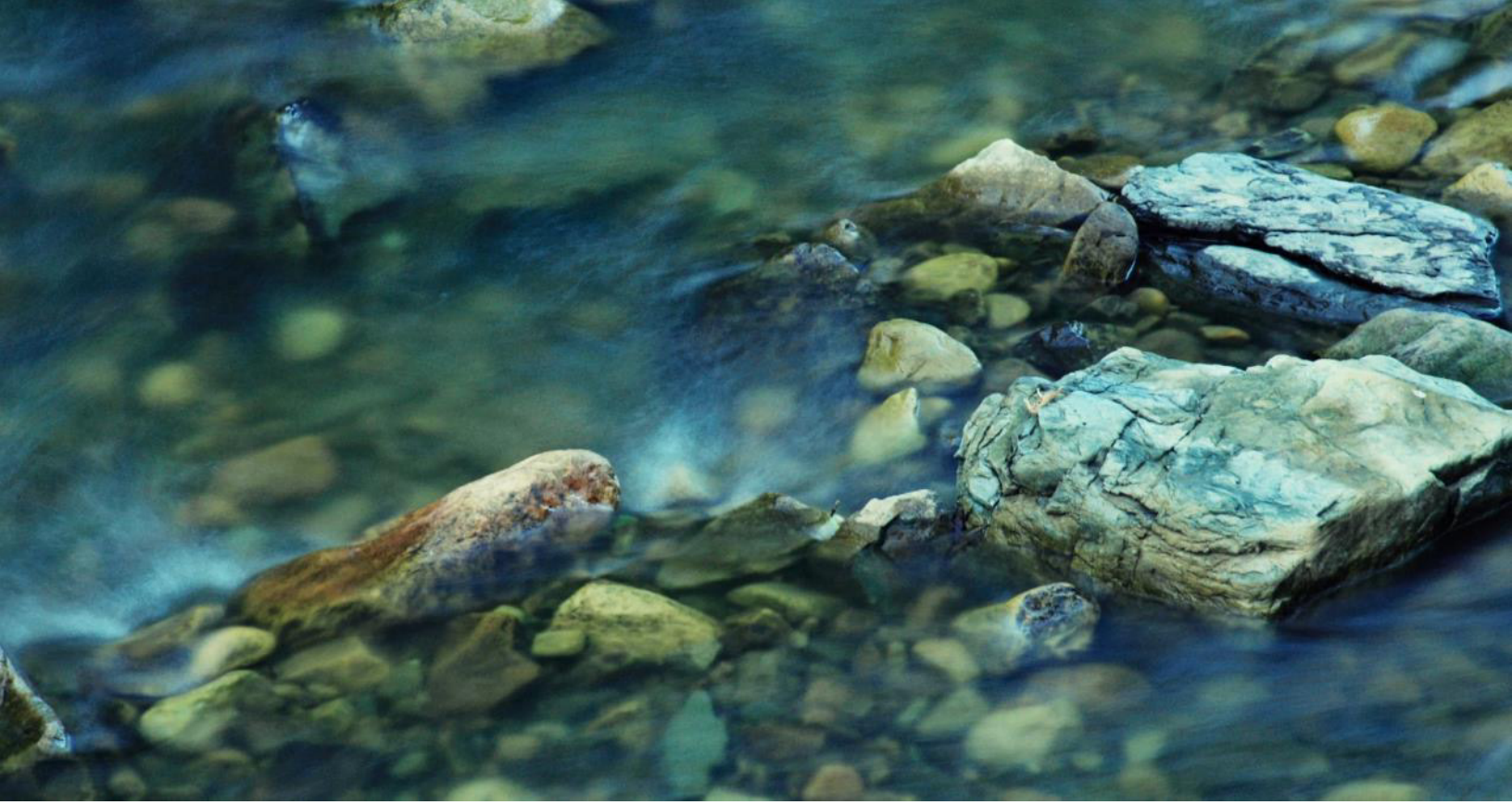
Attachment E
Biological Resources Technical Study



July 2023
Port of Grays Harbor Terminal 4 Expansion and Redevelopment Project

ANCHOR QEA

Biological Resources Technical Study

Prepared for Port of Grays Harbor and Ag Processing, Inc.

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Prepared for
Port of Grays Harbor
Ag Processing, Inc.

Prepared by
Anchor QEA, LLC

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ABBREVIATIONS

AGP	Ag Processing, Inc.
AGP Project	Ag Processing, Inc., Operations Expansion at Terminal 4
AMC	Aberdeen Municipal Code
BLM	Bureau of Land Management
BMP	best management practice
BS	Bureau of Land Management sensitive
CFR	*Code of Federal Regulations*
CWA	Clean Water Act
dB	decibel
Ecology	Washington Department of Ecology
EFH	Essential Fish Habitat
ESA	Endangered Species Act
FS	U.S. Forest Service sensitive
HMC	Hoquiam Municipal Code
HUC	hydrologic unit code
IPaC	Information for Planning and Consultation
MBTA	Migratory Bird Treaty Act
MLLW	mean lower low water
MSA	Magnuson-Stevens Fishery Conservation and Management Act
N/A	not applicable
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
PHS	Priority Habitats and Species
Port	Port of Grays Harbor
Port Project	Rail Upgrades and Site Improvements, Terminal 4A Cargo Yard Relocation and Expansion, and Terminal 4 Dock Fender and Stormwater Upgrades
Proposed Project	Port of Grays Harbor Terminal 4 Expansion and Redevelopment Project
PSAP	Puget Sound and Pacific Railroad
RCW	Revised Code of Washington
RMS	root mean square
RORO	roll-on/roll-off
SEPA	Washington State Environmental Policy Act
T4	Terminal 4
UR	under review
USC	*United States Code*
USFS	U.S. Forest Service

USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WAC	Washington Administrative Code
WGS84	World Geodetic System of 1984
WNHP	Washington National Heritage Program
WRIA	Water Resource Inventory Area
WSDOT	Washington State Department of Transportation

1 Introduction

The Port of Grays Harbor (Port) is proposing the Terminal 4 (T4) Expansion and Redevelopment Project to increase rail and shipping capacity at T4 at the Port located in the cities of Hoquiam and Aberdeen, Washington, to accommodate growth of dry bulk, breakbulk, and roll-on/roll-off (RORO) cargos (Figure 1). This includes the rail upgrades and site improvements (rail upgrades), the Terminal 4A cargo yard relocation and expansion, and the T4 dock fender and stormwater upgrades (Figure 2). These project elements would be constructed by the Port and are referred to as the Port Project. It also includes a new export terminal by Ag Processing, Inc. (AGP), at T4. This project element is referred to as the AGP Project. Together, the Port Project and AGP Project are referred to as the Proposed Project (Figure 3).

The purpose of this technical report is to describe the affected environment and potential impacts of the Proposed Project and its alternatives on biological resources, including terrestrial and aquatic species and habitats. This technical report focuses on biological resources regulated at the state and local level, including state-listed and priority species and habitats. Evaluation of federally listed species, their critical habitat, and Essential Fish Habitat (EFH) is provided in the *Biological Assessment* (Anchor QEA 2022). Wetland species and habitats are present in the study area but are discussed in this technical report primarily in terms of plant species and wildlife use. Details on wetland habitats and jurisdictional waters are addressed in the *Water Resources Technical Study* (Anchor QEA 2023a). Terrestrial species are defined as plants or wildlife that live on land. Examples of terrestrial plants include trees, shrubs, and herbs that are adapted to upland or riparian habitats. Examples of terrestrial wildlife include mammals, birds, reptiles, and insects. Aquatic species are defined as plants or wildlife that must live in water all or most of the time, including semiaquatic species such as amphibians and some mammals such as otters and beaver. Examples of aquatic plants include plants that grow partially or entirely submerged in marine or freshwater habitats. Examples of aquatic wildlife include fish, shellfish, frogs, and some mammals such as whales and porpoises. Wetlands are transitional zones between upland and aquatic areas and include habitats such as swamps, marshes, and bogs. Examples of wetland plants include those species that are adapted to grow in or on the water, or where soils are flooded or seasonally or permanently saturated. Wildlife species that use wetland habitats include a variety of terrestrial and semiaquatic wildlife.

This technical report, along with the Biological Assessment, will be used to support environmental review of the Proposed Project by the state and federal agencies with a funding, jurisdictional, or permitting authority over the Proposed Project. This includes compliance with the Washington State Environmental Policy Act (SEPA) and the National Environmental Policy Act (NEPA). This technical report will also be used as supporting documentation for permitting efforts.

1.1 Location and Regional Setting

Figure 1 shows the location and regional setting of the Port. The Port was founded in 1911 and is located on the Pacific coast of Washington state in the cities of Hoquiam and Aberdeen in Grays Harbor County. The Port is located near where the Chehalis River enters Grays Harbor, approximately 15 miles east from the Pacific Ocean. The Port is the westernmost port in Washington. The Pacific Ocean is accessed from the Port via the Grays Harbor deep-draft federal navigation channel within Grays Harbor. The Proposed Project does not include expansion or deepening of the Grays Harbor federal navigation channel. Rennie Island is just south of the Port and is within Grays Harbor. Bowerman Airport is approximately 4 miles west-northwest of the Port.

1.2 Project Area

The Project Area consists of the area where the proposed facilities would be located, called the On-Site Project Area, and the existing off-site transportation corridors, called the Off-Site Project Area. The On-Site Project Area includes the area that will be directly affected by construction and operation of the Proposed Project (Figure 2). The Off-Site Project Area includes off-site transportation corridors used for rail and vessel transportation. This includes the Puget Sound and Pacific Railroad (PSAP) line from the Port property to the connection with the BNSF Railway and Union Pacific Railroad mainline in Centralia, Washington, and the Chehalis River and Grays Harbor federal navigation channel from the Port property, through Grays Harbor, to the Pacific Ocean, up to 3 nautical miles offshore from the southern mouth of Grays Harbor. The Proposed Project will likely include rail construction on property owned by others (PSAP or other private owners) along the PSAP Rail Corridor east of West Heron Street. It has not been established whether that rail will be built and owned by the PSAP to serve the site, built and owned by the Port, or some other combination of ownership and leasing. Land ownership details will be finalized as the design process progresses. Specific study areas for the analysis of potential impacts of the Proposed Project is defined in Section 5.1 based on the potential for effects to terrestrial and aquatic species and habitat.

Figure 1
Project Vicinity and Study Area Map

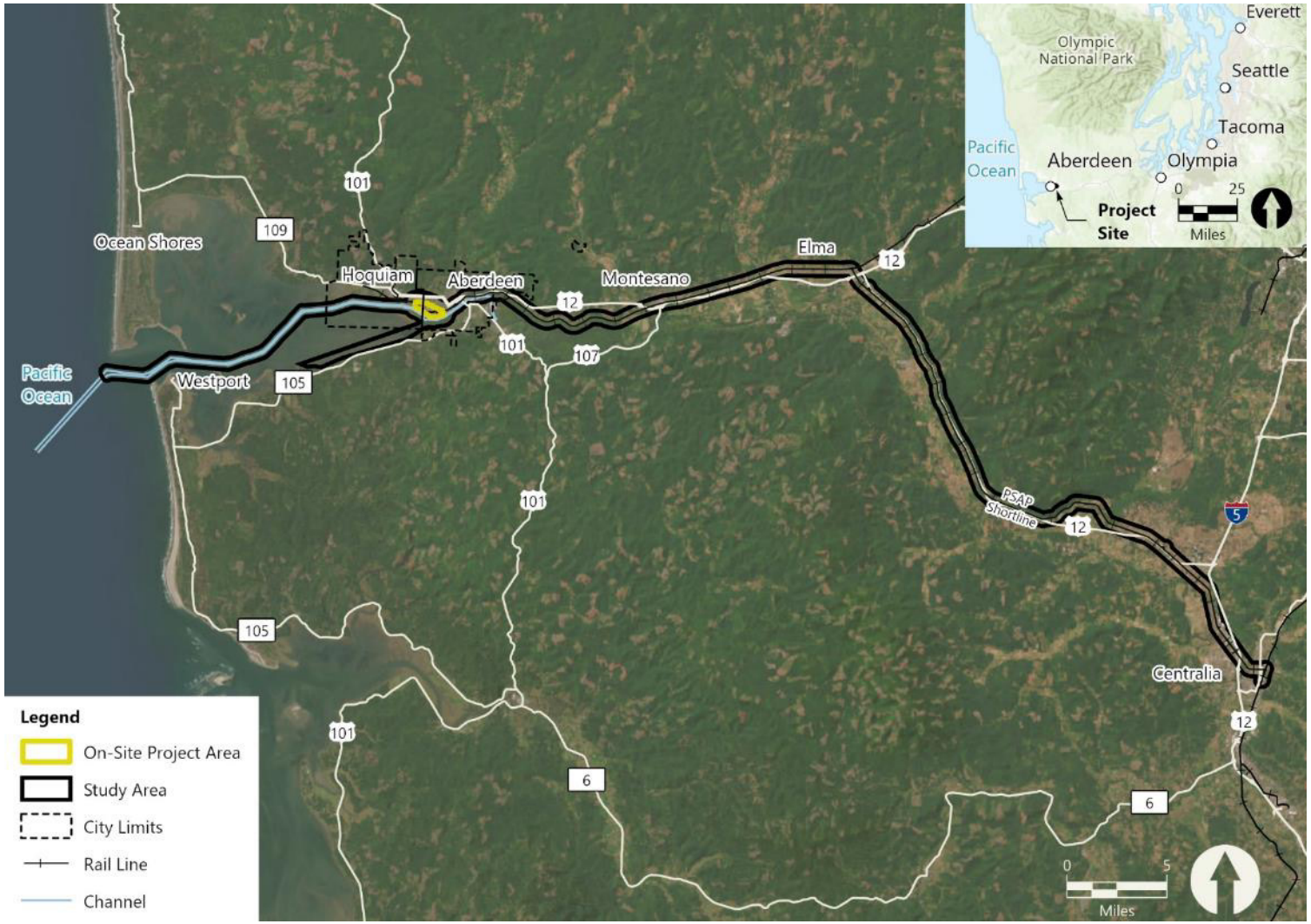


Figure 2
Existing Conditions Map

2 Proposed Project and Alternatives

Two alternatives are evaluated in this report: the Proposed Project and a No Action Alternative. Additional details about these alternatives are documented in the *Project Description Technical Report* (Anchor QEA 2023b). The alternatives include the following:

- **Alternative 1 (Proposed Project).** As noted in Section 1 and as further described in the *Project Description Technical Report*, the Proposed Project consists of the Port Project and the AGP Project (Anchor QEA 2023b; Figure 3). The Port Project includes the following: 1) rail upgrades and site improvements; 2) T4 dock, fender, and stormwater upgrades; and 3) cargo yard relocation and expansion. In addition to these proposed upgrades at T4, AGP, an existing tenant of the Port, intends to upgrade Terminal 4B to include improved rail receiving facilities, a new shiploader, and a soybean meal storage structure (referred to as a surge silo). The primary elements of the Proposed Project are shown in Figure 3 and could be constructed in phases.
- **No Action Alternative.** The No Action Alternative represents the conditions anticipated without construction and operation of the Proposed Project over the course of the construction analysis period of 2024 to 2025 and the operations analysis period from 2025 to 2045. Although the Port would not complete the proposed infrastructure enhancements or redevelop the T4 cargo yard under the No Action Alternative, it is anticipated that the Port would pursue growth opportunities within the existing Port footprint. It is also assumed that AGP would not complete the proposed infrastructure enhancements at Terminal 4B, but AGP would maximize its operations at the existing Terminal 2 facility. However, under the No Action Alternative, the Port would continue to operate and maintain T4 as it exists under existing conditions and would continue to seek out new business. It is also assumed that AGP would not complete the proposed infrastructure enhancements at Terminal 4B. Because activity under the No Action Alternative would be limited to current port infrastructure and terminal capacity limits, the No Action Alternative is anticipated to result in operations similar to existing conditions.

Figure 3
Project Elements Map

3 Regulatory Context

3.1 Regulations

Table 1 presents the regulations, statutes, and guidelines that apply to terrestrial and aquatic species and habitat.

Table 1
Regulations, Statutes, and Guidelines

Regulation, Statute, or Guideline	Description
Federal	
Clean Water Act (33 USC 1251 et seq.)	The CWA establishes the basic structure for the U.S. Environmental Protection Agency to regulate discharges of pollutants into the waters of the United States and regulates water quality standards for surface waters. Section 303(d) includes a requirement for states to identify and list waters where current water pollution control regulations and controls alone cannot meet the water quality standards set for those waters. Section 401 (water quality certification) requires Water Quality Certification from the state for activities requiring a federal permit or license to discharge pollutants into a water of the United States. Certification attests the state has reasonable assurance the proposed activity will meet state water quality standards. Section 402 (33 USC 1342) establishes the National Pollutant Discharge Elimination System program, under which certain discharges of pollutants into waters of the United States are regulated. Section 404 regulates the discharge of dredged or fill material into waters of the United States, including jurisdictional wetlands.
National Environmental Policy Act (42 USC 4321 et seq.)	NEPA establishes a national policy for the environment. It requires federal agencies to assess the environmental effects of proposed major federal actions prior to making decisions. Section 101 sets forth a national policy to use all practicable means in a manner that fosters and promotes the general welfare and to create and maintain conditions under which man and nature can exist in ways that fulfills social, economic, and other requirements. Section 102 establishes procedural requirements for major federal actions significantly affecting the quality of the human environment by requiring federal agencies to prepare a detailed statement on: 1) the environmental impact of the proposed action; 2) any adverse effects that cannot be avoided; 3) alternatives to the proposed action; 4) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity; and 5) any irreversible and irretrievable commitments of resources that would be involved in the proposed action. For this project NEPA compliance will occur through the CWA Section 404 process.
Endangered Species Act (16 USC 1531 to 1544)	Provides for the conservation of species listed as threatened or endangered and the habitats upon which they depend. Section 7

Regulation, Statute, or Guideline	Description
	of the ESA requires federal agencies to consult with USFWS and/or to ensure a federal action is not likely to jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of designated critical habitat.
Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996 (PL 104-267)	Requires fishery management councils to include descriptions of EFH and potential threats to EFH in all federal fishery management plans. Also requires federal agencies to consult with NMFS on activities that may adversely affect EFH. EFH is defined as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" and is designated for groundfish, Pacific salmon, and coastal pelagic composites. EFH includes coral reefs, kelp forests, bays, wetlands, rivers, and areas of the deep ocean that are necessary for fish reproduction, growth, feeding, and shelter (NOAA 2019). Federal standards and guidelines for anadromous salmonid passage facility design are described in NMFS 2011.
Fish and Wildlife Coordination Act (16 USC 661 to 667[e])	Protects fish and wildlife when federal actions result in the control or modification of a natural stream or body of water. The Fish and Wildlife Coordination Act provides the basic authority for the involvement of the USFWS in evaluating impacts to fish and wildlife from proposed water resource development projects, to take action to prevent loss or damage to these resources, and to provide for the development and improvement of these resources. The Fish and Wildlife Coordination Act requires that wildlife conservation be given equal consideration to other features of water resource development programs through planning, development, maintenance, and coordination of wildlife conservation and rehabilitation.
Marine Mammal Protection Act of 1972, Amended 1994 (16 USC 1361)	Prohibits activities that harass, hunt, capture, collect, or kill marine mammals, such as whales, dolphins, seals, and manatees. "Harass" means any act of pursuit, torment, or annoyance that has the potential to injure a marine mammal or marine mammal stock in the wild; or has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering. In order to pursue activities that may incidentally (unintentionally but not unexpectedly) harm marine mammals, private entities or government agencies must apply for a permit. The Marine Mammal Protection Act of 1972, amended 1994, also requires permit holders to monitor the damage they cause and implement mitigation measures. To engage in multiyear activities that may harass, injure or kill marine mammals, an entity must obtain a letter of authorization from NOAA.
Migratory Bird Treaty Act of 1918, as amended (16 USC 703 to 713)	Makes it illegal for anyone to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid permit issued pursuant to federal regulations. Under the regulatory authority of USFWS.

Regulation, Statute, or Guideline	Description
Bald and Golden Eagle Protection Act of 1940, as amended (16 USC 668 to 668c)	Prohibits the taking of bald and golden eagles, including their parts, nests, or eggs, without a permit issued by USFWS, and provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle [or any golden eagle], alive or dead, or any part, nest, or egg thereof."
Tribal	
Chehalis Tribal Code	The Chehalis Tribe retain sovereign rights that are guaranteed under treaties and federal laws. For activities on tribal lands, tribal laws may require critical area permits and approvals. Because the Chehalis Tribe is a non-treaty tribe, their fisheries are limited to the portion of the rivers on the reservation, and their harvest is a portion of the non-treaty allowable harvest. The Chehalis Tribe's portion of the non-treaty harvest is based on a sharing formula between the State of Washington and the Chehalis Tribe.
Quinault Indian Nation Tribal Code	The Quinault Indian Nation retains sovereign rights that are guaranteed under treaties and federal laws. For activities on tribal lands, tribal laws may require critical area permits and approvals. As a signatory of the Treaty of Olympia (1856), the Quinault Indian Nation has treaty-reserved rights that reserve the rights to "taking fish, at all usual and accustomed fishing grounds and stations" and the privilege of hunting and gathering, among other rights, in exchange for ceding lands over which it historically roamed freely (Sharp 2016). As a treaty tribe, the Quinault manage their fisheries and are responsible for regulating tribal fishers both on and off the reservation. The Quinault Indian Nation is a co-manager with WDFW for salmon, steelhead, white sturgeon, and Dungeness crab. The Chehalis River and all its tributaries empty into Grays Harbor and are within the Quinault Indian Nation's usual and accustomed fishing areas (Sharp 2016).
State	
Washington State Hydraulic Code (RCW 77.55; WAC 220-660)	Issued by WDFW for projects with elements that may affect the bed, bank, or flow of a water of the state or productive capacity of fish habitat. Considers effects on riparian and shoreline/bank vegetation in issuance and conditions of the permit, including for the installation of piers, docks, piling, and bank armoring and crossings of streams and rivers (including culverts).
Washington State Fishways, Flow, and Screening Code (RCW 77.57; WAC 220-660-190 through 220-660-250)	Establishes requirements for fishways in dams, diversion of water, fish guards on diversion devices, and water flow policy. Promotes removal of fish passage barriers, unimpeded passage of fish at all life stages, and maintenance of natural channel processes and function. Establishes design requirements for permanent and temporary fish passage improvement structures if barrier removal is infeasible. State standards and guidelines for anadromous passage facility design are described in WDFW 2013.
Washington State Water Pollution Control Act (RCW 90.48)	Grants Ecology the jurisdiction to control and prevent the pollution of streams, lakes, rivers, ponds, inland water, saltwaters, water courses, and other surface and groundwater in the state, including those that are not considered to be waters of the United

Regulation, Statute, or Guideline	Description
	States (i.e., non-jurisdictional) under Section 404 of the Clean Water Act.
Washington Department of Ecology Code (WAC 173)	**Chapter 201A:** Establishes water quality standards for surface waters, implementing RCW 90.48, Water Pollution Control Act. Freshwater designated uses and associated criteria are specifically identified in WAC 173-201A-200. **Chapter 204:** Establishes sediment management standards to reduce and ultimately eliminate adverse effects on biological resources and significant threats to human health from surface sediment contamination.
Ballast Water Management (RCW 77.120)	Regulates the discharge of ballast water from vessels operating in waters of the state to reduce the risk of introducing nonindigenous species. Authorizes discharges of ballast water into waters of the state only if there has been an open sea exchange or if the vessel has treated its ballast water to meet standards set by WDFW consistent with applicable state and federal laws.
Water Resources Act of 1971 (RCW 90.54)	Sets forth fundamental policies for the state to ensure that waters of the state are protected and fully utilized for the greatest benefit.
Washington State Growth Management Act (RCW 36.70A)	Defines a variety of critical areas, which are designated and regulated at the local level under city and county critical areas ordinances. These critical areas may include shorelines or portions of fish habitat.
Washington State Wildlife Action Plan Fish and Wildlife (RCW 77)	Plan to help guide implementation of policies and goals related to Washington state wildlife, fish, and wildlife and fish habitat as set forth by RCW 77, Fish and Wildlife.
Washington Department of Fish and Wildlife State Protected Species (WAC 220-610)	Provides lists of species classified as endangered and threatened in Washington state. Provides legislation that prohibits fishing for or possessing fish that are federally listed as threatened or endangered. Provides rules for the protection of bald eagles. Identifies and classifies native wildlife species. Defines the processes for listing, management, recovery, and delisting a species and the criteria for classifying wildlife as endangered, threatened, or sensitive.
Washington Department of Natural Resources Natural Heritage Program	The Natural Heritage Program has no direct regulatory authority and is advisory only. Conservation status assigned to species and habitats is used to support federal, state, and local land management policies and listing decisions.
Shoreline Management Act (RCW 90.58)	Regulates and manages the use, environmental protection, and public access of the state's shorelines. The Shoreline Management Act was passed by the Washington State Legislature in 1971 and adopted in 1972. Ecology is the agency responsible for enforcing the Shoreline Management Act.
Invasive/Non-Native Species (WAC 220-640)	Washington state legislation on invasive and non-native species applies to all non-native aquatic animal species except those in ballast water. This legislation requires the state to define standards for invasive risk levels and criteria for determining

Regulation, Statute, or Guideline	Description
	environmental impacts, list prohibited and regulated species, and require a permit for possession of listed species.
Rivers and Habitat Open Space Program (WAC 222-223)	The Rivers and Habitat Open Space Program allows Washington State Departments to acquire conservation easements on forest lands within unconfined channel migration zones and forest lands containing a critical habitat for threatened or endangered species.
Local	
Grays Harbor County Shoreline Permit and Shoreline Management Plan	The Grays Harbor County Shoreline Permit is issued in compliance with the Grays Harbor County Shoreline Management Plan and covers all work that occurs landward within 200 feet of the ordinary high water mark of waters of the state and the wetlands associated with these stream segments.
Grays Harbor County Critical Areas Protection Ordinance (Chapter 18.06)	Provides standards to identify and protect the value and function of critical areas while allowing for the reasonable use of private and public property.
Grays Harbor County Critical Areas Ordinance, Article VII(A), Wildlife Habitat (Grays Harbor County Code 18.06.590 to 18.06.650)	Provides development standards and requirements for projects that occur in critical wildlife habitat areas for special-status species, federally designated threatened and endangered species, WDFW PHS, state natural area preserves and natural resource conservation areas, and species and habitats designated as locally important such as critical saltwater habitats. Describes allowed uses within critical wildlife habitat areas and includes the reporting and mitigation requirements for proposed projects in such areas.
City of Hoquiam and City of Aberdeen Critical Areas Ordinance (HMC 11.06; AMC 14.100)	Sets forth the definitions and process for designating and protecting critical areas within the city limits of the cities of Hoquiam and Aberdeen.
City of Hoquiam and City of Aberdeen Shoreline Master Programs (HMC 11.05; AMC 14.50)	Manages and protects shoreline resources per the state's Shoreline Management Act of 1971.
City of Hoquiam and City of Aberdeen Flood Hazard Protection (HMC 11.16.140; AMC 15.55)	Describes standards and restrictions for construction and development in designated flood hazard areas in the city. Areas affected by the regulations are located within the designated floodplain.

3.2 Required Permits and Approvals

This section provides a list of anticipated permits and approvals specific to the protection of terrestrial and aquatic species and habitat. The permits and approvals listed in this section are generally associated with the impacts identified in Chapter 6. Relevant best management practices, development standards, or other actions that would be required by these regulations and/or permits are also provided.

3.2.1 Federal

Federal permits and consultations needed for terrestrial and aquatic species and habitat include the following:

- **Clean Water Act (CWA) Section 404 Permit (U.S. Army Corps of Engineers).** Construction of the project would result in a discharge of fill into wetlands and other waters. A DA authorization under CWA Section 404 would be required. NEPA compliance would occur through the granting of the CWA Section 404 present.
- **CWA Section 402 National Pollutant Discharge Elimination System, Construction Stormwater General Permit (Washington Department of Ecology [Ecology]).** Construction of the project would disturb 1 acre or more of land through clearing, grading, excavating, or stockpiling fill material. This action requires a Construction Stormwater General Permit. This permit requires the preparation of a Stormwater Pollution Prevention Plan and temporary erosion and sediment control plan to identify best management practices (BMPs) to reduce impacts from construction stormwater.
- **Marine Mammal Protection Act compliance (National Marine Fisheries Service [NMFS]/U.S. Fish and Wildlife Service [USFWS]).** If the project is likely to directly affect marine mammals, then an incidental take permit would be required as part of the project. NMFS is responsible for all dolphins, porpoises, whales, seals, and sea lions. USFWS is responsible for sea otter.
- **Endangered Species Act (ESA) Section 7 Consultation (NMFS/USFWS)**. Issuance of a Department of the Army Permit under Clean Water Act Section 404 is a federal action that would require interagency consultation with the NMFS/USFWS regarding aquatic species and their critical habitat under Section 7 of the ESA. Interagency consultation is performed to ensure that the project would not jeopardize the existence of any listed species or their critical habitat.
- **Magnuson-Stevens Fishery Conservation and Management Act (MSA) Consultation.** The MSA requires federal agencies to consult with NMFS to ensure that the project would not jeopardize or affect designated EFH for Pacific salmon, groundfish, or coastal pelagic composites. EFH includes waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.
- **Bald and Golden Eagle Protection Act compliance (USFWS).** The project is not likely to directly affect bald or golden eagle nesting sites; however, if this situation were to occur, then an incidental take permit would be required as part of the project. Direct take of birds is not likely.
- **Migratory Bird Treaty Act (MBTA) compliance (USFWS).** Compliance with the MBTA protects migratory bird species.

3.2.2 State

State of Washington permits would include the following:

- **CWA Section 401 Water Quality Certification (Ecology).** This certification would be required to ensure that the project would not violate state water quality standards.
- **Hydraulic Project Approval (Washington Department of Fish and Wildlife [WDFW]).** Construction of the project would occur in or near the Chehalis River, a water of the state, which requires a hydraulic project approval. This permit would specify conditions of construction, such as timing of in-water work and monitoring requirements.
- **Aquatic Use Authorization (Washington Department of Natural Resources [WDNR]).** Activities that occur in or on state-owned aquatic lands may require an Aquatic Use Authorization (e.g., Aquatic Lands Lease) from WDNR. Aquatic Use Authorizations are legal contracts, not permits. These contracts specify the terms and conditions of the use and allow certain property rights to the lessee in exchange for rent. However, the Proposed Project has been determined to be consistent with the existing Port Management Agreement that the Port is operating under. As such, a new Aquatic Use Authorization is not required for the Proposed Project.
- **Coastal Zone Management Act (Ecology).** Federal actions (e.g., issuance of a permit) that may affect any land use, water use, or natural resources in the coastal zone require a certification of consistency with the state Coastal Zone Management Plan, which is in place to protect, restore, and responsibly develop the state's marine shorelines in Puget Sound and Pacific Ocean coast. Grays Harbor County is a county within the coastal zone.
- **SEPA compliance.** SEPA compliance is required when state or local permits are needed for a project. The Port of Grays Harbor is the SEPA lead agency for this project.

