



DRAFT BIOLOGICAL ASSESSMENT

Eagle Hill and Raise Loop Projects
Shoalwater Bay Indian Reservation
Tokeland, Washington

April 7, 2026

Under Contract to:

Red Plains Engineering
2103 NE 129th Street, Suite 201
Vancouver, WA 98686

DRAFT
Biological Assessment
Eagle Hill, Raise Loop, and North Cove Beach Access Projects
Shoalwater Bay Indian Reservation
Tokeland, Washington

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EXECUTIVE SUMMARY

This biological assessment (BA) was prepared by Landau Associates, Inc. (Landau) in support of the Shoalwater Bay Indian Tribe’s (SBIT) Eagle Hill Duplexes and Raise Loop Road projects (projects). The goal of this BA is to determine the potential impacts on species/critical habitats protected under the Endangered Species Act of 1973 (ESA). The interrelated projects are located near Tokeland, Washington on SBIT Reservation and Tribal Trust land and are therefore overseen by the Bureau of Indian Affairs (BIA). The Eagle Hill project will receive federal funds from the Department of Housing and Urban Development, which is acting as the lead agency for National Environmental Policy Act compliance. The Federal Highway Administration is the designated lead agency for the Raise Loop project, as it is funding the project. The projects will also require a Section 404 Clean Water Act permit from the US Army Corps of Engineers (USACE) associated with unavoidable wetland impacts. Given these federal nexuses, the projects will require evaluation under Section 7 of the ESA.

The projects are located in Water Resource Inventory Area 24 (Willapa Watershed) within Hydrologic Unit Code 171001060203 (Cedar River-Frontal). The projects are located within the following township and ranges: Section 03, Township (T) 14N/Range (R) 11W; Section 24, T15N, R11W; and Section 33, T15N, R11W. The centroid of the projects is located at latitude 46.737497 degrees (°) and longitude -124.041743°.

This BA addresses impacts of the proposed projects on listed species, including the delayed consequences and cumulative effects. The assessment is based on literature reviews, agency consultation, and review of species lists available from the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS) and the US Fish and Wildlife Service (USFWS), collectively referred to as “the Services.” Based on professional judgement and the data available from the Services, listed species that may occur within the combined action area include the marbled murrelet (*Brachyramphus marmoratus*), yellow-billed cuckoo (*Coccyzus americanus*), streaked horned lark (*Eremophila alpestris strigata*), western snowy plover (*Charadrius nivosus nivosus*), monarch butterfly (*Danaus plexippus*), Suckley’s cuckoo bumble bee (*Bombus suckleyi*), and bull trout (*Salvelinus confluentus*). Designated critical habitat for streaked horned lark and western snowy plover occurs in the action area of the proposed projects.

The effect determinations for ESA-listed species and critical habitat addressed in this BA are summarized in the following table.

Table 1. Effects Determinations for Endangered Species Act-Listed Species and Designated Critical Habitat

Species	Species Listing Status	Consulting Agency	Effects Determinations	
			Listed Species	Critical Habitat
Marbled murrelet (<i>Brachyramphus marmoratus</i>)	Threatened	USFWS	May affect, not likely to adversely affect	No effect
Yellow-billed cuckoo (<i>Coccyzus americanus</i>)	Threatened	USFWS	No effect	No effect
Streaked horned lark (<i>Eremophila alpestris strigata</i>)	Threatened	USFWS	No effect	No effect

Species	Species Listing Status	Consulting Agency	Effects Determinations	
			Listed Species	Critical Habitat
Western snowy plover (<i>Charadrius nivosus nivosus</i>)	Threatened	USFWS	May affect, not likely to adversely affect	May affect, not likely to adversely affect
Monarch butterfly (<i>Danaus plexippus</i>)	Proposed Threatened ^a	USFWS	No effect	No effect
Suckley's Cuckoo Bumble Bee (<i>Bombus suckleyi</i>)	Proposed Endangered ^a	USFWS	No effect	No effect
Bull trout (<i>Salvelinus confluentus</i>)	Threatened	USFWS	No effect	No effect

Notes:

- a. Provisional effect determination is provided for species with proposed listing status.

Abbreviations and Acronyms:

USFWS = US Fish and Wildlife Service.

This BA also evaluates potential effects on Essential Fish Habitat (EFH) as defined by the Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (16 United States Code [USC] 1801 et seq.). The MSA mandates that all federal agencies must consult with NMFS regarding activities proposed or authorized, funded, or undertaken by the agency that may result in an adverse effect on EFH (Appendix A). The projects will result in potential effects to water quality in Willapa Bay and therefore may adversely affect Pacific salmon, groundfish, and coastal pelagic EFH. The proposed projects will have no adverse effects on highly migratory species' EFH.

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Appendix	Title
A	Essential Fish Habitat Assessment
B	2012 US Fish and Wildlife Service Concurrence Letter Excerpt
C	Project Plan Sheets
D	Fish Exclusion Protocol and Standards
E	Stormwater Reports
F	Delineation Report
G	Species List
H	Biology of Listed Terrestrial Species

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LIST OF ABBREVIATIONS AND ACRONYMS

°	degree
BA	biological assessment
BA Manual	WSDOT's <i>BA Preparation Manual</i>
BIA	Bureau of Indian Affairs
BMPs	Best Management Practices
CAVFS	compost-amended vegetated filter strips
CD4	Cross Drain 4
CFR	Code of Federal Regulations
dB	decibel
dBA	A-weighted decibels
DNR	Washington State Department of Natural Resources
Ecology	Washington State Department of Ecology
EFH	Essential Fish Habitat
ESA	Endangered Species Act
ft	foot/feet
GDR Co	Green Diamond Resource Company
HCP	habitat conservation plan
ITP	incidental take permit
Landau	Landau Associates, Inc.
LAA	likely to adversely affect
lf	linear feet
mi	mile
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NLAA	not likely to adversely affect
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OHWM	ordinary high water mark
PBF	physical and biological features
PCB	polychlorinated biphenyl
PGIS	Pollution-Generating Impervious Surface
PHS	Priority Habitats and Species
projects	Eagle Hill Duplexes and Raise Loop Road projects
R	Range
Red Plains	Red Plains Professional, Inc.
SBIT	Shoalwater Bay Indian Tribe
Services	literature reviews, agency consultation, species list reviews
SWIFD	Statewide Washington Integrated Fish Distribution

LIST OF ABBREVIATIONS AND ACRONYMS (CONT.)

T	Township
TESC.....	Temporary Erosion and Sediment Control
USACE.....	US Army Corps of Engineers
USC	United States Code
USFWS.....	US Fish and Wildlife Service
WDFW	Washington Department of Fish & Wildlife
WRIA	Water Resource Inventory Area
WSDOT	Washington State Department of Transportation

1.0 INTRODUCTION

The Shoalwater Bay Indian Tribe (SBIT) is proposing the construction of new roadways within the Shoalwater Bay Indian Reservation to support future housing developments for the SBIT community. Relocation is crucial for the continued existence of the SBIT on their ancestral homeland, as the low-lying community is increasingly vulnerable to the effects of sea-level rise, stormwater surges, and potential tsunamis. As outlined in the Executive Summary, the Eagle Hill Duplexes and Raise Loop Road projects (projects) will receive federal funding and require federal permitting. Given these federal nexuses, the projects will require evaluation under Section 7 of the Endangered Species Act (ESA).

Landau Associates, Inc. (Landau) has completed this biological assessment (BA) on behalf of the SBIT to determine potential effects of the proposed projects on species listed under the ESA. Species listed under the ESA are under the jurisdiction of literature reviews, agency consultation, and species list reviews (the Services). This BA addresses delayed consequences and cumulative effects to species and, where applicable, their designated critical habitats. This BA is based on a literature review, site visits completed along the project alignment, agency consultation, review of Priority Habitats and Species (PHS) data from the Washington Department of Fish & Wildlife (WDFW), and information provided by the design engineer.

This BA also includes evaluation of potential effects on Essential Fish Habitat (EFH),¹ as defined by the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and amended by the Sustainable Fisheries Act of 1996 (16 United States Code [USC] 1801 et seq). The MSA mandates that all federal agencies must consult with National Oceanic and Atmospheric Administration (NOAA) Fisheries regarding activities proposed or authorized, funded, or undertaken by the agency that may result in an adverse effect on EFH.

1.1 Consultation History

Green Diamond Resource Company (GDR Co), formerly known as Simpson Timber Company, received an incidental take permit (ITP) for endangered and threatened species (Permit #1265) from National Marine Fisheries Service (NMFS) on October 13, 2000 (NMFS 2000a, NMFS 2000b). In preparation for permit applications, GDR Co developed a habitat conservation plan (HCP) with assistance from the US Fish and Wildlife Service (USFWS) and NMFS between 1997 and 2000. The ITP allows for the incidental take of marbled murrelet (*Brachyramphus marmoratus*), Puget Sound Chinook (*Oncorhynchus tshawytscha*), Hood Canal summer run chum (*Oncorhynchus keta*), and bull trout (*Salvelinus confluentus*) in addition to 48 other unlisted species on its commercial timberland spanning portions of Thurston, Mason, and Grays Harbor Counties below established thresholds. The ITP is valid for a duration of 50 years and is set to expire on October 12, 2050.

On October 18, 2013, GDR Co received concurrence (2012 USFWS Concurrence Letter) from the Services on amendments to the ITP and HCP to include approximately 53,000 acres of newly purchased lands

¹ EFH Assessment is provided at the end of this report as Appendix A.

(referred to as “Added Lands”) encompassing the portions of the project areas (USFWS 2013). USFWS concurred on the effects determinations of the BA, which included “no effect” to bull trout critical habitat; “may affect, not likely to adversely affect” for bull trout, marbled murrelet critical habitat, northern spotted owl (*Strix occidentalis caurina*), and northern spotted owl critical habitat; and “may affect, likely to adversely affect” for marbled murrelet. The amendments were also determined to provide “beneficial” effects to marbled murrelet and northern spotted owl associated with forest thinning practices. In anticipation of the amendments, GDR Co assessed stand conditions for marbled murrelet nesting habitat suitability. The 2012 USFWS Concurrence Letter depicts six identified murrelet habitat patches in the Added Lands, two of which are in the vicinity of the project areas (Appendix B).

The project areas occur, in part, on land included in the 2012 amendments to the GDR Co ITP and HCP. The requirements of the ITP and HCP were transferred to SBIT as comparable new ownership. County tax parcels purchased from GDR Co in the project areas include the following:

- 14110312000
- 15113433000
- 15113430000
- 15113344001
- 14110411047
- 15113360000
- 14110421048.

On October 30, 2018, representatives from SBIT; Red Plains Professional, Inc. (Red Plains); BIA; and USFWS convened in the project area to conduct a site reconnaissance for the purpose of providing SBIT with a preliminary ESA review in support of permitting efforts on the Shoalwater Tribe Moving to Higher Ground Project. Fish and Wildlife Biologist Vince Harke of USFWS provided a memo dated November 20, 2018, summarizing the site visit as well as his findings (Harke 2018). In his memo, Mr. Harke indicates that the group reviewed the lower half of the West End Development (now known as North Cove Beach Access Road), the Eagle Hill Road Spur (east of Eagle Hill Road approximately 0.5 miles north of State Route [SR] 105), and the Teal Duck Slough Access Road (not currently proposed for construction).

Mr. Harke found that the 26.7-acre murrelet habitat conservation area primarily within Parcel No. 14110411047 contained old-growth western hemlock (*Tsuga heterophylla*) with suitable platforms for murrelet nesting. This conservation area, as well as the 300-foot (ft) protective buffer, are outside of the project areas by design, as they were incorporated into early design planning. The only area identified where marbled murrelet habitat may be removed or degraded was the Eagle Hill Spur Road, which is not currently proposed.

Outside of a pre-submittal meeting with USFWS biologist Emma Walz on February 5th, 2026, Landau has not been party to consultation with the Services in advance of preparation of this document.

1.2 Project Location

The project areas are located north of SR-105 on SBIT Reservation and SBIT Trust land. The project areas are located within Section 03/Township (T) 14N/Range (R) 11W, Section 24/T15N/R11W, and Section 33/T15N/R11W within Hydrologic Unit Code 171001060203 (Cedar River-Frontal) of Water Resource Inventory Area 24 (Willapa Watershed). The centroid of the projects is located at latitude 46.737497 degrees (°) and longitude -124.041743°.

Proposed work within the project areas will occur on and adjacent to Eagle Hill Road, North Cove Beach Access Road, and Raise Loop Road on SBIT land forming a loop with SR-105 (Figure 1).

1.3 Projects Description

The SBIT proposes to improve and expand Eagle Hill Road, North Cove Beach Access Road, and Raise Loop Road to provide improved access to future residential development sites. The combined footprint of the projects that includes all necessary cut and fill will be approximately 57.58 acres. The projects will result in the construction of approximately 3.66 miles (mi) of 24-ft-wide roadway with a 5-ft sidewalk along one side of the road and vegetative filter strips on the downgradient side of the roadway compliant with Washington Department of Ecology (Ecology) specifications. To facilitate future development and reduce unnecessary disturbance, the projects will include the installation of utility infrastructure to prepare for potential future developments. Underground utilities to be installed within the roadway alignment will include electric, water, telecommunications, stormwater, and sewer. Roadways will be illuminated by 148 new light poles and one existing light pole.

To facilitate the most cost-effective construction and reduce trucking of material off site, the projects have been designed to represent a balanced cut and fill to the maximum extent possible.

