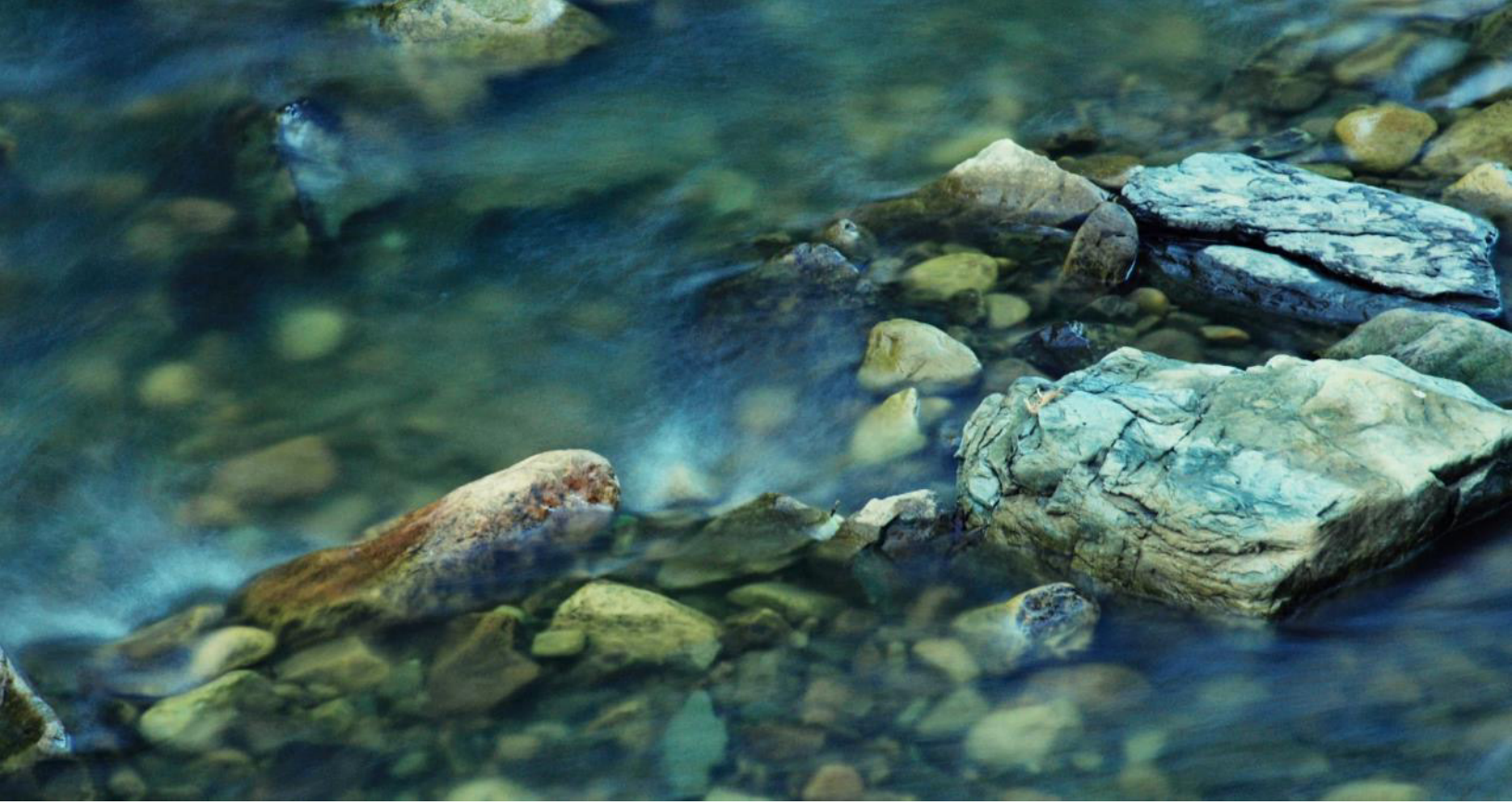
Attachment N
Biological Assessment



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

ANCHOR QEA

Biological Assessment

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

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

Biological Assessment

Prepared for
Port of Grays Harbor
PO Box 660
Aberdeen, Washington 98520

Prepared by
Anchor QEA, LLC
6720 S Macadam Avenue, Suite 125
Portland, Oregon 97219

