensatory mitigation. (A) The following actions require compensatory mitigation: (i) Any stormwater management facility that requires a new or enlarged structure within the riparian zone; or that has insufficient capacity to infiltrate and retain the volume of stormwater called for by this Opinion; (ii) any riprap revetment that extends the use of riprap above the streambank toe, extends the use of riprap laterally into an area that was not previously revetted, or that does not include vegetation and large wood; and (iii) any bridge rehabilitation or replacement that does not span the functional floodplain, or causes a net increase in fill within the functional floodplain; (B) the electronic notification for an action that requires compensatory mitigation must explain how the Corps or applicant will complete the mitigation, including site sketches, drawings, specifications, calculations, or other information commensurate with the scope of the action; (C) include the name, address, and telephone number of a person responsible for designing this part of the action that NMFS may contact if additional information is necessary to complete the effects analysis; (D) describe practices that will be used to ensure: (i) No net loss of habitat function; (ii) completion before, or concurrent with, construction whenever possible; and (iii) achieve a mitigation ratio that is at least a one-to-one, measured as deficit stormwater treatment capacity, and larger when necessary to compensate for time lags between the loss of conservation value in the project area and replacement of conservation value in the mitigation area, uncertainty of conservation value replacement in the mitigation area, or when the affected area has demonstrably higher conservation value than the mitigation area; (E) *for stormwater management:* (i) The primary habitat functions of concern are related to the physical and biological features essential to the long-term conservation of listed species, *i.e*., water quality, water quantity, channel substrate, floodplain connectivity, forage, natural cover (such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels and undercut banks), space, and free passage; (ii) acceptable mitigation for riparian habitat displaced by a stormwater treatment facility is restoration of shallow-water or off-channel habitat; and (iii) acceptable mitigation for inadequate stormwater treatment includes providing adequate stormwater treatment where it did not exist before, and retrofitting an existing but substandard stormwater facility to provide capacity necessary to infiltrate and retain the proper volume of stormwater; (F) *for riprap:* (i) The primary habitat functions of concern are related to floodplain connectivity, forage, natural cover, and free passage; and (ii) Acceptable mitigation for those losses include removal of existing riprap; retrofit existing riprap with vegetated riprap and large wood, or one or more other streambank stabilization methods described in this Opinion; and restoration of shallow water or off-channel habitats; (G) *for a bridge replacement:* (i) The primary habitat functions of concern are floodplain connectivity, forage, natural cover, and free passage; and (ii) acceptable mitigation is removing fill from elsewhere in the floodplain – native channel material, soil and vegetation may not be counted as fill; and (H) mitigation actions will meet general construction criteria and other appropriate minimization measures (dependent on the type of proposed mitigation).

For additional information on compensatory mitigation, see Mitigation Guidelines and Monitoring Requirements, and the Compensatory and Mitigation Plan Checklist, available from the U.S. Army Corps of Engineers, Portland District, Portland, Oregon.

30. Drilling and boring. (A) If drilling or boring are used, isolate drilling operations in wetted stream channels using a steel casing or other appropriate isolation method to prevent drilling fluids from contacting water; (B) if drilling through a bridge deck is necessary, use containment measures to prevent drilling debris from entering the channel; (C) sampling and directional drill recovery/recycling pits, and any associated waste or spoils must be completely isolated from surface waters, off-channel habitats and wetlands; (D) all waste or spoils must be covered if precipitation is falling or imminent; (E) all drilling fluids and waste must be recovered and recycled or disposed to prevent entry into flowing water; and (F) if a drill boring case breaks and drilling fluid or waste is visible in water or a wetland, make all possible efforts to contain the waste and contact NMFS within 48 hours.

31. Drilling waste containment. (A) All drilling equipment, drill recovery and recycling pits, and any waste or spoil produced, must be contained then completely recovered and recycled or disposed of as necessary to prevent entry into any waterway. Use a tank to recycle drilling fluids; and (B) when drilling is completed, remove as much of the remaining drilling fluid as possible from the casing (*e.g.*, by pumping) to reduce turbidity when the casing is removed.