3.2.3 Local

Local permits would include the following:

- **Shoreline Substantial Development and Shoreline Conditional Use Permits (City of Hoquiam and City of Aberdeen).** The project would involve new development in the shoreline of Grays Harbor under the jurisdiction of the cities of Hoquiam and Aberdeen that is regulated by the Washington State Shoreline Management Act and the Shoreline Master Programs of Hoquiam and Aberdeen.
- **Land Use Permit (City of Hoquiam and City of Aberdeen).** These permits are required for land development actions or changes in land use in the cities of Hoquiam and Aberdeen. Proposed uses are expected to be consistent with permitted land uses. The project would require compliance with the City of Hoquiam's and the City of Aberdeen's critical areas ordinance.
- **Fill and Grade Permit (City of Hoquiam and City of Aberdeen).** This permit is required for construction projects that require movement of earth in the shoreline designations of

Hoquiam and Aberdeen. These permits require consideration of erosion and sedimentation to surface waters in the vicinity of the project.

- **Earthmoving Permit (City of Hoquiam and City of Aberdeen).** This permit is required for construction projects that include movement of earth or clearing in the cities of Hoquiam and Aberdeen. The permit requires consideration of erosion and sedimentation to surface waters in the vicinity of the project.
- **Flood Permit (City of Hoquiam and City of Aberdeen).** The cities of Hoquiam and Aberdeen requires this permit for development within the 100-year floodplain.

4 Information Sources

The following information sources were used to describe existing conditions and expected future conditions within the Project Area to support the impact analysis:

- *Draft Wetland and Stream Delineation Report, Port of Grays Harbor – Terminal 4 Rail Upgrade and Site Improvements* (HDR 2022)
- *Chehalis Basin Strategy Final Programmatic Environmental Impact Statement* (Ecology 2017)
- USFWS Grays Harbor National Wildlife Refuge Species webpage (USFWS 2023a)
- USFWS Information for Planning and Consultation (IPaC; USFWS 2023b)
- U.S. Geological Survey (USGS) National Hydrography Dataset (USGS 2022)
- WDFW Priority Habitats and Species (PHS) List (WDFW 2008), online PHS mapper (WDFW 2022a)
- WDFW Species in Washington information (WDFW 2023a)
- WDFW Project Area PHS Data (Guggenmos 2023)
- Washington State Endangered, Threatened, Sensitive, and Candidate Species List (WDFW 2022b)
- WDNR NatureServe/Landfire Habitat Types (WDNR 2019)
- WDNR Ecological Systems of Washington State Guide to Identification (WDFW 2015)
- WDNR Natural Heritage Program 2021 WA Vascular Plant Species of Conservation Concern List (WDNR 2021)
- Ecology Coastal Atlas Map (Ecology 2022)
- Species- and habitat-specific scientific journal articles (e.g., Hastings and Popper 2005; Hatfield et al. 2015; Liang et al. 2020; Nedeau et al. 2009; Rasmussen 2013)
- Other technical reports and assessments supporting the Proposed Project:
  - *Project Description Technical Report* (Anchor QEA 2023b)
  - *Water Resources Technical Study* (Anchor QEA 2023a)
  - *Air Quality and Greenhouse Gas Emissions Technical Study* (Anchor QEA 2023c)
  - *Biological Assessment* (Anchor QEA 2022)
  - *Noise and Vibration Technical Study* (HDR 2023)
  - *Hazardous Materials and Waste Management Technical Study* (Moffatt & Nichol 2023)

5 Affected Environment

This section describes biological resources with the potential to be affected by the alternatives. Resources include those regulated as critical areas by the cities of Hoquiam and Aberdeen. This includes fish and wildlife conservation areas, which are described in Section 5.3 and evaluated in Section 6.4. This report focuses on state biological resources, including state-listed and priority species and habitats. Evaluation of federally listed species, their critical habitat, and EFH is provided in the *Biological Assessment* (Anchor QEA 2022).

5.1 Study Area

The study area includes the Project Area, as described in Section 1.2, and both terrestrial and aquatic areas that may experience environmental effects as a result of project construction and operations (Figure 1).

Based on the types of activities proposed, it was determined that the terrestrial component of the study area encompasses the geographic limits associated with each of the following effects: direct ground disturbance, in-air noise, visual disturbances, truck traffic generated by project construction, and rail traffic related to operations. This area includes a 0.5-mile radius around the Project Area and offset along the PSAP short line railroad for rail traffic transiting to and from the Project Area.

The aquatic component of the study area includes the geographic extents associated with each of the following effects: stormwater, in-water turbidity, in-air noise, underwater noise, visual disturbances, and vessel traffic generated by project construction and operations. This area includes the furthest extent underwater noise is estimated to travel during construction and a 0.25-mile offset along the Grays Harbor federal navigation channel for vessels transiting to and from the Port property, through Grays Harbor, to the Pacific Ocean and up to 3 nautical miles offshore from the southern mouth of Grays Harbor.

5.2 Background

This section describes existing conditions present in the study area and includes general information on the context of each component of the study area specific to terrestrial and aquatic habitats and species.

The majority of the study area (Figure 4) is situated in the Coastal Lowlands, Coastal Uplands, Outwash, and Willapa Hills subregions of the Coast Range ecoregion (Pater et al. 1998). These subregions are characterized by habitats such as estuarine marshes, freshwater lakes and streams, coniferous forests, and industrial timberlands, which have almost completely replaced historic forests. Portions of the study area associated with the PSAP short line railroad also extend into the Southern Puget Prairies, Cowlitz/Chehalis Foothills, and Cowlitz/Newaukum Prairie Floodplains

subregions of the Puget Lowland ecoregion (Pater et al. 1998). These subregions are characterized by habitats such as coniferous forests, prairies, oak woodlands, cropland, and pastureland. Extensive agricultural land use and urban land use also occur within these subregion floodplains.

The study area includes portions of Grays Harbor, an estuarine bay located on the southwest coast of Washington, approximately 45 miles north of the mouth of the Columbia River and approximately 110 miles south of the Strait of San Juan de Fuca. The harbor is approximately 15 miles long and 13 miles wide. The mouth of Grays Harbor is partially separated from the Pacific Ocean by two peninsulas approximately 2 miles apart. Grays Harbor receives flow from six rivers (Chehalis, Elk, Hoquiam, Humptulips, Johns, and Wishkah), and many smaller freshwater creeks and tributaries. The Chehalis River enters Grays Harbor at its eastern end near Aberdeen, Washington. Hydrologically, the study area extends across four basins of the Lower and Upper Chehalis Watersheds, also known as Water Resource Inventory Areas (WRIAs) 22 and 23 (Ecology 2017), including the Grays Harbor (hydrologic unit code 8 [HUC8] 17100105), Willapa Bay (HUC8 17100106), Lower Chehalis (HUC8 17100104), and Upper Chehalis (HUC8 17100103) basins (USGS 2022).

The Chehalis River enters Grays Harbor at its eastern end near Aberdeen, Washington and is the largest river flowing onto the bay, providing more than 80% of freshwater contributed to the bay. The Chehalis River basin (upper and lower) is rain dominated, has no glacial source of water, and drains approximately 2,660 square miles including portions of Lewis and Thurston Counties; limited areas of Pacific, Cowlitz, Mason, Wahkiakum, and Jefferson Counties; and most of Grays Harbor County (Winkowski and Zimmerman 2019). The 10-year average high tide for NOAA tide gage 9441187 in Aberdeen, Washington, and the anticipated high tide line for the Project Area is 12.22 feet mean lower low water (MLLW; Moffatt & Nichol 2023).

Within a 0.5-mile radius of the Project Area, elevation is generally flat in the surrounding lowlands but rises quickly to over 500 feet World Geodetic System of 1984 (WGS84) in the adjacent hills to the north and south of the study area. The study area also includes portions of the cities of Hoquiam and Aberdeen, Washington, which experience a predominantly mild, marine-type climate. Summers are cool and comparatively dry, with average monthly temperatures between 58°F and 62°F and rainfall between 1 and 2 inches (NWS 2022; WRCC 2022). Winters are mild, wet, and cloudy, with average monthly temperatures between 42°F and 44°F and rainfall between 8 and 14 inches (NWS 2022; WRCC 2022).

The PSAP short line railroad portion of the study area remains primarily within the Chehalis River floodplain passing through the cities of Montesano, Satsop, Elma, Oakville, and Rochester, Washington, and just north of the Chehalis Tribe reservation. Between Aberdeen and Centralia, Washington elevation along the study area rail corridor increases from 23 feet to 187 feet. The climate near Centralia is somewhat drier than conditions near the coast, with warmer summer and colder winter temperatures.

5.3 Habitats and Vegetation Communities

This section describes terrestrial and aquatic habitats in the study area that have the potential to be affected by the project, including special status habitats (i.e., WDFW priority habitats). Wetland habitats are also present in the study area but are discussed in this technical report primarily in terms of species use. Wetland habitats are addressed in more detail in the *Water Resources Technical Study* (Anchor QEA 2023a). An overview of study area habitats is shown in Figure 4, while detailed habitats are shown in Appendix A, Figures A-1A to A-1R.

5.3.1 Terrestrial Habitats

Terrestrial habitats in the study area are characterized by a mix of conifer and hardwood forests and woodlands, shrublands, grasslands and forblands, timberland, pasture and agriculture lands, and developed lands and associated managed landscapes (WDNR 2019). Many of these habitats are associated with the riparian zones of Grays Harbor and the Chehalis, Hoquiam, and Wishkah rivers. As discussed in the *Water Resources Technical Study* (Anchor QEA 2023a), the study area also contains estuarine and marine wetland habitats, freshwater forested, scrub-shrub, and emergent wetland habitats, freshwater pond habitat, riverine wetland habitat, and various types of stream habitats.

WDNR Ecological Systems of Washington mapped vegetation types (WDNR 2019) and their approximate acreages in the study area are described in Table 2 and summarized in Figure 4 and Figures A-1A to A-1R. Approximately 5,214 acres are characterized by native North Pacific forests and shrublands including Lowland Riparian Forest and Shrubland, Hypermaritime Sitka Spruce Forest, Maritime Mesic-Wet Douglas-fir-Western Hemlock Forest, North Pacific Broadleaf Landslide Forest and Shrubland, North Pacific Maritime Dry-Mesic Douglas-fir-Western Hemlock Forest, and Hypermaritime Western Red-cedar-Western Hemlock Forest. Other non-wetland native habitat types include 9.6 acres of North Pacific Maritime Coastal Sand Dune and Strand and 154.6 acres of North Pacific Oak Woodland. Oak Woodland is considered a Washington State Priority Habitat and is discussed in Section 5.3.3.

WDNR Ecological Systems of Washington (WDNR 2019) also maps several native North Pacific and Temperate Pacific wetland habitats in the study area (Table 2). Approximately 3,558.3 acres are mapped as Freshwater Emergent Marsh, Intertidal Freshwater Wetland, Tidal Salt and Brackish Marsh, Shrub Swamp, and Hardwood-Conifer Swamp habitats.

Terrestrial habitat in and adjacent to the Project Area and PSAP Rail Corridor parts of the study area are mapped as developed land. This includes 5,411.5 acres of residential and commercial development and open areas that are managed or landscaped, such as parks and golf courses. Another approximately 10,466.8 acres of the terrestrial study area is mapped as agricultural land, including pasture and hay fields, cultivated cropland, or harvested working forest lands.

Despite the higher density residential and commercial land use, parks, yards, garden, brownfields (unused former industrial areas), agricultural lands, and other open areas provide patch-like habitat for species. Interspersion of habitat patches may attract more mobile terrestrial wildlife species, such as small mammals, birds, reptiles, and a variety of invertebrates. Agricultural crop and pasture lands in lower Chehalis River valley are used as overwintering habitat by waterfowl bird species. These waterfowl concentration areas are considered Washington State Priority Habitat and described in more detail in Section 5.3.3.

Table 2
Terrestrial Habitat Types in the Study Area

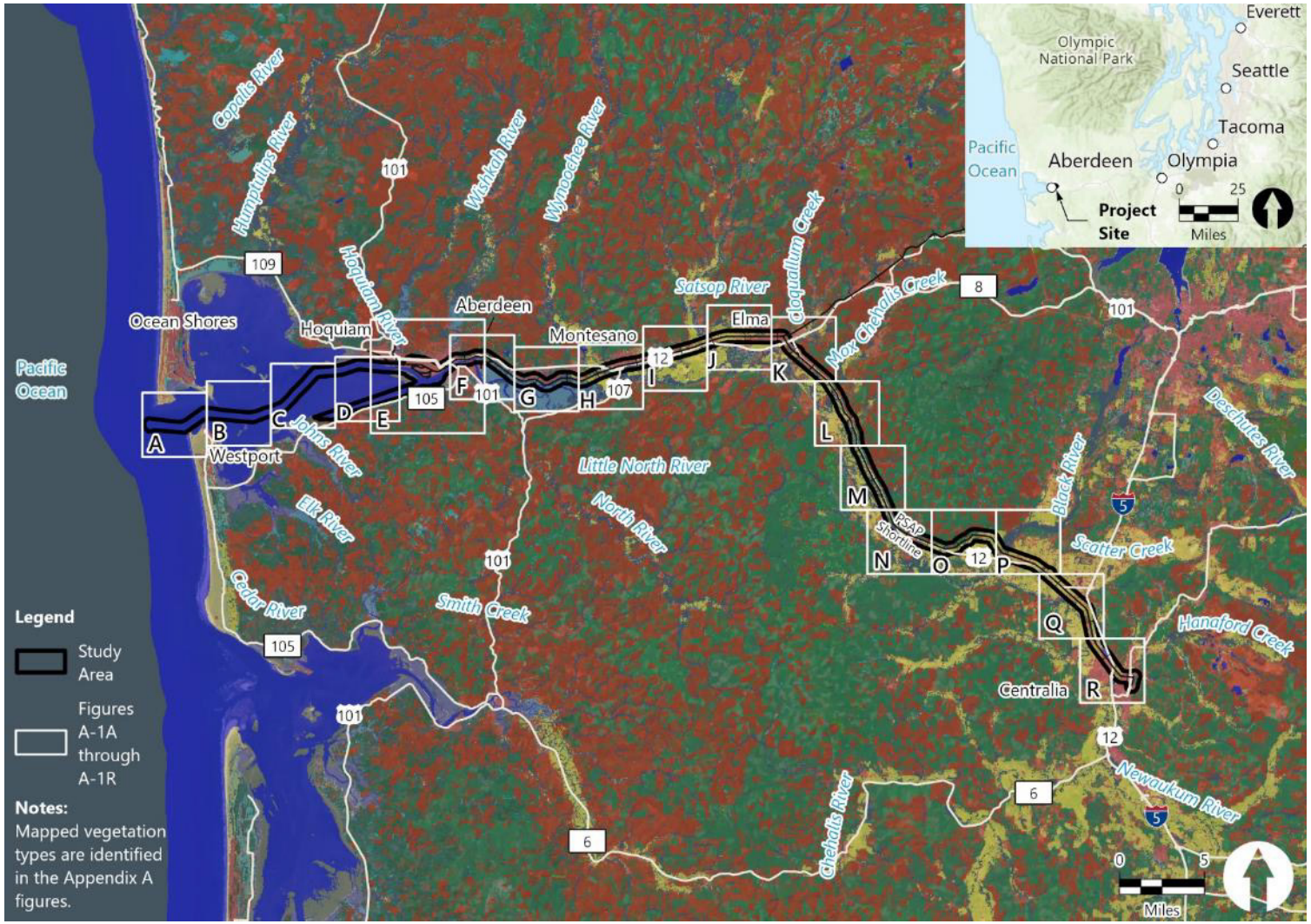
Location in Study Area[1]	Habitat Type[2]	Approximate Area (acreage)
Project Area	Developed, High Intensity	266.0
	Developed, Low Intensity	846.2
	Harvested forest-grass regeneration	24.9
	Harvested forest-shrub regeneration	7.8
	Harvested forest-tree regeneration	19.8
	North Pacific Lowland Riparian Forest and Shrubland	6.4
	North Pacific Shrub Swamp	13.1
	Temperate Pacific Freshwater Emergent Marsh	0.9
	Temperate Pacific Tidal Salt and Brackish Marsh[3]	146.1
Underwater Noise	North Pacific Shrub Swamp	0.7
	Temperate Pacific Freshwater Emergent Marsh	0.4
	Temperate Pacific Tidal Salt and Brackish Marsh[3]	86.3
Vessel Traffic Area	North Pacific Maritime Coastal Sand Dune and Strand	9.6
	North Pacific Shrub Swamp	9.1
	Temperate Pacific Tidal Salt and Brackish Marsh[3]	145.4
PSAP Rail Corridor	Developed, Open Space	114.3
	Developed, Low Intensity	3,577.4
	Developed, High Intensity	607.6
	Pasture/Hay	5,687.1
	Cultivated Cropland	1,160.9
	North Pacific Oak Woodland	154.6
	North Pacific Hypermaritime Sitka Spruce Forest	125.2
	North Pacific Maritime Dry-Mesic Douglas-fir-Western Hemlock Forest	361.8
	North Pacific Maritime Mesic-Wet Douglas-fir-Western Hemlock Forest	1,657.3
	North Pacific Hypermaritime Western Red-cedar-Western Hemlock Forest	106.7
	North Pacific Broadleaf Landslide Forest and Shrubland	19.6
	Harvested forest-tree regeneration	493.7

Location in Study Area[1]	Habitat Type[2]	Approximate Area (acreage)
	Harvested forest-shrub regeneration	1,038.4
	Harvested forest-grass regeneration	2,014.2
	North Pacific Lowland Riparian Forest and Shrubland	2,937.8
	North Pacific Shrub Swamp	301.6
	North Pacific Hardwood-Conifer Swamp	69.4
	North Pacific Intertidal Freshwater Wetland	1,258.3
	Temperate Pacific Freshwater Emergent Marsh	1,516.5
	Temperate Pacific Tidal Salt and Brackish Marsh	10.5

Notes:

1. Locations include their corresponding offsets as described in Section 5.1.
2. Habitat type and amount present in the study area are determined from the WDNR Ecological Systems of Washington GIS data layer (WDNR 2019). Presence is referred to as potential as no field surveys have been performed to confirm mapped designations.
3. Some terrestrial habitat in the Underwater Noise portion of the study overlaps with terrestrial habitat in the Project Area portion of the study area. This consists of 10.23 acres of temperate pacific tidal salt and brackish marsh.

Figure 4
Overview of Mapped Vegetation Types in the Study Area Map



5.3.2 Aquatic Habitats

Aquatic habitats in the study area are dominated by zones of open water, unconsolidated shorelines, aquatic beds, and mudflats (Figure 4 and Appendix A, Figures A-1A to A-1R). For this resource report, aquatic habitats are defined as those where water, rather than air, is the principal medium within which the dominant organisms live (WDFW 2008). Aquatic habitat types that occur in the study area are shown in Table 3 and include the following:

- Areas that are permanently flooded and lying below the deepwater boundary of wetlands. This boundary is approximately 2.5 meters (8.2 feet) below low water because most emergent, or rooted, vegetation cannot grow below this depth (FGDC 2013).
- The entirety of mapped habitats with true aquatic vegetation, such as eelgrass beds, that are periodically or permanently submerged.

Grays Harbor is an estuary, a transition zone between river environments and marine environments. The vast majority (8,010.2 acres) of aquatic habitat in the study area consists of open, deepwater areas of the federal navigation channel and offset areas in Grays Harbor and the lower Chehalis River. The federal navigation channel is maintained at between 350 feet and 1,000 feet wide and dredged to between 32 feet and 38 feet in depth. The *Project Description Technical Report* provides additional information on existing vessel operations and volume (Anchor QEA 2023b). Deepwater in Grays Harbor provides habitat to a range of marine and freshwater aquatic species, including marine mammals, fish, and benthic organisms such as crabs. Birds may also use the surface and just below the surface of deepwater habitat to rest or hunt. Aquatic species that may occur in Grays Harbor estuary are described in Section 5.5.2.

Some open, deepwater water habitat (566.7 acres) also occurs in the lower Chehalis River where it coincides with portions of the 0.5-mile offset associated with the PSAP short line rail corridor. The lower Chehalis River is unconfined and low gradient within a wide floodplain and contains both shallow and deepwater instream habitat.

Because of the 30-meter (98-foot) resolution of WDNR Ecological Systems of Washington data, small streams and shallow water instream habitats are often as mapped as neighboring terrestrial habitat types such as wetland, marsh, riparian, or developed (WDNR 2019). This system is described in Section 5.3.1. Fry Creek is a shallow water instream habitat that is considered a fish-bearing stream (WDFW 2022a) and reaches in the Project Area are mapped as brackish to emergent marsh or developed habitat types (WDNR 2019). It originates in the forested hills north of the Project Area and flows generally north to south through the study area. Near the Project Area, it flows through a series of culverts under city streets and railroad tracks and into Grays Harbor. The lower reach of Fry Creek is tidally influenced and is considered a shoreline of the state (Type S water). East Terminal Way Ditch (HDR 2022) is also a shallow water instream habitat that is tidally influenced channel and flows south

through the study area to Grays Harbor. A WDFW culvert assessment indicated the presence of stickleback fish and crabs of unidentified species in East Terminal Way Ditch (WDFW 2021). WDFW considers the ditch a historic fish-bearing stream but recognizes that it is now disconnected from upstream habitat (Lewis 2022). East Terminal Way Ditch is mapped as high to low intensity developed habitat type (WDNR 2019).

A very small portion (approximately 1.8 acres) of the aquatic study area coincides with mapped North Pacific Maritime Eelgrass Bed habitat south of Moon Island Road and Hoquiam Sewage Treatment Plant (WDNR 2019). However, Ecology Coastal Atlas mapping, which is focused more specifically on coastal and shoreline habitat indicates that eelgrass beds may not be present in this area (Ecology 2022). Instead, this area is identified as patchy saltmarsh fringe (Ecology 2022). In 2019, eelgrass surveys were performed at two sites just east of the WDNR mapped eelgrass habitat between Gary's Gove Old Cannery Park and the mouth of the Hoquiam River (WSP USA 2019). These surveys found two small patches of native common eelgrass (*Zostera marina)*, several more extensive patches of the non-native Japanese eelgrass (*Z. japonica*), and macro-algae in tidal and subtidal areas (WSP USA 2019). This area is part of the 385.4 acres mapped as Temperate Pacific Intertidal Mudflat in the study area.

Additionally, approximately 1.1 acres of the aquatic study area include Temperate Pacific Freshwater Aquatic Bed adjacent to Mox Chehalis Creek near Malone, Washington. Aerial imagery indicates that this habitat is likely to occur in this area. Approximately 74.7 acres of unconsolidated shore occur along the lower and middle Chehalis River in the PSAP Rail Corridor portion of the study area.

Table 3
Aquatic Habitats in the Study Area

Location in Study Area[1]	Habitat Type[2]	Approximate Area (acreage)
Project Area	Open Water[3]	669.6
	Temperate Pacific Intertidal Mudflat[3]	39.4
Underwater Noise Area	Open Water[3]	1,973.5
	Temperate Pacific Intertidal Mudflat[3]	263.8
Vessel Traffic Area	Open Water	5,841.0
	Temperate Pacific Intertidal Mudflat	99.9
	North Pacific Maritime Eelgrass Bed	1.8
PSAP Rail Corridor	Open Water	566.7
	Unconsolidated Shore	74.7
	Temperate Pacific Intertidal Mudflat	6.9
	Temperate Pacific Freshwater Aquatic Bed	1.1

Notes:

1. Locations include their corresponding offset as described in Section 5.1.

2. Habitat type and amount present in the study area are determined from the WDNR Ecological Systems of Washington GIS data layer (WDNR 2019). Presence is referred to as potential as no field surveys have been performed to confirm mapped designations.
3. Some aquatic habitat in the Underwater Noise portion of the study overlaps with aquatic habitat in the Project Area portion of the study area. This includes 473.92 acres of open water and 17.57 acres of temperate pacific mudflat.

5.3.3 Special Status Habitats

WDFW provides spatial information upon request about the known location of PHS in the Study Area (Guggenmos 2023). This resource is not an exhaustive survey and WDFW strongly recommends a field visit by a habitat expert to make determinations about potential priority habitat presence (WDFW 2022a). Table 4 provides a list of terrestrial and aquatic priority habitats identified for Grays Harbor, Thurston, and Lewis counties and summarizes their potential presence in different portions of the study area based on the WDFW PHS data (Guggenmos 2023). A summary of WDFW's mapped PHS in the Project Area is shown in Figure 5. The Pacific Flyway and the Grays Harbor Wildlife Refuge are also described, both of which are used by numerous bird species protected under the MBTA.

Waterfowl concentration areas and shorebird concentration areas are areas that are commonly or traditionally used by waterfowl or shorebirds on a seasonal or year-round basis. The Chehalis River valley is an overwintering site. Rotation of crops, size of fields, flood conditions, and cold periods determine waterfowl, including trumpeter swan (*Cygnus buccinator*), locations in any given year. Southern Grays Harbor, Ocean Shores, Rennie Island mudflats, and South Bay mudflats are regular shorebird concentration areas. Bowerman Basin is also a regular shorebird concentration area in a national wildlife refuge.

Priority habitats associated with wood duck nesting, brood, and foraging areas and harlequin duck (*Histrionicus histrionicus*) breeding areas correspond to various streams, rivers, sloughs, and lakes in the study area. Band-tailed pigeon (*Patagioenas fasciata*) concentration areas occur where mineral salts (especially calcium) necessary for egg production and rearing of young are available (Lewis et al. 2004).

Commercial crabbing priority habitat within the study area is located in portions of Grays Harbor and is defined as the harvest area for commercially important Dungeness crab (*Metacarcinus magister*).

Fresh deepwater and instream habitats in the study area correspond to the USGS National Hydrography Dataset in the study area and are described in Section 5.3.2. Fry Creek in the Project Area is considered state priority habitat (WDFW 2008).

Oregon white oak woodland priority habitat is mapped in areas of rural and urban Lewis County and includes stands of oak or oak/conifer associations where canopy coverage of the oak component of the stand is 25%; or where total canopy coverage of the stand is <25%, but oak accounts for at least 50% of the canopy coverage. In non-urbanized areas west of the Cascades, priority oak habitat consists of stands greater than 1 acre in size.

5.3.3.1 Pacific Flyway

The study area is also located in the Pacific Flyway, one of the main north-south migratory routes used by a variety of bird species. The Pacific Flyway extends from the arctic regions of Alaska and Canada to South America and is bounded on the west by the Pacific Ocean and on the east by the Rocky Mountains. Many migrant bird and raptor species use the Pacific Flyway to migrate between breeding habitat in North America and wintering habitat in the tropics (BirdLife International 2021). The Pacific Flyway encompasses terrestrial, aquatic, and wetland habitats, and many bird species including raptors, shorebirds, and waterfowl make use of multiple habitat types in and adjacent to the study area.

5.3.3.2 Grays Harbor Wildlife Refuge

The Grays Harbor Wildlife Refuge is located approximately 4 miles west of the Project Area and approximately 1 mile outside of the study area boundary. Although the wildlife refuge is outside the study area, species that use refuge habitat, such as birds and fish, may cross the study area while moving to and from the refuge. Habitats that occur in the wildlife refuge include instream habitat, tidal mudflats, tidal marsh, and freshwater wetland. Shorebird and waterfowl concentrations also occur in the refuge.

Figure 5
Overview of WDFW Mapped Priority Habitat in the Study Area

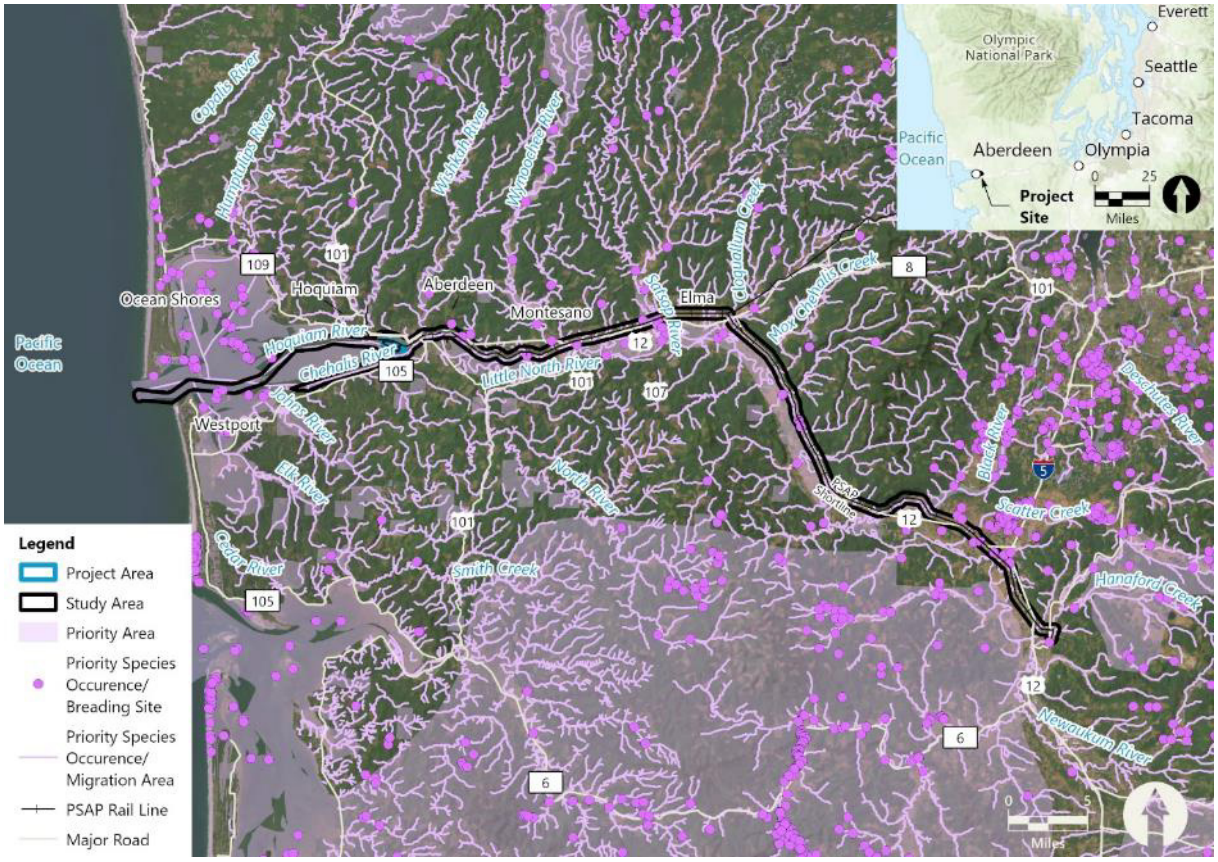


Table 4
WDFW Priority Habitat Types Mapped or Potentially Found Within the Study Area

Priority Habitat Type	Area of Direct Potential Effects	Area of Indirect Potential Aquatic Effects	Area of Indirect Potential Terrestrial Effects
Waterfowl Concentration Area	Not Present	Not Present	Present
Shorebird Concentration Area	Present	Present	Not Present
Wood Duck Nesting, Brood, and Foraging Area	Not Present	Not Present	Present
Harlequin Duck Breeding Area	Not Present	Not Present	Present
Trumpeter Swan Concentration Area	Not Present	Not Present	Present
Band-Tailed Pigeon Concentration Area	Not Present	Not Present	Present
Olympic Mudminnow Concentration Area	Not Present	Not Present	Present
Commercial Crabbing	Not Present	Present	Not Present

Priority Habitat Type	Area of Direct Potential Effects	Area of Indirect Potential Aquatic Effects	Area of Indirect Potential Terrestrial Effects
Roosevelt Elk South Bank Crucial Winter Range	Not Present	N/A	Present
Aspen Stands	Not Present	N/A	Not Present
Biodiversity Areas and Corridors	Not Present	N/A	Present
Herbaceous Balds	Not Present	N/A	Not Present
Old-Growth or Mature Forest	Not Present	N/A	Not Present
Oregon White Oak Woodland	Not Present	N/A	Present
West Side Prairie	Not Present	N/A	Not Present
Riparian	Present	Not Present	Present
Instream	Present	Present	Present
Open Coast Nearshore	Not Present	Not Present	Not Present
Coastal Nearshore	Not Present	Not Present	Not Present
Estuarine and Marine Wetland[1]	Present	Present	Present
Freshwater Wetlands[2]	Present	Present	Present
Fresh Deep Water	Present	Present	Not Present
Freshwater Pond	Not Present	N/A	Present
Riverine	Not Present	N/A	Present
Priority Habitat Feature			
Caves	Not Present	N/A	Not Present
Cliffs	Not Present	N/A	Not Present
Snags and Logs	Assumed Present	N/A	Assumed Present
Talus	Not Present	N/A	Not Present

Notes:
Sources: Ecology 2017; WDFW 2008, 2022a

1. Estuarine and Marine Wetland include Coastal Salt Marshes, Salt Meadows, and Brackish Marshes
2. Freshwater Wetlands may include Freshwater Emergent Wetlands and Freshwater Forested/Shrub Wetland

5.4 Plant Species

The following sections present terrestrial, wetland, and aquatic plant species that are known to be present or have the potential to be present in each component of the study area based on the habitats presented in Section 5.3 and publicly available sources (Ecology 2017; HDR 2022). Plant species are also discussed in terms of their special status at the state level (i.e., those that are listed as threatened, endangered, sensitive, or proposed as threatened, endangered, or sensitive), including WDFW priority species.