Site plans are included in Appendix C.

1.3.1 Construction Methods/Equipment

1.3.1.1 Timber Harvest

Prior to the start of clearing activities, timber harvest boundaries will be clearly marked in the field with staking, flagging, or paint. Special attention will be paid to wetlands and streams within the project area to prevent incidental impacts to these sensitive areas during clearing activities.

Timber will be harvested from the forested portions of the project area. The total area of timber harvest will equal approximately 47 acres. Approximately 85 percent of the 47 acres to be harvested is young coniferous forest that was planted in 2005, 2006, 2015, and 2018. These replanting times indicate that the oldest trees harvested from this area are 21 years old. The remaining 15 percent of timberland to be harvest exists as medium-aged coniferous forest that was replanted in 1974, 1977, and 1985, making these trees between 41 and 52 years old. Formal timber cruises have not been conducted within these areas, so the total number of trees to be harvested could not be determined.

Timber will be harvested using traditional harvest methods that may include yarding and skidding logs to established landing areas. The majority of the timber will not be required to be yarded due to the proximity of the trees to the road alignment. Harvest trees will be delimbed and stacked for eventual transport off site. Logs will be loaded and transported off site using existing gravel roads.

1.3.1.2 Erosion and Sediment Control Measures

Prior to initiating any earth-disturbing activities, wetlands, streams, and any sensitive habitats will be located and marked near the active project site. Areas not subject to the projects will be avoided to reduce the potential for unanticipated disturbance. Temporary erosion and sediment control measures will be installed prior to any earth disturbing activities. Silt fencing, inlet protection, slope protection and matting, wheel washes, and rock construction entrances will be utilized to prevent offsite tracking of materials. Erosion control measures will be maintained throughout the projects to limit stormwater runoff. These measures will be evaluated and updated throughout the projects.

1.3.1.3 Clearing and Grubbing

All brush and vegetation from the grading areas will be cleared using mechanical methods. This will most likely be a combination of brush mowers and excavator-mounted flail mowers. The upper 6 inches of soil on the site is not suitable for structural fill and will be stripped with common excavators and bulldozers. Stripping and subsequent grading would be phased to prevent exposed inactive areas from becoming a source of erosion. This material will be collected and transported to an approved upland disposal site via dump trucks. The disposal location has not been designated at this time, but this area will be an upland location that is subject to review and approval by Tribal staff prior to depositing spoil materials. Once areas have been sufficiently stripped, preliminary and final grading activities will commence.

1.3.1.4 Grading

Grading will be initiated once areas have been successfully brushed and stripped. The cut slopes will be surveyed and grade stakes installed to guide the removal and transport of material. Cutting will be facilitated with graders, excavators, and bulldozers as deemed appropriate by the contractor.

To the maximum extent possible, excavated material will be used as fill within the project area. Transportation of excavation spoils will be a combination of pushing material with bulldozers when the fill areas are close and loading and trucking spoils material with excavators and dump trucks when the fill areas are too far to effectively push material. Earthwork totals for the projects are summarized in the table below.

Table 2. Earthwork Totals (Cubic Yards)

Project	Total Cut	Organics (haul off)	Total Fill	Sum
Eagle Hill	+81,000	-5,000	-21,000	+55,00
Raise Loop	+695,500	-64,500	-637,500	-6,500
Totals	+776,500	-69,500	-658,500	+48,500

1.3.1.5 Utility Installation

Utilities will be installed below the roadbed alignment. Utility installation will likely occur during the second construction season after base rock has been placed within the road alignment to limit erosion. Utility installation will require excavation of the base rock layers and installation of water, stormwater, sewer, electric, and telecommunications. Utility installation will follow standard construction practices with pipes installed atop compacted gravels and backfilled. Utility manholes for maintenance and future access will be installed.

1.3.1.6 Paving and Concrete

Following preparation of the roadbed, the entire alignment will be paved with hot-mix asphalt. Asphalt will be applied with a standard dump truck and asphalt spreader combination and then compacted with a vibratory drum roller. Painting and stripping will be completed with a standard paint application truck.

All the proposed sidewalks and any transitions will be formed in place. Concrete will be poured, screed and floated with a mixture of mechanical trowels and by hand. After proper concrete setup, forms will be pulled and disposed of off-site.

1.3.2 Construction Sequence and Timeline

Construction is scheduled to begin in the first work window following project approval and is anticipated to begin in the Spring of 2027. While certain aspects of the projects such as timber harvest, clearing and grubbing, and utility work can be conducted throughout the year, most of the earthwork will be conducted during the drier season, which lasts from April to October, in order to maintain soil integrity and reduce chances for erosion and sedimentation from occurring.

Year 1 will include timber harvest, clearing and grubbing, mass grading, and rocking of road alignment.

Year 2 will include adjustments to the road profile, installation of utilities, pouring of sidewalks, and paving of the road.

1.3.3 Stormwater Treatment

Stormwater runoff from the improved road surfaces will be captured by a total of 20,411 linear ft of compost-amended vegetated filter strips (CAVFS) on the downgradient side of new roadways. Runoff will be treated by CAVFS prior to exiting the project area via 12 planned outfalls. All of the planned outfalls will discharge to well vegetated upland areas.

The projects will result in new pollutant-generating impervious surfaces (PGIS) in the form of pavement. Table 3 provides a summary of proposed changes to PGIS in the project areas.

Table 3. Stormwater Summary

	Eagle Hill Road Project	Raise Loop Road Project	Total
Current Conditions (Acres)			
Non-PGIS	0	0	0
PGIS	0.7	4.3	5.0
Pervious	5.2	47.8	53.0
Total Area	5.9	52.1	58.0
Proposed Conditions (Acres)			
PGIS	0.5	1.5	2.0
PGIS	1.2	9.6	10.8
Pervious	4.2	41.0	45.2
Net new non-PGIS	0.5	1.5	2.0
Net new PGIS	0.5	5.3	5.8

Abbreviations and Acronyms:

PGIS = pollution-generating impervious surface

Hydrology and hydraulics reports prepared by Red Plains for the projects are in Appendix D.

1.3.4 Culvert Replacement

The existing culvert that conveys Stream 6 under North Cove Beach Access Road is perched, and the surface water drop is a fish passage barrier. In addition to the perched nature of the culvert outlet, it is currently undersized for flows and results in a hydraulic jump. Stream 6 is the only perennial fish-bearing stream within the project area and is listed as providing habitat for coho salmon. The projects propose to replace this culvert with an 8-ft-diameter concrete culvert. The culvert will be partially buried and contain streambed material with a low-flow channel to allow for fish passage. Culvert plans are currently being developed.

The proposed culvert replacement will be completed concurrent with the road improvements to minimize the window of potential disturbances to Stream 6 during construction. The in-water work will be completed within the US Army Corps of Engineers (USACE) designated in-water work window of July 15th to October 15th. The portions of the stream subject to in-water work will be isolated through the deployment of block nets to facilitate the collection and removal of fish and other aquatic organisms in accordance with the Washington State Department of Transportation (WSDOT) Fish Exclusion Protocols and Standards (Appendix E). Following isolation and removal, stream flows will be diverted around the work area and released downstream. The work area will remain isolated until the culvert is fully installed and the stream flows are restored.

1.3.5 Wetland Impacts

Wetlands and waterways within the project area were delineated by Landau in the early spring of 2026 (Appendix F). A total of 11 palustrine wetlands and six streams were identified and delineated (Figure 2). Except for Wetlands A and B, which are large, depressional forested wetlands located adjacent to SR-105, the delineated wetlands are very small, low-functioning, slope-class wetlands located in the upper reaches of the drainages within the project area. These slope class wetlands appear to be supported by groundwater expression in steep areas with concave topography.

Due to the extensive grading necessary to achieve the project goals, the project will impact a total of 10 different palustrine wetlands that are scattered throughout the project area. Table 4 below summarizes the proposed wetland impacts.

Table 4. Wetland Impact Summary

Wetland Name	HGM/Cowardin Classification	Ecology Rating	Impact (acres)
Wetland A	Depressional/PFO	III	-
Wetland B	Depressional/PFO	III	0.02
Wetland C	Slope/PFO	IV	0.13
Wetland D	Slope/PFO	IV	0.001
Wetland E	Slope/PFO	IV	0.02
Wetland F	Slope/PFO	IV	0.03
Wetland G	Slope/PFO	IV	0.05
Wetland H	Slope/PFO	IV	0.01
Wetland I	Slope/PFO	IV	0.04
Wetland J	Slope/PFO	IV	0.01
Wetland K	Slope/PFO	IV	0.02
Total			0.331

Abbreviations and Acronyms:

HGM = hydrogeomorphic
PFO = palustrine forested

Wetland functional impacts are anticipated to be minimal and limited to a small reduction in habitat diversity, support of characteristic vegetation, and a small amount of water quality function. Owing to their slope nature, which does not provide water storage and delay functions, the impacted wetlands do not provide any hydrologic functions.

Wetland mitigation will take place through the utilization of the SBIT Ghost Dike advanced wetland mitigation site. The mitigation site was established in 2023 and involved the restoration and enhancement of vitally important and rare estuarine marsh plain and tidal channels within Willapa Bay. This was accomplished by removing a relic dike, filling artificial drainage channels, and establishing native emergent plant communities within wetland and buffer areas. This project resulted in the re-establishment and rehabilitation of 20.32 acres of estuarine wetland. The credits generated by this project can be utilized by the SBIT to mitigate for both palustrine and estuarine wetland impacts as specified within the Ghost Dike Advanced Wetland Mitigation Project prospectus.

The applicant will be submitted for the required wetland approvals from the USACE concurrent with the review of this BA.

1.3.6 Waterway Impacts

The required grading will also impact several small, intermittent streams within the action area. A total of five of the streams will be impacted. All of the impacted channels exist as narrow, seasonally flowing headwater channels where groundwater is being expressed from the steep slopes. While these waterways had recognizable ordinary high water marks (OHMW), none of these streams displayed stream-like characteristics outside of a bed and bank and flowing water. The streams have beds composed of clay or silt and lack a continuous layer of gravel or cobble, and for all intents and purposes

are slowly downcutting erosion rills. The drainages are far too steep to provide habitat for fish and do not appear to have any primary productivity in terms of benthic macroinvertebrates due to the lack of streambed materials and flows that are limited to the rainy season. Table 5 below summarizes the proposed impacts to waterways within the action area.

Table 5. Stream Impact Summary

Feature Name	Approximate Bankfull Width (inches)	DNR Stream Type	Length Impacted (lf)	Area Impacted (sf)
Stream 1	10	Ns	84	70
Stream 2	18	Ns	118	177
Stream 3	20	Ns	227	378
Stream 4	21	Ns	595	1,041
Stream 5	14	Ns	81	94.5
Stream 6	24	F	-	-
Total			1,105 lf	1,760.5 sf (0.04 acres)

Abbreviations and Acronyms:

DNR = Washington State Department of Natural Resources

F = fish-bearing

lf = linear feet

Ns = non-fish bearing seasonal

sf = square feet

Due to the small size of the streams, their position within the upper portion of the watershed, and seasonal flow characteristics, the primary stream function that will be impacted by the proposed fills is support of downstream flows. This impact will be mitigated through two methods. The primary method to avoid a loss of downstream flows will be the placement of drainage rock at the base of the proposed fill slopes. This base rock will allow the continued expression of groundwater to flow downhill and support flows within the larger perennial streams that exist outside of the project area. The second method is through the transfer of credits from the Ghost Dike Advanced Mitigation Site.

1.4 Impact Avoidance and Minimization

Impact avoidance, while preferred, may not be reasonable or feasible in meeting a project's objectives. Minimization measures reduce the impact of a project on listed species or habitats. Best management practices (BMPs) are techniques used during construction to reduce project impacts on listed species and habitats. The following minimization measures and BMPs have been incorporated into the proposed projects:

- Stormwater Quality and Quantity
 - Installed stormwater facilities will increase stormwater treatment capacity and reduce long-term impacts to waterways downstream compared to existing conditions.
 - A project-specific Temporary Erosion and Sediment Control (TESC) plan, Stormwater Pollution Prevention Plan, and Spill Prevention, Control, and Countermeasures Plan will be developed and implemented.