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ABBREVIATIONS

AGP	Ag Processing, Inc.
AGP Project	Ag Processing, Inc., Operations Expansion at Terminal 4
BA	Biological Assessment
BMP	best management practice
CFR	*Code of Federal Regulations*
CR	Columbia River
CWA	Clean Water Act
cy	cubic yard
dB	decibel
DPS	distinct population segment
Ecology	Washington State Department of Ecology
EFH	Essential Fish Habitat
ESA	Endangered Species Act
ESU	evolutionarily significant unit
FR	*Federal Register*
g	gram
HAPC	Habitat Area of Particular Concern
IHA	Incidental Harassment Application
LCR	Lower Columbia River
m	meter
MHHW	mean higher high water
MI	Major Industrial
MLLW	mean lower low water
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NA	not applicable
NE	no effect
NLAA	may affect, not likely to adversely affect
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
PAH	polycyclic aromatic hydrocarbon
PBF	physical or biological features
PCE	primary constituent element
PHFS	Public Highway Freight System
PIR	Port Industrial Road
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 action	Port of Grays Harbor Terminal 4 Expansion and Redevelopment Project
Proposed Project	Port Project and AGP Project
PSAP	Puget Sound and Pacific Railroad
rail upgrades	rail upgrades and site improvements
RMS	root mean square
RORO	roll-on/roll-off
SEL	sound exposure level
SPCC	spill prevention, control, and countermeasure
SPL	sound pressure level
SWPPP	Stormwater Pollution Prevention Plan
T1	Terminal 1
T2	Terminal 2
T3	Terminal 3
T4	Terminal 4
T4A	Terminal 4A
T4B	Terminal 4B
TESC	temporary erosion and sediment control
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
UWR	Upper Willamette River
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington State Department of Natural Resources
WGS84	World Geodetic System of 1984

1 Introduction

This Biological Assessment (BA) has been prepared for the Port of Grays Harbor Terminal 4 Expansion and Redevelopment Project. The Port of Grays Harbor (Port) is proposing the Terminal 4 (T4) Expansion and Redevelopment Project to expand 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 (Figures 1 and 2). This includes the rail upgrades and site improvements (rail upgrades), the Terminal 4A (T4A) cargo yard relocation and expansion, and the T4 dock fender and stormwater upgrades. These Project elements would be constructed by the Port and are referred to as the Port Project. It also includes an expansion of operations 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.

The Proposed Project includes both upland and in-water work under the jurisdiction of the U.S. Army Corps of Engineers (USACE), and the issuance of the USACE Section 404/10 permit serves as the federal nexus requiring Endangered Species Act (ESA) Section 7 review.

In accordance with Section 7(a)(2) and Section 3(5)(A) of the ESA, this BA addresses the potential effects on federally listed species and their designated critical habitats for the proposed action[1]. This BA addresses species protected under the authority of National Marine Fisheries Service (NMFS) and species protected under the authority of U.S. Fish and Wildlife Service (USFWS). The preliminary effects determinations described in Section 6 were made for the listed, proposed, or candidate species that may occur in the vicinity of the Proposed Project.

This BA also provides an evaluation of the effects of the Proposed Project on Essential Fish Habitat (EFH) pursuant to the Magnuson-Stevens Fishery Conservation and Management Act (MSA), the 1996 Sustainable Fisheries Act, and the North Pacific Fisheries Management Council. Under this legislation, an evaluation for impacts to EFH is necessary for activities that may adversely affect EFH. EFH is defined by the MSA in 50 *Code of Federal Regulations* (CFR) 600.905–930 as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The EFH assessment is included in Section 7.