5.4.1 Terrestrial Plant Species

Common terrestrial and wetland plants that may be in the study area include but are not limited to the species summarized in Table 5.

Table 5
Terrestrial Plant Species Potentially Found Within the Study Area

Common Name	Scientific Name	Common Name	Scientific Name
Sitka spruce	*Picea sitchensis*	False lily of the valley	*Maianthemum dilatatum*
Western hemlock	*Tsuga heterophylla*	Western sword fern	*Polystichum munitum*
Western red cedar	*Thuja plicata*	Wood ferns	*Dryopteris* spp.
Douglas fir	*Pseudotsuga menziesii*	Deer fern	*Blechnum spicant*
Bigleaf maple	*Acer macrophyllum*	Redwood sorrel	*Oxalis oregana*
Red alder	*Alnus rubra*	Vanilla leaf	*Achlys triphylla*
Shore pine	*Pinus contorta*	Arctic sweet coltsfoot	*Petasites frigidus*
Pacific silver fir	*Abies amabilis*	Fringecup	*Tellima grandiflora*
Grand fir	*Abies grandis*	Lady fern	*Athyrium filix-femina* var. *cyclosorum*
Western white pine	*Pinus monticola*	Western skunk cabbage	*Lysichiton americanus*
Oregon white oak	*Quercus garryana*	Common nettle	*Urtica dioica*
Ponderosa pine	*Pinus ponderosa*	Water parsley	*Oenanthe sarmentosa*
Sitka willow	*Salix sitchensis*	Tufted hairgrass	*Deschampsia caespitosa*
Pacific willow	*Salix lucida lasiandra*	Curly dock	*Rumex crispus*
Black cottonwood	*Populus trichocarpa*	Fringed willowherb	*Epilobium ciliatum*
Oregon ash	*Fraxinus latifolia*	Field horsetail	*Equisetum arvense*
Cherry	*Prunus* spp.	Toad rush	*Juncus bufonius*
Salal	*Gaultheria shallon*	Common cattail	*Typha latifolia*
Evergreen huckleberry	*Vaccinium ovatum*	Common rush	*Juncus effusus*
Red huckleberry	*Vaccinium parvifolium*	Smallfruit bullrush	*Scirpus microcarpus*
Oval-leaf blueberry	*Vaccinium ovalifolium*	Common spikerush	*Eleocharis palustris*
Salmonberry	*Rubus spectabilis*	Slough sedge	*Carex obnupta*
Devil's club	*Oplopanax horridus*	Needle spikerush	*Eleocharis acicularis*
Dwarf Oregon grape	*Mahonia nervosa*	Monkeyflower	*Mimulus* spp.
Tall Oregon grape	*Mahonia aquifolium*	Beaked sedge	*Carex exsiccate*
Pacific rhododendron	*Rhododendron macrophyllum*	Pacific silverweed	*Argentina pacifica*
Vine maple	*Acer circinatum*	Silver burr ragweed	*Ambrosia chamissoni*
Twinflower	*Linnaea borealis*	Pickleweed	*Salicornia virginica*
Thimbleberry	*Rubus parviflorus*	Lyngbye's sedge	*Carex lyngbye*

Common Name	Scientific Name	Common Name	Scientific Name
Stink currant	*Ribes bracteosum*	Baltic rush	*Juncus balticus*
Red osier dogwood	*Cornus sericea*	Yellow sand verbena	*Abronia latifolia*
Rose spirea	*Spiraea douglasii*	Seablite	*Suaeda calceoliformis*
Oregon crabapple	*Malus fusca*	Seaside plantain	*Plantago maritima*
Sweetgale	*Myrica gale*	Marsh jaumea	*Jaumea carnosa*
Cascara buckthorn	*Rhamnus purshiana*	Chairmaker's bulrush	*Schoenoplectus americanus*
Pacific ninebark	*Physocarpus capitatus*	Seaside arrowgrass	*Triglochin maritima*
Pacific serviceberry	*Amelanchier alnifolia*	Desert saltgrass	*Distichlis spicata*
Red elderberry	*Sambucus racemosa*	Sea clubrush	*Schoenoplectus maritimus*
Common snowberry	*Symphoricarpos albus*	Dunegrass	*Elymus mollis*
Nootka rose	*Rosa nutkana*	Bunchgrass	*Festuca* spp.
Douglas hawthorn	*Crataegus douglasii*	Bentgrasses	*Agrostis* spp.
Scotch broom	*Cytisus scoparius*	Bluegrasses	*Poa* spp.
Trailing blackberry	*Rubus ursinus*	Bird's foot trefoil	*Lotus corniculatus*
Himalayan blackberry	*Rubus armeniacus*	Reed canarygrass	*Phalaris arundinacea*

Note:
Sources: Ecology 2017; HDR 2022; WDNR 2015

5.4.2 Aquatic Plant Species

Common aquatic plants that may be in the study area include but are not limited to the species summarized in Table 6.

Table 6
Aquatic Plant Species Potentially Found Within the Study Area

Common Name	Scientific Name	Common Name	Scientific Name
Common eelgrass	*Zostera marina*	Pond lily	*Nuphar lutea* ssp. *polysepala*
Beaked tasselweed	*Ruppia maritima*	Bog bean	*Menyanthes trifoliata*
Sea lettuce	*Ulva lactuca*	Longroot smartweed	*Polygonum amphibium*
Rockweed	*Fuchus distichus*	Common water-crowfoot	*Ranunculus aquatilis*
Broadleaf arrowhead	*Sagittaria latifolia*	Water bulrush	*Schoenoplectus terminalis*
Watershield	*Brasenia schreberi*	Silver burr ragweed	*Ambrosia chamissoni*
Mosquito ferns	*Azolla* spp.	Common mare's-tail	*Hippuris vulgaris*
Smartweed	*Polygonum* spp.	Bur-reed	*Sparganium* spp.
Pondweed	*Potamogeton* spp.	Water moss	*Fontinalis* spp.
Waterweeds	*Elodea* spp.	Bladderworts	*Utricularia* spp.

Common Name	Scientific Name	Common Name	Scientific Name
Watermilfoils	*Myriophyllum* spp.	Water-starwort	*Callitriche* spp.
Hornwort	*Ceratophyllum* spp.	Eurasian watermilfoil	*Myriophyllum spicatum*
Buttercup	*Ranunculus* spp.	Variable-leaf watermilfoil	*Myriophyllum heterophyllum*
Duckweed	*Lemna* spp.	Brazilian elodea	*Egeria densa*
Watermeal	*Wolffia* spp.	Parrotfeather	*Myriophyllum aquaticum*
Quillworts	*Isoetes* spp.	Japanese eelgrass	*Zostera japonica*

Note:
Source: WDNR 2015

5.4.3 Special Status Plant Species

Special status plant species are defined in this report as those listed as state endangered, threatened, sensitive, or candidate species; and WDNR Heritage species (WDNR 2021). All state-listed plant species that are also federally listed are addressed in the *Biological Assessment* (Anchor QEA 2022).

Table 7 summarizes the state endangered, threatened, and sensitive plant species that may potentially occur in Grays Harbor County, Thurston County, or Lewis County and therefore may be present in the study area.

Table 7
Special Status Plant Species[1] Potentially Found Within the Study Area

Common Name	Scientific Name	State Status[2]
Weak thistle	*Cirsium remotifolium* var. *remotifolium*	E
Golden paintbrush	*Castilleja levisecta*	T
Kincaid's lupine	*Lupinus oreganus* var. *kincaidii*	E
Nelson's checkermallow	*Sidalcea nelsoniana*	E
Pale larkspur	*Delphinium leucophaeum*	E
Thompson's fleabane	*Erigeron peregrinus* var. *thompsonii*	E
Thin-leaved peavine	*Lathyrus holochlorus*	E
Pacific peavine	*Lathyrus vestitus* var. *ochropetalus*	E
Olympic fawn-lily	*Erythronium quinaultense*	T
Water howellia	*Howellia aquatilis*	T
True babystars	*Leptosiphon minimus*	T
Salmon Jacob's-ladder	*Polemonium carneum*	T
Hairy-stemmed checkermallow	*Sidalcea hirtipes*	T
Tall bugbane	*Actaea elata* var. *elata*	S
Mt. Hood bugbane	*Actaea laciniata*	S

Common Name	Scientific Name	State Status[2]
Tall agoseris	*Agoseris elata*	S
Yellow-flowered sedge	*Carex anthoxanthea*	S
Dense sedge	*Carex densa*	S
Longawn sedge	*Carex macrochaeta*	S
Bulb-bearing water-hemlock	*Cicuta bulbifera*	S
Pacific lanceleaved springbeauty	*Claytonia multiscapa* ssp. *pacifica*	S
Scurvygrass	*Cochlearia groenlandica*	S
Oregon coyote-thistle	*Eryngium petiolatum*	S
Coast fawn-lily	*Erythronium revolutum*	S
Western wahoo	*Euonymus occidentalis* var. *occidentalis*	S
Common bluecup	*Githopsis specularioides*	S
Oregon goldenweed	*Heterotheca oregona*	S
Large St. Johns'-wort	*Hypericum majus*	S
Nuttall's quillwort	*Isoetes nuttallii*	S
Torrey's peavine	*Lathyrus torreyi*	S
Northern bog clubmoss	*Lycopodiella inundata*	S
Branched montia	*Montia diffusa*	S
Old field blue toadflax	*Nuttallanthus canadensis**	S
Texas blue toadflax	*Nuttallanthus texanus*	S
Alaska plantain	*Plantago macrocarpa*	S
Lax-flower bluegrass	*Poa laxiflora*	S
Blunt-leaved pondweed	*Potamogeton obtusifolius*	S
Bear's-foot sanicle	*Sanicula arctopoides*	S
Columbia white-topped aster	*Sericocarpus rigidus*	S
Rose checkermallow	*Sidalcea virgata*	S
Scouler's catchfly	*Silene scouleri* ssp. *scouleri*	S
Hall's aster	*Symphyotrichum hallii*	S
Small-flowered trillium	*Trillium albidum* var. *parviflorum*	S
Giant chain-fern	*Woodwardia fimbriata*	S
Narrow-leaf mule's-ears	*Wyethia angustifolia*	S
Brewer's cinquefoil	*Potentilla breweri*	S
California sword fern	*Polystichum californicum*	S
Coiled sedge	*Carex circinata*	S
Cooley's buttercup	*Arcteranthis cooleyae*	S
Eastwood's daisy	*Erigeron aliceae*	S
Frigid shooting-star	*Dodecatheon austrofrigidum*	E
Fringed synthyris	*Veronica schizantha*	E

Common Name	Scientific Name	State Status[2]
Marsh grass-of-Parnassus	*Parnassia palustris*	S
Menzies' burnet	*Sanguisorba menziesii*	T
Monterey centaury	*Zeltnera muehlenbergii*	S
Mt. Rainier lousewort	*Pedicularis rainierensis*	S
Pine-foot	*Pityopus californicus*	S
Short-spurred plectritis	*Plectritis brachystemon*	S
Tree clubmoss	*Dendrolycopodium dendroideum*	S
Whipplevine	*Whipplea modesta*	S

Notes:
Source: WDNR 2021

1. 2021 Washington Vascular Plant Species of Special Concern presence in Project Area determined by its present in Grays Harbor County, Thurston County, or Lewis County.
2. All state-listed wildlife species that are also federally listed are addressed in the Biological Assessment (Anchor QEA 2022).

E: endangered
S: sensitive
T: threatened

5.5 Wildlife Species

The following sections present terrestrial, aquatic, and semiaquatic wildlife species that are supported by the habitats described in Section 5.3. This includes mammals, fish, birds, amphibians, reptiles, and invertebrates. Wildlife species are also discussed in terms of their special status at the state level (i.e., those that are listed as threatened, endangered, sensitive, or proposed as threatened, endangered, or sensitive), including WDFW priority species. Candidate species are not discussed but are listed in Appendix B, Table B-1.

5.5.1 Terrestrial Wildlife Species

Common wildlife species associated with terrestrial and wetland habitat types in the study area include but are not limited to the following:

- **Mammals:** Deer (*Odocoileus* spp.), elk (*Cervus canadensis*), black bear (*Ursus americanus*), cougar (*Puma concolor*), coyote (*Canis latrans*), Cascade red fox (*Vulpes vulpes cascadensis*), bats (Order: Chiroptera), Douglas squirrel (*Tamiasciurus douglasii*), raccoon (*Procyon lotor*), North American beaver (*Castor canadensis*), river otter (*Lontra canadensis*), skunk (Family: *Mephitidae*), shrews (*Sorex* spp.), moles (*Scapanus townsendii*), voles (*Microtus* spp.), and mice (Order: Rodentia)
- **Birds:** Various waterfowl (e.g., mallard [*Anas platyrhynchos*], geese [*Branta* spp.], mergansers [*Mergus* spp.], sandpipers (*Calidris* spp.), loons [*Gavia* spp.], dowitchers [*Limnodromus* spp.], gulls [*Larus* spp.]), bald eagle (*Haliaeetus leucocephalus*), Turkey vulture (*Cathartes aura*), owls (Order: Strigiformes), osprey (*Pandion haliaetus*), golden eagle (*Aquila chrysaetos*), red-tailed

hawk (*Buteo jamaicensis*), Cooper's hawk (*Accipiter cooperii*), woodpecker (*Dryocopus* spp.), Red-breasted sapsucker (*Sphyrapicus ruber*), common raven (*Corvus corax*), northwest crow (*Corvus caurinus*), Steller's jay (*Cyanocitta stelleri*), American robin (*Turdus migratorius*), belted kingfisher (*Megaceryle alcyon*), northern flicker (*Colaptes auratus*), chickadees (*Poecile* spp.), sparrows (*Passer* spp.), nuthatches (*Sitta* spp.), juncos (*Junco* spp.), kinglets (*Regulus* spp.).

- **Reptiles:** Common garter snake (*Thamnophis sirtalis*), northwestern garter snake (*Thamnophis ordinoides*), western terrestrial garter snake (*Thamnophis elegans*), and northern alligator lizard (*Elgaria coerulea*) (Washington NatureMapping Program 2019)
- **Invertebrates:** Various arthropods, annelids, and mollusks

Located in the Pacific Flyway, the Grays Harbor estuary and National Wildlife Refuge and associated shorelines, mudflats, and aquatic beds attract massive numbers of shorebirds and other bird species during migration. In late April through mid-May, large numbers of western sandpiper (*Calidris mauri*), dunlin (*Calidris alpina*), short-billed dowitchers (*Limnodromus griseus*), long-billed dowitchers (*Limnodromus scolopaceus*), and semipalmated plover (*Charadrius semipalmatus*), as well as black-bellied plover (*Pluvialis squatarola*), red knot (*Calidris canutus*) and least sandpiper (*Calidris minutilla*) stop to rest and forage on the extensive mudflats in Grays Harbor (USFWS 2023a). Some species, such as dunlin, mallards, American wigeon (*Mareca americana*), and northern pintail (Anas acuta), winter along the Washington coast, attracting predators such as peregrine falcon (*Falco peregrinus*), bald eagle, northern harrier (*Circus hudsonius*), and red-tailed hawk. Numerous passerines (e.g., songbirds) also use the estuary and refuge.

In addition, Audubon Pacific Flyway priority birds such as the bobolink (*Dolichonyx oryzivorus*), varied thrush (*Ixoreus naevius*), and Cassin's auklet (*Ptychoramphus aleuticus*) have been observed in Grays Harbor (Audubon 2022; eBird 2022). A list of bird species that have been documented in Grays Harbor and could be present in the study area are provided in Appendix C.

5.5.2 Aquatic Wildlife Species

Common aquatic wildlife species associated with aquatic habitats in the study area include but are not limited to the following:

- **Marine Mammals:** Humpback whale (Megaptera novaeangliae), gray whale (*Eschrichtius robustus*), orca (*Orcinus orca*), harbor porpoise (*Phocoena phocoena*), common dolphin (*Delphinus delphis*), California sea lion (*Zalophus californianus*), Steller sea lion (*Eumetopias jubatus*), harbor seal (*Phoca vitulina*)
- **Fish:** Spring-run and fall-run Chinook salmon (*Oncorhynchus tshawytscha*), coho salmon (*O. kisutch*), chum salmon (*O. keta*), steelhead and resident rainbow trout (*O. mykiss*), sea-run and resident coastal cutthroat trout (*O. clarkii clarkii*), mountain whitefish (*Prosopium williamsoni*), Pacific lamprey (*Entosphenus tridentatus*), river lamprey (*Lampetra ayresii*),

western brook lamprey (*Lampetra richardsoni*), Olympic mudminnow (*Novumbra hubbsi*), largescale sucker (*Catostomus macrocheilus*), speckled dace (*Rhinichthys osculus*), longnose dace (*Rhinichthys cataractae*), redside shiner (*Richardsonius balteatus*), reticulate sculpin (*Cottus perplexus*), northern pikeminnow (*Ptychocheilus oregonensis*), peamouth chub (*Mylocheilus caurinus*), riffle sculpin (*Cottus gulosus*), prickly sculpin (*Cottus asper*), threespine stickleback (*Gasterosteus aculeatus*), and white sturgeon (*Acipenser transmontanus*). Ten non-native fish species have been confirmed to be present in the middle and lower Chehalis River, including a mix of catfish, herring, minnows, perch, bass, and sunfish (Hayes et al. 2019; Winkowski and Zimmerman 2019). Bass include largemouth bass (*Micropterus salmoides*) and smallmouth bass (*Micropterus dolomieu*).

- **Amphibians:** Western toad (*Bufo boreas*), northern red-legged frog (*Rana aurora*), Pacific treefrog (*Pseudacris regilla*), coastal tailed frog (*Ascaphus truei*), Dunn's salamander (*Plethodon dunni*), Van Dyke's salamander (*Plethodon vandykei*), giant salamander (*Dicamptodon tenebrosusis*)
- **Aquatic Invertebrates:** Dungeness crab (*Metacarcinus magister*), red rock crab (*Cancer productus*), the invasive European green crab (*Carcinus maenus*), shore crabs (*Hemigraphis* spp.), Pacific little neck clam (*Leukoma staminea*), butter clam (*Saxidomus gigantea*), cockles (Family: *Cardiidae*), blue mussels (*Mytilus edulis*), oysters (Order: Ostreoidea), western pearshell (*Margaritifera falcata*), floaters (*Anodonta* spp.), western ridged mussel (*Gonidea angulata*), and other various crustaceans, mollusks, bivalves, and macroinvertebrates.

5.5.3 Special Status Wildlife Species

Special status wildlife species are defined in this report as those listed as state endangered, threatened, sensitive, or candidate species; and WDFW priority species. All state-listed wildlife species that are also federally listed are addressed in the *Biological Assessment* (Anchor QEA 2022).

Table 8 summarizes the state endangered, threatened, and sensitive wildlife species that may occur in Grays Harbor County, Thurston County, or Lewis County and therefore may be present in the study area. Many of these species are also protected under the federal ESA. In addition, there are 16 wildlife species designated as candidates for listing in Washington as endangered, threatened, or sensitive that are potentially present in the study area, including three mammals, seven birds, one reptile, one fish, and four amphibians (Appendix B, Table B-1). There are also 19 wildlife species considered WDFW priority species, including three mammals, nine birds, six fish, and one invertebrate (Appendix B, Table B-1).

Table 8
State Threatened, Endangered, and Sensitive Wildlife Species Potentially Found Within the Study Area

Common Name	Scientific Name	State Status[1]
Mammals		
Gray wolf	*Canis lupus*	E
Fisher	*Pekania pennanti*	E
Western gray squirrel	*Sciurus griseus*	T
Mazama pocket gopher	*Thomomys mazama*	T
Yuma myotis (bat)	*Myotis yumanensis*	S
Marine Mammals		
Fin whale	*Balaenoptera physalus*	E
Sei whale	*Balaenoptera borealis*	E
Blue whale	*Balaenoptera musculus*	E
Humpback whale	*Megaptera novaeangliae*	E
North Pacific right whale	*Eubalaena japonica*	E
Sperm whale	*Physeter macrocephalus*	E
Southern Resident killer whale	*Orcinus orca*	E
Northern sea otter	*Enhydra lutris kenyoni*	T
Birds		
Northern spotted owl	*Strix occidentalis*	E
Marbled murrelet	*Brachyramphus marmoratus*	E
Streaked horned lark	*Eremophila alpestris strigata*	E
Yellow-billed cuckoo	*Coccyzus americanus*	E
Oregon vesper sparrow	*Pooecetes gramineus affinis*	E
Western snowy plover	*Charadrius nivosus*	E
Sandhill crane	*Grus canadensis*	E
Common loon	*Gavia immer*	S
Reptiles		
Western pond turtle	*Actinemys marmorata*	E
Leatherback sea turtle	*Dermochelys coriacea*	E
Loggerhead sea turtle	*Caretta*	E
Green sea turtle	*Chelonia mydas*	T
Fish		
Olympic mudminnow	*Novumbra hubbsi*	S
Amphibians		
Oregon spotted frog	*Rana pretiosa*	E

Common Name	Scientific Name	State Status[1]
Invertebrates		
Oregon silverspot butterfly	*Argynnis zerene hippolyta*	E
Taylor's checkerspot	*Euphydryas editha taylori*	E
Mardon skipper	*Polites mardon*	E
Pinto abalone	*Haliotis kamtschatkana*	E

Notes:
Sources: WDFW 2022a, 2022b

1. All state-listed wildlife species that are also federally listed are addressed in the Biological Assessment (Anchor QEA 2022).

E: endangered
S: sensitive
T: threatened

Fishers (*Pekania pennanti*) inhabit coniferous and mixed coniferous-deciduous forests that have moderate to high canopy closure (WDFW 2023a), a habitat type that is limited in the study area due to active forest management practices.

Western gray squirrels (*Sciurus griseus*) are typically associated with mature stands of pine and oak trees for cover, denning, and food, but may also be associated with Douglas fir trees if oak or pine trees are also present (WDFW 2023a). Mature stands of pine and oak trees are limited the study area but may occur in portions of the PSAP short line railroad offset area. The closest known documentation of western gray squirrel presence is on the Joint Base Lewis-McChord in Pierce and Thurston counties.

Yuma myotis bats (*Myotis yumanensis*) are widely distributed in Washington and inhabit moist and dry forests, riparian zones, and grasslands closely associated with rivers, streams, ponds, and lakes in the lowlands of western Washington (WDFW 2023a). Because these habitats are present in and around the study area, Yuma myotis bats are likely to occur throughout the study area.

Sandhill crane (*Grus canadensis*) breeding habitat includes wetlands, grassy uplands, partially forested uplands, and wet meadows, and are found in open grassland, agricultural fields, and river valleys during migration (WDFW 2023a). Because these habitats are present in and around the study area, Sandhill crane are likely to occur throughout the study area. Common loons (*Gavia immer*) are likely to be present in the study area as they reside in marine and estuarine coastal waters and use larger inland lakes, reservoirs, and rivers in winter and during migration (WDFW 2023a).

Northern sea otters (*Enhydra lutris kenyoni*) are usually found in rocky marine habitats and kelp beds and take refuge among kelp or in coves and inlets (WDFW 2023a). Because these habitat types are limited in the study area, northern sea otter presence in the study area is also likely limited.

Olympic mudminnow (*Novumbra hubbsi*) are usually found in high quality wetland habitat, slow-moving streams, and ponds that have a muddy bottom, minimal to no water flow, and abundant aquatic vegetation (WDFW 2013). A 2010 to 2011 study recorded Olympic mudminnow in its preferred habitat in portions of the study area (WDFW 2013). Many of these Olympic mudminnow habitat sites are located around Grays Harbor and in the Chehalis River floodplain; therefore, this species is likely to be present in the study area.

Mardon skipper (*Polites mardon*) prefer short, open-structured, native fescue grasslands interspersed with blue violet and common vetch as nectar sources (WDFW 2023a). The closest recorded observation of the species relative to the study area was on May 11, 2016, where a couple of individuals were observed along a trail in the Scatter Creek Wildlife Recreation Area near Grand Mound (Lotts and Naberhaus 2021). In addition, a 2008 to 2009 sampling survey was conducted by WDFW to estimate the population of mardon skipper in the Scatter Creek Wildlife Recreation Area, which resulted in peak counts in excess of 150 butterflies (Hatfield et al. 2015). While mardon skipper habitat may be present in portions of the study area, its potential presence is likely limited to the Scatter Creek Wildlife Recreation Area and any surrounding areas that contain prairie habitat.

Pinto abalone (*Haliotis kamtschatkana*) live in kelp beds along well-exposed coasts in the low intertidal zone to 120 feet in depth (NOAA 2023a). This species population has declined in abundance and has experienced widespread reproductive failure (WDFW 2023b). Because of dwindling numbers and limited habitat in the study area, Pinto abalone is unlikely to be present.

6 Environmental Consequences

This section describes the environmental consequences of the No Action Alternative and the Proposed Project.

6.1 Assumptions

This analysis is based on the assumptions in the *Project Description Technical Report* (Anchor QEA 2023b). Additional assumptions relevant to this analysis are listed as follows:

- A total of up to 914 piles would be removed or installed for the Proposed Project using vibratory and impact hammers, direct pull, and/or breaking off near mudline. Up to 50 in-water piles would be installed using impact and vibratory hammer requiring up to 600 impact strikes per pile. Up to 24 in-water piles would be installed using impact and vibratory hammer, requiring up to 500 impact strikes per pile. Up to 664 landward piles would be installed using impact and vibratory hammer, requiring up to 300 impact strikes per pile; however, not all piles will be impact driven. The average vibratory hours per pile would range from up to 0.5 to 1.5 hours.
- Construction-related noise estimates are based on analysis conducted for the *Biological Assessment* (Anchor QEA 2022).
  - The in-air noise analysis considered pile installation using impact and vibratory hammers as the loudest component of project construction and calculated a maximum combined noise level of 110 decibels (dB) at 50 feet from the source. Because the Project Area is in and industrial zone and surrounded by developed land, a 0.5-mile radius was included to assess impacts to terrestrial species already acclimated to human disturbance.
  - The in-water noise analysis considered 36-inch steel pile installation using impact hammers as the loudest component of project construction and calculated a maximum is 210 dB peak, and 193 dB root mean square (RMS) measured at 10 meters from the source. It is anticipated that a standard bubble curtain will be used during impact hammer pile driving to attenuate underwater noise and provide a 5 dB noise reduction. Under existing conditions, the vicinity of the Port includes anthropogenic underwater noise from barge and cargo ship traffic and regular dredging that is estimated to have an ambient noise level of 120 dB RMS. Underwater noise generated by the Proposed Project has the potential to extend up to approximately 212 miles from the terminal. However, the presence of Rennie Island and the southern Grays Harbor and lower Chehalis River shoreline will reduce the distance that underwater noise will travel, because noise transmission will stop when it intersects with land. The area affected by underwater noise includes an approximately 7.1-mile reach extending southwest from the terminal to the south shoreline of Grays Harbor, and eastward approximately

1.1 miles across the mouth of the Chehalis River with an area totaling approximately 3.6 square miles.

- The rail bridge over Fry Creek and culvert improvements at the East Terminal Way Ditch will be constructed in a manner to isolate, dewater and remove fish from waters in the proposed work areas. For instance, the rail bridge construction work could include driven steel sheets as cofferdams, fish and water could be removed and then construction could be performed in the dry, followed by cofferdam removal.
- The majority of construction impacts would occur in previously developed areas and no undeveloped habitat areas would be converted for project use.
- A silt curtain will be used to isolate the T4 Dock Fender Upgrades in-water work area. A full depth or partial depth curtain may be used by the contractor. If a full curtain is used, efforts will be made to exclude fish from the work area using acoustic fish deterrent methods or similar. If a partial silt curtain is installed it is assumed that fish would be able to leave the in-water work area when disturbance occurs.
- AGP Project electrical system upgrades would require replacement of existing aboveground powerlines, but no new aboveground powerlines would be required.
- The duration of construction barge presence is the same as the in-water work window for salmon and bull trout, July 16 to February 14.
- Barges are conservatively assumed to be temporary overwater cover and fill from spud use.
- Vessel operations are expected to increase under operations of the Proposed Project as described in the *Project Description Technical Report* (Anchor QEA 2023b). It is assumed that Proposed Project-related vessels would be required to adhere to the state and federal regulations that control discharge and water quality of ballast water.

6.2 Approach and Methods

This section describes the approach to the impact analysis, including the types of impacts considered, the impact indicators, and evaluation methods.