- BMPs will be installed and maintained to ensure that no foreign material such as uncured concrete, construction debris, or sediments enter storm drainage/aquatic systems.
- Vegetation Removal
 - Clearing and grubbing limits will be clearly marked in the field prior to construction activities.
 - Vegetation clearing will be minimized to the extent feasible.
 - Temporarily impacted vegetation will be restored immediately following project construction.
 - Vegetation will be grubbed only from areas undergoing permanent alteration. No grubbing will occur in areas slated for temporary clearing followed by revegetation.
- In-Water Work
 - All in-water work will be completed during the approved in-water work window specified in USACE permits.
 - The in-water work areas will be isolated through the installation of block nests, and aquatic life will be collected and released downstream of the project area.
- Revegetation
 - Exposed soils will be stabilized and specified in the TESC plan.
 - Temporarily disturbed areas will be reseeded with an erosion control grass seed mix.
 - All disturbed areas will be mulched and seeded with an approved native or noninvasive herbaceous seed mix following construction and/or planted with native vegetation during the first available planting season.
- General Construction
 - Construction limits will be confined to the minimum area necessary to complete the projects.
 - Boundaries of clearing limits associated with site access and construction limits will be flagged to prevent ground disturbance outside the limits.
 - A Spill Prevention, Control, and Containment Plan will be developed for the projects to ensure that all pollutants and products are controlled and contained.
 - All exposed soils will be stabilized during the first available period and will not be allowed to sit idle for more than 7 days (depending on time of year) without receiving the erosion control treatment specified in the TESC plan.
 - Activities located within ½ mile of suitable marbled murrelet nesting habitat or western snowy plover critical habitat, as identified by the project biologist, will develop and implement a trash-handling plan to ensure that food wastes and other items attractive to crows, jays, and other Corvidae will be disposed of in a manner that makes it unavailable to these species at any time.
- Pollutant Protection

- The contractor will use BMPs, as stated in the Spill Prevention, Control, and Countermeasures Plan, to ensure that no foreign material such as oil or fuel from construction equipment will enter any wetlands, flowing water, or standing water.
- A TESC plan and a source control plan will be developed and implemented. The BMPs in these plans will be used to control sediments from all vegetation-disturbing or ground-disturbing activities.
- All equipment will be fueled and maintained more than 200 ft from the nearest ditch, flowing water, or standing water.
- Equipment will be checked daily for leaks and will be maintained to prevent lubricants and any other deleterious materials from entering waters of the state. All equipment will be free of any external petroleum products, hydraulic fluid, coolants, and other deleterious materials.
- Concrete Work
 - Concrete truck chute cleanout areas will be established to properly contain wet concrete and wash water and prevent it from entering wetlands and other water bodies.
 - The contractor will protect all inlets and catchments to prevent stormwater runoff from conveying fresh concrete/asphalt, tackifier, striping paint, or other contaminants into the stormwater system.
 - All concrete will be poured in the dry and will be allowed to cure a minimum of 7 days before contact with stormwater runoff.
- Restrictions in Rainy Weather
 - No paving, chip sealing, or stripe painting will be initiated in rainy weather.

1.5 Action Area

The project action area includes all areas that could be directly or indirectly affected by the proposed projects. As a result, the terrestrial component of the action area will include the extent of the proposed work (including the equipment staging areas) and the attenuation limit of construction noise. The aquatic component of the action area will include the extent of potential water quality impacts associated with the proposed projects. For these projects, Chapter 7 of the WSDOT Biological Assessment Preparation Manual was used to prepare the noise analysis (WSDOT 2025).

1.5.1 Terrestrial Component

For terrestrial impacts, the action area is defined as the area of project construction and the area within which project-related construction noise will travel before it is indistinguishable from background ambient noise.

Construction noise is estimated to be as loud as 93 A-weighted decibels (dBA)² measured 50 ft (D_o) from construction equipment over soft ground (α). Communities adjacent to the project area are estimated to have an environmental noise baseline (ambient sound level) of 40 dBA based on population density (WSDOT 2025). The calculation for distance (D) of construction noise attenuation to ambient sound levels is based on the following equation (WSDOT 2025):

$$D = D_o * 10^{((\text{Construction Noise} - \text{Ambient Sound Level in dBA})/\alpha)}$$

$$D = 50 * 10^{((93-40)/25)}$$

$$D = 6,591 \text{ ft}$$

This distance is calculated as approximately 1.25 mi (6,591 ft; Figure 3).

1.5.2 Aquatic Component

Exposure to stormwater runoff contaminants presents the greatest risk of effect to listed fish species and their prey base and is the primary factor for determining the boundaries of the aquatic component of the action area. In-water work is associated with the proposed action for the installation of a culvert on a perennial stream (Stream 6) and the upstream edge of two seasonal drainages (Streams 1, 2, 3, 4, and 5). However, in accordance with WSDOT BA Manual Chapter 17.0 (WSDOT 2025), the extent of potential stormwater effects for projects that drain to the Pacific Coast should be analyzed to the location of discharge marine waters (Willapa Bay). Potential stormwater runoff from the project area discharges to vegetated upland slopes at 11 of the 12 outfall locations and directly upslope of Stream 6, a fish-bearing stream, at the improved fish passage culvert location on North Cove Beach Access Road (approximately Station 29+30). Stream 6 flows south for approximately 0.4 mi, parallel to the eastern edge of North Beach Access Road. At the intersection with SR-105, the stream enters a culvert beneath the road grade. Flow exits the culvert on the southern side of SR-105, entering Willapa Bay or spilling out onto the beach during low tide (Figure 3).

The culvert beneath SR-105 is inventoried by WDFW as 33 percent fish passable due to water surface drops at each end of the culvert (Site ID 993133). Streams 1 and 2 flow south from the edge of the Raise Loop Road project area, converging approximately 1,525 ft and 1,250 ft downgradient, respectively. From the confluence, Stream 1 continues to the south approximately 1,800 ft to a culvert beneath SR-105 east of Panoramic Lane then flows onto the Willapa Bay shoreline. Streams 3 and 5 converge with Stream 4 within the North Cove Beach Access Road project area. From the edge of the project area, Stream 4 flows southeast then south to a culvert beneath SR-105 west on Panoramic Lane. Stream 4 flows through the culvert beneath SR 105 and onto the Willapa Bay shoreline.

² The 93-dBA noise level was determined using guidance from the WSDOT BA Manual Chapter 7 Table 7-4 and is based on rules for decibel addition (Table 7-8) for the three predominant noise-producing pieces of construction equipment identified by the project engineer: excavator (87 dbA), dump truck (91 dbA), dozer (85 dbA).

2.0 SPECIES AND HABITAT INFORMATION

Lists of threatened and endangered species and critical habitats were obtained from the USFWS and NMFS websites and are provided in Appendix G. Site-specific species and habitat information was obtained from the WDFW PHS database, the Statewide Washington Integrated Fish Distribution (SWIFD) map, and Washington State Department of Natural Resources (DNR) Natural Heritage Program.

2.1 Species and Critical Habitat List and Listing Status

The listed and proposed species and their critical habitat provided in Table 6 are discussed in this BA given their potential presence in the action area, while a summary of habitat requirements is provided below. An expanded discussion of species and habitat requirements is provided in Appendix H.

Table 6. Listed Species and Critical Habitats

Species	Species Listing Status	Critical Habitat	Consulting Agency
Marbled murrelet (<i>Brachyramphus marmoratus</i>)	Threatened	Designated, but not present in the action area	USFWS
Yellow-billed cuckoo (<i>Coccyzus americanus</i>)	Threatened	Proposed, but not present in the action area	USFWS
Streaked horned lark (<i>Eremophila alpestris strigata</i>)	Threatened	Designated and present in the action area	USFWS
Western snowy plover (<i>Charadrius nivosus nivosus</i>)	Threatened	Designated and present in the action area	USFWS
Monarch butterfly (<i>Danaus plexippus</i>)	Proposed Threatened	None	USFWS
Suckley's Cuckoo Bumble Bee (<i>Bombus suckleyi</i>)	Proposed Endangered	None	USFWS
Bull trout (<i>Salvelinus confluentus</i>)	Threatened	Designated, but not present in the action area	USFWS

Abbreviations and Acronyms:

USFWS = US Fish and Wildlife Service

2.1.1 Presence of Species and Critical Habitat in the Action Area

2.1.1.1 Species and Critical Habitat in the Region but Not in the Action Area

The WDFW's PHS on the Web, the Statewide Integrated Fish Distribution map, Cornell Labs eBird, and iNaturalist do not identify the presence of marbled murrelet, yellow-billed cuckoo, monarch butterfly, Suckley's cuckoo bumble bee, or bull trout in the action area, and critical habitat for these species is not designated in the action area. Previous consultation with USFWS resulted in the identification of suitable marbled murrelet nesting habitat in the action area, and this species will be discussed further in Section 2.1.2. The following Table 6 species are not expected to occur in the action area, as the action area does not provide suitable habitat for these species, and they are not discussed further in this document.

- *Yellow-Billed Cuckoo* – Yellow-billed cuckoos require large tracts of willow-cottonwood or mesquite forest or woodland for nesting habitat. Foraging and stopover sites have similar

characteristics but may be as small as 10 acres in size. Foraging habitat contains a dense tree canopy with high foliage volume. Yellow-billed cuckoos are considered extirpated in Washington (WDFW 2025a). The proposed projects will have no effect on this species.

- *Monarch Butterfly* – Most monarch butterflies that breed west of the Rocky Mountains, including in Washington, overwinter in California (WDFW 2025b). Monarchs breed and travel through Washington but do not overwinter in the state. Monarchs require secure patches of milkweed (primarily *Asclepias* spp.) and nectar resources during breeding, as well as roosting sites and safe travel corridors for migration. Milkweeds and monarchs in Washington occur in weedy fields and sparsely vegetated habitats, typically near wetlands or riparian areas. Although monarchs are dependent on temperate zones for reproduction, adults cannot survive freezing temperatures. In Washington, they are found east of the Cascades where milkweed occurs (WDFW 2025b). The projects will not jeopardize the continued existence of the monarch butterfly because secure patches of milkweed do not occur in the action area, and this species is not known to occur in the action area. However, if the monarch butterfly becomes listed prior to completion of the projects, a provisional determination of no effect is provided for the reason stated above.
- *Suckley's Cuckoo Bumble Bee* – Typical hosts for the Suckley's cuckoo bumble bee include western bumble bees (*Bombus occidentalis*) and Nevada bumble bees (*B. nevadensis*, with other less-preferred potential hosts in the subgenus *Bombus*). Western bumble bee surveys from WDFW have located only a handful of populations in Washington, primarily in remote subalpine and montane sites (WDFW 2025c), and Nevada bumble bee surveys have not been completed. Suckley's cuckoo bumble bees are typically found in low abundance at the edges of their host species' range, with their distribution being smaller than that of their hosts' (Antonovics and Edwards 2011). Recent WDFW surveys in Washington detected Suckley's cuckoo bumble bee in only six unspecified localities (WDFW 2025c). The projects will not jeopardize the continued existence of the Suckley's cuckoo bumble bee because suitable habitat does not occur in the action area and this species is not known to occur in the action area. However, if Suckley's cuckoo bumble bee becomes listed prior to completion of the projects, a provisional determination of no effect is provided for the reason stated above.
- *Bull Trout (US, coterminous, [lower 48 states])* – In November 1999, USFWS listed bull trout (*Salvelinus confluentus*) under the ESA as threatened. Coterminous bull trout encompasses all Pacific Coast drainages within the State of Washington. This population segment is highly significant to the species because it supports all life history forms of the species, including the only known amphidromous forms of bull trout in the coterminous US (USFWS 2010). Bull trout have adapted to cold water and require water temperatures around 48 to 50 degrees Fahrenheit (°F) for rearing and spawning (USFWS 1999); however, incubating eggs require cold water, with optimal development at temperatures ranging from 36 to 39°F (McPhail and Murray 1979). Juvenile rearing and spawning typically occur in smaller tributaries and headwater streams, and juvenile bull trout prefer cold water temperatures between 39 and 50°F (McPhail and Baxter 1996). Juvenile bull trout can reside in gravel substrate for more than 220 days, from egg deposition to emergence, making them especially vulnerable to sediment deposition and bedload movement (USFWS 1999). They are strongly associated with the stream bottom and cover features such as wood, boulders, and interstitial spaces in the substrate (USFWS 2010). They typically mature as 5- to 7-year-olds and spawn in the fall from mid-September to mid-November, although the time of spawning may vary with geographic region and life-history strategy (Wydoski and Whitney 2003).

The Willapa Basin has a relatively low gradient with dominant winter peak flows and a lack of spring snowmelt, making the system less than optimal for bull trout (Smith 1999; USFWS 2012). WDFW's updated *Washington State Salmonid Stock Inventory: Bull Trout/Dolly Varden* does not list the presence of bull trout or Dolly Varden stock in the Willapa Basin (WDFW 2004). Additionally, Tom Kollasch from the Coast Salmon Partnership for Willapa Bay stated that there are no known populations of bull trout present in Willapa Bay.

Willapa Bay does not include designated bull trout critical habitat. Critical habitat for bull trout in Pacific Ocean marine areas does not extend south of Point Brown, which is the northern edge of the Grays Harbor entrance, and is about 20 miles north of the project area.

Bull trout use of Willapa Bay and the Willapa River system is not well known. While bull trout are believed to forage in Willapa Bay, no resident populations of bull trout have been recorded in the watershed. In 2002, a fisheries technician with WDFW caught a sub-adult bull trout at Forks Creek, a tributary of the Willapa River, near river mile 29. This fish would have had to migrate over 150 kilometers through oceanic waters from the nearest core spawning area (Quinault or Hoh River) to reach the Willapa River (Goetz et al. 2004). Aside from this occurrence, bull trout presence has not been recorded in the Willapa Basin.

2.1.2 Species and Critical Habitats in the Action Area

PHS on the Web identifies snowy plover and streaked horned lark presence, and critical habitat is designated south of Highway 105 in the southern extent of the action area. PHS on the Web does not identify marbled murrelet, and marbled murrelet critical habitat is not designated in the action area by USFWS, but potential suitable habitat was previously identified in the action area by USFWS (Harke 2018). The following section summarizes listed species and critical habitat potentially affected by the projects.