32. Pesticide-treated wood installation. (A) Use of lumber, pilings, or other wood products treated or preserved with pesticidal compounds (e.*g*., chromated copper arsenate (CCA), ammoniacal copper zinc arsenate (ACZA), alkaline copper quat (ACQ-B and ACQ-D), ammoniacal copper citrate (CC), copper azole (CBA-A), copper dimethyldithiocarbamate (CDDC), borate preservatives, and oil-type wood preservatives, such as creosote, pentachlorophenol, and copper naphthenate. For alternatives sources of structural lumber and pilings designed for industrial and marine applications, but not based on pesticide-treated wood, including silica-based wood preservation, improved recycled plastic technology and environmentally safe wood sealer and stains, see, *e.g.*, American Plastic Lumber (Shingle Springs, California) and Resco Plastics (Coos Bay, Oregon) for structural lumber from recycled plastic; Plastic Pilings, Inc. (Rialto, California) for structurally reinforced plastic marine products; Timbersil (Springfield, Virginia) for structural lumber from wood treated with a silica-based fusion technology; and Timber Pro Coatings (Portland, Oregon) for nonpetroleum based wood sealer and stains. The use of trade, firm, or corporation names in this Opinion is for the information and convenience of the action agency and applicants and does not constitute an official endorsement or approval by the U.S. Department of Commerce or NMFS of any product or service to the exclusion of others that may be suitable) may not be used below ordinary high water, or as part of an in-water or overwater structure, except as described below; (B) pesticide-treated wood shipped to the project area must be stored out of contact with standing water and wet soil, and protected from precipitation; (C) each load and piece of pesticide-treated wood must be visually inspected and rejected for use in or above aquatic environments if visible residue, bleeding of preservative, preservative-saturated sawdust, contaminated soil, or other matter is present; (D) use prefabrication when possible to ensure that cutting, drilling and field preservative treatment are minimized; (E) when field fabrication is necessary, all cutting and drilling of pesticide-treated wood, and field preservative treatment of wood exposed by cutting and drilling, must occur above ordinary high water to minimize discharge of sawdust, drill shavings, excess preservative and other debris in riparian or aquatic habitats; (F) use tarps,

plastic tubs or similar devices to contain the bulk of any fabrication debris, and wipe off any excess field preservative; (G) all pesticide-treated wood structures, including pilings, must have design features to avoid or minimize impacts and abrasion that would deposit pesticide-treated wood debris and dust in riparian or aquatic habitats; and (H) pesticide-treated wood may be used to construct a bridge, overwater structure or an in-water structure, if all surfaces exposed to leaching by precipitation, overtopping waves, or submersion are coated with paint, opaque stain, or barrier that will be maintained for the life of the project. Coatings and any paint-on field treatment must be carefully applied and contained to reduce contamination. Surfaces that are not exposed to precipitation or wave attack, such as parts of a timber bridge completely covered by the roadway-wearing surface of the bridge deck, are exempt from this requirement.

33. Pesticide-treated wood removal. (A) Projects that require removal of pesticide-treated wood must ensure that, to the extent possible, no wood debris falls into the water. If wood debris does fall into the water, remove it immediately; (B) after removal, place wood debris in an appropriate dry storage site until it can be removed from the project area; (C) do not leave wood construction debris in the water or stacked on the streambank at or below the ordinary high water; and (D) evaluate wood construction debris removed during a project, including pesticide treated wood pilings, to ensure proper disposal of debris.

6.3 Additional Best Management Practices

Working Hours. To limit disturbance to neighbors, construction work shall occur only between the hours of 7:00 a.m. and 5:00 p.m. Monday through Friday. No work will occur at night except for emergency situations. Extended work hours (earlier or later in the day, or on Saturday) may be allowed with USFWS approval.

Cultural Resource Monitoring Plan. Because the project area is known to contain substantial cultural resources, a monitoring plan shall be developed by the USFWS in consultation with the Coquille Indian Tribe and the Confederated Tribes of Siletz Indians prior to the start of construction. The plan shall include protocols for artifact documentation, monitoring, and collection, and would be submitted to the Tribes for approval. Elements of the plan were discussed in a tribal consultation meeting on December 9, 2008, and are summarized from those recommended in CIT (2007):

- Monitors shall observe any ground disturbance and vegetation removal activities associated with work in or near areas of concern.
- Monitors shall record the placement of any archaeological soils if they are moved from their original location.
- Monitors shall opportunely collect and record diagnostic artifacts for storage in approved facilities.
- Monitors shall issue stop work orders should a significant cultural feature be discovered. The monitor will consult with the FHWA, the USFWS, the Tribes, the SHPO, and the contractor to determine the appropriate course of action.
- Should human remains be discovered, all work in the vicinity shall be immediately halted. The appropriate law enforcement agency, the USFWS, the FHWA, the SHPO, and the Commission on Indian Services shall be immediately notified. No human remains shall be moved or reburied without consultation with all concerned parties.
- Revegetation plans shall include culturally important species as appropriate for the sites in need of replanting.