6.2.1 Approach to Analysis

This study evaluated the potential direct, indirect, and cumulative impacts of the alternatives that would be different from existing conditions. Existing conditions include those present at the time the analysis was completed in 2023. When informative, the study also includes a comparison of the operational impacts of the Proposed Project to the No Action Alternative. This was done to provide additional information about whether the project impacts may be different later in the analysis period.

Cumulative impacts are caused by the incremental impact of the alternatives when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor, but collectively significant actions, which take place over time (40 *Code of Federal*

Regulations [CFR] 1508.7). The list of cumulative projects is presented in the *Project Description Technical Report* (Anchor QEA 2023b). The following approach was developed based on guidance from the Council of Environmental Quality (CEQ 1997):

- Determine the cumulative impacts study area for each environmental resource. The study area used to evaluate cumulative impacts is the same as described in Section 5.1.
- Assess the existing condition of each resource as it has been affected by past actions. This is based on information provided in the corresponding Affected Environment section of this study, which includes the effects of past actions.
- Evaluate the cumulative impacts of all past, present, and reasonably foreseeable future actions on each resource in the study area, which is described in Section 6.
- Assess how the Proposed Project would contribute to cumulative impacts, which is also described in Section 6.

6.2.2 Impact Terminology

Direct impacts are those that would occur as the result of and at the same time and place as the activities proposed by the Port and AGP). Direct impacts would only occur in the On-Site Project Area. Indirect impacts would occur later in time or farther in distance from the immediate project location but would be attributable to the Proposed Project. Indirect impacts also include those that would occur as the result of operating the project, such as traffic to and from the Project Area. These impacts could be temporary or permanent.

Project impacts can be characterized by duration. Permanent impacts would affect the resource to such a degree that they would not return to their preconstruction state during the analysis period. Temporary impacts may be short-term or long-term. Short-term impacts were assumed to last for fewer than 2 years. Long-term temporary impacts would affect functions that will eventually be restored or recover over time, but not within 1 year or more after the impact ceases.

The magnitude of impacts is also described in terms of low, medium, and high impacts. Table 9 provides guidance for how the impact levels were assessed. The level of impacts was assessed assuming that applicable regulations and permits and approvals listed in Section 3 would be adhered to and obtained. If needed, the impact analysis also identifies where mitigation would be required to reduce the impact to acceptable levels. Mitigation is described in Section 7.

Table 9
Biological Resources Impact Indicators

Impact Indicator	Determining Degree of Impact
Direct Disturbance, Injury, or Killing of Wildlife or Plant Species	**No/Negligible Impact:** An Alternative would cause only slight disturbance or injury to non-special status species and would not cause disturbance, injury, or death of any special status species. **Low:** An Alternative would cause 1) mortality or injury to individuals of non-special status species, or 2) temporary disturbance to individuals of a special status species that would not result in direct mortality or injury. **Medium:** An Alternative would cause mortality or injury, including to individuals of a special status species. **High:** An Alternative would cause mortality or injury of any species that 1) increases the need for state listing of a species or 2) adversely affects species viability or 3) puts the local population at risk.
Impacts from Noise and Vibration[1]	**No/Negligible Impact:** An Alternative would not result in any noticeable noise or vibration above baseline conditions. **Low:** An Alternative would result in temporary increases that may disrupt normal behavior but are not injurious to nearby individuals. **Medium:** An Alternative would result in short-term increases that 1) may disrupt normal behavior or 2) are injurious to nearby individuals. **High:** An Alternative would result in long-term increases that disrupt normal behavior and are injurious to species.
Loss of Habitat Area or Function	**No/Negligible Impact:** An Alternative would cause no noticeable degradation, loss, or change of existing habitat function. **Low:** An Alternative would cause 1) temporary disturbance or 2) permanent loss or conversion of low-quality or abundantly available habitat. **Medium:** An Alternative would cause permanent degradation, loss or conversion of habitat, including rare or special status habitat, but would not affect species viability or put local populations at risk. **High:** An Alternative would cause the permanent degradation, loss, or change of habitat that is critical to species viability or puts local populations at risk.
Reduced Habitat Connectivity (including Reduced Fish Passage)	**No/Negligible Impact:** An Alternative would not noticeably impact habitat connectivity. **Low:** An Alternative would result in a temporary reduction in habitat connectivity that would not affect species viability or put the local population at risk. **Medium:** An Alternative would result in a permanent reduction in habitat connectivity that would not affect species viability or put the local population at risk. **High:** An Alternative would result in a permanent reduction in habitat connectivity that would 1) affect species viability or 2) put local populations at risk.
Loss of Prey or Increase in Non-Native Species	**No/Negligible Impact:** An Alternative would not cause noticeable changes to patterns of species presence (including predator and prey abundance) or non-native species populations.

Impact Indicator	Determining Degree of Impact
	Low: An Alternative would result in temporary changes to prey abundance or non-native species populations that would not 1) affect species viability or 2) put local populations at risk. **Medium:** An Alternative would result in permanent changes to prey abundance or non-native species populations that would not 1) affect species viability or 2) put local populations at risk. **High:** An Alternative would result in permanent changes to prey abundance or non-native species populations that would 1) affect species viability or 2) put local populations at risk.

Note:

1. Noise and vibration have the potential to cause direct killing of wildlife species. Noise and vibration that results in direct killing is evaluated using the Direct Disturbance, Injury, or Killing of Wildlife or Plant Species impact thresholds.

6.2.3 Methods

The analysis of potential impacts considered construction- and operation-related effects of the Proposed Project and No Action Alternative on biological species and habitats in the study area. The analysis considers the effects of constructing the complete project; however, the Port and AGP may construct project elements in phases. Any major differences in the Proposed Project would be re-evaluated as appropriate. The analyses were primarily qualitative and based on review of available information including field surveys of the Project Area or near the Project Area, previous regulatory documents for proposed projects near the Project Area, publicly available habitat mapping, species-specific studies and information, lists of state and federal threatened and endangered species, and lists state PHS. Quantitative analysis was used to determine the amount and type of habitat that could be affected because of the Proposed Project. If available, field surveys and delineations were used to define the type and quantity of habitat that would be affected by the Proposed Project (WSP USA 2019; HDR 2022). Other study area habitat types were defined based on the Washington Natural Heritage Program (WNHP) Ecological Systems of Washington State map layer and guide (WDNR 2015, 2019). WNHP habitat types are commonly used for biodiversity conservation and management planning purposes (WDNR 2015).

6.3 No Action Alternative

Under the No Action Alternative, the Port and AGP would not complete any of the proposed improvements. For the purposes of this analysis, it is assumed the Port would not make significant infrastructure improvements and AGP would not complete the AGP Project at Terminal 4B. AGP would continue to maximize its operations at the existing T2 facility although existing infrastructure cannot accommodate the increased demand for AGP services. The Port has included several upgrade and maintenance projects in their approved Capital Budget Plan for 2023 to 2028, including the fender system replacement, pile cap repairs, and repairs to the seawall approaches.

Under the No Action Alternative, the Port would continue to pursue implementation of their approved Capital Budget Plan; however, because it is not presently funded or permitted, fender system replacement under the No Action Alternative is not considered to be reasonably foreseeable. Port operations over the next 20 years are assumed to largely continue similar to existing conditions, as described in the *Project Description Technical Report* (Anchor QEA 2023b).

Under the No Action Alternative there would be negligible impacts to species and habitat relative to existing conditions because it is assumed the Project Area would remain the same and operations would continue at a similar level. However, the Port would also pursue growth opportunities within the existing terminal footprint, which may include expansion of industrial and commercial activities at existing facilities that are not at capacity and that could have the potential to result in impacts to biological resources.

6.4 Proposed Project

This section describes the direct and indirect impacts that would occur as the result of construction and operations of the Proposed Project. Project impacts to federally listed species, their critical habitat, and EFH are assessed in the *Biological Assessment* (Anchor QEA 2022).

6.4.1 Construction

Construction for the Proposed Project is estimated to last approximately 18 months, with project elements beginning sequentially between April and June 2024 as described in Section 5 of the *Project Description Technical Report* (Anchor QEA 2023b). Terrestrial and aquatic habitat impairments include increases in disturbance, including from in-air and underwater noise and vibration, decreases to water quality, and decreases to air quality. Decreases to water quality could occur because of stormwater runoff and operational leaks and spills. Decreases in air quality would occur because of increased transportation emissions. Potential construction impacts to terrestrial habitat would be low. This is because the majority of construction impacts would occur in previously developed areas and no undeveloped habitat areas would be converted for project use. Potential construction impacts to aquatic habitat would be low to medium. This would include medium impacts to WDFW priority instream habitat for coho salmon, Chinook salmon, steelhead, and coastal cutthroat trout.

Direct killing, injury, and disturbance of aquatic and terrestrial species, including special status species, has the potential to occur because of Proposed Project construction. Direct killing of plant species could occur to riparian and plant species during rail crossing upgrades from excavation and fill. Based on wetland and stream delineation in the Project Area these are not expected to be listed or special status plant species.

Direct killing or acute noise injury of wildlife species could occur from impact pile-driving noise. Fledgling birds and bats in the immediate Project Area would be most sensitive and impacts could

be low to medium depending on the species. While sensitive bird species are not expected to occur in the Project Area or Project Area offset, a state-sensitive bat species could occur. The Port commits to the mitigation measures listed in Section 7 to survey the Project Area for sensitive species and remove potential habitat before pile driving to avoid this impact.

Similarly, death and acute injury to aquatic species could occur from underwater noise from impact pile driving. Impacts could be low to medium depending on the species but could be reduced by use of silt and bubble curtains, a fish guidance net, and auditory deterrents around the construction site and implementing marine mammal monitoring during construction. While salmonids in the Chehalis Basin are not listed, the in-water work window of July 16 to February 14 is a period when the fewest salmonids have the potential to be present in the study area. Wildlife could also experience effects of increase air pollution and emission during construction, but the impact is expected to be low.

6.4.1.1 Habitat Impacts

Potential habitat impacts during construction could occur as the result of temporary impacts, including habitat loss, reduced water quality, increased air pollution, and increased noise and vibration. Project impacts to federally listed species, their critical habitat, and EFH are assessed in the *Biological Assessment* (Anchor QEA 2022).

Habitat Loss

There would be no impacts from permanent habitat loss because no undeveloped areas would be converted for project use. The terrestrial portion of the On-Site Project Area would experience disturbance from increased activity during construction, including increases in vehicle traffic and equipment use. These disturbances would be short-term and temporary and would occur in previously developed areas and low-quality habitats that are high-disturbance under existing conditions. Therefore, impacts to terrestrial habitat in the Project Area would be low.

Temporary loss of Fry Creek and East Terminal Way Ditch instream aquatic habitat could occur during construction of a new rail bridge as part of the Rail Upgrade and Site Improvements element of the project. Fry Creek is considered a fish-bearing stream and it would be temporarily unable to provide instream fish habitat and fish passage between upstream and downstream habitat during removal of the existing culvert and construction of the new bridge. East Terminal Way Ditch is not considered to be a fish-bearing stream, but fish are known to be present. Because the loss of habitat would be temporary the impact is low.

During construction, there would be a temporary increase in overwater cover from the work barges in Grays Harbor and the tug used to move them, which are expected to operate for approximately 8 months. The temporary additional overwater cover would reduce the quality of existing juvenile salmonid habitat because it creates darkened areas for predators to lurk. Project Area ports, where barges would most likely be present, are low-quality salmonid habitat under existing conditions. The

barges would further degrade the habitat but would have a short-term temporary presence resulting in a low impact.

Reduced Water Quality

Construction has the potential to temporarily affect water quality. This includes effects to WDFW priority instream habitat for coho salmon, Chinook salmon, steelhead, and coastal cutthroat trout. Construction would require in-water work and upland disturbance that could affect water quality through stormwater discharge, accidental spills and leaks, and increases in turbidity from erosion. Elements of the project that result in reduced water quality include construction of a new rail bridge at Fry Creek, construction of a new railcar receiving facility, filling the former casting basin and upgrading surface treatments to create a new cargo laydown yard, dock upgrades required to support new shiploaders, and construction activities within and over surface waters and at nearby upland areas. Construction of these project elements has the potential to result in accidental discharge of chemical contaminants, construction and demolition debris, and/or sediment loads to surface waters of the study area, including to state priority habitats.

Project construction may generate excess turbidity in the in-water portion of the study area during construction of the bridge over Fry Creek, roads and stormwater facilities, culvert extension/replacement, and/or dock demolition/removal and upgrades and installation of the pile-support foundation. Upland improvements that include ground-disturbing activities may also result in erosion of sediment that could potentially be introduced to adjacent waterways increasing turbidity in aquatic and wetland habitat.

Impacts to aquatic habitat could also occur if there is an accidental spill of uncured concrete used during construction or if uncured concrete is washed into surface waters during truck cleaning. The pH of freshwater is normally between 6.5 and 8.5, but concrete spills can cause very alkaline water with a pH of up to 13 (WDFW 2009). Uncured and new concrete could raise the pH of water that comes into contact with it up to a pH of 12 or 13, which is highly alkaline (WDFW 2009). Because fish generally have a narrow range of pH preference, any water contaminated with concrete stormwater runoff would temporarily be unable to function as aquatic habitat (WDFW 2009).

Direct and indirect stormwater impacts during construction will be mitigated through implementation of temporary erosion and sediment control BMPs required under the Ecology National Pollutant Discharge Elimination System construction permitting process. As such, impacts related to stormwater, erosion, leaks, and spills during construction is expected to be low. Impacts to water resources are described in more detail in the *Water Resources Technical Study* (Anchor QEA 2023a).

Air Pollution

Terrestrial, aquatic, and wetland habitats in the study area would be impaired during construction because of increased air pollution. While direct effects of increased air pollution would be temporary

and short-term, indirect effects of increased air pollution could be long-term. For example, settling components of air pollution contribute to soil acidification, surface water acidification, and surface water eutrophication (i.e., excessive nutrients), potentially altering the community of species these habitats can support (Lovett et al. 2017). Estimated air emissions are presented in the *Air Quality and Greenhouse Gas Technical Study* (Anchor QEA 2023c). Although the overall emissions would have a low impact on air quality, air pollution caused by construction has the potential to disperse outside of the study area, to sensitive habitats such as eelgrass beds and the Grays Harbor National Wildlife Refuge. This could cause habitat impairment, which would result in a low impact. Impacts to eelgrass beds are described in Section 6.4.1.3.

In-Air Noise and Vibration

The in-air noise analysis considered impact pile installation to be the loudest component of project construction and would be 110 dB at 50 feet from the source increased noise and vibration would make habitat less suitable for sensitive species, such as birds and bats. Because the impairment would be temporary and short-term and the project is in an industrial area with elevated ambient noise levels, the impact to terrestrial habitat from increased noise and vibration would be low.

The Grays Harbor National Wildlife Refuge is located 4 miles from the Project Area and is outside the study area. This area would not experience noise levels above existing conditions during construction because construction-related noise and vibration is not expected to have an impact beyond the 0.5-mile radius established for the terrestrial component of the study area. Other noise and vibration impacts, including those to human receptors, are evaluated in the *Noise and Vibration Technical Study* (HDR 2023).

Underwater Noise and Vibration

The underwater noise analysis considered impact pile installation to be the loudest component of project construction (210 dB peak, and 193 dB RMS measured at 10 meters from the source) and calculated that noise would extend through the lower Chehalis River and Grays Harbor as show in Figure 1 and described in Section 6.1.

In-water construction would impair aquatic habitat through increased noise and vibration such that the habitat is unable to support normal use by local aquatic species. The impairment would result from in-water work on T4 Dock Fender and Stormwater Upgrades and AGP Project occurring for up to 8 months at a time during the in-water work window from July 16 to February 14. Because noise and vibration would cause temporary disturbance to habitat and would not permanently alter priority habitat, the direct impact to aquatic habitat is low.

Because noise and vibration would be transmitted across the entire mouth of the Chehalis River, project construction could impair the ability of aquatic habitat to provide upstream and downstream fish passage. This is because it is assumed that fish would avoid this area while in-water construction

is occurring. Migratory adult fish, such as salmon and lamprey, have the potential to be returning from the ocean and entering the lower Chehalis River during the July 16 to February 14 in-water work window. Adult fish are larger and would be less susceptible to injury from noise than juvenile fish. Outmigrating juvenile salmonids and lamprey could also be present and are more susceptible to noise levels. However, the in-water work window is timed to reduce the likelihood of juvenile fish being present. Because the impairment of aquatic habitat resulting in reduced fish passage is temporary and short-term, this is considered a low impact to habitat. Impacts to species from underwater noise and vibration are described in Section 6.4.1.2.

6.4.1.2 Plant and Wildlife Species Impacts

Potential plant and wildlife impacts during construction could occur as the result of temporary impacts, including direct disturbance, reduced water quality, increased air pollution, and increased noise and vibration. Project impacts to federally listed species, their critical habitat, and EFH are assessed in the *Biological Assessment* (Anchor QEA 2022).

Disturbance

Construction would result in direct disturbance, injury, or killing of plants or wildlife species. Although no undeveloped habitat areas will be converted for project use, plant and wildlife species could be killed during rail crossing improvements at Fry Creek, East Terminal Way Ditch, and Wetlands 1 through 9 (Anchor QEA 2023a). Plant species would be killed during excavation and trampled by construction equipment and vehicles. There is also the potential for aquatic species to be disturbed during construction.

Based on wetland and waterway delineations in the Project Area, plant species are primarily common wetland and terrestrial species, including noxious weeds such as reed canary grass (HDR 2022). No state priority, rare, or culturally important species are expected to be present in the construction areas. To discourage the return of noxious weeds and restore native riparian and wetland plants that would support fish and other native wildlife species, a post-construction vegetation management strategy is proposed as mitigation in Section 7.

Soil and surface associated invertebrates, such as insects, spiders, and worms, could also be injured or killed during construction activities. Flying insects such as bees and butterflies would be able to move away from the immediate construction area. No special status invertebrates are expected to be present in the Project Area.

Juvenile salmonids and non-salmonid fish such as stickleback have the potential to occur in Fry Creek and East Terminal Way Ditch (WDFW 2021, 2022c). Work areas would be isolated from the rest of the waterway and fish would be removed from the isolated areas prior to construction. Fish would be at risk of entrainment and stranding during the dewatering process if water is removed too quickly.

However, it is expected that prior to dewatering, as many fish as possible would be relocated. Overall, impacts to species from direct injury or killing in the Project Area would be low.

Over 300 bird species, including native migratory bird species protected under the MBTA have the potential to be present in the Project Area, especially near waterways and in open areas such as the proposed laydown area near Cow Point. These include ground-nesting species and species that forage on the ground. Adult birds and migratory bird species would be able to avoid construction disturbance and activities by moving to other nearby habitats, however any nests present may be disturbed or destroyed.

Bats have the potential to be present in the Project Area because some bat species prefer to roost in manufactured structures such as building eaves and rafters, bridges, and culverts (WDFW 2004; CalTrans 2016). If present, bats could be injured or killed during construction activities such as the tear-down of existing structures; therefore, the potential impact to more common bats would be low to medium. Impacts to state-sensitive Yuma myotis are discussed in Section 6.4.1.3. Mitigation to reduce this impact is suggested in Section 7.

As described in Section 5.5.1, other terrestrial wildlife species with the potential to be in the Project Area include raccoons, deer, coyotes, skunks, and squirrels. These species are generally less active during the day when construction would occur and would be able to move away from construction disturbance to nearby unaffected habitats. Impacts from direct disturbance, killing, or injury to these species would range from no impact to negligible.

Reduced Water Quality

Impacts to aquatic habitat caused by in-water work and upland disturbance that could affect water quality through stormwater discharge, accidental spills and leaks, and increases in turbidity from erosion are described in Section 6.4.1.1. Those habitat impacts could adversely affect aquatic species in Fry Creek, East Terminal Way Ditch, and Grays Harbor near the Project Area. In the short term, turbidity in the water from upland erosion could block or damage fish gills and smother less-mobile species, such as bivalves or benthic macroinvertebrates, that are present (WDFW 2009). Aquatic species in the Project Area could also be affected if there is an accidental spill of fresh or uncured concrete into the water. Concrete spills causing very alkaline water can result in the direct killing of fish that often have a narrow range of pH tolerance (WDFW 2009). In rainbow trout, severe physiological effects occurred at a pH above 8.4 and mortality occurred at a pH of 9.3 (WDFW 2009). Contaminant spills and leaks can also cause physical damage, changes in behavior, and dispersal through the food web causing long-term exposure through bioaccumulation (Wenger et al. 2017). Spills and leaks could also cause direct killing if the spill or leak is very nearby. Storm events during construction could increase the risk that aquatic species would be exposed to increased turbidity or contaminants, which could affect their condition and survival. However, BMPs would be put in place

during construction to manage stormwater and erosion and reduce the likelihood that a spill or leak would occur.

A number of aquatic species, including adult and juvenile fish, aquatic and marine invertebrates (e.g., clams and crabs), and marine mammals have the potential to be present in the Grays Harbor study area as described in Section 5.5.2 and 5.5.3. Highly mobile species, such as fish and marine mammals would have the ability to quickly move away from unfavorable water quality conditions. Therefore, the impact to highly mobile species from stormwater, spills, and leaks is expected to be low.

Low mobility and non-mobile species include shore crabs, clams, mussels, and barnacles. Freshwater mussels are unlikely to be present near the Project Area because brackish conditions are not a documented habitat (Nedeau et al. 2009). During a site visit by Anchor QEA on October 14, 2022, barnacles were observed attached to boat structures at the 28th Street Boat launch just outside the Project Area (Anchor QEA 2022). No other attached invertebrates, such as marine mussels or oysters were observed. The shoreline in the vicinity of the Project Area is primarily armored, but some sandy areas occur between Terminal 2 and Terminal 4B. Intertidal invertebrates such as clams, burrowing shrimp, and fish such as the Pacific sand lance are potentially present in these areas and shore crabs can be found along both sandy and rocky shorelines. Pacific sand lance are normally free swimming but become less mobile when they come to shore to spawn (WDNR 2014). Because of their location along the shoreline and low mobility, intertidal species would be at risk for injury from any construction-related contaminants or reductions in water quality, which is considered a medium impact. However, with the implementation of project BMPs for stormwater management and spill and erosion prevention, impacts could be reduced to low. Impacts to Pacific sand lance, a Washington State priority species, are described in more detail in Section 6.4.1.3.

Dungeness crab, red rock crab, and the invasive European green crab may also be present throughout subtidal areas of the Grays Harbor, including in the study area adjacent to the Project Area. Adult Dungeness crabs are mobile species that are known to commonly move up to 20 kilometers (12 miles) and could potentially avoid areas of low water quality (Rasmussen 2013). However, in other Pacific Northwest working harbors, red rock and Dungeness crab are common near high human-use areas and are known to accumulate high levels of chemical contaminants (Eikenhoff et al. 2003; Ikonomou et al. 2002). Stormwater, spills, and leaks from project construction could contribute to the total levels of contaminants to which crabs are exposed. Similar to other aquatic species described above with implementation of project BMPs, impacts to crabs would be low. Because Dungeness crabs are commercially important state priority species, impacts to this species are further discussed in Section 6.4.1.3.

Species present in instream habitat located in the Project Area may also be affected by reduced water quality. Juvenile fall-run Chinook salmon, Coho salmon, Rainbow trout (steelhead and resident), and sea-run coastal cutthroat are presumed to be present in Fry Creek (NWIFC and

WDFW 2022; WDFW 2022c). Stickleback fish and crabs are documented in East Terminal Way Ditch and juvenile Chinook salmon, Coho salmon, and trout are presumed to be present (WDFW 2021). Because these are small waterways, erosion of upland sediment, stormwater inputs, spills, and leaks have the potential to reduce water quality. However, work areas would be isolated from the rest of the stream and fish would be removed from the isolated areas prior to construction. Therefore, the impacts to fish and other aquatic species in small waterways in the Project Area from reduced water quality during construction are expected to be low.

Stormwater, spills, leaks, and increased erosion from construction have the potential to affect aquatic and wetland vegetation located in the Project Area and nearby study area. Most vegetation in wetlands and waterways in the Project Area consist of common, fast growing, or non-native plant species. While injury or killing of these plant species could occur, they would be likely to become reestablished after construction, so impacts to wetland and aquatic plant species is low. Rockweed (*Fucus vesiculosus*) is the primary species observed along the shoreline and present in some areas along the Grays Harbor shoreline of the Project Area; however, it was not observed near T4 where in-water work will occur during a site visit (Anchor QEA 2022). Because the shoreline near T4 is primarily armored with little aquatic vegetation, impacts from reduced water quality during in-water work to aquatic vegetation likely to be found in the Project Area would be low. Macro-algae, aquatic plants, and wetland plants present in the Grays Harbor portion of the study area could potentially be affected by increased contaminated stormwater runoff and on-water spills during construction. The risk of such events would be reduced by implementation of BMPs for managing stormwater and prevention of spills. Therefore, the impacts to aquatic and wetland plant species in the Grays Harbor study area during construction are expected to be low.

Air Pollution

During construction, an increase in air pollution would occur as described in Section 6.4.1.1. Birds are known to be susceptible to air pollution and can result in direct damage to bird respiratory systems (Liang et al. 2020). Ozone pollution in particular can inhibit growth rate and biomass of plants and trees, reduce the number of plant species, chemically impede plant–pollinator interactions, increase plant susceptibility to damage and disease, alter soil microbial communities, and lower arthropod abundance (Liang et al. 2020). Because of the temporary and short duration of construction air pollution above existing conditions, it is expected that impacts to terrestrial species from direct injury or loss of prey species would be low.

Air pollution can also have an effect on aquatic species. As described in Section 6.4.1.1, settling air pollution can lead to surface water acidification and surface water eutrophication, which can in turn affect the aquatic species that are present. For example, acidification (pH below 6.5 to 8.5) can inhibit upstream migration and decrease survival for salmonids, particularly smolts (WDFW 2009). Low pH can also make it more difficult for marine invertebrates to grow shells and skeletons (Parks 2005;

NOAA 2021). Surface water eutrophication can result in proliferation of harmful algae and low-oxygen conditions that can kill fish and eelgrass (NOAA 2022). These effects to aquatic species take time to develop and likely would not occur during construction, so impacts to aquatic species directly caused during the period of increased air pollution would be low.

In-air Noise and Vibration

As described in Section 6.4.1.1, intermittent and temporary in-air noise and vibration would occur during construction from pile-driving activities. Lower-level increased noise conditions may be present more continuously during work hours from increased vehicle traffic and use of construction equipment.

Not all wildlife species respond the same way to similar sound sources, although wildlife response to construction noise can generally be described as harassment or harm. Harassment would include such responses as area avoidance and disturbance to feeding, nesting, and roosting. Harm would result in the direct injury or mortality of individuals and would likely only result if wildlife are near pile driving or other high-noise-producing activities. Because construction noise would occur in an area that experiences high disturbance under existing conditions, the number of individuals present in the Project Area is expected to be low and acclimated to increased noise levels. Overall, because construction noise from pile driving and blasting could cause mortality or injury to non-special status species, this would result in a low impact to terrestrial wildlife.

As described above, there is a potential for bird nests in the Project Area. Birds present in Project Area are likely habituated to human activity but may still experience disturbance or injury when noise above ambient levels occurs. Due to their limited mobility, unfledged birds would be most likely to experience injury. Late breeding western grebe, brown pelican, black oystercatcher, bald eagle, and other bird species could still have fledglings from mid-July through mid to late October, after construction has started (USFWS 2023b). Spatial buffers of 650 feet to 1 mile from construction activity are suggested to prevent disturbance (Richardson and Miller 1997). For non-special status species, impacts to fledging birds could be low to medium.

Bald eagles also have the potential to begin nesting season in January or February before the end of in-water work. Disturbance from construction could cause adults to nest farther away than they would otherwise or to become habituated to the noise. While sensitive species are unlikely to occur within the study area, to reduce the likelihood of potential impacts to any birds nesting in the Project Area, pre-construction bird nest surveys and biological monitoring during construction are proposed as mitigation in Section 7.

Some birds that could be present in the study area forage in groups (i.e., mixed-species foraging flock) and use vocalizations as a social communication strategy. Elevated sound levels, such as those from project construction could mask these communications (USFWS 2013). However, mixed-species

foraging flocks would be unlikely to remain near noise disturbance from construction and would quickly move away from the Project Area so impacts would be low.

Potential effects to bats from construction noise and vibration include acute acoustic trauma, disturbance, and displacement from important food and shelter resources (CalTrans 2016). Acoustic trauma can be a very serious effect because bats depend on echolocation and passive listening for both immediate and long-term survival. Because pile driving will occur during the day, it should not affect bat foraging flights at night. Depending on species presence, impacts could be low to medium. Impacts to state-sensitive Yuma myotis are discussed in Section 6.4.1.3. To reduce the likelihood of impacts to bats roosting in the Project Area, pre-construction bat surveys, removal of any bats found, and biological monitoring during construction are proposed as mitigation in Section 7.

Underwater Noise and Vibration

As described in Section 6.4.1.1, elevated underwater noise would be produced by the Proposed Project, specifically during impact pile installation. Impact hammers used during pile installation produce short, intense, pulse-type sounds that can be isolated events or repeated in succession. These sounds have the potential to physically injure fish due to their relatively rapid rise in ambient pressure. This can cause a range of effects in fish, including brief acoustic annoyance, temporary or permanent loss of hearing, behavioral changes, stress, or pressure-related tissue injuries (Hastings and Popper 2005; Hedges 2011; Ruggerone et al. 2008; Popper and Hawkins 2019; WSDOT 2020). For example, a fish's swim bladder can be damaged by the rapid increase and decrease in pressure as a pulse of underwater noise passes (Halvorsen et al. 2011). Injuries can include bruising, bleeding, or a deflated or ruptured swim bladder (Halvorsen et al. 2011). Pulse noises can also temporarily stun fish (Hastings and Popper 2005).

Even when a noise and pressure-related injury is not immediately fatal to a fish, it can cause behavioral changes that reduce the chance of survival. For example, fish may change critical foraging behaviors or be less able to avoid predators (Anderson 1990; Popper and Hawkins 2019). Continuous sound can reduce a fish's ability to detect biologically important sounds and may make fish less able to avoid predators (Popper and Hawkins 2019). Continuous sound may also cause salmonids to avoid the sound source area (Carlson et al. 2001). This can cause juvenile fish to abandon rearing habitat or cause delayed migration in adults and juveniles. Overall, impacts to fish from underwater noise during construction would be short-term and temporary. Because construction noise would result in short-term increases that may disrupt normal behavior or are injurious to nearby individuals, the level of impact to non-special status species would be medium depending on the distance of the fish to the pile-driving location. Impacts to priority salmonid species are discussed further in Section 5.5.3.