2.1.2.1 Western Snowy Plover (Pacific Coast Distinct Population Segment)

The western snowy plover breeds along the North American Pacific coast from southern Washington to Baja, California and locally at interior areas in states west of the Rockies except Idaho and Washington (WDFW 1995). Snowy plovers nest primarily above the high tide line in unvegetated or sparsely vegetated areas of coastal beaches. Less common nesting habitats include bluff-backed beaches, dredged material disposal sites, salt pond levees, dry salt ponds, and river bars. In winter, snowy plovers are found on many of the beaches used for nesting as well as on beaches where they do not nest, in manmade salt ponds, and on estuarine sand and mud flats (Pearson et al. 2014). The breeding season of the coastal population of the western snowy plover extends from mid-March through mid-September. Nest initiation and egg laying occurs from mid-March through mid-July (Wilson 1980, Warriner et al. 1986).

Western snowy plovers have been consistently recorded nesting on Graveyard Spit south of SR-105 and the project area within the action area (WDFW 1995; Stinson 2022). Coastal erosion is one of the greatest hurdles to population recovery within the action area (Stinson 2022).

In July of 2025, the SR-105/Graveyard Spit – Dynamic Revetment and Dune Restoration project began construction (Ecology and WSDOT 2022). The restoration project will raise the elevation of the existing

dune with installed cobble and gravel, creating a wave-absorbing dynamic revetment and stabilizing the area with native species such as American dune grass (*Leymus mollis*), beach pea (*Lathyrus japonicus*), and Hooker's willow (*Salix hookeriana*). In addition to protecting SR-105 and SBIT properties, the restoration project will shield an existing tidal marsh as well as streaked horned lark and western snowy plover nesting habitat from further erosion. Construction of the dune revetment is scheduled for completion March 2026, and planting is anticipated to be completed by October 2026 (WSDOT 2026).

Aside from coastal erosion, human activities such as driving vehicles, walking, harvesting driftwood, flying kites, exercising dogs, and making campfires pose a threat to nesting western snowy plovers (Pearson et al. 2014).

2.1.2.2 Western Snowy Plover (Pacific Coast Distinct Population Segment) Critical Habitat

Two areas separated by exempt SBIT land are designated as western snowy plover critical habitat in the southern portion of the action area along the Willapa Bay shoreline (Figure 4).

2.1.2.3 Streaked Horned Lark

Historically, the streaked horned lark's breeding range extended south from southern British Columbia, Canada through the Puget lowlands and outer coast of Washington, along the lower Columbia River, through the Willamette Valley and Oregon coast, and into the Umpqua and Rogue River valleys of southwestern Oregon (Pearson and Altman 2005). The current range of the streaked horned lark can be divided into three regions:

- 1) The Puget lowlands in Washington
- 2) The Washington coast and lower Columbia River islands (including dredge spoil deposition sites near the Columbia River in Portland, Oregon)
- 3) The Willamette Valley in Oregon.

Streaked horned larks are birds that require wide open spaces with no trees and few or no shrubs. The streaked horned lark nests on the ground in sparsely vegetated sites dominated by grasses and forbs in a broad range of habitats, including native prairies, coastal dunes, fallow and active agricultural fields, wetland mudflats, sparsely vegetated edges of grass fields, recently planted Christmas tree farms with extensive bare ground, moderately to heavily grazed pastures, gravel roads or gravel shoulders of lightly traveled roads, airports, and dredge deposition sites in the lower Columbia River. Nesting begins in late March and continues into late August. Wintering streaked horned larks use habitats that are very similar to breeding habitats (USFWS 2021).

Streaked horned larks are regularly documented nesting in the sparsely vegetated portions of Graveyard Spit to the south of the project area and SR-105 within the action area (Pearson et al. 2005; Stinson 2016; Ecology and WSDOT 2022). Coastal erosion and rising sea levels have and will continue to pose a threat to streaked horned lark habitat on Graveyard Spit. The SR-105/Graveyard Spit – Dynamic Revetment and Dune Restoration project, currently under construction, aims to protect human

infrastructure and valuable habitat for streaked horned lark and western snowy plover (Ecology and WSDOT 2022; see Section 2.1.2.1 for more project information).

Aside from coastal erosion, human activities such as driving vehicles, walking, harvesting driftwood, flying kites, exercising dogs, and making campfires pose a threat to nesting streaked horned larks (Stinson 2016).

2.1.2.4 Streaked Horned Lark Critical Habitat

Two areas separated by exempt SBIT land are designated as streaked horned lark critical habitat in the southern portion of the action area along the Willapa Bay shoreline (Figure 5).

2.1.2.5 Marbled Murrelet

Marbled murrelets occur in many areas of western Oregon and Washington, where suitable forested habitat occurs within approximately 50 miles of the Puget Sound or the Pacific Ocean (Ralph, et al. 1994). In Washington, at-sea counts of murrelets indicate approximately 5,000 birds are present offshore from April through July, the largest concentrations being found in the Puget Sound area (Speich, et al. 1992). Marbled murrelets were listed as threatened by the USFWS in 1992 on the basis of available data when declines in their population were observed in the southern portion of their range (USFWS 1992). The decline has been attributed primarily to the loss of nesting habitat for the species (Ralph and Miller 1995). Secondary concerns for murrelet survivability include gill net fisheries and oil pollution, as well as their impact on feeding and resting murrelets at sea.

The marbled murrelet breeds from Alaska to central California and winters off shore from southern Alaska to central California, with casual wintering in southern California (Speich, Wahl, and Manuwal 1992). Marbled murrelets typically nest high in the canopy of old-growth forests, where there are at least some trees greater than 32 inches in diameter breast high and/or 200 years of age. Or they nest in stands of large trees infested with mistletoe (*Arceuthobium* spp.), where mistletoe brooms of greater than 1 sf of surface area are also occasionally used by nesting murrelets (Ralph and Miller 1995). Marbled murrelets feed in shallow coastal waters, typically within 1.25 miles of shore. Murrelets spend most of their life at sea and, unlike other alcids, come inland to nest and rear their young in coniferous forests, except for a small percentage of the population in Alaska that nest on the ground (Marshall 1988; USFWS 1992).

Suitable marbled murrelet habitat was identified by USFWS in a mature stand of western hemlock in the action area during a 2018 site reconnaissance. This area was subsequently placed within a conservation easement. Other potentially suitable habitat for marbled murrelets within the action area is located west of the project areas along steep, north-facing slopes. This area contains mature conifers that, while not older than approximately 100 years, are presumed to contain some amount of suitable nesting platforms. The remaining forested portions of the action area exist as commercial timberland subject to regular harvest intervals. There are no timber stands older than the USFWS-identified western hemlock stand within the action area. Figure 6 illustrates the location of suitable marbled murrelet habitat along with the age of the existing stands of trees subject to Tribal management.

The action areas north of the proposed road alignments have all been harvested within the past 70 or so years and do not contain mature trees except for narrow corridors adjacent to streams. The suitable marbled murrelet habitat and effect threshold buffer distance are shown in Figure 7.

2.1.2.6 Marbled Murrelet Critical Habitat

Marbled murrelet critical habitat is designated approximately 7 miles southeast of the project areas in a forested area along the Bone River (Figure 8). The action areas do not overlap designated marbled murrelet critical habitat, and no effect on critical habitat is anticipated. Marbled murrelet critical habitat will not be discussed further.

3.0 ENVIRONMENTAL SETTING

The following sections summarize the environmental conditions of the project area and action area.

3.1 General Setting

The project area is located within the Environmental Protection Agency's 1b Coastal Uplands and 1a Coastal Lowlands Level IV ecoregions. This area is characterized by a temperate climate heavily influenced by the adjacent maritime environment. Annual rainfall is quite high in this region with average precipitation ranging from 60 to 78 inches per year. The area experiences moderate temperatures with average daily temperatures in the high 30s during the winter and summertime highs near 70°F.

The coastal lowland areas are characterized by extensive wetlands, estuaries, beaches, and dunes. The coastal upland areas transition to coniferous forestland historically dominated by Sitka spruce (*Picea sitchensis*), western redcedar (*Thuja plicata*), evergreen huckleberry (*Vaccinium ovatum*), salal (*Gaultheria shallon*) and western sword fern (*Polystichum munitum*).

The Willapa Watershed (WRIA 24) is located primarily in Pacific County; extends into portions of Grays Harbor, Lewis, and Wahkiakum Counties; and includes all lands draining into Willapa Bay. The headwaters of major tributaries start in the surrounding Willapa Hills. The remainder of the watershed includes marine nearshore areas that drain to the Pacific Ocean (Ecology 2023).

The projects are located on the Shoalwater Bay Reservation as well as adjacent tribal trust lands in unincorporated Pacific County between the North Cove and Tokeland communities. The project area connects to SR-105 at North Beach Access Road and Eagle Hill Road. The adjacent portion of SR-105 abuts the northern shoreline of Willapa Bay and Graveyard Spit.

3.2 Terrestrial Habitat Conditions

The terrestrial component of the action area extends across forestlands and natural areas to the north and east, mixed agricultural and residential land uses to the west, residential uses in the southeast, and the nearshore environment to the south. SR-105 bisects the action area from the northwest to the east and parallels the north shore of Willapa Bay.

The forestlands surrounding the project area have been subject to historic and recent commercial timber harvest. Gravel roads have been constructed through these forestlands to facilitate timber harvest and hauling. Most of the forestland adjacent to the project area exists as either recently clear-cut harvested lands that have been replanted or medium-aged, second-growth timber. Land uses adjacent to the project area include a single-family residence and police station. Both are located near the southwestern portion of the project area. Landau identified 11 wetlands within or directly adjacent to the project area (Figure 2). Wetlands were observed in depressions at the toe of the slopes along SR-105 as well as in seeps located on the steep hillsides.

The topography of the project area is highly variable and ranges from moderately sloping to very steep. The alignment of the project area generally follows a north-south-oriented ridgeline that falls off steeply on both sides. This ridgeline is accessed from the north and south by steep gravel roads that have been carved into the adjacent hillsides. The project area drains to the north and south along these roads, while the dominant ridgeline drains to the east and west.

The north shore of Willapa Bay has experienced decades of flooding, storm surges, and the fastest rates of eroding shoreline on the United States west coast, averaging 100 ft per year over the past century in some places (Michalsen, 2018; Talebi et al. 2017). In 1937, Cape Shoalwater, immediately west of Graveyard Spit, had an area of 837 acres, largely composed of sand dunes capable of supporting snowy plover nesting. By 1992, the area had eroded to less than 20 acres and included virtually no plover habitat (WDFW 1995). WSDOT and Ecology calculated the average rate of coastline retreat on Graveyard Spit from 2003 and 2019 to be 75 ft per year (Ecology and WSDOT 2022). Because of this erosion, significant dune and saltwater wetland habitat has been lost.

3.3 Aquatic Habitat Conditions

The projects generally avoid impacting aquatic environments in the action area by concentrating activities on existing roadways, consolidating runoff with CAVFTs, and directing treated stormwater outfalls away from existing surface waters. Water quality will be affected in all identified streams within the project area (Streams 1 through 6). Streams 1 through 5 are headwaters in the steep slopes adjacent to the Raise Loop Road project area. These headwater streams follow narrow channels that flow downgradient to the south through timberland in various stages of regrowth. Stream 2 is a tributary to Stream 1, and Streams 3 and 5 are tributaries to Stream 4. Streams 1 and 4 flow into roadside wetlands north of SR-105 before entering culverts beneath the roadway and discharging to the Willapa Bay shoreline. The culverts associated with Streams 1 and 4 are marked as fish passable by WDFW, though no fish presence is identified by SWIFD.

Stream 6, a perennial tributary to Willapa Bay, is largely undisturbed except for reaches that cross beneath roadways via culvert. The riparian buffer condition transitions at the North Cove Beach Access Road, crossing from second-growth forest downgradient to recent clearcut upgradient. From North Cove Beach Access Road, Stream 6 flows down a moderately steep drainage and through a gently sloping floodplain. The stream passes through a corrugated steel culvert that is perched above the channel on the downstream end. The channel has an average bankfull width of 27 inches as it flows through the project area. Based on the bankfull width and slope, Stream 6 meets the physical criteria to be considered a potential fish-bearing stream. Stream 6 is mapped within the SWIFD database as potentially containing winter steelhead and coho salmon, though potential presence of winter steelhead does not extend up to the culvert beneath North Cove Beach Access Road. Additionally, the culvert that conveys this stream under SR-105 and outfalls into Willapa Bay is listed by the WDFW as being 33 percent passable due to water surface drops at either end of the culvert.

To avoid impacts to additional drainages, the projects intentionally capture and route stormwater to upland discharge locations for infiltration prior to reaching surface waters. As such, the drainage areas north, west, and east of the project area are not included in the aquatic component of the action area.

4.0 ANALYSIS OF EFFECTS

Effects of the action are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action but that are not part of the action. A consequence is caused by the proposed action if it would not occur but for the proposed action and is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (50 Code of Federal Regulations [CFR] 402.02).

4.1 Direct Effects

A direct effect is the immediate effect (or consequence) of the projects on a species or its habitat. Consequences can be beneficial or adverse. Though the projects do not anticipate adverse effects to listed aquatic species, effects to aquatic habitat are included to provide a comprehensive assessment. Direct effects of the proposed projects are summarized below.

4.1.1 Noise

The terrestrial component of the action area is established to ensure that potential noise impacting a varied group of listed species is assessed. Once the list of potentially affected listed species is established, noise impacts can be assessed on a species-by-species basis. Noise attenuation distances are based upon the simplistic formula used to establish the terrestrial component of the action area, and the result does not consider the effects of topography, site-specific conditions, or the location of construction activities within the project areas. Given the varied topography surrounding the project areas and areas of dense canopy, it is likely that noise attenuation distances are lower than reported but, absent a detailed noise analysis, the terrestrial component of the action area is used here to represent the area of anticipated elevated noise levels caused by project construction.