Chapter 7
Comments and Correspondence

Public comments for this project were solicited on two separate occasions: a public open house held May 13, 2008, and a formal scoping period from November 5 through December 5, 2008. Concerns of adjacent landowners were solicited to identify potential impacts to private property that could result from the proposed project.

Comments received from the public were generally supportive (Table 4). Comments ranged from complete endorsement of the restoration to comments about the safety of Randolph Road and flooding of North Bank Lane. In addition to the comments specifically identified below, the USFWS received two phone calls in support of the proposed project.

Table 4. Comments and Correspondence

Comment Author	Topic	Summarized and/or Paraphrased Comment
L.M. Hultin Private citizen	Safety	The stretch of road [work] does have beautiful views [but].....coming down Randolph Hill [it] is very poorly constructed with springs breaking out on the narrow right-hand side and only a shallow ditch that doesn't hold the water. Cars continually crowd into the "ditch" when meeting uphill traffic, and the water and mud is spread onto the road. Cars have been stuck here...this area has curves that are scenic but dangerous. I have seen many trucks...going over the edge when meeting a car coming down towards them...luckily, no one has been killed or seriously injured. It has blocked the road for hours.
		Speed limits should be set and enforced...for the safety of hikers, bikers, and local people walking on the road...
		In favor of sharing the beauty of this area...but hope it can be done so it will last and be safe.
L. Ehle By-the-Sea Gardens	Preferred Alternative	[In favor] of the proposed improvements to the North Bank Lane access to the Bandon Marsh area...
	Preferred Alternative	This area is wonderfully diverse and a rich upper estuarine habitat that the more we can show and educate about its role in our watershed, the better.
T. Hultin Private citizen	Traffic	[Concerned about] traffic created by the improvements and scenic byway designation [that] would use the Randolph Hill road.
	Safety	...we have seen many large trucks, school buses, and cars in the ditch on Randolph Road because the road is too narrow and has no shoulder...
	Alternatives	...you should address Randolph Road first...then work on North Bank Lane. Another alternative is to change the scenic byway to continue on North Bank Lane and over Beaver Hill Road.
	Preferred Alternative	...when you have people working in the area...it would be proper to notify property owners along the road about what is happening.

Table 4. Comments and Correspondence

Comment Author	Topic	Summarized and/or Paraphrased Comment
W.P. Russell Private citizen	Preferred Alternative	I very strongly endorse the restoration of tidal influence on the Ni-les'tun Unit.
	Wildlife	...one of the main barriers to the restoration of Coho salmon runs on the Coquille River is the lack of refuge in the estuary for smolts; this restoration will make a significant contribution to that asset.
	Cultural Resources	The preparation of the former pasture for inundation will present a unique opportunity to conduct archaeological work on the Refuge.
	Preferred Alternative	The restored salt marsh will provide outstanding opportunities for environmental education.
M. Keiser Bandon Dunes Golf Resort	Preferred Alternative	I wish to restate [our] support for project planning that would restore tidal wetlands on the Ni-les'tun Unit...as well as for the road improvements on North Bank Lane adjacent to the marsh.
	Preferred Alternative	Flooding and road damage on North Bank Lane remains a chronic issue that tidal wetland restoration within the Marsh's exterior would likely exacerbate...the Service's proactive approach with the Federal Highway Administration in jointly planning wetland and associated road work should be applauded as an effort to ensure flooding issues are positively addressed in a way that benefits wetland restoration and public transportation.
	Wildlife	The Service would be right to advance work such as ditch filling and other actions to address past land use practices on the interior of the Marsh that have reduced habitat complexity, species diversity, and overall tidal wetland and estuary health.
	Preferred Alternative	The effort...is the kind of big-picture planning that the area needs, and support through the implementation phase should be a priority for federal funding and agency management.
M. Graybill Manager, South Slough National Estuarine Research Reserve	Preferred Alternative	Phone call to David Ledig, USFWS South Coast Refuge Manager, stating support for the restoration and road improvement project associated with the Ni-les'tun Unit of Bandon Marsh Refuge.
R. Straus City of Bandon Planning Commissioner	Preferred Alternative	Phone call to David Ledig, USFWS South Coast Refuge Manager, stating support for the restoration and road improvement project associated with the Ni-les'tun Unit of Bandon Marsh Refuge.

Chapter 8
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The individuals identified below participated in the preparation and review of this EA.

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Chapter 9
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Personal Communication

David Ledig, USFWS South Coast Refuge Manager, electronic mail to Demian Ebert, PBS&J, January 14, 2009.