A number of marine mammals have the potential to be present in Grays Harbor, as described in Section 5.5.2. Both impulsive and continuous (e.g., from vibrations) underwater noise can cause

disturbance and injury to marine mammals. Effects of underwater noise on marine mammals include hearing loss, changes to behavior, and masking of auditory communication (NMFS 2018). Similar to fish, impulsive sounds have characteristics that make them more likely to injure marine mammals. Because different frequencies are more or less harmful to different groups of marine mammals (NMFS 2018), the level of impact to marine mammals will depend on the frequency of the noise, the species that are present, and the distance from the pile-driving location. Because project construction would cause temporary or short-term increases in noise that may disrupt normal behavior or are injurious to nearby individuals, impacts on non-special status marine mammals could range from low to medium. To reduce the likelihood of direct impacts to marine mammals in Project Area, marine mammal monitoring during the in-water work window is proposed as mitigation in Section 7.

Marine mammals could also experience effects of noise and vibration from loss of prey during construction. For example, fish and other prey marine mammals feed on may not be located in the Project Area during construction because they would likely avoid disturbing noise and vibration. Because this is a temporary change to prey abundance that is not expected to impact overall species viability for non-special status species, this is considered a low impact. Impacts to special status marine mammals are described in Section 6.4.1.3. Changes to prey abundance could also contribute to cumulative impacts as described in Section 6.5.

Underwater noise and vibration also have the potential to affect crustaceans, such as crabs. Less is known compared to fish and mammals, but crabs are known to exhibit stress and bursts of locomotion in response to underwater noise (Wale et al. 2013; Edmonds et al. 2016). Additionally, the ability to detect underwater sounds and vibrations plays an important role in the orientation and settlement of some pelagic crab larvae (Edmonds et al. 2016). While adult crustaceans may be insensitive to underwater noises that could injure fish or mammals, continuous underwater noise, such as though vibration pile driving can disrupt the ability of crustaceans to sense predators or prey (Edmonds et al. 2016). Because construction noise may temporarily disrupt normal behavior, impacts to crustaceans would be low. Impacts to Dungeness crabs are described in Section 6.4.1.3.

As described above, a high number of bird individuals and species have the potential to forage and hunt in Grays Harbor. Under existing condition, the area around the Port is noisy with ship and human activity such that hunting or foraging near this part of inner Grays Harbor is unlikely, particularly during in-water construction. However, if any individuals were to enter the water during a pile-driving sound pulse they could be susceptible to harm from underwater noise. However, the bird would have to enter within close proximity of the in-water work at the time that a pile-driving pulse occurs. As such, the impacts to birds from underwater noise would be low.

6.4.1.3 Special Status Plant, Wildlife, and Habitats Impacts

Special status species and habitats occur in the study area and have the potential to experience direct killing, disturbance, injury and degradation because construction of the Proposed Project. State-listed species and habitats most likely to experience impacts are described below. Project impacts to federally listed species, their critical habitat, and EFH are assessed in the *Biological Assessment* (Anchor QEA 2022).

State-Listed Species

Two state-listed birds, sandhill crane and common loon, have the potential to be present in the study area during construction. As described in Section 6.4.1.2, birds could experience disturbance or injury from in-air noise, disturbance from increased activity, and increased air pollution during construction. Adult sandhill crane and common loon are unlikely to experience mortality from construction activities because disturbances are short-term and temporary, and birds are highly mobile and could move to nearby unaffected habitats in Grays Harbor. Sandhill crane nests are unlikely to occur in study area because their breeding habitat has not been documented to occur (Fink et al. 2022). Common loon have the potential to nest in Grays Harbor (Fink et al. 2022), however they would be unlikely to nest in the immediate Project Area and offset area because their nesting habitat of marshy areas and aquatic vegetation mats (WDFW 2023a) does not occur. Therefore, impacts to sandhill crane and common loon would be low.

Some state-listed species, including fishers, western gray squirrel, and mardon skipper are unlikely to occur in Project Area because their preferred habitat types are not present. These species could be present but have not been documented near the Project Area. If present, fishers, western gray squirrel, and mardon skipper could experience similar disturbance from short-term intermittent noise and vibration similar to other small and mobile mammals; therefore, impacts would be low.

State-sensitive Olympic mudminnow are not documented in the Project Area waterways or wetlands and are unlikely to be present in Grays Harbor because of its intolerance to salinity, but the species is documented as present in surrounding wetlands and streams. Because of their location outside the study area, impacts to Olympic mudminnow would be low.

State-sensitive bat species *Yuma myotis* has the potential to occur in the Project Area because it is known to roost in human structures and prefers areas near water. Direct killing of this species could occur during tear-down or removal of existing structures on the project site during construction. Severe injury can occur to bats from in-air noise related to pile driving as described in Section 6.4.1.2. Because killing of *Yuma myotis* could potentially reduce species viability, this has the potential to be a medium impact. The Port and AGP commit to the mitigation measures listed in Section 7 to survey the Project Area for sensitive species and remove potential habitat before pile driving to avoid this impact.

State Priority Species and Habitats

Washington State priority species Dungeness crab likely range widely in the harbor and a portion of the state priority commercial harvesting area overlaps with the study area. Due to the short-term temporary nature of project construction impacts and the ability of Dungeness crab to range over large distance and move away from project activities, the impacts to this species would be low.

Pacific sand lance are Washington State priority species that return to spawn on sandy intertidal beaches between November and February when in-water construction is scheduled to occur (WDNR 2014). Sandy intertidal areas occur east and west of the Project Area and between T1 and T4 in the Project Area. Therefore, returning adult Pacific sand lance could be exposed to underwater noise from pile driving. Because of the relatively small size of this fish (adults grow to approximately 8 inches in length; WDNR 2014), individuals could experience injury or death if they were in the vicinity of the in-water work. Additionally, sand lance eggs incubate from approximately 4 weeks, at which point tides and currents disperse the larval fish (approximately 1 inch in length) into the water column. Because of their small size, larval Pacific sand land are considered free-floating and would be unable to disperse from the Project Area of their own volition. Although Pacific sand lance is a priority species, it is not currently endangered or threatened, and impacts are considered medium.

Adult Chinook salmon, Coho salmon, Chum salmon, steelhead, sea-run coastal cutthroat, and trout and their priority habitat are present in the study area and juveniles could be present in the Project Area as well. Juvenile salmonids that are present in Fry Creek or East Terminal Way Ditch in the Project Area would be removed from the isolated construction area before work begins but could be impinged or killed during water removal if pumping rates are too high. The project-related effects described in Section 6.4.1.1 would degrade priority habitat for salmonids and result in low to medium impacts. Underwater noise from impact pile driving could cause disturbance, injury, or killing of salmonids depending on their size (adult or juvenile) and distance from the work area. The in-water work window is a period when the fewest salmonids have the potential to be present, however some species and life stages of salmonids are likely to be present in the study area nearly year-round. As described in Section 5.5.3, salmonid runs that originate in the upper and lower Chehalis Basin are considered state priority species for their commercial, tribal, and cultural importance but are not listed as threatened or endangered. Therefore injury, disturbance, or killing of salmonids would be a low to medium impact.

The location of the in-water work will cause underwater noise to span the mouth of the lower Chehalis River and could result in delayed migration of adult and juvenile salmonids if fish avoid this area. While salmonids have the potential to be present nearly year-round, the in-water work window is timed to reduce the likelihood of juvenile fish being present. Delayed migration can cause salmonids to experience poorer downstream or upstream conditions such as warmer temperatures and lower flows, increase exposure to predation, change the timing of food availability, and potentially reduce

ocean survival (Freshwater et al. 2016; Marschall et al. 2011). Because this would be temporary reduction in fish passage that would not affect species viability, this is considered a low impact.

A number of state priority and state candidate bird species are expected to occur in the study area as presented in Appendix B, Table B-1. These bird species could experience disturbance or injury similar to other birds described in Section 6.4.1.2. Because effects from project construction would be short-term temporary and are not expected to affect species viability, impacts would be low to medium.

There is the potential for low indirect effects to eelgrass bed habitat from stormwater runoff from the Proposed Project. Impacts to eelgrass beds would be low because BMPs for stormwater management and erosion prevention would be implemented. In addition, eelgrass beds could experience long-term indirect effects from increased settling of air pollution caused by the project. While the impact from air pollution above existing conditions during construction of the Proposed Project would be low, there could be long-term or cumulative impacts as described in Sections 6.4.2 and Section 6.5.

Marine Mammals

State-listed northern sea otter could be present in the study area, but their presence would be limited because their preferred habitat does not occur. State candidate species Pacific harbor porpoise and state priority species harbor seal have the potential to occur in the study area. Stellar sea lions may also be present but are not a special status species. As described in Section 6.4.1.2, underwater noise has the potential to result in disturbance or injury to marine mammals depending on species, noise characteristics, and distance. Because of the short-term temporary duration of underwater noise from construction, and because effects would be unlikely to reduce viability of these two species (WDFW 2023a; NatureServe 2023), impacts to Pacific harbor porpoise and harbor seal would be medium. Impacts to marine mammals during construction would be reduced by implementing a marine mammal monitoring program as described in Section 7.

6.4.2 Operation

As described in *Project Description Technical Report* (Anchor QEA 2023b), the analysis of operations considers a 20-year period starting in 2025. Over this time period, vessel and rail traffic in the study area are expected to increase as described in Section 6.1.

Terrestrial and aquatic habitat impairments that could occur because of project operations include increases in disturbance, including from noise and vibration, decreases to water quality, and decreases to air quality. Decreases to water quality could occur because of stormwater runoff, operational leaks and spills, and increased vessel scour and propwash. Decreases in air quality would occur because of increased transportation emissions. Operational leaks and spills could also cause degradation of terrestrial habitat along the rail corridor.

Injury, mortality, and disturbance could occur to terrestrial and aquatic species, including special status species, in the study area because of Proposed Project operations. In the long term, the increased operations increase the likelihood of wildlife strikes by vessels or trains. There would also be a long-term increase in disturbance to aquatic wildlife from the increase in frequency and duration of underwater vessel-related noise in Grays Harbor and vessel effects such as increased turbidity from propwash. Along the rail corridor portion of the study area, terrestrial species would experience a long-term increase in disturbance from increased frequency or duration of noise and vibration. Railway vibrations propagating from land to water could also disturb aquatic species in habitats adjacent to the railway. Aquatic and terrestrial species would also experience long-term increases in air pollution and emissions, which can have individual and population level effects. Overall, the impacts to wildlife species range from negligible to medium.

6.4.2.1 Habitat Impacts

Disturbance

In the long term, some habitats in the study area would experience increased disturbance and degradation related to increased vessel traffic, rail traffic, and human activity. Increases to the frequency of habitat disturbance may lower overall habitat quality and reduce the ability of the habitat to support some of its associated species relative to existing conditions. Because aquatic and terrestrial habitats in the study area are high-disturbance under existing conditions, this impact is low.

Impacts to Project Area wetlands during operations are discussed the *Water Resources Technical Study* (Anchor QEA 2023a). Over time increased operations (e.g., higher intensity of use) in the study area could contribute to lower quality of the overall habitat mosaic (e.g., the patchwork of surrounding habitats).

Reduced Water Quality

The increased vessel traffic that would occur during operations would increase the risk that an on-water fuel spill could occur. Similarly, the increase in rail traffic would increase the risk that derailments and fuel spills in the rail corridor portion of the study area could occur. Impacts from the spill would be minimized by implementing the Port's and PSAP's hazardous spill prevention BMPs and response plan, which are required by Washington state regulations. Therefore, increased risks would be low.

Increased operations in the Project Area could increase the likelihood of contaminant sources to harbor waters, either through spills and leaks, or from upland stormwater runoff. However, the Proposed Project is expected to result in a net beneficial effect to stormwater quality because proposed stormwater improvements will be designed and constructed to updated codes to collect and convey stormwater runoff from the wharf to landside treatment facilities. All future stormwater

will be treated before entering the harbor. Water quality in Fry Creek and East Terminal Way Ditch would also be improved because of the stormwater management system upgrade. The *Project Description Technical Report* (Anchor QEA 2023b) provides additional description of stormwater upgrades.

Increased vessel traffic that would occur during operations could also decrease water quality in the study area because of increased propwash or vessel scour. Vessel maneuvering can resuspend bottom sediments increasing water turbidity and potentially redistributing any previously settled contaminants around the harbor (Hayes et al. 2006). The potential for increases in contaminated sediment from working Port areas being redistributed around the harbor could result in impacts; however, impacts are anticipated to be low because the dredging of the berths at the Port to depths of 41 feet and the common practice for vessels of transiting in out of the port during high tides to increase depth and take advantage of currents. Alternative maneuvers to reduce ship scour have been proposed (Castells-Sanabra et al. 2021) and could be implemented by the Port to reduce vessel scour and sediment redistribution.

Air Pollution

There is expected to be an increase in emissions above baseline conditions during operations of the Proposed Project (Anchor QEA 2023c). This increase is expected to be below the prevention of significant deterioration (PSD) thresholds. As described in Section 6.4.1.1., air pollution can have negative effects on both aquatic and terrestrial habitats. Settling air pollution has the potential to cause long-term degradation of habitats in the study area. Because the increase is expected to remain under the PSD thresholds and total greenhouse gas emission would be just under the mandatory Washington State greenhouse gas reporting threshold during the operational period, the impact would be low.

In-Air Noise and Vibration

Operational in-air noise and vibration at the Port would generally be similar to existing conditions; however, there would be an increase in noise at the northeast corner of the Port where trains would be entering Port property. As noted previously, habitat quality in the vicinity of the Port is low and already largely developed. Therefore, this increase would have a low impact on habitat quality.

Rail traffic in the rail corridor portion of the study area is expected to increase by approximately 300 round-trip trains per year, or approximately 1.7 train passbys per day. Increased train traffic has the potential to result in increased noise, particularly at at-grade rail crossings where trains are required by law to sound their horns. However, train noise would be intermittent and would continue to occur in areas that already experience noise from existing train traffic. Therefore, rail operations would result in a low impact on habitat. Additional information on noise is presented in the *Noise and Vibration Technical Study* (Wilson Ihrig 2023)

Underwater Noise and Vibration

In the navigation channel portion of the study area, there would be impacts from increased underwater noise and vibration associated with increased vessel traffic. Shipping noise is considered the most pervasive source of human-caused underwater continuous noise and local intermittent noise (Syrjälä et al. 2020). Pervasive noise changes the underwater acoustic environment and has been recognized as a pollutant to underwater environments (UNGA 2018). Given existing vessel use at the Port, the number of additional vessel trips associated with the Proposed Project is not likely to create noise that is measurable above baseline conditions. However, the overall number of one-way noise-making vessel trips through the harbor would go from approximately 5 per week (fewer than one per day) to approximately 7 per week (one per day). Species may rely on the time when habitat is quieter to find food, avoid predators, choose mates, and navigate (Williams et al. 2015). Because there would be a permanent increase in habitat degradation, this would be a medium impact. An increase in the duration or frequency of underwater noise in the harbor would be an incremental increase in degradation in an already permanently degraded habitat because of existing Port operations and is therefore evaluated under cumulative impacts.

6.4.2.2 Plant and Wildlife Species Impacts

Disturbance

Increased vessel traffic and rail traffic would result in an increased risk of wildlife strikes. All sizes of vessels have the potential to collide with nearly any marine species (NOAA 2023b). Most reported collisions involve large whales, seals, or sea lions. Strikes to smaller species may occur but go unreported because they are not noticed by the vessel operator (NOAA 2023b). These strikes may result in the injury or death of the animal. Similarly, an increase in train strikes of wildlife could occur because of increased rail traffic. Train strikes of ungulates are common, but strikes with mammals such as bears, lynx, rodents, and opossums occur (Borda-de-Água et al. 2017). Birds, including waterfowl, gulls, and raptors, and amphibians also make up a substantial portion of reported train strike mortality (Borda-de-Água et al. 2017). The level of impact would depend on the species and if the increased mortality would affect species viability. For abundant and widespread species, vessel or train strikes resulting from increased project traffic would be a low impact.

Reduced Water Quality

As described in Section 6.4.2.1, increased vessel traffic increases the risk for on-water fuel spills. Similarly, increased railway traffic increases the risk of train accidents and fuel spills along the rail corridor. The level of effects to plant and wildlife species would depend on the size and location of the potential spill. Impacts from the spill would be minimized by implementing the Port's and PSAP's hazardous spill prevention BMPs and response plan, which are required by Washington state regulations. Therefore, increased risks would be low.

As described in Section 6.4.2.1, some aspects of water quality would improve because of project-related upgrades to the Port stormwater management system. This would be a beneficial effect to aquatic species in the study area and throughout Grays Harbor because upland sources of contaminants, warm water, and nutrients would be reduced. Improvements to the Port's stormwater management system would also improve habitat for fish, including salmon, and other aquatic species in Fry Creek and East Terminal Way Ditch.

High turbidity and contaminant resuspension from increased vessel scour could occur during operations. As described in Section 6.4.1.2, these changes can have detrimental effects to aquatic species. Over time, routine increases in turbidity could give advantages to invasive fish species that like to lurk in high turbidity areas. If there was a permanent change in invasive fish species abundance this could be a medium impact. However, alternative maneuvers to reduce ship scour have been proposed (Castells-Sanabra et al. 2021) and could be implemented by the Port to reduce increases in turbidity.

Air Pollution

As described in Section 6.4.1.2, increased air pollution can have harmful effects on a variety wildlife and plant species, species interactions, and species community composition. During operations the increase air pollution would come from vessels in the navigation channel portion of the study area, motor vehicle traffic in the Project Area, and trains in the Project Area and along the rail corridor portion of the study area. Rail and vessel transport would be the largest sources of emissions (Anchor QEA 2023c). This means that the increase in air pollution over existing operations would be emitted widely over approximately 65 miles. Therefore, the potential injury to species in any one area is low, resulting in low impact.

In-Air Noise and Vibration

Increases in in-air noise and vibration will primarily occur along the rail corridor portion of the study area, as described in Section 6.4.2.1. Human-caused transportation noise can be disturbing to birds, including MBTA-protected birds, frogs, and other species whose acoustic communications may be masked or inhibited. In addition to communication, noise and vibration can also affect behavior and physiology (Sordello et al. 2020). In comparison to road noise, railway noise is much more intermittent. The expected effects of increased railway disturbance depend on species sensitivity and the timing of migratory birds moving through the area. The level of impact would depend on the species and how the increased disturbance would affect species viability. For most species there would be a low impact.

Underwater Noise and Vibration

As described in Section 6.4.2.1, increased vessel traffic during operation would result in underwater noise more often in Grays Harbor. Species may rely on the time when habitat is quieter to find food,

avoid predators, choose mates, and navigate (Williams et al. 2015). The level of impact would depend on the species and how the increased disturbance would affect species viability. For most species there would be a low impact.

6.4.2.3 Special Status Plant, Wildlife, and Habitats Impacts

Special status species and habitats occur in the study area and have the potential to experience direct killing, disturbance, injury, or degradation because operation of the Proposed Project. Species and habitats most likely to experience impacts are described below.

State-Listed Species

Common loon could be present in the study area, especially in Grays Harbor. This species is expected to experience little increase in disturbance from noise and vibration related to project operations. Like other birds, common loon could be susceptible to project-related increases in air pollution, but these increases are expected to be small relative to existing conditions. Overall, impacts would be negligible to low.

Olympic mudminnow and northern sea otter also have the potential to be present in the study area near Grays Harbor. Norther sea otter are discussed with marine mammals below. Olympic minnow could also be present in aquatic habitats along the rail corridor portion of the study area. Olympic mudminnow are expected to experience little increase in disturbance from noise and vibration related to project operations. This is because Olympic mudminnow generally occur in off-channel freshwater habitat, rather than the main part of Grays Harbor where vessel traffic would occur. Along the rail corridor, Olympic mudminnow could experience increased frequency of intermittent short-term vibration disturbances from increased rail traffic that may disrupt normal behavior. Overall, impacts to Olympic mudminnow would be negligible to low.

Sandhill crane could be present in bird congregation areas that occur in the study area in Grays Harbor and along the rail corridor. These areas are migratory habitat for sandhill crane and no breeding habitats have been documented (Fink et al. 2022). Impacts from project operations in the study area near Grays Harbor and along the rail corridor are expected to be negligible to low.

Fisher and western gray squirrel could occur in the study area primarily along the rail corridor portion where pockets of preferred habitat are located, though presence of these species has not been confirmed (WDFW 2023a; Lewis et al. 2022). Both species likely avoid rail transportation corridors except when moving across the landscape; therefore, impacts from train noise and vibration would be low. Both species would be at risk of rail strike because small mammals, such as squirrels, and small to medium predators, such as foxes and martens, are known to make up 4% to 18% of trail strike mortality (Borda-de-Água et al. 2017). Overall, the relative increase in risk because of the project is expected to be low. Therefore, impacts to fisher and western gray squirrel would be low.

Mardon skipper could occur in the study area, but the species is not confirmed to be present. There are only small amounts of its preferred meadow habitat in the study area. Mardon skipper is expected to experience little increase in disturbance from noise and vibration related to project operations, so impacts would be low.

The bat, Yuma myotis, has the potential to be present in the study area and is known to use human infrastructure for roosting. The genus *Myostis* is known to be particularly sensitive to railway disturbances (Vandevelde et al. 2014). The increase in rail traffic has the potential to affect Yuma myotis foraging and commuting flights. Similar to ground dwelling mammals, bats can experience train strikes, but the increased risk relative to existing conditions would be small. Overall, Yuma myotis impacts would be low under operations of the Proposed Project.

State Priority Species and Habitats

Most of the existing mapped priority habitats in the study area would be indirectly affected by project operations. Impacts would be low over the long term as a result of increased vessel traffic, rail traffic, and human activity.

Terrestrial priority habitats would experience low impacts from air pollution and emission and railway noise and vibrations. Priority aquatic habitats, including priority salmonid habitat, along the rail corridor would also have low impacts from increased vibration. Harbor aquatic habitats would experience increased underwater noise and scour. Habitats associated priority habitat features, such as snags and downed logs, are not expected to be altered or reduced under project operations.

Overall, state priority species would experience low impacts from project operations. Pacific sand lance, state priority salmonids, and state priority and state candidate bird species are expected to return and utilize the post-construction habitat similar to pre-construction conditions The Roosevelt elk herd, whose range crosses the rail corridor portion of the study area, would experience low impacts in the form of potential increases in interruption to migration corridors and mortality along the Chehalis River as a result of increased rail traffic. The priority Dungeness crab commercial crabbing area in Grays Harbor crosses the navigation channel portion of the study area. Because the navigation channel is maintained and dredged under exiting conditions, increases in Port operation are not expected to impact the fishery.

Marine Mammals

As described in Section 6.4.1.3, northern sea otter, Pacific harbor porpoise, harbor seals, and Stellar sea lions have the potential to be present in the study area. During operations these species would have an increased risk of vessel strikes compared to existing conditions. This risk would be likely be lower for northern sea otter because they are less likely to swim in open water. Marine mammals would also be affected by an increase in the frequency and duration vessel noise in the harbor. Overall, impacts to marine mammals would be medium.

Marine mammals could also experience injury or death in the event that an operational accident and fuel spill occurred, similar to existing conditions. Such a spill could affect species viability for northern sea otter because it is currently threatened, but this event would be less likely to have a population level effect on Pacific harbor porpoise, harbor seals, and Stellar sea lions. However, the change in risk of such a spill is likely small.

6.5 Cumulative Impacts

Cumulative impacts are caused by the incremental impact of the alternatives when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor, but collectively significant actions, which take place over time (40 CFR 1508.7) and are evaluated as described in Section 6.2.1. Current conditions are a result of past and present actions. The current conditions in the study area that were used as the baseline existing environmental condition are described in Section 5. Therefore, the cumulative effect of past actions were assumed to be captured in the analysis of project impacts and were not separately called out in the analysis of cumulative impacts.

6.5.1 Reasonably Foreseeable Future Actions

A number of other projects are currently in progress or are expected to occur in the foreseeable future, regardless of whether the Port Project or the AGP Project proceeds. The impacts of these projects may have the potential to contribute to a cumulative impact on resources when combined with the impacts of the Proposed Project. A complete list of projects with project descriptions is provided in Table 1 of the *Project Description Technical Report* (Anchor QEA 2023b). The 12 individual projects can generally be grouped by type of action and potential effects on biological resources, as shown in Table 10.

Table 10
Cumulative Projects and Potential Effects on Biological Resources

Type of Project	Project	Potential Effects on Biological Resources[1]
Rail Maintenance and Improvements	PSAP Railroad Annual Maintenance and Improvements, Grays Harbor County, WA (PSAP)	• Air pollution and emissions from increased rail traffic • Noise and vibration levels could be reduced from track maintenance and upgrades • Frequency of noise and vibration could be increased from increased rail traffic • Direct loss and disturbance of habitat because of construction activities and because of widening of the rail footprint in some areas • Direct killing, injury, and/or disturbance of species because of construction activities and because of widening of the rail footprint in some areas
	South Elma Rail Siding Construction, Elma, WA (PSAP)	
	Blakeslee Junction Track #1 and #2 Expansion Project, Lewis County, WA (PSAP)	
	Blakeslee Junction Track #4 Project, Lewis County, WA (PSAP)	
	Cedar Creek Siding #2 Project, Lewis County, WA (PSAP)	

Type of Project	Project	Potential Effects on Biological Resources[1]
Traffic and Road Improvements	North Aberdeen Bridge Replacement, Aberdeen, WA (City of Aberdeen)	• Air pollution and emissions could be increased or decreased depending on reduced traffic congestion or from increased overall traffic • Water quality could be increased because of stormwater management improvements • Traffic noise could be increased or decreased depending on reduced traffic congestion or from increased overall traffic • Direct loss and disturbance of habitat because of construction activities and because of widening of the rail footprint in some areas • Direct killing, injury, and/or disturbance of species because of construction activities and because of widening of the rail footprint in some areas
	Aberdeen U.S. 12 Highway-Rail Separation, Aberdeen, WA (City of Aberdeen)	
	U.S. 12 Heron Street Bridge Rehabilitation, Hoquiam, WA (WSDOT)	
	Port Industrial Road Pavement Preservation Project	
Habitat Improvements	Fry Creek Restoration and Pump Station Aberdeen, WA (City of Aberdeen)	• Water quality and quantity could be improved because of restoration • Restoration elements such as floodplain connection, sinuosity, large wood, and plant cover could provide improved habitat for salmon and other aquatic species
	U.S. 101 Fry Creek Culvert Replacement Aberdeen, WA (WSDOT)	
Levee Construction	Aberdeen-Hoquiam Flood Protection Project, Aberdeen, WA and Hoquiam, WA (City of Hoquiam and City of Aberdeen)	• Levees appear to primarily follow lines of high intensity development and would therefore be unlikely to reduce high quality floodplain habitat connection relative to existing condition
Marina Improvement	Westport Marina Modernization, Westport, WA (City of Westport)	• Water quality could be reduced from increased spills and leaks from increased vessels at the marina • Water quality could be improved if stormwater management and fuel dock improvements are made • Water and sediment quality and wildlife health could be improved if creosote-coated wood structures are removed • Degradation of aquatic habitat if more overwater structures are added • Aquatic and marine wildlife disturbance could be increased from increased vessel traffic • Air quality could be reduced from increased vessel emissions

Note:

1. Potential effects on biological resources are effects that could occur based on the type of project and do not represent evaluation of project specific details.

6.5.2 Cumulative Biological Resource Impacts

Construction of the Proposed Project would have low habitat impacts, mainly related to short-term and temporary increases in noise and vibration. Construction of the cumulative projects would also have the potential to temporarily increase noise and vibration. However, construction activities for the Proposed Project would be limited to the Port facilities and therefore is not expected to result in cumulatively significant impacts to habitat.

Construction of the Proposed Project also has the potential to result in low to medium impacts on plant and wildlife species, including to special status habitat and species. This would mainly result from construction noise and increased activity affecting bird and bat species. Construction activities for the Proposed Project would be limited to the Port facilities and would be short-term and temporary in duration. Most of the cumulative projects are not close enough to the Proposed Project to contribute to noise and vibration impacts to the same species. Additionally, the impacts of those projects would be short-term and temporary in duration as well. Therefore, construction of the Proposed Project is not expected to result in cumulatively significant impacts to plant or wildlife species. In addition, implementation of the mitigation presented in Section 7 would help to further reduce the potential impacts of the Proposed Project.

Operational impacts on habitats and species from the Proposed Project would mainly be low, with medium impacts occurring mainly as the result of increased noise and vibration from vessel and rail traffic. The cumulative projects would improve transportation facilities and would not be expected to result in additional increases in vessel and rail traffic in the study area over the long term. Therefore, operation of the Proposed Project would not contribute to cumulatively significant impacts on habitats and species.

7 Mitigation

This section proposes mitigation actions based on impacts from the Proposed Project described in Sections 6.4.1 and 6.4.2. Proposed mitigation is intended to be specific to the impact addressed and includes measures to avoid, minimize, rectify, reduce, or compensate for lost resources and functions. Mitigation measures to address impacts may require coordination and consultation with the Army Corp of Engineers, Tribes, and other state and federal agencies (e.g., WDFW, USFWS, NOAA). The Port and AGP propose to implement the following measures; specific mitigation actions would be confirmed during project permitting:

- Conduct biological and marine mammal monitoring during construction to reduce the chance of impacts to marine mammals, birds, and bats.
- Conduct pre-construction bird nest surveys to identify the presence of fledgling birds in the Project Area. If fledgling birds would be present during noise-intensive activities, evaluate feasible measures that could be implemented to reduce the chance of noise related impacts to fledgling birds.
- Conduct pre-construction bat surveys before tear-down or demolition activities in structures that bats may roost in to reduce the chance for impacts to special status bat species.
- Conduct Pacific sand lance egg surveys in sandy beach areas that are consistent with WDFW grain size for spawning. If spawning Pacific sand lance are found, isolate the area in order to prevent impacts to this priority species.
- Conduct pre-construction fish surveys of Fry Creek and East Terminal Way Ditch to confirm if fish are present prior to construction in these areas.
- Install a fish guide net at upstream end of T4 work area to route fish around construction areas with the highest potential for noise impacts.
- Account and compensate for any unavoidable impacts to wetland or stream riparian habitat or protective buffers caused by construction or operation of the project as described in the *Water Resources Technical Study* (Anchor QEA 2023a).

8 References

Anchor QEA (Anchor QEA, LLC), 2022. *Biological Assessment*. Port of Grays Harbor Terminal 4 Expansion and Redevelopment Project. Prepared for Port of Grays Harbor. December 2022.

Anchor QEA, 2023a. *Water Resources Technical Study*. Port of Grays Harbor Terminal 4 Expansion and Redevelopment Project. Prepared for Port of Grays Harbor and Ag Processing, Inc. January 2023.

Anchor QEA, 2023b. *Project Description Technical Report*. Port of Grays Harbor Terminal 4 Expansion and Redevelopment Project. Prepared for Port of Grays Harbor and Ag Processing, Inc.

Anchor QEA, 2023c. *Air Quality and Greenhouse Gas Emissions Technical Study*. Port of Grays Harbor Terminal 4 Expansion and Redevelopment Project. Prepared for Port of Grays Harbor and Ag Processing, Inc. January 2023.

Anderson, J.J., 1990. "Assessment of the Risk of Pile Driving to Juvenile Fish." Fisheries Research Institute of Washington. Presented to the Deep Foundations Institute. October 10–12, 1990, Seattle, Washington. October 1990.