Elevated noise levels associated with clearing, grading, and road construction from the project areas are anticipated to extend to suitable marbled murrelet habitat and two designated western snowy plover and streaked horned lark critical habitat areas. Elevated noise levels have the potential to flush adults from nests, potentially resulting in lower reproductive rates and higher fledgling mortality.

Distance thresholds for direct effects caused by noise have been established based on guidance provided in Chapter 13 of WSDOT's *BA Preparation Manual* (BA Manual; WSDOT 2025). This guidance is based on the 2014 WSDOT Programmatic Biological Opinion-Supplemental Effects Analysis for Marbled Murrelet within Washington Municipal Boundaries (WSDOT 2014). The BA Manual effect determination guidance is based upon expected results from transportation-related actions, including road construction. Therefore, the effects of the proposed projects can be expected to be comparable to similar actions outlined in the BA Manual.

The BA Manual establishes effect distance thresholds for marbled murrelet (Table 7). The projects will utilize chainsaws and heavy equipment for road construction. Suitable marbled murrelet habitat is mapped in a forested area in the middle of the loop created by North Cove Beach Access Road, Raise

Loop Road, Eagle Hill Road, and SR-105. Suitable murrelet habitat is within 0.25 miles of the central portion of the Raise Loop Road project area, and noise disturbance is anticipated during this phase of construction (Figure 6). The closest section of the projects is approximately 700 ft from suitable nesting habitat. Construction-generated noise should attenuate to approximately 64 dB at the outer edge of the suitable habitat polygons. All other project areas are greater than 0.25 miles from suitable marbled murrelet habitat and are not anticipated to affect marbled murrelet.

Table 7. Effect Distance Thresholds for Marbled Murrelet During Breeding Season

Project Activity	No Effect	NLAA “may affect” disturbance distance	LAA – Harass disruption distance	LAA – Harm direct injury or mortality
Chainsaws (including felling hazard/danger trees)	>0.25 mi	328 feet to 0.25 miles	<328 feet	Potential for mortality if trees felled contain platforms
Heavy equipment for road construction, road repairs, bridge construction, culvert replacements, etc.	>0.25 mi	328 feet to 0.25 miles	<328 feet	Not applicable

Source: WSDOT. 2025. Updated: Biological Assessment Preparation for Transportation Projects – Advanced Training Manual. Washington State Department of Transportation. January.

Abbreviations and Acronyms:

LAA = likely to adversely affect

NLAA = not likely to adversely affect

Western snowy plover critical habitat and documented nesting sites occur on Graveyard Spit just south of SR-105 from the project area. The BA Manual states that an effect determination of no effect is appropriate for “all projects that occur in Grays Harbor or Pacific counties that occur over 0.25 mile from potential foraging or nesting habitat as identified by the project biologist” and a “may affect/not likely to adversely affect (NLAA)” determination is appropriate for “projects that occur in Grays Harbor or Pacific counties that generate noise above background levels in potential foraging or nesting habitat as identified by the project biologist” (WSDOT 2025). A 0.25-mile buffer projected off western snowy plover critical habitat overlaps the southern 2,100 ft (Station 0+00 to 21+00) and a 650-ft section (Station 33+50 to 40+00) of the North Cove Beach Access Road project area. A 0.25-mile buffer projected off suitable western snowy plover habitat on SBIT Reservation land overlaps the southern 1,400 ft (Station 0+00 to 14+00) of the Eagle Hill Road project area (Figure 4). As such, noise disturbance to western snowy plover is anticipated while construction activities occur on the specified 2,750 ft of North Cove Beach Access Road and the 1,400 ft of Eagle Hill Road, which constitute approximately 21.5 percent of the total road length to be installed.

Streaked horned lark critical habitat and documented nesting sites occur on Graveyard Spit just south of SR-105 from the entrance to the North Cove Beach Access Road project area. The BA Manual states that an effect determination of no effect is appropriate for “projects that occur in Pierce, Thurston, Mason, Grays Harbor, Pacific, Wahkiakum, and Cowlitz counties during the breeding season (March 15 to August 15) that occur further than 100 feet (1.0 mile for blasting or pile driving) from suitable breeding habitat as identified by the project biologist” (WSDOT 2025). The 100-ft threshold is derived from observations recorded in WDFW’s *Range-wide Streaked Horned Lark (Eremophila alpestris strigata)*

Assessment and Preliminary Conservation Strategy (Pearson and Altman 2005). The closest portion of the North Cove Beach Access Road project area is approximately 140 ft from suitable streaked horned lark habitat and 75 ft from designated critical habitat. The most encumbering portion of designated critical habitat is adjacent to SR-105, composed of riprap-armored shoreline below the high tide line, and does not provide suitable streaked horned lark habitat.

4.1.2 Turbidity

Project construction includes ground-disturbing activities such as grading and excavation that would temporarily disturb soils. Additionally, a potentially fish-bearing stream (Stream 6) will be impacted when a passage barrier culvert is replaced with a passable culvert (Cross Drain 4; CD4). The contractor will be required to comply with BMPs contained in the WSDOT Standard Specifications for Road, Bridge, and Municipal Construction (WSDOT 2023). These BMPs will prevent or reduce erosion during construction. A project-specific TESC plan will be developed and implemented by the contractor. Erosion and sediment control specifications will focus on soil and slope protection and stabilization measures, followed by site restoration methods (including planting and landscaping). Erosion and sediment controls will be inspected and maintained daily. For the reasons listed above, no direct adverse impacts to adjacent waterways are anticipated during upland construction activities.

Turbidity caused by in-water work could occur associated with the Stream 6 culvert removal and CD4 installation. The culvert replacement work will be completed in the dry after the stream is diverted around the culvert work area utilizing a coffer dam and pipe. A small amount of turbidity is expected following the completion of the culvert installation and rewatering of the stream channel. This turbidity will be temporary and should be dissipated within a couple hundred ft downstream of the project area.

4.1.3 Stormwater and Water Quality

Project construction includes ground-disturbing activities such as grading and excavation that would temporarily disturb soils. Construction activities will be conducted within and adjacent to Stream 6, a tributary to Willapa Bay. The contractor will be required to comply with BMPs contained in the WSDOT Standard Specifications for Road, Bridge, and Municipal Construction (WSDOT 2023). These BMPs will prevent or reduce erosion during construction. A project-specific TESC plan will be developed and implemented by the contractor. Erosion and sediment control specifications will focus on soil and slope protection and stabilization measures, followed by site restoration methods (including planting and landscaping). Erosion and sediment controls will be inspected and maintained daily.

Stormwater generated by roadway runoff includes contaminants and pollutants harmful to fish life, including persistent bioaccumulating toxicants, petroleum hydrocarbons, microplastics, metals, pesticides and surfactants, nutrients and sediment, elevated water temperature and low dissolved oxygen, and bacteria (WSDOT 2022). Motor vehicles are the primary source of pollutants present in stormwater runoff, while PGIS provides a pathway for pollutants to be mobilized by stormwater runoff and transported to waterways. Pollutants and contaminants associated with vehicles include those derived from tire wear (e.g., 6PPD-quinone), brake pads (e.g., copper and other metals), and exhaust (e.g., phenanthrene and other polycyclic aromatic hydrocarbons). Metals such as copper, zinc, cadmium,

and mercury can have a range of acute and chronic physiological and behavioral effects on salmonids, with those effects ranging from avoidance to mortality depending on the pollutant and its concentration (Feist et al. 2011; Gobel et al. 2007; McIntyre et al. 2012; Spromberg et al. 2006; Sandahl et al. 2007; Spromberg et al. 2015, per WSDOT 2022). Additionally, sediment loads and turbidity from roads and construction projects can degrade spawning and incubation habitat in streams and may also cause physiological stress responses that can increase maintenance energy and reduce feeding and growth. A large fraction of the total cumulative toxic load present in stormwater runoff (treated or untreated) is often bound with or carried by sediments (Grant et al. 2003, per WSDOT 2022). Lipophilic chemicals (e.g., polychlorinated biphenyls [PCBs]) within sediments are very persistent and tend to bioaccumulate in the tissues of organisms, particularly those at the top of trophic food chains such as salmonids and killer whales. Accumulation of these chemicals can result in adverse long-term impacts including altering species behavior, reproduction, and growth (WSDOT 2022). PCB concentrations in resident fish often exceed Washington's water quality criteria for human health concentrations (Ecology 2021). While a portion of the projects will discharge stormwater runoff adjacent to Stream 6, the projects will provide water quality treatment CAVFTs that will reduce/minimize discharge of runoff from the projects to receiving waters.

In 2022, Ecology evaluated the effectiveness of various BMPs to reduce concentrations of 6PPD and 6PPD-quinone in stormwater runoff (Ecology 2022). As part of the study evaluation, CAVFTs received a "high" ranking because the method provides filtration, sorption, and infiltration capabilities. Because stormwater will pass through a system of CAVFTs, it can be concluded that the system will be rated as providing "high" function with respect to treatment of metal contaminants and removal of 6PPD and 6PPD-quinone, thus reducing potential effects to fish resources downgradient.

4.1.4 Fish Exclusion

Replacement of a potential fish passage barrier culvert on North Beach Access Road will require work below the OHWM in a perennial stream. While it is unlikely that fish will be present, as this work will occur during an approved in-water work window, WSDOT's fish exclusion protocols and standards will be used as needed for moving fish (Appendix D). Due to the small nature of the stream and limited amounts of in-stream cover, it is expected that electrofishing will not be required to satisfactorily remove aquatic life from the exclusion zone.

4.1.5 In-Stream Habitat

The projects will result in temporary loss of in-stream habitat associated with culvert replacement on Stream 6. The existing culvert is a 24-inch corrugated steel culvert perched above the channel on the downstream end, which creates a fish passage barrier. This culvert will be replaced with an 8-ft-diameter concrete pipe that is partially buried and filled with streambed material. The replacement culvert will provide fish passage at all anticipated flows. Fish passage improvement is anticipated to open up approximately 2,000 linear feet (lf) of potential fish habitat upstream of the culvert.

Approximately 1,100 lf of Streams 1, 2, 3, 4, and 5 will be filled as part of necessary grading work associated with the Raise Loop Road construction. These are seasonal streams, and the areas to be filled will be dry during construction. These stream reaches do not meet the physical fish-bearing requirements outlined in Washington Administrative Code 222-16-031 and are not anticipated to provide habitat to fish. The potential impacts to downstream flow contributions will be mitigated through the placement of a thick layer of drain rock atop of the impacted streams prior to the placement of earthen fills. This drain rock will allow further expression of groundwater discharges that will flow into the remaining streams downslope of the project area. A TESC plan utilizing BMPs will be developed and implemented by the contractor to limit construction impacts to remaining in-stream habitat from construction activities.

The completed projects will result in a net gain of approximately 910 lf of potential fish habitat.

4.2 Delayed Consequences

Delayed consequences can include changes to ecological systems resulting in altered predator/prey relationships and long-term habitat alteration, as well as anticipated changes in human activities, including changes in land use.

The projects include the improvement and development of new roadways and utility infrastructure for future residential development. Though not included as part of the projects, there are plans for 51 1- to 1.2-acre residential lots; 21 along North Cove Beach Access Road, 28 along Raise Loop Road, and two along Eagle Hill Road (Figure 9). Concepts for additional residential development are in progress as well. These future phases rely on the completion of roadway and utility development, and therefore the effects of future development made possible by the projects would not occur but for the proposed actions.

4.2.1 Predator/Prey Relationships

Prey species for marbled murrelet, western snowy plover, and streaked horned lark do not rely on areas planned for future development. Marbled murrelets primarily eat small forage fish species such as anchovy, herring, and sand lance, which reside in the nearshore environment of Willapa Bay. Western snowy plovers feed on insects, crustaceans, and marine worms found along the wrack line and in wet sand associated with the Willapa Bay shoreline. Streaked horned larks feed primarily on seeds and grass but exclusively feed their young insects (Stinson 2022; USFWS 2024; USFWS 2019).

Bird feeders, roadkill, the creation of forested edge, and poorly managed trash at future residential developments have the potential to increase the abundance of common urban-adapted species such as crows, ravens, gulls, rats, mice, raccoons, and coyotes as well as domesticated cats and dogs. These species are known to harass and kill other bird species such as marbled murrelet, snowy plover, and streaked horned lark. Crows and other members of the corvid family pose a particular threat to all three listed bird species as they are known to plunder nests, prey on fledglings, and harass and occasionally prey on adults (Stinson 2022; USFWS 2024; USFWS 2019).

As future development is largely in the conceptual phase, mitigation measures to offset effects to predator-prey relationships have not been developed. Potential management measures could include increased education regarding private trash management, community policies requiring wildlife-resistant trash receptacles and frequent trash pickup, and a prohibition on the feeding of wildlife.

Due to existing human land uses in the vicinity (e.g., SR-105, recreational beach use, private residences, and the Shoalwater Bay Casino), it is anticipated that potential urban-adapted predator species are present and established in the project vicinity. It is also anticipated that future residential development will result in an increase to the abundance of these species, especially crows, gulls, rats, and domesticated dogs and cats. An increase to predatory species in the vicinity of known and suitable habitat has the potential to result in the delayed consequence of increased mortality and decreased reproductive success of marbled murrelet, western snowy plover, and streaked horned lark.