This BA was prepared to support the ESA consultation led by USACE under Section 7(a)(2) of the ESA, which requires the following:

> …each Federal agency shall, in consultation with and with the assistance of the Secretary, ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any

[1] As defined in Section 2 of this BA, the proposed action includes all construction and operational activities of the Proposed Project and any avoidance and minimization measures, including potential mitigation activities.

endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined by the Secretary, after consultation as appropriate with affected States, to be critical, unless such agency has been granted an exemption for such action by the Committee pursuant to subsection (h) of this section.

1.1 Project Overview, Purpose, and Need

The purpose of the Proposed Project is to strive toward the Port's mission: "To best utilize our resources to facilitate, enhance and stimulate international trade, economic development and tourism for the betterment of the region" (Port of Grays Harbor 2023). The Proposed Project will support the Port's mission by upgrading the Port's terminal and rail infrastructure, including expanding the capacity of the current rail loop, upgrading the existing T4 dock with new dock fenders and a shiploader, and replacing backland cargo storage capacity lost to the expanded rail footprint by redeveloping the vacant 55-acre industrial site to the east of T4 by filling the casting basin site and returning the property to a viable industrial site to support the marine activities at T4A.

The T4 facility currently is underutilized following a decision by Chrysler Automotive in late 2019 to move their export shipping location from Grays Harbor to Portland, Oregon. The loss of this customer, along with the Port's 2018 purchase of the adjacent 55-acre Washington State Department of Transportation pontoon site, provides the Port the opportunity to redevelop the area that was previously used to support the automobile exports and the pre-casting of bridge pontoons into a robust multimodal terminal for agricultural products, breakbulk, logs, and other cargos needing a coastal marine terminal.

These improvements are needed to support Port economic resiliency and to increase the Port's operational capacity and efficiency to support increased growth, job creation and retention, and economic opportunities related to multimodal port operations, including the expansion of AGP's agricultural export facilities, ship loading productivity, storage capacity, and the efficient movement of goods through the Port (Port of Grays Harbor 2022a).

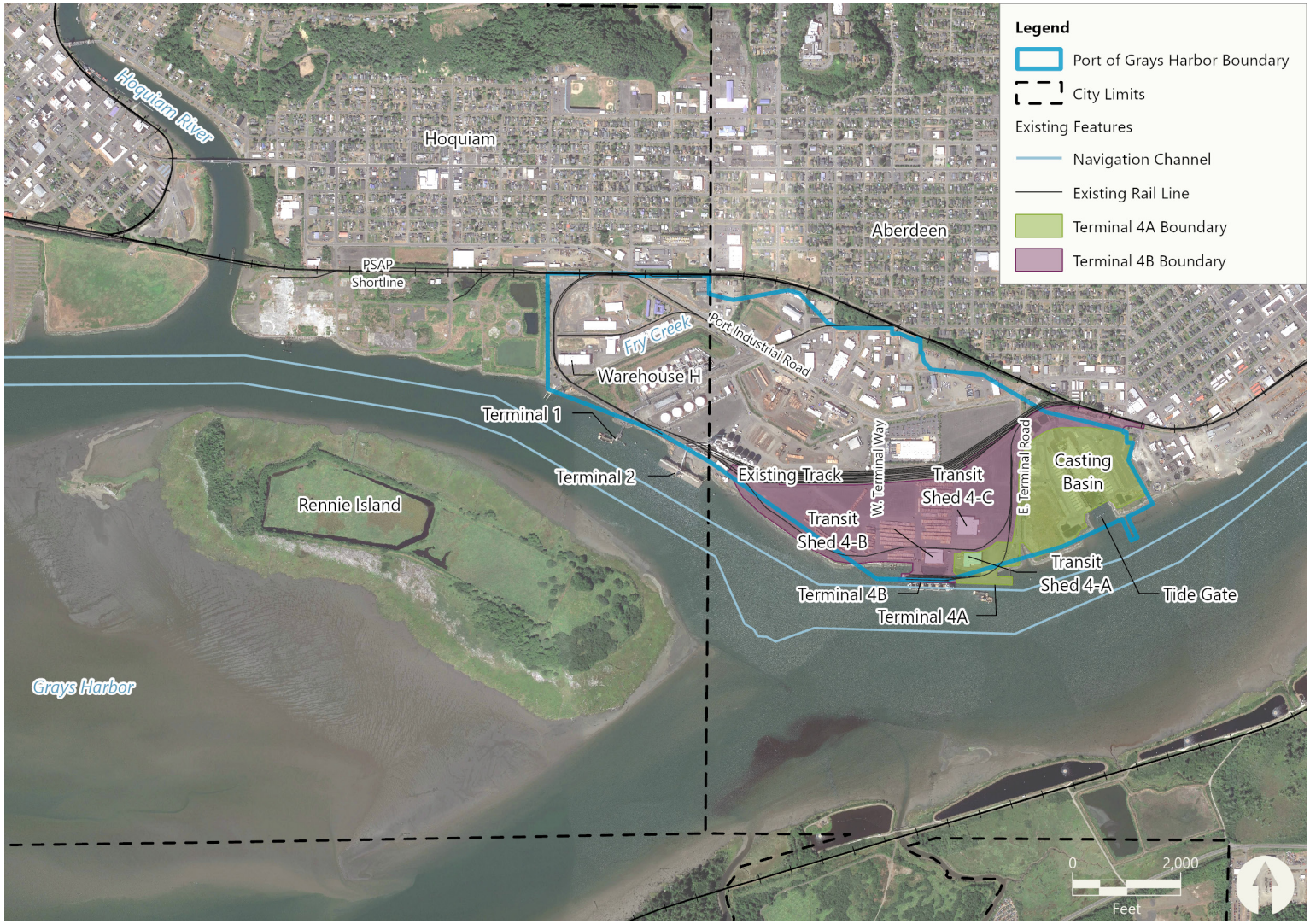
The Proposed Project will provide a key transportation link to international markets for thousands of U.S. soybean farmers, while creating jobs and economic benefits for the local community, the Port, and current Port tenants in this Historically Disadvantaged Community of Washington State (U.S. Department of Transportation 2023). These investments will provide AGP the infrastructure to accommodate increased throughput of soybean meal and other bulk commodities to meet global market demand.