Audubon, 2022. "Pacific Flyway." Accessed December 29, 2022. Available at: https://www.audubon.org/pacific-flyway.

BirdLife International, 2021. "Pacific Americas Flyway Factsheet." Accessed August 19, 2021. Available at: http://datazone.birdlife.org/userfiles/file/sowb/flyways/1_Pacific_Americas_Factsheet.pdf.

Borda-de-Água, L., R. Barrientos, P. Beja, and H.M. Pereira, 2017. *Railway Ecology*. Berlin, Germany: Springer Nature; p. 320.

CalTrans (California Department of Transportation), 2016. *Technical Guidance for the Assessment and Mitigation of the Effects of Traffic Noise and Road Construction Noise on Bats*. Contract 43A0306. Sacramento, CA. Prepared by ICF International, Sacramento, CA, and West Ecosystems Analysis, Inc., Davis, CA. July 2016.

Carlson, T.J., G. Ploskey, R.L. Johnson, R.P. Mueller, and M.A. Weiland, 2001. "Observations of the Behavior and Distribution of Fish in Relation to the Columbia River Navigation Channel and Channel Maintenance Activities." PNNL-13595, Pacific Northwest National Laboratory, Richland, Washington. 2001.

Castells-Sanabra, M., A. Mujal-Colilles, T. Lull, J. Moncunill, F.M. de Osés, and X. Gironella, 2021. "Alternative Manoeuvres to Reduce Ship Scour." *The Journal of Navigation* 74(1):125–142.

CEQ (Council of Environmental Quality), 1997. *Considering Cumulative Effects Under the National Environmental Policy Act*. January 1997.

eBird, 2022. Grays Harbor, WA Checklist. Accessed December 22, 2022. Available at: https://ebird.org/region/US-WA-027.

Ecology (Washington Department of Ecology), 2017. *Chehalis Basin Strategy Final Programmatic Environmental Impact Statement*. Accessed January 8, 2023. Available at: http://chehalisbasinstrategy.com/programmatic-eis/.

Ecology, 2022. *Washington Department of Ecology Coastal Atlas*. Accessed December 28, 2022. Available at: https://apps.ecology.wa.gov/coastalatlas/tools/Map.aspx.

Edmonds, N.J., C.J. Firmin, D. Goldsmith, R.C. Faulkner, and D.T. Wood, 2016. "A Review of Crustacean Sensitivity to High Amplitude Underwater Noise: Data Needs for Effective Risk Assessment in Relation to UK Commercial Species." *Marine Pollution Bulletin* 108(1–2):5–11.

Eickhoff, C.V., S.X. He, F.A. Gobas, and F.C. Law, 2003. "Determination of Polycyclic Aromatic Hydrocarbons in Dungeness Crabs (*Cancer magister*) Near an Aluminum Smelter in Kitimat Arm, British Columbia, Canada." *Environmental Toxicology and Chemistry: An International Journal* 22(1):50–58.

FGDC (Federal Geographic Data Committee), 2013. *Classification of Wetlands and Deepwater Habitats of the United States*. FGDC-STD-004-2013. Second Edition. Wetlands Subcommittee, Federal Geographic Data Committee and U.S. Fish and Wildlife Service, Washington, DC. Available at: https://www.fgdc.gov/standards/projects/wetlands/nwcs-2013.

Fink, D., T. Auer, A. Johnston, M. Strimas-Mackey, S. Ligocki, O. Robinson, W. Hochachka, L. Jaromczyk, A. Rodewald, C. Wood, I. Davies, and A. Spencer, 2022. eBird Status and Trends, Data Version: 2021; Released: 2022. Cornell Lab of Ornithology, Ithaca, New York. https://doi.org/10.2173/ebirdst. 2021.

Freshwater, C., M. Trudel, T.D. Beacham, L. Godbout, C.E.M. Neville, S. Tucker, and F. Juanes, 2016. "Divergent Migratory Behaviours Associated with Body Size and Ocean Entry Phenology in Juvenile Sockeye Salmon." *Canadian Journal of Fisheries and Aquatic Sciences* 73(12):1723–1732.

Guggenmos, Lori (Washington Department of Fish and Wildlife), 2023. Personal communication with Sydney Gonsalves (Anchor QEA, LLC). Regarding: Port of Grays Harbor Terminal 4 Expansion and Redevelopment Project. January 30, 2023.

Halvorsen, M.B., T.J. Carlson, A.N. Popper, B.M. Casper, and C.M. Woodley, 2011. "Hydroacoustic Impacts on Fish from Pile Installation." National Cooperative Highway Research Program, Research Results Digest 363.

Hastings, M.C., and A.N. Popper, 2005. "Effects of Sound on Fish." January 28, 2005; Revised Appendix B, August 23, 2005.

Hatfield, R., S. Jepsen, and S.H. Black, 2015. "The Imperiled Mardon Skipper Butterfly: An Initial Conservation Success." *News of The Lepidopterists' Society* 57(2):92–94.

Hayes, D.F., R. Chintamaneni, P. Bommareddy, and B. Cherukuri, 2006. "Propwash Impacts on Water Quality Around Dredging and Other Marine Construction Activities." *26th Annual WEDA Conference* (pp. 17–26).

Hayes, M., J. Tyson, J. Layman, and K. Douville, 2019. *Intensive Study of Chehalis Floodplain Off-Channel Habitats*. Olympia, Washington: Washington State Department of Fish and Wildlife, Fish Program, Fish Science Division. March 26, 2019.

HDR, 2022. *Draft Wetland and Stream Delineation Report, Port of Grays Harbor – Terminal 4 Rail Upgrade and Site Improvements*. City of Aberdeen and City of Hoquiam, Washington. November 21, 2022.

HDR, 2023. *Noise and Vibration Technical Study*. Port of Grays Harbor Terminal 4 Expansion and Redevelopment Project. Prepared for Port of Grays Harbor and Ag Processing, Inc. 2023.

Hedges, C.J., 2011. "Hydroacoustic Impacts on Fish from Pile Installation." National Cooperative Highway Research Program, Research Results Digest 363.

Ikonomou, M.G., S. Rayne, M. Fischer, M.P. Fernandez, and W. Cretney, 2002. "Occurrence and Congener Profiles of Polybrominated Diphenyl Ethers (PBDEs) in Environmental Samples from Coastal British Columbia, Canada." *Chemosphere* 46(5):649–663.

Lewis, Randy (Port of Grays Harbor), 2022. Personal communication with Frank Proctor (HDR), Lisa Danielski (HDR), and Kris Koski (Port of Grays Harbor). Regarding: Washington Department of Fish and Wildlife Follow Up. August 24, 2022.

Lewis, J.C., M. Tirhi, and D. Kraege, 2004. "Band-Tailed Pigeon." *Management Recommendations for Washington's Priority Species, Volume IV: Birds*. Editors, E. Larsen, J.M. Azerrad, and N. Nordstrom. Olympia, Washington: Washington Department of Fish and Wildlife; pp. 22-1–26-4.

Lewis, J.C., J.I. Ransom, T. Chestnut, D.O. Werntz, S. Black, D. Whiteside, J.L. Postigo, and A. Moehrenschlager, 2022. *Cascades Fisher Reintroduction Project: Final Project Report*.

Natural Resource Report NPS/PWR/NRR—2022/2418. National Park Service, Fort Collins, Colorado. Available at: https://doi.org/10.36967/2293605.

Liang, Y., I. Rudik, E.Y. Zou, A. Johnston, A.D. Rodewald, and C.L. Kling, 2020. "Conservation Cobenefits from Air Pollution Regulation: Evidence from Birds." *Proceedings of the National Academy of Sciences* 117(49):30900–30906.

Lotts, K., and T. Naberhaus, 2021. Butterflies and Moths of North America. Sighting 1080901: Mardon Skipper (*Polites mardon*). Accessed January 6, 2023. Available at: https://www.butterfliesandmoths.org/sighting_details/1080901.

Lovett, G.M., T.H. Tear, D.C. Evers, S.E. Findlay, B.J. Cosby, J.K. Dunscomb, C.T. Driscoll, and K.C. Weathers, 2009. "Effects of Air Pollution on Ecosystems and Biological Diversity in the Eastern United States." *Annals of the New York Academy of Sciences* 1162(1):99–135.

Marschall, E.A., M.E. Mather, D.L. Parrish, G.W. Allison, and J.R. McMenemy, 2011. "Migration Delays Caused by Anthropogenic Barriers: Modeling Dams, Temperature, and Success of Migrating Salmon Smolts." *Ecological Applications* 21(8):3014–3031.

Moffatt & Nichol, 2023. *Hazardous Materials and Waste Management Technical Study*. Port of Grays Harbor Terminal 4 Expansion and Redevelopment Project. Prepared for Port of Grays Harbor and Ag Processing, Inc.

NatureServe, 2023. *Phoca vitulina* Harbor Seal. January 6, 2023. Accessed January 8, 2023. Available at: https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.104705/Phoca_vitulina.

Nedeau, E.J., A.K. Smith, J. Stone, and S. Jepsen, 2009. *Freshwater Mussels of the Pacific Northwest*. Second Edition. Portland, Oregon: The Xerces Society. Available at: www.xerces.org/western-freshwater-mussels/.

NMFS (National Marine Fisheries Service), 2011. *Anadromous Salmonid Passage Facility Design*. Portland, Oregon: National Marine Fisheries Service, Northwest Region.

NMFS, 2018. 2018 Revisions to: Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0): Underwater Thresholds for Onset of Permanent and Temporary Threshold Shifts. U.S. Dept. of Commerce, NOAA. NOAA Technical Memorandum NMFS-OPR-59, 167 p.

NOAA, 2019. "Understanding Essential Fish Habitat." Accessed November 8, 2019. Available at: https://www.fisheries.noaa.gov/insight/understanding-essential-fish-habitat.

NOAA, 2021. "Acidification Impedes Shell Development of Plankton Off the U.S. West Coast." *NOAA Research News*. January 19, 2021. Accessed January 3, 2022. Available at: https://research.noaa.gov/article/ArtMID/587/ArticleID/2705/Acidification-impedes-shell-development-of-plankton-off-the-US-West-Coast.

NOAA, 2022. "What Is Eutrophication?" Updated September 11, 2022. Accessed January 4, 2023. Available at: https://oceanservice.noaa.gov/facts/eutrophication.html.

NOAA, 2023a. Species Directory: Pinto Abalone. Assessed January 6, 2023. Available at https://www.fisheries.noaa.gov/species/pinto-abalone.

NOAA, 2023b. Marine Life in Distress. Understanding Vessel Strikes. Assessed January 7, 2023. Available at: https://www.fisheries.noaa.gov/insight/understanding-vessel-strikes.

NWIFC and WDFW (Northwest Indian Fisheries Commission; Washington Department of Fish and Wildlife), 2022. Statewide Washington Integrated Fish Distribution (SWIFD) Mapping. Updated November 30, 2022. Accessed January 3, 2023. Available at: https://geo.nwifc.org/swifd/.

NWS (National Weather Service), 2022. Climate. NOWData – NOAA Online Weather Data for Aberdeen STP, WA. Accessed December 19, 2022. Available at: https://www.weather.gov/wrh/Climate?wfo=sew.

Parks, N., 2005. Ocean Acidification Bad for Shells and Reefs. "Increasing Carbon Dioxide Levels Signal Danger for Marine Life." *Science Magazine News*. September 28, 2005. Accessed January 4, 2022. Available at: https://www.science.org/content/article/ocean-acidification-bad-shells-and-reefs.

Pater, D.E., S.A. Bryce, T.D. Thorson, J. Kagan, C. Chappell, J.M. Omernik, S.H. Azevedo, and A.J. Woods, 1998. *Ecoregions of Western Washington and Oregon* (2-sided color poster with map, descriptive text, summary tables, and photographs). U.S. Geological Survey, Reston, VA. Scale 1:1,350,000).

Popper, A.N., and A.D. Hawkins, 2018. "The Importance of Particle Motion to Fishes and Invertebrates." *The Journal of the Acoustical Society of America* 143:470.

Rasmuson, L.K., 2013. "The Biology, Ecology and Fishery of the Dungeness Crab, *Cancer magister*." *Advances in Marine Biology* 65:95–148.

Popper, A.N., and A.D. Hawkins, 2019. "An Overview of Fish Bioacoustics and the Impacts of Anthropogenic Sounds on Fishes." *Journal of Fish Biology* 2019(94):692–713.

Richardson, C.T., and C.K. Miller, 1997. "Recommendations for Protecting Raptors from Human Disturbance: A Review." *Wildlife Society Bulletin* 634–638.

Ruggerone, G.T., S. Goodman, and R. Miner, 2008. *Behavioral Response and Survival of Juvenile Coho Salmon Exposed to Pile Driving Sounds for Port of Seattle*. July 2008.

Sharp, F.R. (President, Quinault Indian Nation), 2016. Letters to: M. Bellon, Director, Washington Department of Ecology. Regarding: Quinault Indian Nation Treaty Rights and Usual and Accustomed Areas, Chehalis Basin Strategy Programmatic Environmental Impact Statement, Quinault Indian Nation Preliminary Comments and Information. April 6, 2016, and May 13, 2016.

Sordello, R., O. Ratel, F. Flamerie De Lachapelle, C. Leger, A. Dambry, and S. Vanpeene, 2020. "Evidence of the Impact of Noise Pollution on Biodiversity: A Systematic Map." *Environmental Evidence* 9(1):1–27.

Syrjälä, J., R. Kalliola, and J. Pajala, 2020. "Underwater Acoustic Environment of Coastal Sea with Heavy Shipping Traffic: NE Baltic Sea During Wintertime." *Frontiers in Marine Science* 7:589141.

UNGA (United Nations General Assembly), 2018. *Report on the Work of the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea at Its Nineteenth Meeting*. Document A/73/124. July 9, 2018. Available at: https://www.un.org/depts/los/consultative_process/consultative_process.htm.

USFWS (U.S. Fish and Wildlife Service),2013. "Conducting Masking Analysis for Marbled Murrelets & Pile Driving Projects." Presentation for WSDOT Biologists and Consultants. Presented by Emily Teachout, USFWS, WFWO. November 19, 2013.

USFWS, 2023a. Grays Harbor National Wildlife Refuge Species. Accessed January 5, 2023. Available at: https://www.fws.gov/refuge/grays-harbor/species.

USFWS, 2023b. Information for Planning and Consultation (IPaC). Accessed January 16, 2023. Available at: https://ipac.ecosphere.fws.gov/.

USGS (U.S. Geological Survey), 2022. The National Hydrography Dataset (NHD). Accessed December 6, 2022. Available at: http://nhd.usgs.gov/data.html.

Vandevelde, J.C., A. Bouhours, J.F. Julien, D. Couvet, and C. Kerbiriou, 2014. "Activity of European Common Bats Along Railway Verges." *Ecological Engineering* 64:49–56.

Wale, M.A., S.D. Simpson, and A.N. Radford, 2013. "Noise Negatively Affects Foraging and Antipredator Behaviour in Shore Crabs." *Animal Behaviour* 86(1):111–118.

Washington NatureMapping Program, 2019. "Reptiles." Washington Wildlife Distribution Maps. Accessed August 20, 2019. Available at: http://naturemappingfoundation.org/natmap/maps/wa/#reptiles.

WDFW (Washington Department of Fish and Wildlife), 2004. Living with Wildlife: Bats. Accessed December 21, 2021. Available at: https://wdfw.wa.gov/species-habitats/living/species-facts/bats#types.

WDFW, 2008. Priority Habitat and Species List. Updated March 2022. Olympia, Washington. 292pp. Accessed December 28, 2022. Available at: https://wdfw.wa.gov/sites/default/files/publications/00165/wdfw00165.pdf.

WDFW, 2009. *Compiled White Papers for Hydraulic Project Approval Habitat Conservation Plan (HCP)*. March 2009. Accessed January 19, 2023. Available at: https://wdfw.wa.gov/publications/00803.

WDFW, 2013. *Threatened and Endangered Wildlife in Washington: 2012 Annual Report*. Listing and Recovery Section, Wildlife Program, Washington Department of Fish and Wildlife, Olympia. 251 pp. Originally published August 2013. Accessed January 6, 2023. Available at: https://www.eopugetsound.org/articles/olympic-mudminnow-novumbra-hubbsi.

WDFW, 2021. Fish Passage and Diversion Screening Inventory Database. Site Description Report and Level A Culvert Assessment Report for Culvert 921831. January 4, 2021. Accessed December 28, 2022. Available at: https://wsdot.maps.arcgis.com/apps/webappviewer/index.html?id=c2850f301118480fbb576f1ccfda7f47.

WDFW, 2022a. Priority Habitats and Species Maps. Accessed December 1, 2022. Available at: http://wdfw.wa.gov/mapping/phs/.

WDFW, 2022b. *Washington State Endangered, Threatened, Sensitive, and Candidate Species List*. March 28, 2022. Accessed January 3, 2023. Available at: https://wdfw.wa.gov/sites/default/files/2022-04/StateListed%26amp%3BCandidateSpecies28Mar2022.pdf.

WDFW, 2022c. Fish Passage and Diversion Screening Inventory Database. Site Description Report and Level A Culvert Assessment Report for Culvert 127W0367. November 14, 2022. Accessed December 28, 2022. Available at:

https://wsdot.maps.arcgis.com/apps/webappviewer/index.html?id=c2850f301118480fbb576f1ccfda7f47.

WDFW, 2023a. Species in Washington. Accessed January 6, 2023. Available at: https://wdfw.wa.gov/species-habitats/species.

WDFW, 2023b. *Status Report for the Pinto Abalone in Washington*. Accessed January 6, 2023. Available at: https://wdfw.wa.gov/publications/02031.

WDNR (Washington Department of Natural Resources), 2014. Pacific Sand Lance – *Ammodytes hexapterus*. Aquatic Land Habitat Conservation Plan Species Spotlight. FS-12-021. February 25, 2014. Accessed January 4, 2022. Available at: https://www.dnr.wa.gov/Publications/em_fs13_021.pdf.

WDNR, 2015. *Ecological Systems of Washington State: A Guide to Identification*. Natural Heritage Report 2015-04. Prepared by F. Joseph Rocchio and Rex. C. Crawford. October 19, 2015.

WDNR, 2019. *Ecological Systems of Washington*. Published March 16, 2017; updated August 8, 2019. Accessed December 20, 2022. Available at: https://data-wadnr.opendata.arcgis.com/documents/wadnr::ecological-systems-of-washington-zipped-raster-grid/about.

WDNR, 2021. 2021 WA Vascular Plant Species of Conservation Concern List. Accessed December 2022. Available at: https://www.dnr.wa.gov/NHPlists.

Wenger, A.S., E. Harvey, S. Wilson, C. Rawson, S.J. Newman, D. Clarke, B.J. Saunders, N. Browne, M.J. Travers, J.L. Mcilwain, and P.L. Erftemeijer, 2017. "A Critical Analysis of the Direct Effects of Dredging on Fish." *Fish and Fisheries* 18(5):967–985.

Williams, R., C. Erbe, E. Ashe, and C.W. Clark, 2015. "Quiet(er) Marine Protected Areas." *Marine Pollution Bulletin* 100(1):154–161.

Winkowski, J., and M.S. Zimmerman, 2019. *Chehalis River Smolt Production, 2018*. FPA 19-01. Olympia, Washington: Washington Department of Fish and Wildlife.

WRCC (Western Regional Climate Center), 2022. Climate of Washington. Accessed December 19, 2022. Available at: https://wrcc.dri.edu/Climate/narrative_wa.php.

WSDOT (Washington State Department of Transportation), 2020. *Washington State Department of Transportation Biological Assessment Preparation Manual*.

WSP USA, 2019. *BHP Proposed Grays Harbor Potash Export Facility Eelgrass Survey and Tier 1 Delineation Report*. Prepared for BHP, Saskatoon, Canada. July 15, 2019.