4.2.2 Long-Term Habitat Alteration

As part of the purchase agreement with GDR Co, the SBIT has agreed to honor the habitat conservation covenant that is currently protecting the identified marbled murrelet habitat north of SR-105. While the proposed projects will not alter any of the identified marbled murrelet habitat present within the action area, the projects will eventually result in the long-term conversion of commercial timberland to residential development. This conversion will decrease forested areas and increase the amount of forest edge habitat in the area, thereby increasing the potential effects of invasive plant and animal species becoming established along the forest margins.

The proposed projects will not result in long-term critical habitat alteration because no development is proposed in or critically adjacent to suitable nesting habitat for marbled murrelet, western snowy plover, or streaked horned lark.

4.2.3 Human Activities and Changes in Land Use

If unaddressed, human activities and changes in land use are anticipated to result in potential adverse effects to marbled murrelet should they occupy identified suitable marbled murrelet nesting habitat in the action area. Aside from delayed consequences outlined in Section 4.2.1 above, increased vehicle traffic and formation of new informal walking trails by residents of the residential development have the potential to affect nesting marbled murrelets in the identified suitable marbled murrelet habitat, if present. Average vehicle noise is unlikely to significantly disturb and very unlikely to flush nesting murrelets, though an increased level of alertness may come at an increased energetic cost (Long and Ralph 1998; USFWS 2024). Significant disturbance from increased vehicle noise is only anticipated from exceptionally loud or sudden noises and is unlikely to be substantially different from the present effects of SR-105 traffic (Long and Ralph 1998).

Foot traffic near nesting marbled murrelets has also been observed to have potential adverse effects. In the terrestrial environment, adult murrelets have been observed to be aborting feeding attempts or flushing off the nest branch during attempted food deliveries when people on the ground were visible to

the birds, or occasionally when vehicles passed directly under a nest tree (Hamer, et al. 1998). Adult murrelets that are incubating an egg are not likely to flush from noise disturbance alone; the normal behavior of incubating adults is to rest and remain motionless during the day (Hébert and Golightly 2006). Noise disturbance can disrupt this normal behavior by causing the adults to remain vigilant and alert during a time when they are normally resting, which comes with energetic costs that could have negative consequences for nesting success (Hébert and Golightly 2006).

These energetic expenses could have significant impacts on murrelet fitness, especially during times of high energetic expenditure, such as breeding or winter survival, or at times of low prey abundance resulting from poor ocean conditions (Ronconi and Burger 2008; Agness et al. 2013). Murrelet energy expenditures are especially high when they must fly long distances to travel between nesting and foraging habitats (Hull et al. 2001; Lorenz et al. 2017), and an inability to meet the energetic demands of successful breeding reduces nesting success and ultimately reduces the population growth rate (Peery et al. 2004; Ronconi and Burger 2008). In periods of low prey availability, many murrelets are unable to meet the energetic demands of successful breeding (Peery et al. 2004; Ronconi and Burger 2008), and additional energy expenditure on disturbance responses can only increase the energy deficit birds experience in these conditions.

4.3 Effects to Listed Species and Critical Habitats

A summary of direct effects on listed species and designated critical habitats is provided in Table 8. Indirect effects will not occur associated with the projects and are not included.

Table 8. Direct Effects on Listed Species and Designated Critical Habitats

Species/Critical Habitat Physical and Biological Features (PBFs)		Direct Effects
Western Snowy Plover		Potential adverse effect. Anticipated construction noise on the south end of Eagle Hill Road will overlap known western snowy plover nesting habitat during the breeding season (mid-March to mid-September). Project noise is not anticipated to have a lasting effect on western snowy plover.
Western Snowy Plover Critical Habitat PBFs	PBF 1—Areas that are below heavily vegetated areas or developed areas and above the daily high tides.	No effect. The projects do not propose ground-disturbing activities in western snowy plover nesting habitat.
	PBF 2—Shoreline habitat areas for feeding, with no or very sparse vegetation, that are between the annual low tide or low-water flow and annual high tide or high-water flow, subject to inundation but not constantly under water, that support small invertebrates, such as crabs, worms, flies, beetles, spiders, sand hoppers, clams, and ostracods, which are essential food sources.	No effect. The projects do not propose ground-disturbing activities below the annual high tide line.

Species/Critical Habitat Physical and Biological Features (PBFs)		Direct Effects
	PBF 3—Surf- or water-deposited organic debris, such as seaweed (including kelp and eelgrass) or driftwood located on open substrates that supports and attracts small invertebrates described in PBF 2 of this entry for food, and provides cover or shelter from predators and weather, and assists in avoidance of detection (crypsis) for nests, chicks, and incubating adults.	No effect. The projects do not propose ground-disturbing activities in areas of surf- or water-deposited organic debris.
	PBF 4—Minimal disturbance from the presence of humans, pets, vehicles, or human-attracted predators, which provide relatively undisturbed areas for individual and population growth and for normal behavior.	Potential adverse effect. Noise generated by the projects has the potential to disturb nesting western snowy plover, which has the potential to result in reduced reproductivity and fledgling mortality.
Streaked Horned Lark		No effect. The closest point of proposed development is approximately 140 feet (ft) from the nearest suitable habitat. Areas within the nearest 100 ft are comprised of State Route (SR) 105, road shoulder, guard rail, and riprap armored shoreline at the high-water line.
Streaked Horned Lark Critical Habitat PBFs	PBF 1—Large (300-acre [120-hectare]), flat (0 to 5 percent slope) areas within a landscape context that provides visual access to open areas such as open water or fields	No effect. No 300-acre flat areas are present within 100 ft of the project areas.
	PBF 2—Areas smaller than described in PBF 1, but that provide visual access to open areas such as open water or fields.	No effect. The project area is approximately 75 ft from the nearest designated critical habitat, though suitable habitat is not present within 100 ft of the project areas. Areas within the nearest 100 ft are composed of SR-105, road shoulder, guard rail, and steep riprap armored shoreline at the high-water line. The nearest designated critical habitat area is approximately 50 acres in size and, due to shoreline erosion in the years since its designation, entirely below the high-water line.
Marbled Murrelet		Potential adverse effect. Anticipated construction noise will overlap suitable marbled murrelet nesting habitat during the breeding season (April 1 to September 23) during the construction of the northern portion of North Cove Beach Access Road and the central portion of Raise Loop Road. Project noise is not anticipated to cause a lasting effect on marbled murrelet.

5.0 CONCLUSIONS AND EFFECT DETERMINATIONS

The determination of effects for protected species discussed in this report is contingent upon implementation of the previously identified impact minimization measures and BMPs. The proposed actions may have potential impacts on multiple species. The recommended effect determinations for ESA-listed species and critical habitat addressed in this BA are summarized below in Table 9.

Table 9. Effects Determinations for ESA-Listed Species and Designated Critical Habitat

Species	Species Listing Status	Consulting Agency	Effects Determinations	
			Species	Critical Habitat
Marbled murrelet (<i>Brachyramphus marmoratus</i>)	Threatened	USFWS	NLAA	NE
Western snowy plover (<i>Charadrius nivosus nivosus</i>)	Threatened	USFWS	NLAA	NLAA
Streaked horned lark (<i>Eremophila alpestris strigata</i>)	Threatened	USFWS	NE	NE

Abbreviations and Acronyms:

NE = no effect

NLAA = not likely to adversely affect

USFWS = US Fish and Wildlife Service

5.1 Marbled Murrelet

Considering the information referenced in this report, the projects **may affect** marbled murrelet because of the following:

- Suitable marbled murrelet nesting habitat was identified within the terrestrial component of the action area.
- Anticipated project noise will occur within the 0.25-mile disturbance threshold.

The proposed projects are **not likely to adversely affect** marbled murrelet because of the following:

- Project noise will not occur within the 328-ft harassment threshold.
- Nesting marbled murrelet have not been observed in the action area.
- Activities located within 1 mile of suitable marbled murrelet nesting habitat, as identified by the project biologist, will develop and implement a trash-handling plan to ensure that food wastes and other items attractive to crows, jays, and other Corvidae will be disposed of in a manner that makes them unavailable to these species at any time.
- All equipment that may result in noise disturbance will be restricted during crepuscular hours LOPs within 0.25 miles of suitable murrelet nesting habitat (April 1 to September 23).

5.2 Marbled Murrelet Critical Habitat

The projects will have **no effect** on marbled murrelet critical habitat because of the following:

- Designated critical habitat for marbled murrelet is not present in the action area.

5.3 Western Snowy Plover

Considering the information referenced in this report, the projects **may affect** western snowy plovers because of the following:

- Suitable western snowy plover nesting habitat was identified within the terrestrial component of the action area.
- Anticipated project noise from the southern extent of the Eagle Hill Road project will occur within the 0.25-mile disturbance threshold.

The projects are **not likely to adversely affect** western snowy plovers because of the following:

- No physical disturbance to western snowy plover suitable habitat is proposed.
- Only approximately 10 percent of the total road length to be installed is within the 0.25-mile disturbance threshold.
- Activities located within 1 mile of suitable western snowy plover nesting habitat, as identified by the project biologist, will develop and implement a trash-handling plan to ensure that food wastes and other items attractive to crows, jays, and other Corvidae will be disposed of in a manner that makes them unavailable to these species at any time.

5.4 Western Snowy Plover Critical Habitat

The projects **may affect** western snowy plover critical habitat because of the following:

- Designated critical habitat western snowy plover nesting habitat was identified within the terrestrial component of the action area.
- Anticipated project noise from the southern extent of the Eagle Hill Road project will occur within the 0.25-mile disturbance threshold.

The projects are **not likely to adversely affect** western snowy plover critical habitat because of the following:

- No physical disturbance to western snowy plover critical habitat is proposed.
- Only approximately 11 percent of the total road length to be installed is within the 0.25-mile disturbance threshold.
- Activities located within 1 mile of western snowy plover critical habitat will develop and implement a trash-handling plan to ensure that food wastes and other items attractive to crows, jays, and other Corvidae will be disposed of in a manner that makes them unavailable to these species at any time.

5.5 Streaked Horned Lark

Considering the information referenced in this report, the projects will have **no effect** on streaked horned lark because of the following:

- At its closest point, suitable streaked horned lark nesting habitat was identified approximately 140 ft from the southern extent of the North Cove Beach Access Road project, which is outside the 100-ft disturbance threshold for typical construction projects (non-blasting).

5.6 Streaked Horned Lark Critical Habitat

The projects will have **no effect** on streaked horned lark critical habitat because of the following:

- The portion of designated critical habitat within the 100-ft disturbance threshold from the project areas is adjacent to SR-105 and composed of riprap-armored shoreline below the high tide line, which is not indicative of suitable streaked horned lark habitat.
- The nearest designated critical habitat is in an area of severe coastal erosion, and the mapped area no longer provides nesting habitat for streaked horned lark.

6.0 USE OF THIS REPORT

This report has been prepared for the exclusive use of Red Plain Engineering for specific application to the Eagle Hill, Raise Loop, and North Cove Beach Access Projects. No other party is entitled to rely on the information, conclusions, and recommendations included in this document without the express written consent of Landau Associates, Inc. (Landau). Further, the reuse of information, conclusions, and recommendations provided herein for extensions of the project or for any other project, without review and authorization by Landau, shall be at the user's sole risk. Landau warrants that within the limitations of scope, schedule, and budget, our services have been provided in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions as this project. Landau makes no other warranty, either express or implied.

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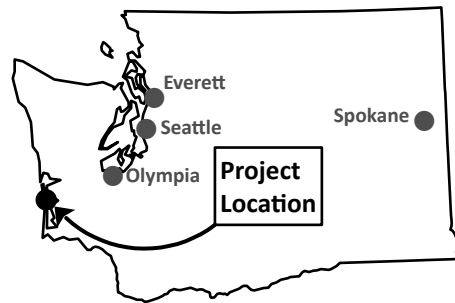
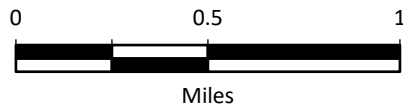
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Data Source: Esri.

Raise Loop and Eagle Hill Projects
Tokeland, Washington

Vicinity Map

Figure
1

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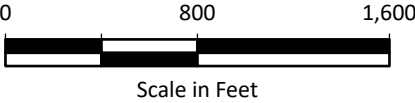


Legend

- Streams
- Wetlands
- Project Area

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.



Data Sources: WADNR; Google Earth Pro.

Raise Loop and Eagle Hill Projects
Tokeland, Washington

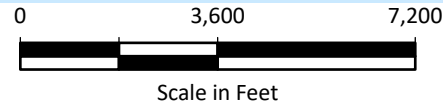
Wetland and Water Summary



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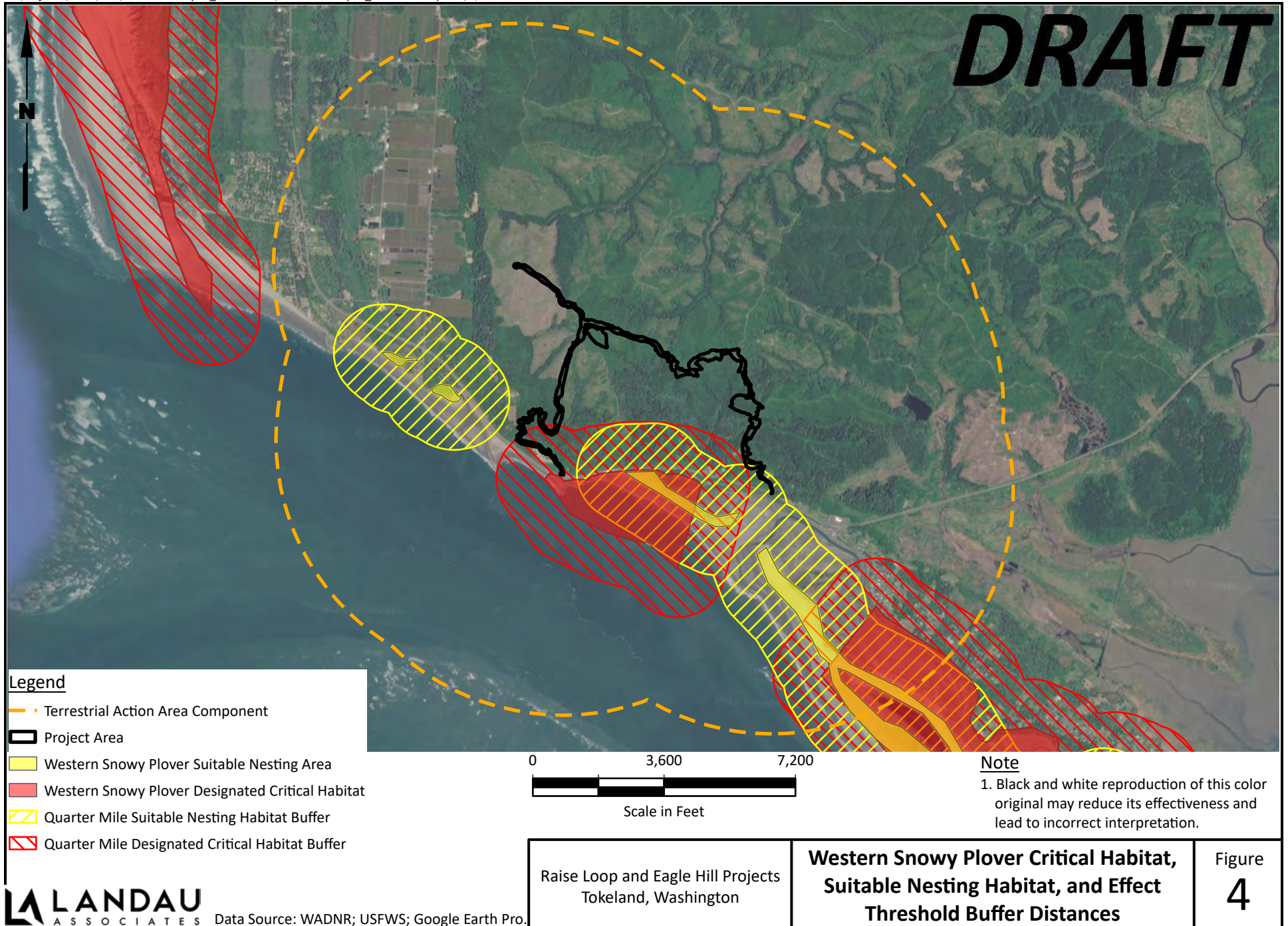
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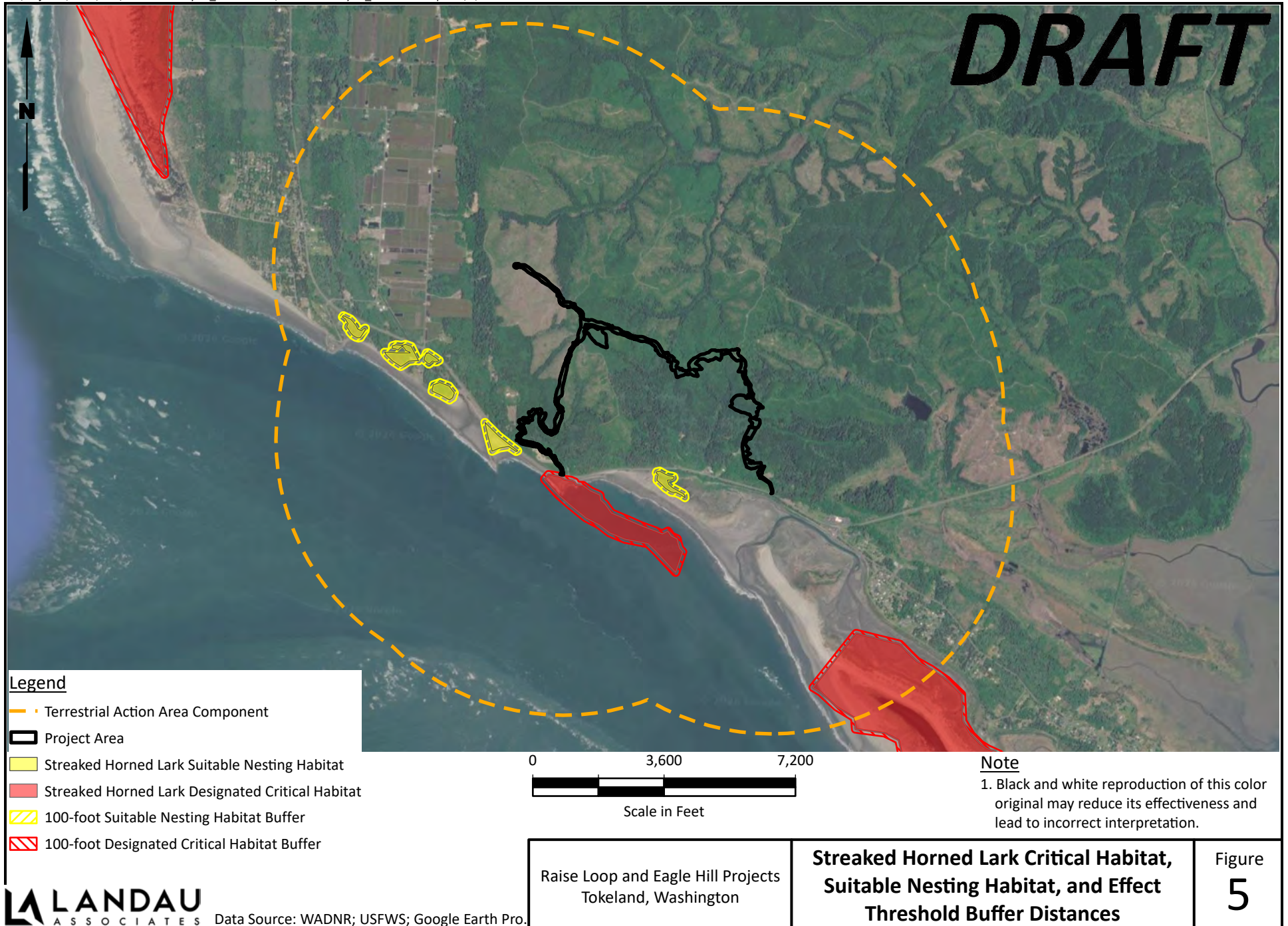
- Aquatic Component
- - - Terrestrial Component
- Project Area

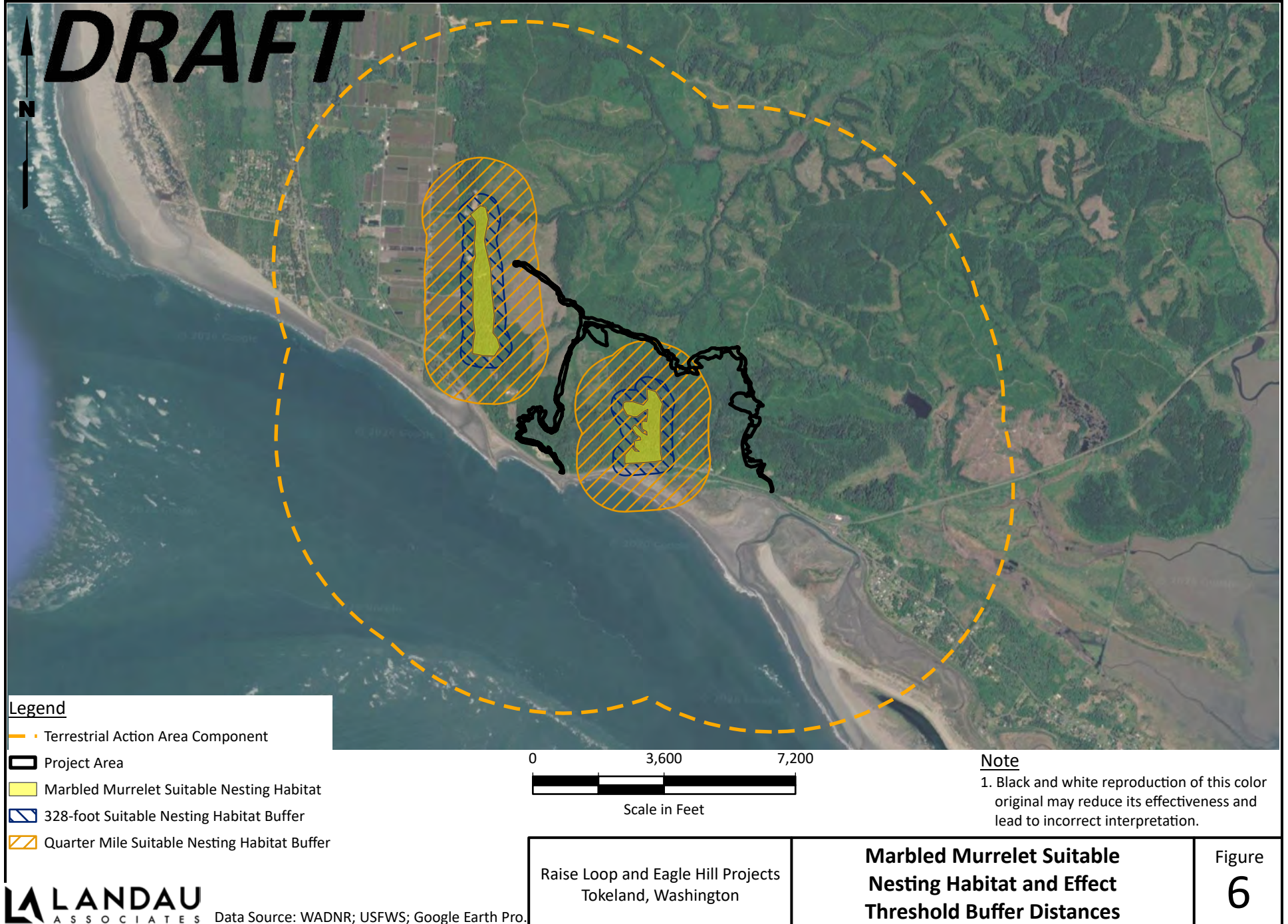


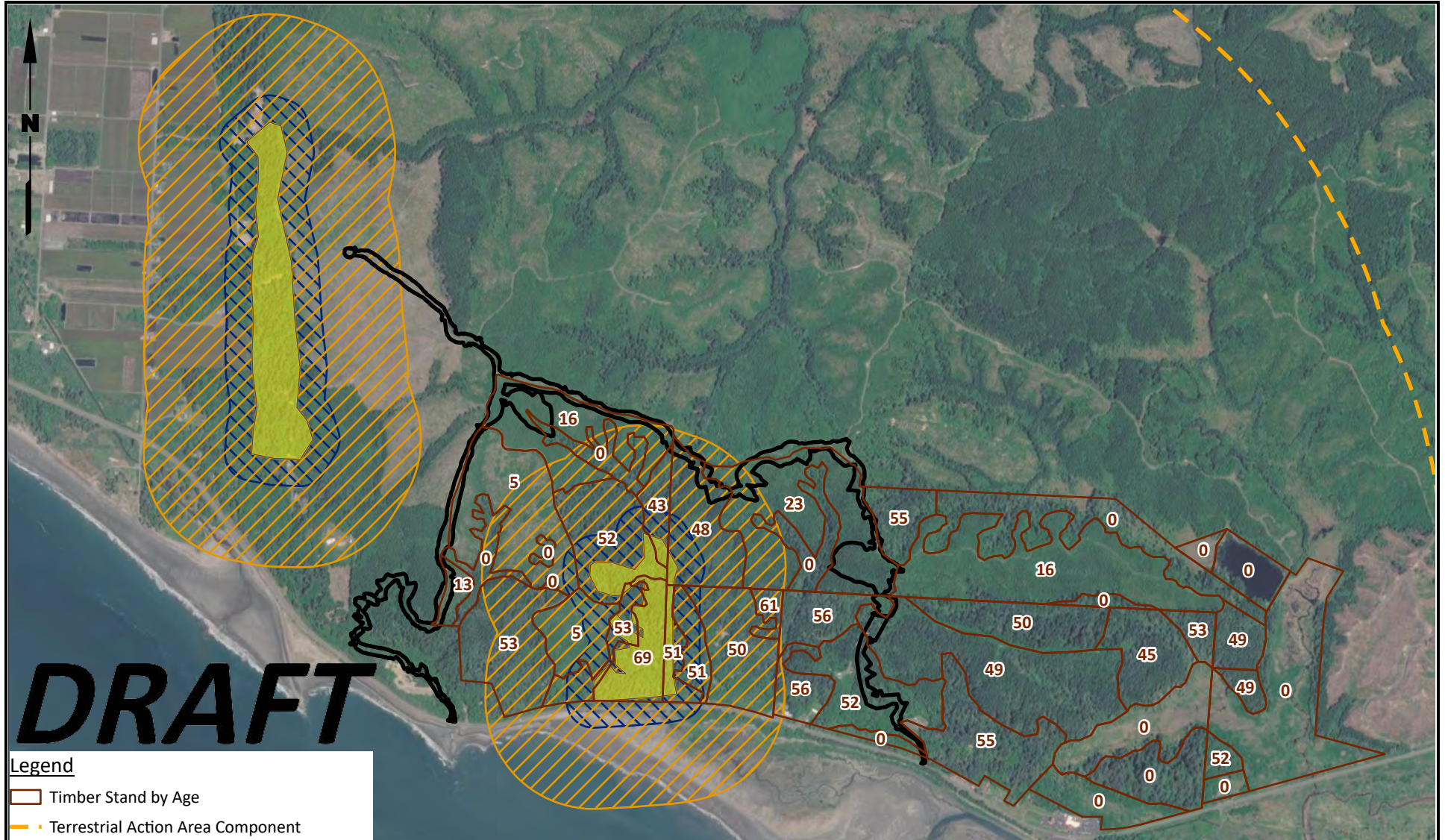
Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.