Appendix A
Mapped Vegetation Communities and Habitat in Study Area

Figure A-1A
Mapped Vegetation Communities and Habitat in Study Area

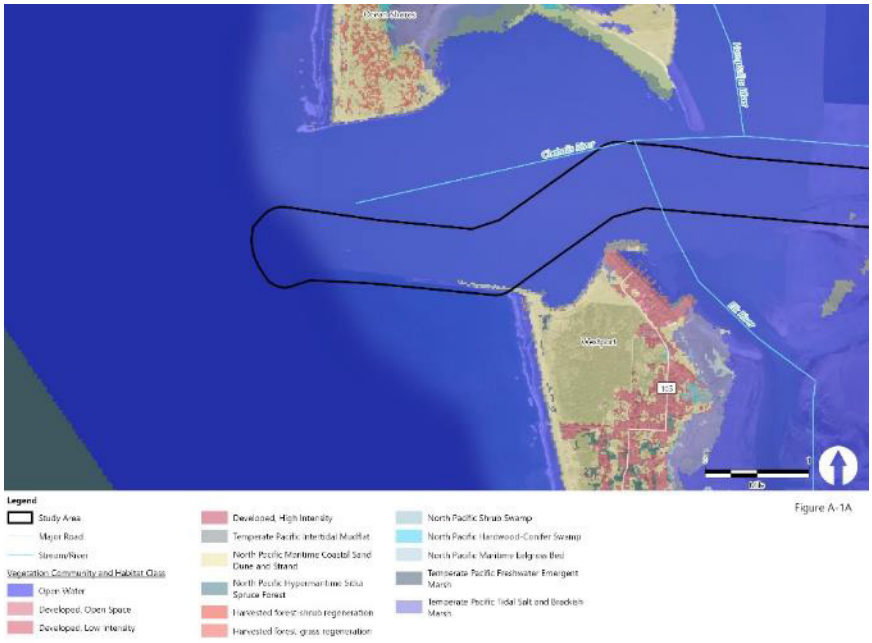


Figure A-1A

Figure A-1B
Mapped Vegetation Communities and Habitat in Study Area

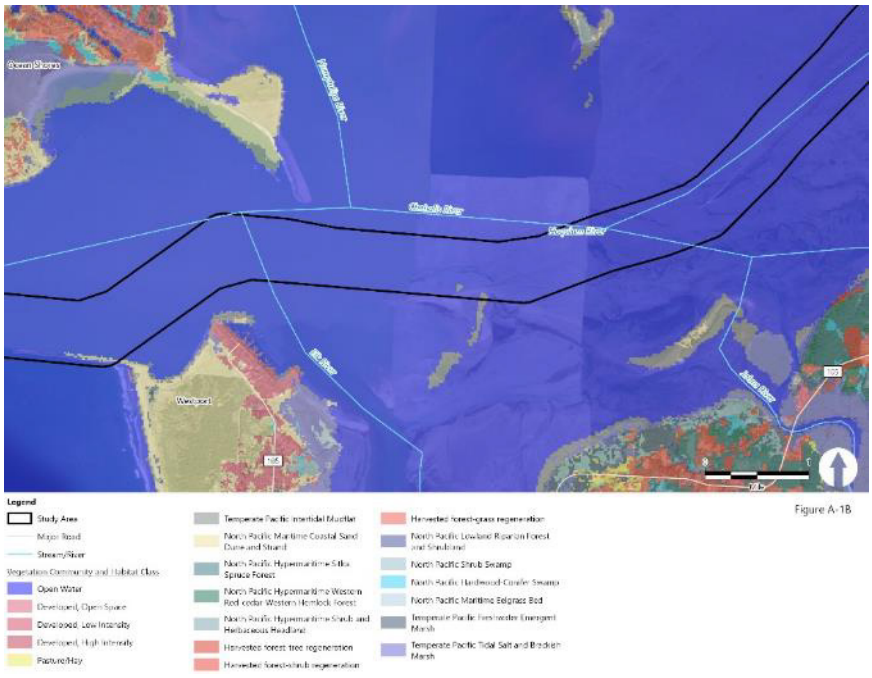


Figure A-1B

Figure A-1C
Mapped Vegetation Communities and Habitat in Study Area

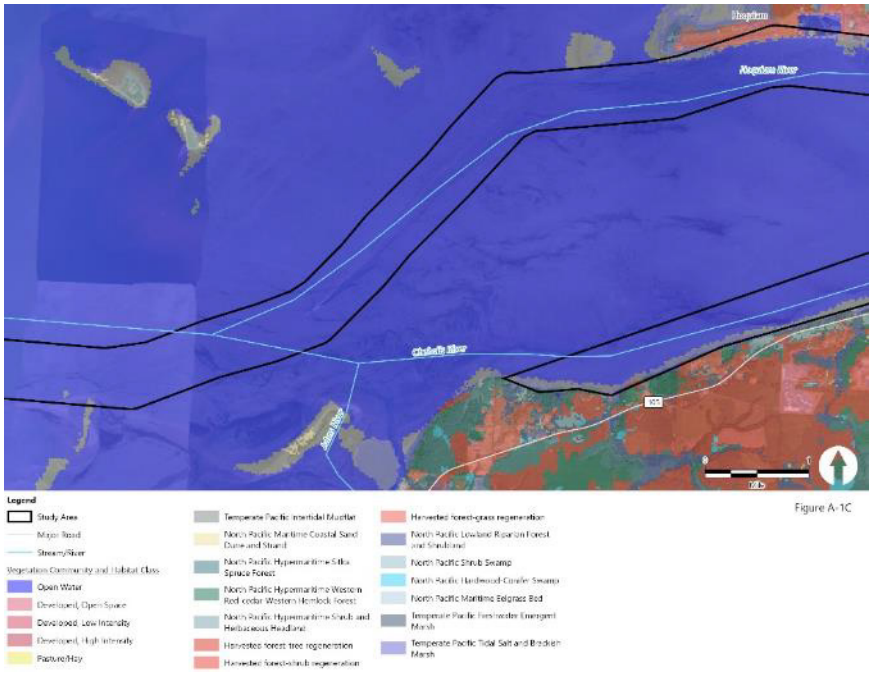


Figure A-1C

Figure A-1D
Mapped Vegetation Communities and Habitat in Study Area

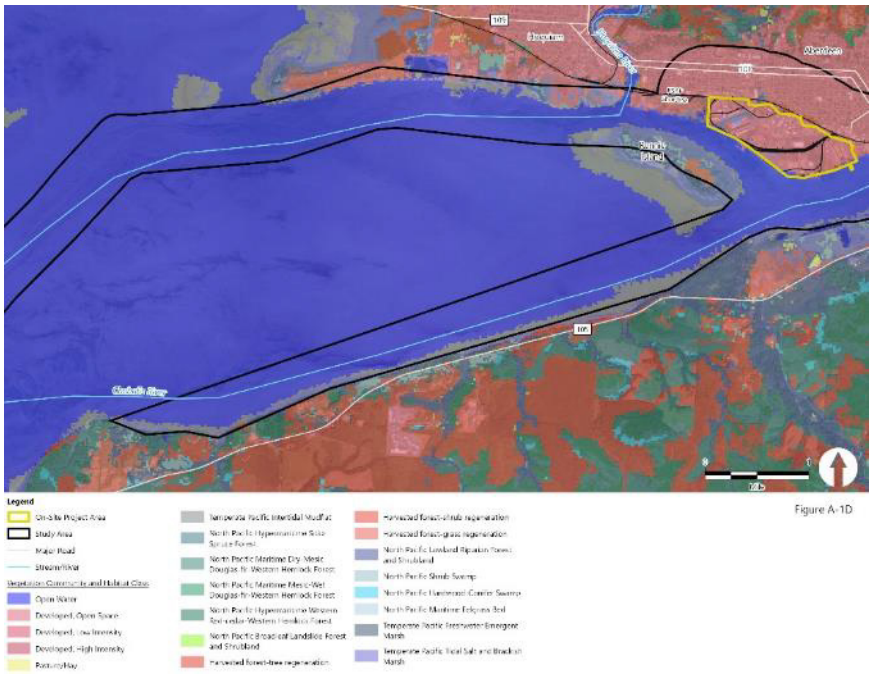


Figure A-1D

Figure A-1E
Mapped Vegetation Communities and Habitat in Study Area

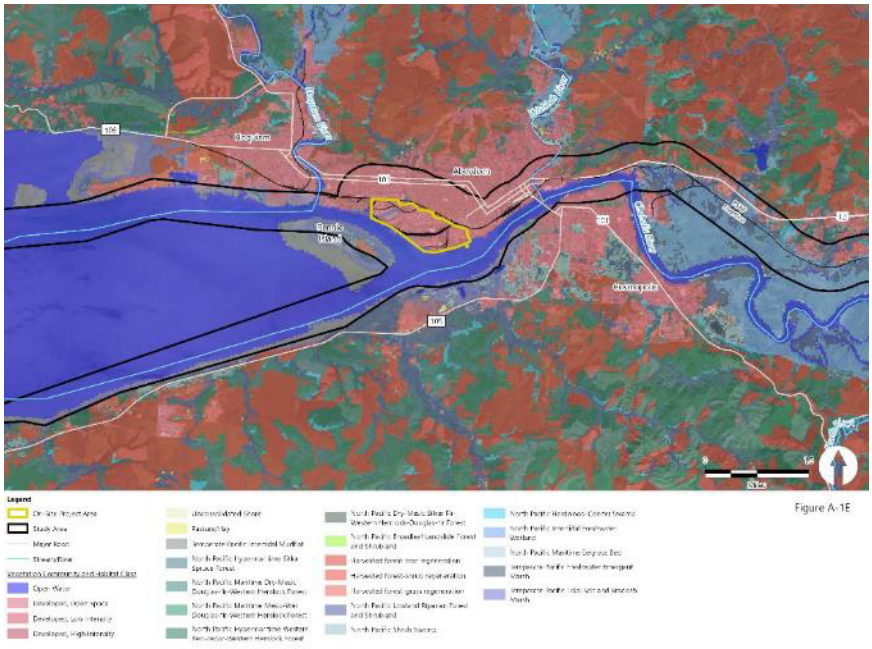


Figure A-1F
Mapped Vegetation Communities and Habitat in Study Area

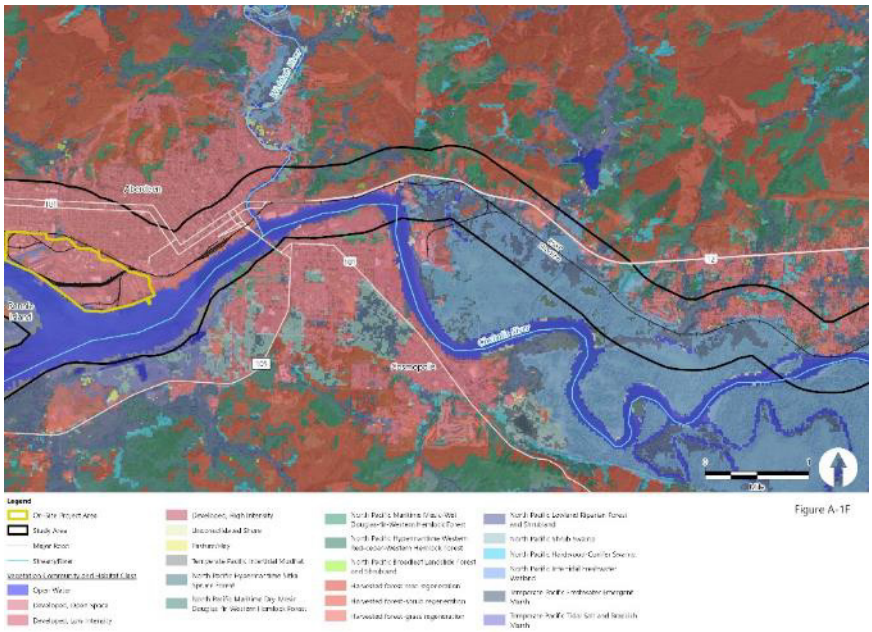


Figure A-1G
Mapped Vegetation Communities and Habitat in Study Area

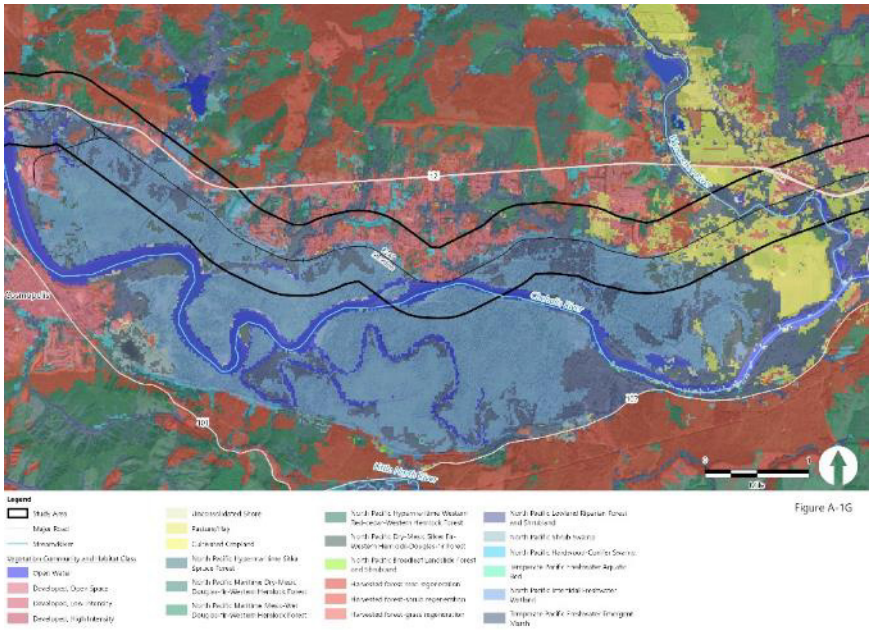


Figure A-1H
Mapped Vegetation Communities and Habitat in Study Area

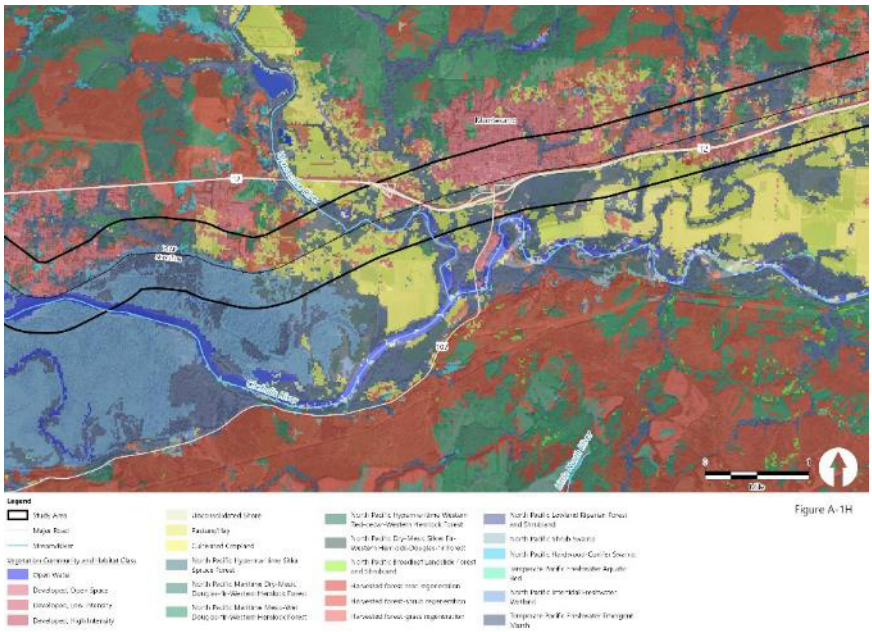


Figure A-1I
Mapped Vegetation Communities and Habitat in Study Area

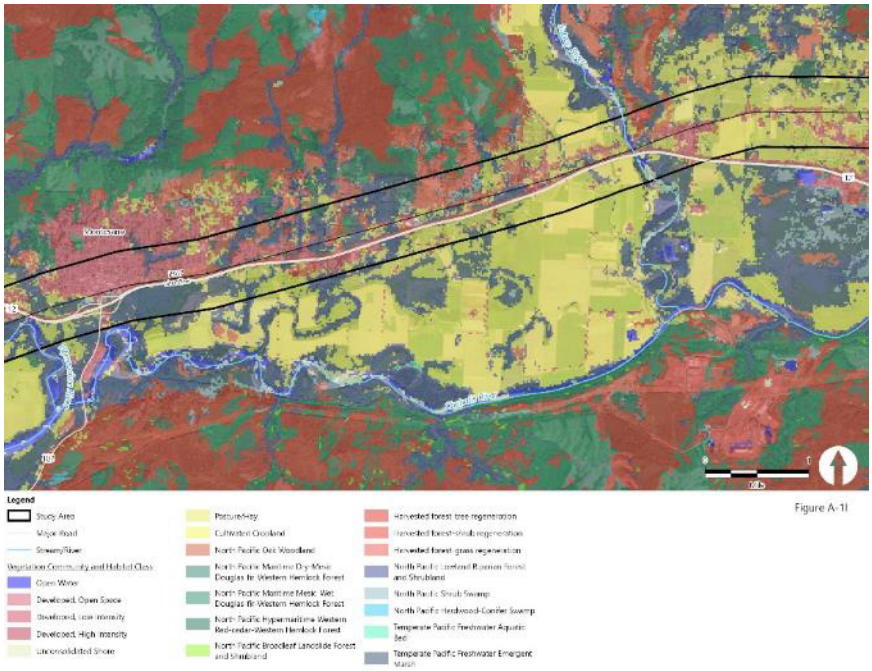


Figure A-1I

Figure A-1J
Mapped Vegetation Communities and Habitat in Study Area

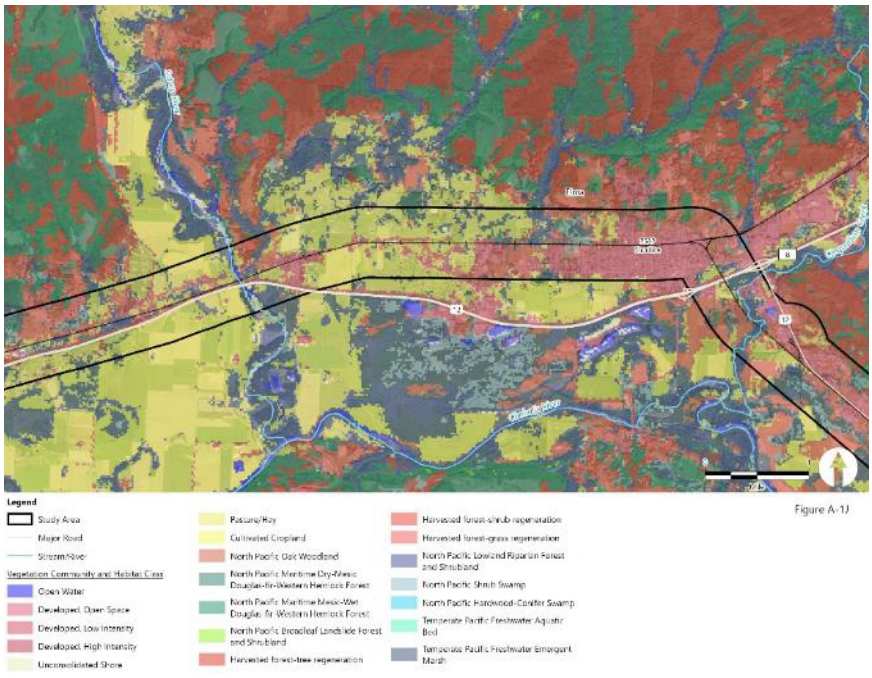


Figure A-1J

Figure A-1K
Mapped Vegetation Communities and Habitat in Study Area

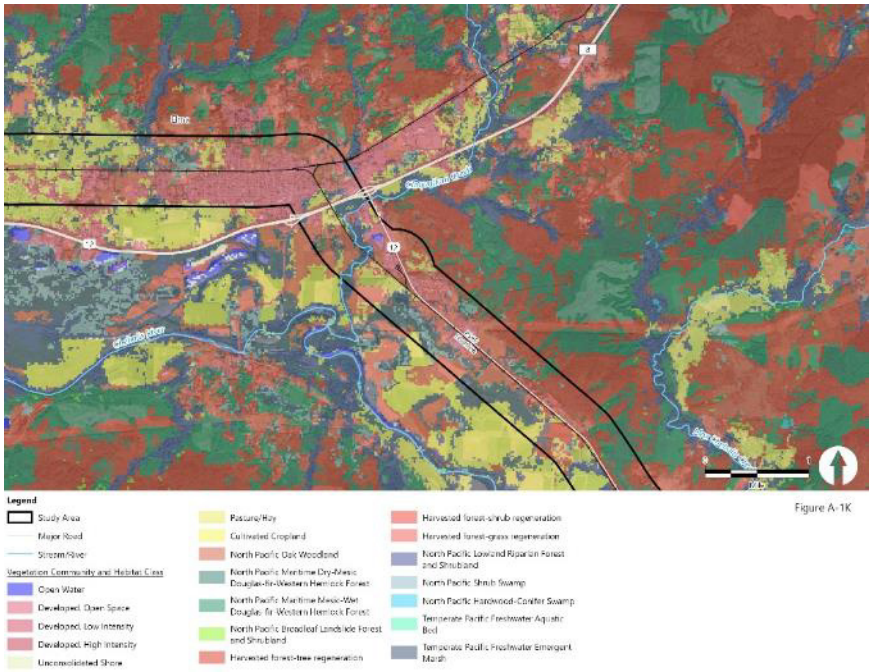


Figure A-1K

Figure A-1L
Mapped Vegetation Communities and Habitat in Study Area

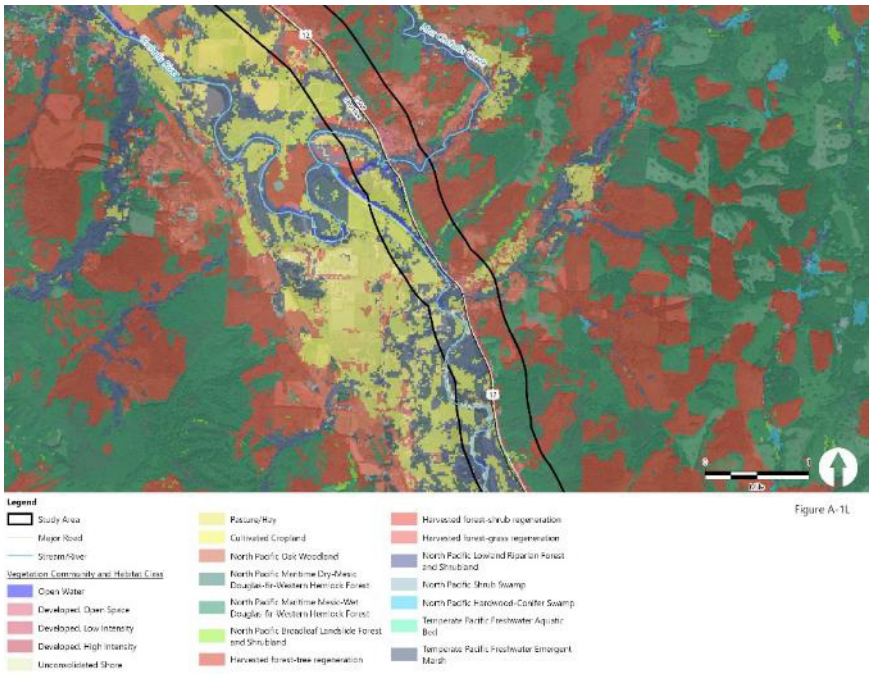


Figure A-1L

Figure A-1M
Mapped Vegetation Communities and Habitat in Study Area

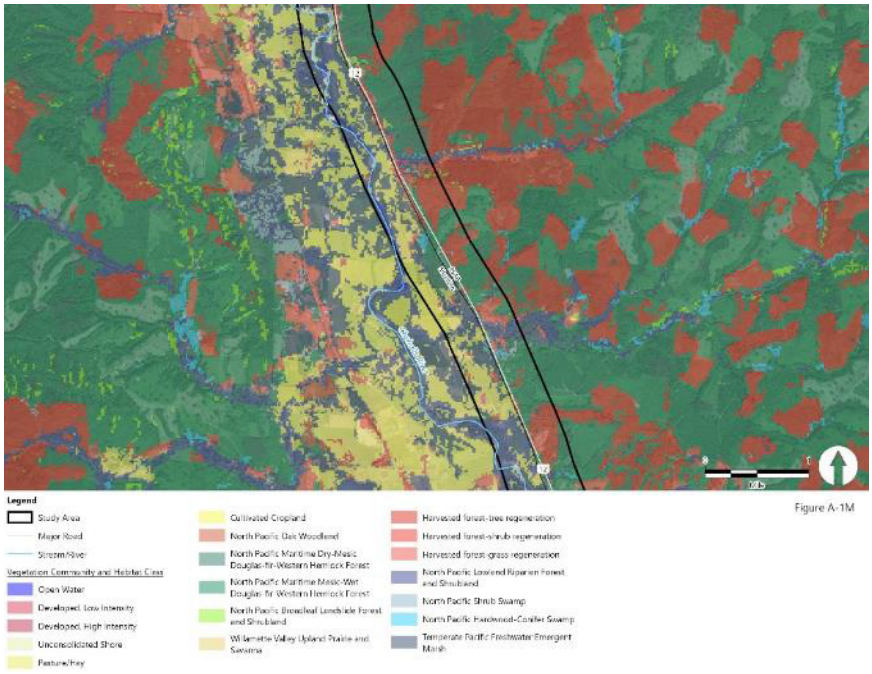


Figure A-1M

Figure A-1N
Mapped Vegetation Communities and Habitat in Study Area

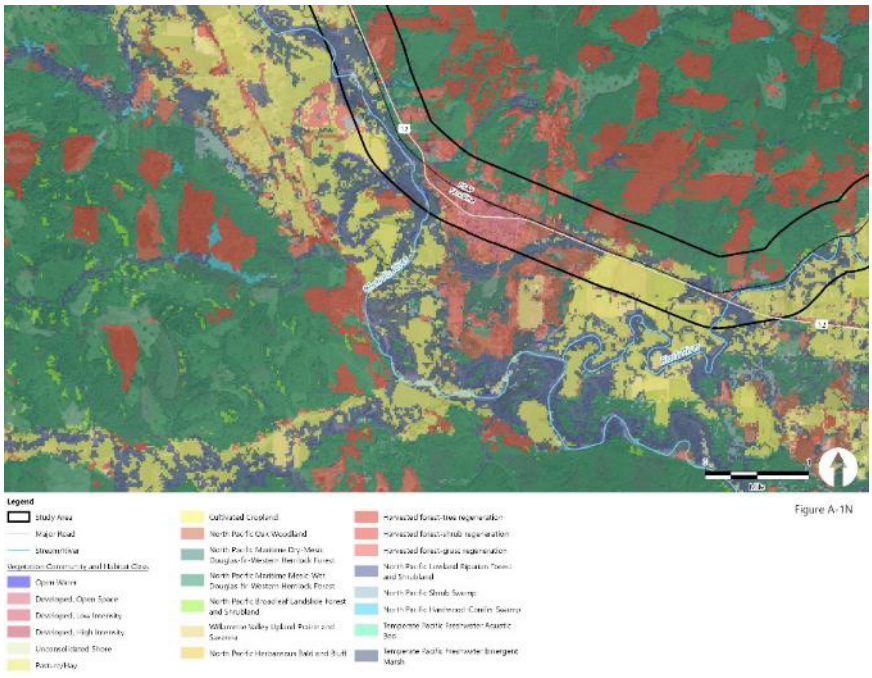


Figure A-1N

Figure A-1O
Mapped Vegetation Communities and Habitat in Study Area

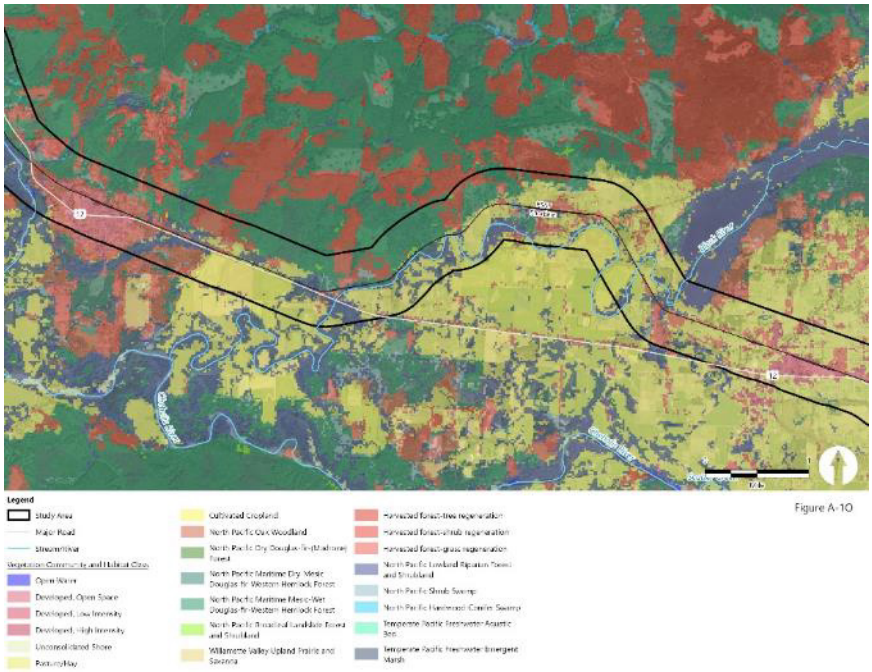


Figure A-1P
Mapped Vegetation Communities and Habitat in Study Area

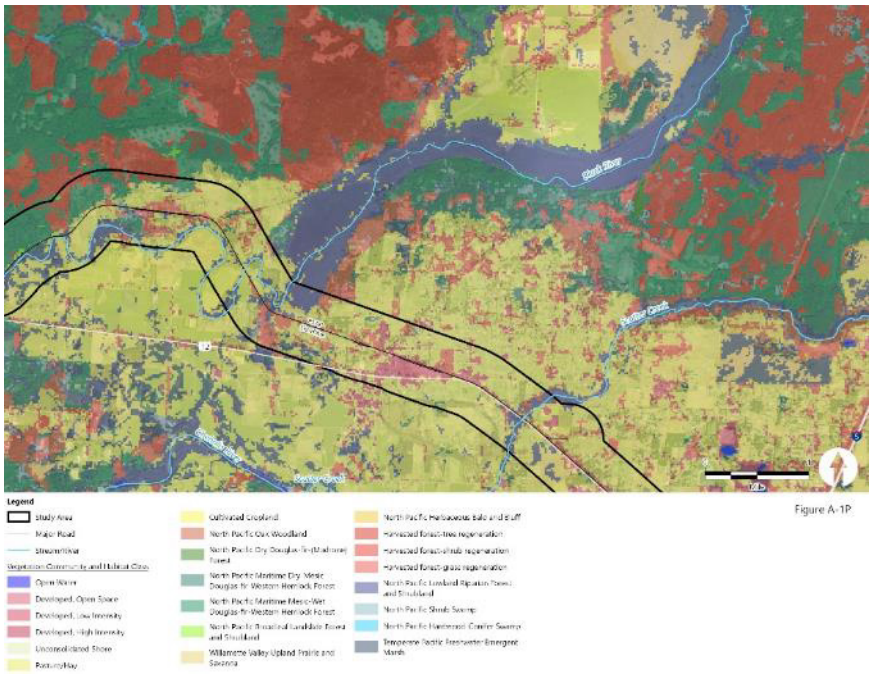


Figure A-1Q
Mapped Vegetation Communities and Habitat in Study Area

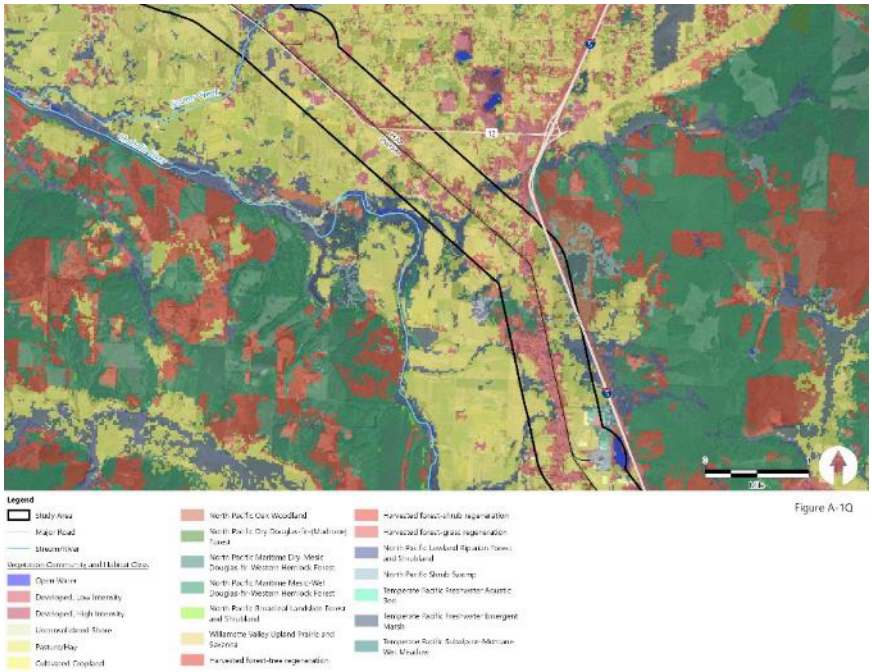


Figure A-1Q

Figure A-1R
Mapped Vegetation Communities and Habitat in Study Area

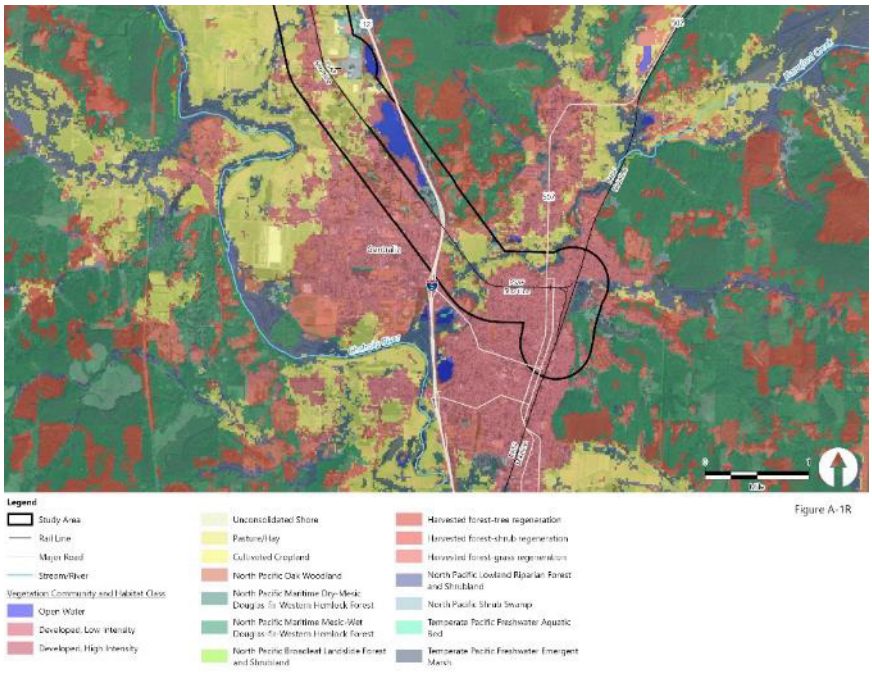


Figure A-1R

Appendix B
State Priority, Listed, and Candidate Wildlife Species List

Appendix B
State Priority, Listed, and Candidate Wildlife Species List

Species Group	Common Name	Scientific Name	State Status	Federal Status	Preferred Habitat[1]	Study Area Potential Presence
Fish	Olympic Mudminnow	*Novumbra hubbsi*	S	-	Olympic mudminnows prefer low-velocity streams, shallow water, shaded areas with aquatic vegetation, and mud or silt substrate. Several species of mudminnow use wetlands and ponds for spawning habitat. Spawning activities have been observed from late November to the following June and eggs hatch approximately ten days after being deposited in vegetation. Olympic mudminnow tend to be less abundant in areas where other native and non-native species are present, likely due to predation.	Documented observations
Fish	Rainbow Trout/Steelhead (Southwest Washington DPS)	*Oncorhynchus mykiss*	PS	-	Rainbow trout spawn in small streams with fine gravel substrate. Rainbow trout are non-anadromous and prefer cooler, high-velocity water in pool-riffle channels with woody material, but can also survive in warmer water.	Documented observations
Fish	Coho Salmon (Southwest Washington Coast ESU)	*Oncorhynchus kisutch*	PS	-	Coho spawn in small coastal streams and the tributaries of larger rivers. They prefer areas of mid-velocity water with small to medium sized gravels. Coho can be found in virtually every small coastal stream with a year-round flow. Returning coho often gather at the mouths of streams and wait for the water flow to rise, such as after a rain storm, before heading upstream. The higher flows and deeper water enable the fish to pass obstacles, such as logs across the stream or beaver dams, that would otherwise be impassable. Spawning occurs in the fall. Fry emerge from the gravel the next spring and go to sea about 18 months after being deposited. Coho fry are usually found in the pools of small coastal streams and the tributaries of larger rivers.	Documented observations
Fish	Chinook Salmon (Washington Coast ESU)	*Oncorhynchus tshawytscha*	PS	-	Chinook salmon tend to spawn in the mainstem of streams, where the water flow is high. Because of their size they are able to spawn in larger gravel than most other salmon. Some fish travel hundreds of miles upstream to reach spawning grounds. Because of the distance, these fish enter streams early and comprise the spring and summer runs. Fall runs spawn closer to the ocean and more often use small coastal streams. All chinook reach their spawning grounds by fall, in time to spawn. Chinook fry rear in freshwater from three months to a year, depending on the race of chinook and the location. Spring chinook tend to stay in streams for a year; fish in northern areas, where the streams are less productive and growth is slower, also tend to stay longer. Rearing chinook fry use mainstems and their tributaries.	Documented observations
Fish	Chum Salmon (Pacific Coast ESU)	*Oncorhynchus keta*	PS	-	Chum salmon prefer big rivers with low gradients to medium rivers with moderate gradient, with pool and riffle habitat. Adults return to spawn in streams where they hatched, sometimes moving up to 2,000 km upstream, but usually spawning not far from salt water (usually within 100 km). Spawning occurs in gravel riffles in rivers and streams of various sizes. The female digs a redd, or nest, by displacing gravel and making depressions in an area of about 2.25 square meters.	Documented observations
Fish	Coastal Cutthroat Trout	*Oncorhynchus clarkii*	PS	-	Genetic stocks of coastal cutthroat trout are distinguishable by the geographic distribution of spawning grounds. *Resident* - spawn in freshwater in areas upstream and downstream of anadromous barriers. *Fluvial* - migrate in freshwater within rivers and spawn in mainstem and accessible tributary reaches. *Anadromous* - spawn in mainstem and accessible tributary reaches. *Adfluvial* - spawn and rear in freshwater streams.	Documented observations
Fish	Bull Trout/Dolly Varden	*Salvelinus confluentus*	C	T	Bull trout have different life histories that can vary by individual population. Some spend their entire lives in small streams and their size remains small. Some migrate from small streams to larger rivers and back again to the stream to spawn. Those fish are generally larger. Some migrate into lakes or reservoirs then back to their natal stream or river to spawn. The varying life histories have an influence on maximum size, from 10 to 12 inches to over 30 inches and many pounds in weight.	Likely to be present
Fish	Pacific Sand Lance	*Ammodytes hexapterus*	PS	-	Sand lances are generally pelagic (using open water) from March through August. Pacific sand lance spawn from November through February on sandy intertidal beaches with freshwater seeps between mean higher-high water (MHHW) and +7 feet (2 meters).	Likely to be present

Appendix B
State Priority, Listed, and Candidate Wildlife Species List

Species Group	Common Name	Scientific Name	State Status	Federal Status	Preferred Habitat[1]	Study Area Potential Presence
Birds	Northern Spotted Owl	*Strix occidentalis*	E	T	The northern spotted owl inhabits mid and late seral coniferous forests. Typical habitat characteristics include high canopy closure, complex forest structure with trees of multiple age classes, large decaying trees and/or snags, high volume downed wood. Northern spotted owls have large home ranges, and in those areas they hunt a number of prey species.	Potentially present
Birds	Marbled murrelet	*Brachyramphus marmoratus*	E	T	This species is a seabird that forages in marine waters but nests in old growth forests or residual old growth tress in younger forest. Nest are located in depressions on a mat of moss, lichen, or debris accumulations on large branches. The availability of nest platforms is a primary factor influencing breeding distribution in Washington state. These birds are more common in the northern Puget Sound and less common along the southwestern coast.	Potentially present
Birds	Streaked Horned Lark	*Eremophila alpestris strigata*	E	T	Prairie and grassland south of Puget Sound, coastal beaches, dredge spoil islands and sparsely vegetated shoreline sites on the lower Columbia River.	Potentially present
Birds	Yellow-Billed Cuckoo	*Coccyzus americanus*	E	T	Yellow-billed cuckoos display a strong preference for large, continuous riparian zones with cottonwoods and willows. In Washington, nesting also took place in fir woodlands and open brushy hillsides.	Potentially present
Birds	Oregon Vesper Sparrow	*Pooecetes gramineus affinis*	E	UR	Open habitats (grassland, shrub-steppe, and agriculture)	Documented observation
Birds	Western Snowy Plover	*Charadrius nivosus*	E	T	Open habitats (plowed fields, airports, golf courses, beach dunes, and sod farms)	Migratory, potentially present
Birds	Sandhill Crane	*Grus canadensis*	E	-	Southcentral Columbia Basin	Migratory, potentially present
Birds	Band-Tailed Pigeon	*Columba fasciata*	PS	-	This pigeon is reliant on upland forests and limited mineral sources in western Washington. Food resources include berry- and nut-producing trees and shrubs such as cascara, elderberry, wild cherry, huckleberry, and madrone. Band-tailed pigeons seek a mineral supplement to their diet. Mineral concentration habitat occurs in study area.	Likely to be present
Birds	Wood Duck	*Aix sponsa*	PS	-		Documented Present
Birds	Dusky Canada goose	*Branta canadensis occidentalis*	PS	-	Dusky Canada goose winter in Washington where they use agricultural areas such as pastures and grain crops.	Migratory, potentially present
Birds	Trumpeter Swan	*Cygnus buccinator*	PS		Nearly three-quarters of the trumpeter swans that migrate along the west coast's great Pacific Flyway will winter in Washington state. The birds arrive generally in late October and stay in northwestern Washington over the winter before beginning their northward migration in April to their breeding sites. Trumpeter swans are present in riparian areas and marine shorelines.	Migratory, potentially present
Birds	Vaux's Swift	*Chaetura vauxi*	PS	-	Vaux's swifts are strongly associated with old-growth coniferous forests, where the insides of large hollow trees and snags are frequently used for nesting and roosting. Nests are often placed in hollow trees used by roosting pileated woodpeckers (Dryocopus pileatus), with swifts entering these trees through woodpecker holes. Chimneys are also occasionally used as nest sites, with older brick chimneys preferred. Vaux's swifts are present in Washington as spring and autumn migrants and as summer residents.	Migratory and resident, likely to be present
Birds	Harlequin Duck	*Histrionicus histrionicus*	PS	-	The harlequin duck is found on fast-flowing streams in riparian, subalpine, and coastal habitats during the breeding season. Birds move to the coast to molt in summer. These same molting areas are important wintering areas for harlequin ducks from several western states and provinces.	Migratory, likely to be present