Legend

- Timber Stand by Age
- Terrestrial Action Area Component
- Project Area
- Marbled Murrelet Suitable Nesting Habitat
- 328-foot Suitable Nesting Habitat Buffer
- Quarter Mile Suitable Nesting Habitat Buffer

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Raise Loop and Eagle Hill Projects
Tokeland, Washington

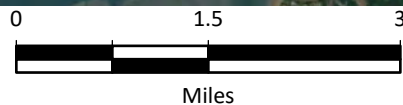
**Timber Age Adjacent to
Marbled Murrelet
Suitable Nesting Habitat**

Figure
7



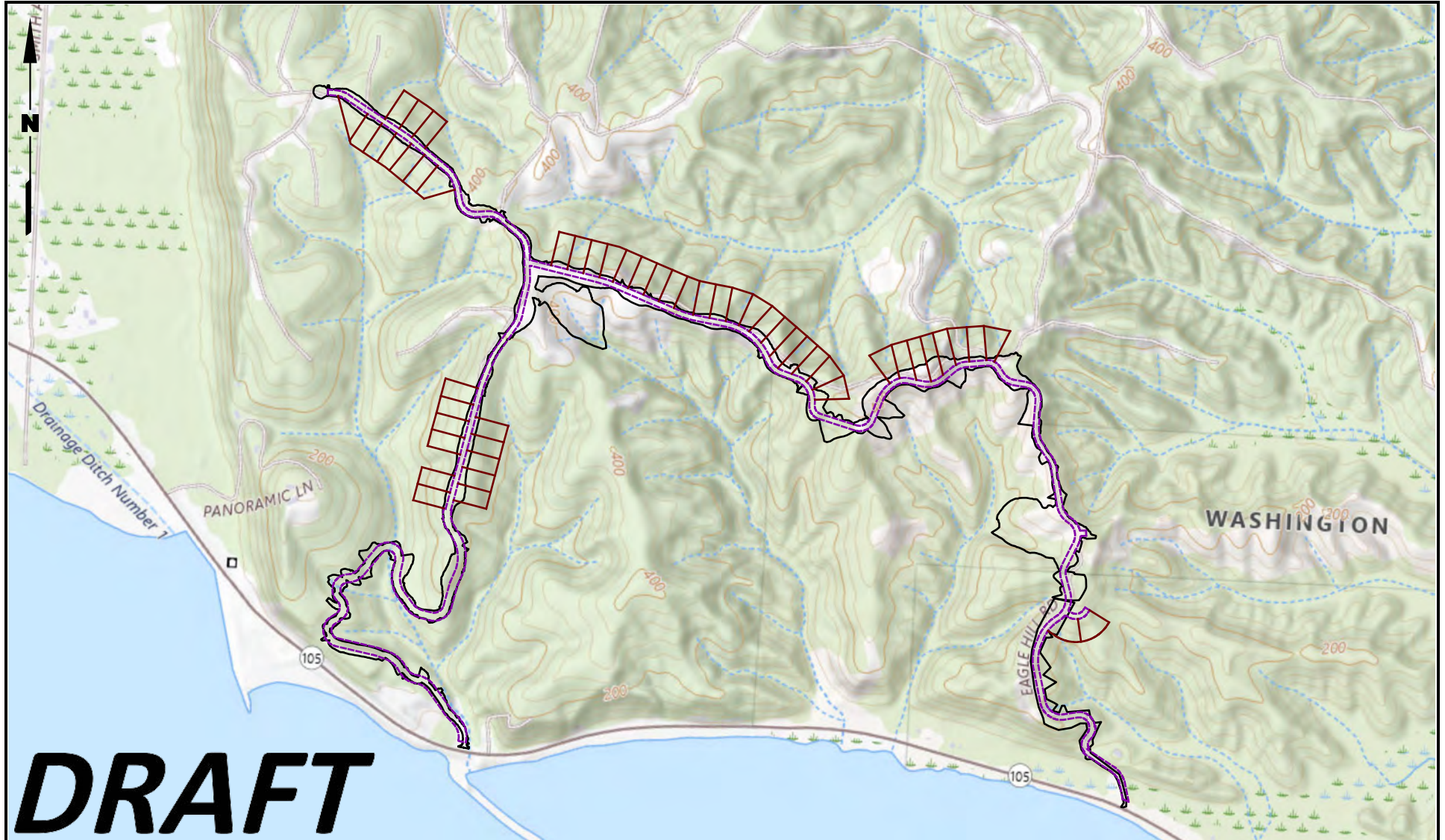
Legend

- Terrestrial Action Area Component
- Project Area
- Marbled Murrelet Designated Critical Habitat



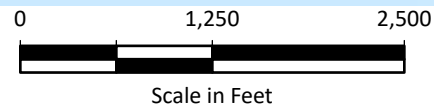
Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.



Legend

- Terrestrial Component
- Project Area
- Future Lots
- Right-of-Way



Note

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Essential Fish Habitat Assessment

APPENDIX A: ESSENTIAL FISH HABITAT ASSESSMENT

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), requires federal agencies to consult with National Oceanic and Atmospheric Administration (NOAA) Fisheries on activities that may adversely affect Essential Fish Habitat (EFH).

The objective of this EFH assessment is to determine whether the proposed action(s) “may adversely affect” designated EFH for relevant commercially and federally managed fisheries species within the proposed action area. It also describes conservation measures proposed to avoid, minimize, or otherwise offset potential adverse effects to designated EFH resulting from the proposed action. The NOAA Fisheries Essential Fish Habitat Mapper and Part 660 of Chapter VI Title 50 of the Code of Federal Regulations were reviewed to determine extents of EFH in the project action areas.

Identification of Essential Fish Habitat

The Pacific salmon fishery management unit includes Chinook salmon, coho salmon (*O. kisutch*), and pink salmon (*O. gorbuscha*). Pacific salmon fishery-designated EFH includes all streams, lakes, ponds, wetlands, and other waterbodies currently or historically accessible to salmon in Washington, except above select impassable dams (Pacific Fishery Management Council [PFMC] 2014). Estuarine and marine areas extend from the nearshore and tidal submerged environments within Washington territorial waters to the full extent of the exclusive economic zone. Hydrological Unit Code (HUC) 17100106 is listed EFH for Chinook (*Oncorhynchus tshawytscha*) and coho (*O. kisutch*) salmon (NOAA 2016).

Chinook and coho salmon utilize estuarine environments as out-migrating juveniles and returning adult spawners. Juvenile salmon enroute to ocean waters use the shallow subtidal areas of estuaries as nurseries to acclimate to the marine environment and to prepare for their ocean life stage. Coho salmon spawn in smaller tributaries, with juvenile salmon staying in their freshwater habitat up to 18 months before migrating to the ocean. A detailed life history for these salmon species can be found in Page and Burr (1991).

Groundfishes, which include 90-plus species managed by the Pacific Coast Groundfish Fishery Management Plan, live on or near the bottom of the ocean. This unit includes skates, sharks, rockfish, flatfish, grenadiers, ratfish, morids, and roundfish such as lingcod (*Ophiodon elongatus*), cabezon (*Scorpaenichthys marmoratus*), and Pacific cod (*Gadus macrocephalus*). EFH for Pacific Coast groundfish includes all waters and substrates within areas with a depth less than or equal to 3,500 meters shoreward to the mean higher high-water level or the upriver extent of saltwater intrusion (PFMC 2025). Groundfish EFH is not mapped in the aquatic component of the project action area.

Coastal pelagics are schooling species not associated with the ocean bottom; they migrate in coastal waters. Pelagics include market squid (*Loligo opalescens*), Pacific sardine (*Sardinops sagax caerulea*), Pacific chub (*Scomber japonicus*), northern anchovy (*Engraulis mordax*), and jack mackerel (*Trachurus symmetricus*). The EFH for groundfish and coastal pelagics is defined as those waters and substrate

necessary to ensure the production needed to support a long-term sustainable fishery. The extent of EFH for these species includes those waters from the nearshore and tidal submerged environment within Washington State territorial waters to the limits of the Exclusive Economic Zone (200 miles off the Pacific Coast; PPMC 2024). Coastal pelagic EFH is not mapped in the aquatic component of the project action area.

Description of the Proposed Action

The Shoalwater Bay Indian Tribe (SBIT) is proposing the construction of new roadways within the Shoalwater Bay Indian Reservation to support future housing developments for the SBIT community. Relocation is crucial for the continued existence of the SBIT on their ancestral homeland as the low-lying community is increasingly vulnerable to the effects of sea-level rise, stormwater surges, and potential tsunamis.

The SBIT proposes to improve and expand Eagle Hill Road, North Cove Beach Access Road, and Raise Loop Road to provide improved access to future residential development sites. The combined footprint of the projects will be approximately 57.58 acres and include approximately 3.66 miles of 24-foot (ft) wide roadway with a 5-ft sidewalk along one side of the road and vegetative filter strips on the downgradient side of the roadway compliant with Washington State Department of Ecology (Ecology) specifications. To facilitate future development and reduce unnecessary disturbance, the projects will further develop utility infrastructure to prepare for potential future developments. Utility infrastructure improvements will include electrical, water, telecommunications, stormwater, and sewer all installed subsurface.

Potential treated stormwater runoff from the project areas will discharge to vegetated upland slopes at 11 of the 12 outfall locations and to areas immediately upslope of Stream 6, an unnamed fish-bearing stream at the improved fish passage culvert location. The unnamed stream flows south for approximately 0.4 miles, paralleling the eastern edge of North Beach Access Road. At the intersection with Hwy 105 the stream enters a culvert beneath the road grade. Flow exits the culvert on the southern side of Hwy 105 entering Willapa Bay or spilling out onto the beach during low tide.

Potential Adverse Effects of the Proposed Action

Runoff from project Pollution-Generating Impervious Surface (PGIS) will undergo water quality treatment. The proposed treatment system is expected to provide a high amount, but not complete, removal of 6PPD-quinone particulates and other potential contaminant concentrations before stormwater is released to the areas directly upslope of the unnamed stream. As a result, treated stormwater from the project may contain residual concentrations of contaminants including 6PPD-quinone that may adversely impact water quality in the unnamed Creek.

Adverse Effects on Essential Fish Habitat for Pacific Salmon

Chinook and pink salmon presence are not mapped by the Washington Department of Fish & Wildlife (WDFW) or its partnering agencies in the aquatic portion of the action area. Direct effects on EFH are to water quality from project stormwater discharge associated with the amount of new PGIS. Runoff will

be controlled during construction by implementing the project-specific Temporary Erosion and Sediment Control (TESC) plan during construction and controlled by the completed project by conveyance through roadside vegetative filter strips. However, potential residual contamination in discharge has the potential to degrade water quality beyond the action area in Willapa Bay.

Coho salmon have the potential to occur within the unnamed tributary, but their presence has not been documented. The culvert at Hwy 105 is currently listed by the WDFW as 100 percent impassible to fish, which further decreases the likelihood that Coho salmon are utilizing the reaches of the stream within the project action area.

No Adverse Effects on Essential Fish Habitat for Ground Fishes

Projects of this type, with no direct discharge of stormwater to marine or large estuarine environments, will have no adverse effect for groundfish EFH.

No Adverse Effects on Essential Fish Habitat for Coastal Pelagics

Projects of this type, with no direct discharge of stormwater to marine or large estuarine environments, will have no adverse effect for coastal pelagic EFH.

Essential Fish Habitat Conservation Measures

Impact avoidance and minimization measures, including Best Management Practices, will be employed and are described in the Biological Assessment (BA).

Essential Fish Habitat Assessment Conclusions

The project will add new PGIS and water quality treatment of associated runoff, but residual contamination in treated runoff that discharges to the unnamed stream has the potential to affect EFH for Pacific salmon within the unnamed tributary. Potential effects to EFH would be reduced by the proposed stormwater treatment, which is expected to provide some removal of contaminants, including 6PPD-quinone before stormwater is discharged in close proximity to the unnamed stream. Furthermore, conservation measures discussed in the BA will prevent or reduce impacts to EFH from construction associated with the proposed project.

Therefore, the project will result in potential impairment of water quality in the unnamed stream, which may adversely affect Pacific salmon EFH and will have no adverse effect on groundfish EFH or coastal pelagic EFH.

* * * * *

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