Appendix B
State Priority, Listed, and Candidate Wildlife Species List

Species Group	Common Name	Scientific Name	State Status	Federal Status	Preferred Habitat[1]	Study Area Potential Presence
Birds	Brown Pelican	*Pelecanus occidentalis*	PS	-	Brown pelicans inhabit mainly coastal waters and are rarely seen inland or far out at sea. They feed mostly in shallow estuarine waters and occasionally up to 40 miles from shore. They use sand spits, offshore sand bars, and islets for nocturnal roosting and daily loafing, especially non-breeders and during the non-nesting season. Dry roosting sites are essential. Brown pelicans that roost on beaches can be disturbed by humans, including pedestrians and motorists.	Likely to be present
Birds	Purple Martin	*Progne subis*	PS	-	The primary purple martin nesting and foraging habitat in Washington is open land near water. They can be found in developed areas, along waterfronts, and in fields, wetlands, and clearings.	Documented observation
Birds	Great Blue Heron	*Ardea herodias*	PS	-	Great blue heron occur in saltwater and freshwater habitats, from open coasts, marshes, sloughs, riverbanks, and lakes to backyard goldfish ponds. They also forage in grasslands and agricultural fields. Breeding birds gather in colonies to build stick nests high off the ground.	Likely to be present
Birds	Western Grebe	*Aechmophorus occidentalis*	C	-	Large freshwater lakes, reservoirs, and marshes during the summer breeding season; relatively sheltered coastal marine areas in winter	Likely to be present
Birds	Clark's Grebe	*Aechmophorus clarkii*	C	-	Large freshwater lakes, reservoirs, and marshes during the summer breeding season; relatively calm coastal marine areas in winter	Migratory
Birds	Short-Tailed Albatross	*Phoebastria albatrus*	C	E	The short-tailed albatross is a rare visitor to Washington waters, but was once common. They are ocean surface feeders, relying primarily on squid, flying fish, fish eggs, and crustaceans. They also follow fishing vessels for bait lines and processing scraps.	Migratory, potentially present, but unlikely to be present
Birds	Northern Goshawk	*Accipiter gentilis*	C	-	Boreal and montane forest habitats of northern continents	Potentially present
Birds	Golden Eagle	*Aquila chrysaetos*	C	-	Dry open forests of eastern Washington, shrub-steppe, canyonlands, in high-elevation alpine zones of all regions, and sparingly in clearcut areas in western Washington	Likely to be present
Birds	Cassin's Auklet	*Ptychoramphus aleuticus*	C	-	Cassin's Auklets forage mostly offshore and out of sight of land. They nest on island habitat with rocky crevices and only return to nesting burrows under cover of darkness to avoid attracting predators.	Potentially present
Birds	Slender-Billed White-Breasted Nuthatch	*Sitta carolinensis aculeata*	C	-	Oak and oak-conifer woodlands; Oregon white oak, black cottonwood, and Oregon ash	
Birds	Common Loon	*Gavia immer*	S	-	Marine and estuarine coastal waters, larger inland lakes, reservoirs, and rivers	Likely to be present
Mammals	Gray Wolf	*Canis lupus*	E	E	Wolves were formerly common throughout most of Washington, but endangered in the state. Wolves are highly adaptable and can live in a variety of habitats if sufficient prey is available. In the northwestern states and western Canada, wolves are most common in relatively flat forested areas, rolling hills, or open spaces such as river valleys and basins, where prey animals are easier to chase and catch. Wolves generally avoid humans and human activities. They prefer and do best in remote areas with extensive public lands.	Potentially present
Mammals	Roosevelt Elk	*Cervus elaphus roosevelti*	PS	-	Roosevelt elk are the subspecies found in the coastal ranges of the Olympic Peninsula, southwest Washington, and the western slopes of the Cascade Range including Western Washington river valleys.	Likely to be present

Appendix B
State Priority, Listed, and Candidate Wildlife Species List

Species Group	Common Name	Scientific Name	State Status	Federal Status	Preferred Habitat[1]	Study Area Potential Presence
Mammals	Columbian White-Tailed Deer	*Odocoileus virginianus leucurus*	E	T	The Columbian white-tailed deer is the westernmost subspecies of white-tailed deer and is considerably smaller than other white-tailed deer in northern latitudes. These deer historically preferred upland prairie edge and deciduous woodland habitat types, but due to habitat fragmentation and loss are often now found in lowland and floodplain habitat.	Likely to be present
Mammals	Fisher	*Pekania pennanti*	E	-	Fishers were once extirpated from Washington, but have now been reintroduced in the Olympic Peninsula and Cascade Mountain Range. Fishers inhabit coniferous and mixed coniferous-deciduous forests and tend to avoid areas without substantial tree cover.	Potentially present
Mammals	Western Gray Squirrel	*Sciurus griseus*	T	-	Western gray squirrels are most frequently associated with pine trees, which provide nesting cover and seeds for food, and oak trees, which provide natal den sites and acorns for food. The closest know population is the oak woodlands and conifer forests on Joint Base Lewis-McChord in Pierce and Thurston counties	Potentially present
Mammals	Townsend's Big-Eared Bat	*Corynorhinus townsendii*	C	-	These bats are found in westside lowland conifer-hardwood forest, ponderosa pine forest and woodlands, mixed highland conifer forest, eastside mixed conifer forest, shrub-steppe, riparian forest/wetlands and open fields. Day and maternity roosts are in caves, abandoned mines, buildings, concrete bunkers, tunnels, and bridges. Winter hibernacula include mines, tunnels, and concrete bunkers.	Potentially present
Mammals	Keen's Myotis Bat	*Myotis keenii*	C	-	These bats are closely associated with low elevation, moist, mature coastal conifer forests during the active season and may move to hibernacula in mid-elevation caves for winter. Summer roosts are in tree cavities, snags, rock crevices, small caves, and buildings.	Potentially present
Mammals	Yuma Myotis (Bat)	*Myotis yumanensis*	S	-	Relatively common in western Washington lowlands. Buildings, bridges, cliff crevices, caves, mines, and trees are used as summer day roosts, especially when located near water. Maternity colonies occupy buildings, caves, mines, and the undersides of train trestles and piers.	Likely to be present
Mammals	Big Brown Bat	*Eptesicus fuscus*	PS	-	This bat is present throughout Washington. Summer day roosts and maternity colonies occur in a variety of settings, including building attics and walls, trees, snags, caves, mines, crevices in cliffs, and bridges. This species may also occupy trees and snags with hollow cavities and crevices.	Likely to be present
Mammals	Mazama Pocket Gopher	*Thomomys mazama*	T	T[2]	Pocket gophers are truly subterranean and are rarely observed above ground. Mazama pocket gophers are herbivores that require grasses and forbs for food. They eat a wide variety of roots and above-ground plant parts	Documented Present
Mammals	Fin Whale	*Balaenoptera physalus*	E	E	Fin whales usually inhabit deep offshore waters and the outer slopes of continental shelves, where they feed. They prefer temperate and subpolar regions	Potentially present, but unlikely to be present
Mammals	Sei Whale	*Balaenoptera borealis*	E	E	This species generally occurs along the edges of continental shelves and in deeper oceans, especially where ocean fronts and eddies exist. Temperate waters may be preferred.	Potentially present, but unlikely to be present
Mammals	Blue Whale	*Balaenoptera musculus*	E	E	Blue whales are more pelagic than most other whales, but also visit coastal waters. Most blue whales migrate between summer and winter ranges. Occurrence in some areas is linked to zooplankton availability. The whales are not known to enter the Washington state's inner waters.	Potentially present, but unlikely to be present
Mammals	Humpback Whale	*Megaptera novaeangliae*	E	E	Humpback whale are highly migratory, with most populations moving long distances from tropical and subtropical wintering areas to higher latitudes in the summer. Habitat includes the open ocean and coastal waters but inshore areas such as bays are sometimes used.	Potentially present

Appendix B
State Priority, Listed, and Candidate Wildlife Species List

Species Group	Common Name	Scientific Name	State Status	Federal Status	Preferred Habitat[1]	Study Area Potential Presence
Mammals	North Pacific Right Whale	*Eubalaena japonica*	E	E	North Pacific right whales are thought to migrate between higher latitudes during spring and summer and lower latitudes in winter. The whales inhabit coastal and continental shelf waters but are sometimes found in deep waters. Presence in some areas is linked to high zooplankton prey abundance. The current population is thought to be about 30 whales.	Potentially present, but unlikely to be present
Mammals	Sperm Whale	*Physeter macrocephalus*	E	E	The sperm whale is the largest species of toothed whale and is found in deep oceans.	Not likely to be present
Mammals	Southern Resident Killer Whale	*Orcinus orca*	E	E	Killer whales occupy pelagic and coastal (including inland marine) waters. Southern Resident spend more time in coastal areas, where their preferred salmon prey is typically found.	Potentially present
Mammals	Gray Whale	*Eschrichtius robustus*	S	E	Gray whales migrate through deep waters but young are born in lagoons and bays.	Potentially present
Mammals	Pacific Harbor Porpoise	*Phocoena phocoena*	C	-	Harbor porpoise are mostly found in coastal waters, including bays and estuaries.	Likely to be present
Mammals	Harbor Seal	*Phoca vitulina*	PS	-	Common and widespread in Washington coastal and inland marine waters. Priority haul-out habitat in the study area.	Likely to be present
Mammals	Sea Otter	*Enhydra lutris kenyoni*	T	-	Sea otters are commonly found in rocky marine habitats and kelp beds within about a mile from shore. Females tend to use habitats closer to the shore than males.	Likely to be present
Reptiles	Western Pond Turtle	*Actinemys marmorata*	E	90d	Ponds and lakes adjacent to open upland habitats that receive extensive sun exposure	Potentially present
Reptiles	Leatherback Sea Turtle	*Dermochelys coriacea*	E	E	The leatherback sea turtle inhabits open ocean, often near the edges of continental shelves. Turtles may forage off the coast of Washington.	Unlikely to be present
Reptiles	Loggerhead Sea Turtle	*Caretta caretta*	E	E	Loggerhead sea turtles mostly inhabit continental shelf and nearshore marine waters, but occur in the open sea during migration. There are few sighting reported in Washington.	Unlikely to be present
Reptiles	Green Sea Turtle	*Chelonia mydas*	T	T	Feeding occurs in shallow, low-energy marine waters with abundant submerged vegetation, as well as in convergence zones in open ocean. Rocky outcrops near feeding areas are used for resting. This species prefers tropical to subtropical waters and is rarely observed in Washington.	Unlikely to be present
Reptiles	Common Sharp-Tailed Snake	*Contia tenuis*	C	-	Edges of coniferous or open hardwood forest; riparian/river floodplain with deciduous trees, shrubs and accumulations of decaying down woody logs	Not likely to be present
Amphibians	Oregon Spotted Frog	*Rana pretiosa*	E	T	This species is highly aquatic and rarely found away from water. Existing populations occur in large shallow wetland systems associated with a stream or stream network. Breeding habitat is in seasonally flooded margins of wetlands and areas of extensive shallow water.	Potentially present
Amphibians	Dunn's Salamander	*Plethodon dunni*	C	-	Shaded rocky edges of highly humid forested streams and moist talus	Potentially present
Amphibians	Van Dyke's Salamander	*Plethodon vandykei*	C	-	Cool, moist habitats associated with streams, seepages, and rock outcrops	Potentially present
Amphibians	Cascade Torrent Salamander	*Rhyacotriton cascadae*	C	90d	High-gradient, cold streams, off-channel habitats, seepages and waterfall splash zones, typically in areas with a thick canopy cover	Potentially present

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State Priority, Listed, and Candidate Wildlife Species List

Species Group	Common Name	Scientific Name	State Status	Federal Status	Preferred Habitat[1]	Study Area Potential Presence
Amphibians	Western Toad	*Anaxyrus boreas*	C	-	Wetlands, ponds, lakes, reservoir coves, still-water off-channel habitats of rivers, and river edges adjacent to prairies, forests, canyon grasslands and ponderosa pine-Oregon oak habitat	Documented observation
Invertebrates	Dungeness Crab	*Metacarcinus magister*	PS	-	Subtidal sandy areas along the Pacific coast and sandy and muddy bays and estuaries.	Documented observation
Invertebrates	Oregon Silverspot Butterfly	*Argynnis zerene hippolyta*	E	T	The Oregon silverspot butterfly uses open, short-stature grasslands in coastal dunes, bluffs, and nearby forest glades. This butterfly is sedentary and does not migrate. The population in Washington state is currently considered extinct.	Unlikely to be present
Invertebrates	Taylor's Checkerspot	*Euphydryas editha taylori*	E	E	Dependent on prairie and grassland habitats. It also occupies coastal bluffs and dunes as well as small forest openings (balds).	Potentially present
Invertebrates	Mardon Skipper	*Polites mardon*	E	-	In south Puget Sound, glacial outwash prairies with abundant Roemer's Fescue habitat	Potentially present
Invertebrates	Pinto Abalone	*Haliotis kamtschatkana*	E	-	Complex rocky reef habitat, generally found between water depths of 9 to 60 feet	Likely to be present

Notes:
1. Preferred habitat and presence in the study information is based on information from Guggenmos 2023, WDFW 2022, WDFW 2023, and The Cornell Lab of Ornithology 2023.
2. Federal threated status is assigned on a subspecies basis. Subspecies of the western pocket gopher listed as threatened are Olympia western pocket gopher (*Thomomys mazama pugetensis*), Tenino pocket gopher (*Thomomys mazama tumuli*), and Yelm pocket gopher (*Thomomys mazama yelmensis*).
DPS: Distinct Population Segment
ESU: Evolutionarily Significant Unit

Federal Status Abbreviations:
"-": no status
UR: under review
C: candidate
T: threatened
State Status Abbreviations:
PS: priority species
C: candidate
S: sensitive
T: threatened
E: endangered
Natural Heritage Rank Abbreviations
WNHP uses the ranking system developed by NatureServe to assess global and state conservation status of each plant species, subspecies, and variety.

References:
Guggenmos, Lori (Washington Department of Fish and Wildlife), 2023. Personal communication with Sydney Gonsalves (Anchor QEA, LLC). Regarding: Port of Grays Harbor Terminal 4 Expansion and Redevelopment Project. January 30, 2023.
WDFW (Washington Department of Fish and Wildlife), 2022. Priority Habitats and Species Maps. Accessed December 1, 2022. Available at: http://wdfw.wa.gov/mapping/phs/.
WDFW, 2023. Species in Washington. Accessed January 6, 2023. Available at: https://wdfw.wa.gov/species-habitats/species.
The Cornell Lab of Ornithology, 2023. All About Birds website. Accessed January 18, 2023. Available at: https://www.allaboutbirds.org.

Appendix C
Bird Species Documented in Grays Harbor

eBird Field Checklist

Grays Harbor County, Washington, US

ebird.org/region/US-WA-027

369 species (+118 other taxa) - Year-round, All years

Date: _____
Start time: _____
Duration: _____
Distance: _____
Party size: _____
Notes:

This checklist is generated with data from eBird (ebird.org), a global database of bird sightings from birders like you. If you enjoy this checklist, please consider contributing your sightings to eBird. It is 100% free to take part, and your observations will help support birders, researchers, and conservationists worldwide.

Go to ebird.org to learn more!

Waterfowl

___Emperor Goose
___Snow Goose
___Ross's Goose
___Snow x Ross's Goose (hybrid)
___Greater White-fronted Goose
___Taiga Bean-Goose
___Pink-footed Goose
___Domestic goose sp. (Domestic type)
___Brant
___Barnacle Goose
___Cackling Goose
___Canada Goose
___Domestic goose sp. x Canada Goose (hybrid)
___Cackling/Canada Goose
___goose sp.
___Mute Swan
___Trumpeter Swan
___Tundra Swan
___Trumpeter/Tundra Swan
___Whooper Swan
___swan sp.
___Muscovy Duck
___Wood Duck
___Garganey
___Blue-winged Teal
___Cinnamon Teal
___Blue-winged x Cinnamon Teal (hybrid)
___Blue-winged/Cinnamon Teal
___Northern Shoveler
___Gadwall
___Eurasian Wigeon
___American Wigeon
___Eurasian x American Wigeon (hybrid)
___Eurasian/American Wigeon
___Mallard
___American Wigeon x Mallard (hybrid)
___Northern Pintail
___Mallard x Northern Pintail (hybrid)
___Green-winged Teal
___teal sp.
___dabbling duck sp.
___Canvasback
___Redhead
___Ring-necked Duck
___Tufted Duck
___Greater Scaup
___Lesser Scaup
___Greater/Lesser Scaup
___Aythya sp.
___King Eider
___Common Eider
___Harlequin Duck
___Surf Scoter
___White-winged Scoter
___Black Scoter
___Surf/Black Scoter
___scoter sp.
___Long-tailed Duck
___Bufflehead

___Common Goldeneye
___Barrow's Goldeneye
___Common x Barrow's Goldeneye (hybrid)
___Common/Barrow's Goldeneye
___Hooded Merganser
___Common Merganser
___Red-breasted Merganser
___Common/Red-breasted Merganser
___merganser sp.
___Ruddy Duck
___duck sp.
___waterfowl sp.

Grouse, Quail, and Allies

___Helmeted Guineafowl
___Mountain Quail
___Northern Bobwhite
___California Quail
___Wild Turkey
___Ruffed Grouse
___Sooty Grouse
___grouse sp.
___Ring-necked Pheasant
___Ring-necked/Green Pheasant

Grebes

___Pied-billed Grebe
___Horned Grebe
___Red-necked Grebe
___Eared Grebe
___Horned/Eared Grebe
___Western Grebe
___Clark's Grebe
___Western x Clark's Grebe (hybrid)
___Western/Clark's Grebe
___grebe sp.

Pigeons and Doves

___Rock Pigeon
___Band-tailed Pigeon
___Eurasian Collared-Dove
___African Collared-Dove
___Eurasian/African Collared-Dove
___Mourning Dove
___pigeon/dove sp.

Cuckoos

___Yellow-billed Cuckoo

Nightjars

___Common Nighthawk

Swifts

___Black Swift
___Vaux's Swift

Hummingbirds

___Anna's Hummingbird
___Rufous Hummingbird
___hummingbird sp.

Rails, Gallinules, and Allies

___Virginia Rail
___Sora
___American Coot
___rail/crake sp.

Cranes

___Sandhill Crane

Shorebirds

___American Avocet
___Black Oystercatcher
___Black-bellied Plover
___American Golden-Plover
___Pacific Golden-Plover
___American/Pacific Golden-Plover (Lesser Golden-Plover)
___Black-bellied Plover/golden-plover sp.
___Lesser Sand-Plover
___Snowy Plover
___Semipalmated Plover
___Common Ringed/Semipalmated Plover
___Killdeer
___Mountain Plover
___Eurasian Dotterel
___plover sp.
___Upland Sandpiper
___Bristle-thighed Curlew
___Whimbrel
___Long-billed Curlew
___curlew sp.
___Bar-tailed Godwit
___Hudsonian Godwit
___Marbled Godwit
___godwit sp.
___Ruddy Turnstone
___Black Turnstone
___Red Knot
___Surfbird
___Ruff

___Sharp-tailed Sandpiper
___Stilt Sandpiper
___Curlew Sandpiper
___Temminck's Stint
___Red-necked Stint
___Sanderling
___Dunlin
___Rock Sandpiper
___Baird's Sandpiper
___Least Sandpiper
___White-rumped Sandpiper
___Buff-breasted Sandpiper
___Pectoral Sandpiper
___Sharp-tailed/Pectoral Sandpiper
___Semipalmated Sandpiper
___Western Sandpiper
___peep sp.
___Calidris sp.
___Short-billed Dowitcher
___Long-billed Dowitcher
___Short-billed/Long-billed Dowitcher
___Wilson's Snipe
___Wilson's Phalarope
___Red-necked Phalarope
___Red Phalarope
___Red-necked/Red Phalarope
___phalarope sp.
___Spotted Sandpiper
___Solitary Sandpiper
___Wandering Tattler
___Greater Yellowlegs
___Willet
___Lesser Yellowlegs
___Greater/Lesser Yellowlegs
___shorebird sp.

Skuas and Jaegers

___South Polar Skua
___Pomarine Jaeger
___Parasitic Jaeger
___Pomarine/Parasitic Jaeger
___Long-tailed Jaeger
___Parasitic/Long-tailed Jaeger
___jaeger sp.

Alcids

___Common Murre
___Thick-billed Murre
___Pigeon Guillemot
___Long-billed Murrelet
___Marbled Murrelet
___Scripps's Murrelet
___Guadalupe Murrelet
___Scripps's/Guadalupe Murrelet (Xantus's Murrelet)
___Ancient Murrelet
___murrelet sp.
___Cassin's Auklet
___Parakeet Auklet
___Least Auklet
___Rhinoceros Auklet
___auklet sp.
___Horned Puffin
___Tufted Puffin
___alcid sp.

Gulls, Terns, and Skimmers

___Black-legged Kittiwake
___Red-legged Kittiwake
___Sabine's Gull
___Bonaparte's Gull
___Little Gull
___Laughing Gull
___Franklin's Gull
___Heermann's Gull
___Short-billed Gull
___Ring-billed Gull
___Western Gull
___California Gull
___Herring Gull
___Iceland Gull
___Lesser Black-backed Gull
___Slaty-backed Gull
___Glaucous-winged Gull
___Western x Glaucous-winged Gull (hybrid)
___Herring x Glaucous-winged Gull (hybrid)
___Western/Glaucous-winged Gull
___Glaucous Gull
___Herring x Glaucous Gull (hybrid)
___Glaucous-winged x Glaucous Gull (hybrid)
___Larus sp.
___gull sp.
___Least Tern
___Caspian Tern

___Black Tern
___Common Tern
___Arctic Tern
___Common/Arctic Tern
___Forster's Tern
___Sterna sp.
___Elegant Tern
___large tern sp.
___tern sp.
___gull/tern sp.

Loons

___Red-throated Loon
___Pacific Loon
___Common Loon
___Yellow-billed Loon
___loon sp.

Albatrosses

___White-capped Albatross
___Laysan Albatross
___Black-footed Albatross
___Short-tailed Albatross
___albatross sp.

Storm-Petrels

___Wilson's Storm-Petrel
___Fork-tailed Storm-Petrel
___Leach's Storm-Petrel
___Ashy Storm-Petrel
___storm-petrel sp. (dark-rumped)
___storm-petrel sp.

Petrels, Shearwaters, and Diving-Petrels

___Northern Fulmar
___Murphy's Petrel
___Mottled Petrel
___Hawaiian Petrel
___Pterodroma sp.
___Pink-footed Shearwater
___Flesh-footed Shearwater
___Great Shearwater
___Buller's Shearwater
___Sooty Shearwater
___Short-tailed Shearwater
___Sooty/Short-tailed Shearwater
___Manx Shearwater
___black-and-white shearwater sp.
___shearwater sp.
___Procellariid sp.

Frigatebirds, Boobies, and Gannets

___Brown Booby

Cormorants and Anhingas

___Brandt's Cormorant
___Pelagic Cormorant
___Double-crested Cormorant
___cormorant sp.

Pelicans

___American White Pelican
___Brown Pelican

Herons, Ibis, and Allies

___American Bittern
___Great Blue Heron
___Great Egret
___Snowy Egret
___Cattle Egret
___Green Heron
___Black-crowned Night-Heron
___White-faced Ibis

Vultures, Hawks, and Allies

___Turkey Vulture
___Osprey
___White-tailed Kite
___Golden Eagle
___Northern Harrier
___Sharp-shinned Hawk
___Cooper's Hawk
___Sharp-shinned/Cooper's Hawk
___Northern Goshawk
___Accipiter sp.
___Bald Eagle
___Golden/Bald Eagle
___Red-shouldered Hawk
___Swainson's Hawk
___Red-tailed Hawk
___Rough-legged Hawk
___Buteo sp.
___hawk sp.

Owls

___Barn Owl
___Western Screech-Owl
___Snowy Owl
___Great Horned Owl

___Northern Pygmy-Owl
___Burrowing Owl
___Spotted Owl
___Barred Owl
___Long-eared Owl
___Short-eared Owl
___Northern Saw-whet Owl
___owl sp.

Kingfishers

___Belted Kingfisher

Woodpeckers

___Red-naped Sapsucker
___Red-breasted Sapsucker
___Lewis's Woodpecker
___Acorn Woodpecker
___Downy Woodpecker
___Hairy Woodpecker
___Downy/Hairy Woodpecker
___Pileated Woodpecker
___Northern Flicker
___woodpecker sp.

Falcons and Caracaras

___American Kestrel
___Merlin
___Gyrfalcon
___Peregrine Falcon
___Prairie Falcon
___falcon sp.
___diurnal raptor sp.

Tyrant Flycatchers: Pewees, Kingbirds, and Allies

___Olive-sided Flycatcher
___Western Wood-Pewee
___Willow Flycatcher
___Least Flycatcher
___Hammond's Flycatcher
___Pacific-slope Flycatcher
___Empidonax sp.
___Black Phoebe
___Say's Phoebe
___Tropical Kingbird
___Western Kingbird
___new world flycatcher sp.

Vireos

___Hutton's Vireo
___Cassin's Vireo
___Warbling Vireo
___Red-eyed Vireo
___vireo sp.

Shrikes

___Loggerhead Shrike
___Northern Shrike

Jays, Magpies, Crows, and Ravens

___Canada Jay
___Steller's Jay
___Blue Jay
___California Scrub-Jay
___jay sp.
___American Crow
___crow sp.
___Common Raven
___crow/raven sp.

Tits, Chickadees, and Titmice

___Black-capped Chickadee
___Mountain Chickadee
___Chestnut-backed Chickadee
___chickadee sp.

Larks

___Horned Lark

Martins and Swallows

___Northern Rough-winged Swallow
___Purple Martin
___Tree Swallow
___Violet-green Swallow
___Tree/Violet-green Swallow
___Bank Swallow
___Barn Swallow
___Cliff Swallow
___swallow sp.

Long-tailed Tits and Bushtit

___Bushtit

Kinglets

___Ruby-crowned Kinglet
___Golden-crowned Kinglet
___Ruby-crowned/Golden-crowned Kinglet

Nuthatches

___Red-breasted Nuthatch

Treecreepers

___Brown Creeper

Gnatcatchers

___Blue-gray Gnatcatcher

Wrens

___Rock Wren
___House Wren
___Pacific Wren
___Marsh Wren
___Bewick's Wren
___wren sp.

Dippers

___American Dipper

Starlings and Mynas

___European Starling

Catbirds, Mockingbirds, and Thrashers

___Gray Catbird
___Northern Mockingbird

Thrushes

___Western Bluebird
___Mountain Bluebird
___Townsend's Solitaire
___Varied Thrush
___Swainson's Thrush
___Hermit Thrush
___Catharus sp.
___American Robin
___Varied Thrush/American Robin
___thrush sp.

Old World Flycatchers

___Northern Wheatear

Waxwings

___Bohemian Waxwing
___Cedar Waxwing

Old World Sparrows

___House Sparrow

Wagtails and Pipits

___Gray Wagtail
___American Pipit

Finches, Euphonias, and Allies

___Brambling
___Evening Grosbeak
___Pine Grosbeak
___Gray-crowned Rosy-Finch
___House Finch
___Purple Finch
___Common Redpoll
___Red Crossbill
___White-winged Crossbill
___crossbill sp.
___Pine Siskin
___Lesser Goldfinch
___American Goldfinch
___Acanthis/Spinus sp.
___finch sp.

Longspurs and Snow Buntings

___Lapland Longspur
___Chestnut-collared Longspur
___Smith's Longspur
___longspur sp.
___Snow Bunting
___McKay's Bunting

Old World Buntings

___Little Bunting

New World Sparrows

___Chipping Sparrow
___Clay-colored Sparrow
___Black-throated Sparrow
___Lark Sparrow
___American Tree Sparrow
___Fox Sparrow
___Dark-eyed Junco
___White-crowned Sparrow
___Golden-crowned Sparrow
___White-crowned x Golden-crowned Sparrow (hybrid)
___Harris's Sparrow
___White-throated Sparrow
___Zonotrichia sp.
___Vesper Sparrow
___Savannah Sparrow
___Song Sparrow
___Lincoln's Sparrow
___Swamp Sparrow
___Spotted Towhee
___new world sparrow sp.

Yellow-breasted Chat

___Yellow-breasted Chat

Blackbirds

___Yellow-headed Blackbird
___Bobolink
___Western Meadowlark

___Orchard Oriole
___Hooded Oriole
___Bullock's Oriole
___Red-winged Blackbird
___Brown-headed Cowbird
___Rusty Blackbird
___Brewer's Blackbird
___Rusty/Brewer's Blackbird
___blackbird sp.

Wood-Warblers

___Tennessee Warbler
___Orange-crowned Warbler
___Nashville Warbler
___Leiothlypis sp.
___MacGillivray's Warbler
___Common Yellowthroat
___American Redstart
___Yellow Warbler
___Chestnut-sided Warbler
___Palm Warbler
___Yellow-rumped Warbler
___Black-throated Gray Warbler
___Townsend's Warbler
___Black-throated Gray/Townsend's Warbler
___Hermit Warbler
___Townsend's x Hermit Warbler (hybrid)
___Townsend's/Hermit Warbler
___Wilson's Warbler
___new world warbler sp.

Cardinals, Grosbeaks, and Allies

___Western Tanager
___Rose-breasted Grosbeak
___Black-headed Grosbeak
___Lazuli Bunting
___Dickcissel

Others

___passerine sp.
___bird sp.