The Proposed Project will advance economic growth in the region and provide a link between the U.S. and Asian markets to meet demand for high-quality U.S. soybean meal. The expansion of export

capacity at the Port of Grays Harbor is also important to support the increased soybean meal production that will be generated at new Midwest soybean processing plants opening in 2025. Currently, U.S. domestic market demand for soybean meal has been reached.

Figure 1
Vicinity Map

Figure 2
Existing Conditions



1.2 Action Area

The action area is the defined geographic area to be directly or indirectly affected by the Proposed Project (50 CFR 402.02). For the purposes of establishing baseline conditions from which to evaluate potential effects of the Proposed Project, the types of activities to be performed and physical site conditions were examined and evaluated. The action area includes both terrestrial and aquatic components that may experience environmental effects as a result of Project construction and Port operations (Figures 5, 6, 7, and 8).

Based on the types of activities proposed, it was determined that the terrestrial component of the action 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 Port operations. The terrestrial action area for direct effects was calculated based on the loudest potential Project sound sources, which will be single-strike impact pile driving. The loudest of these pile driving activities is impact installation of 36-inch steel pipe piles. Peak noise created by this action (110 decibels [dB]) was used to define the furthest extent of in-air noise and defines the outermost limits of the terrestrial portion of the action area.

The aquatic component of the action 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 Port operations. Affected aquatic habitats include those associated with on-site ditches, the on-site fish-bearing stream (Fry Creek), on-site wetlands, and the waters of Grays Harbor. The aquatic action area for direct effects was calculated based on the loudest potential Project sound sources, which will be single-strike impact pile driving. The loudest of these pile driving activities is impact installation of 36-inch steel pipe piles. Peak noise created by this action (210 dB) with a 5 dB noise reduction as a result of standard bubble curtain attenuation was used to define the furthest extent of underwater noise and defines the outermost limits of the in-water portion of the action area.

The estimates for these thresholds and more detailed descriptions of Project-related effects and action areas are described in Section 5.

1.3 ESA-Listed Species and Habitats that May Occur in the Action Area

In accordance with Section 7(a)(2) of the ESA, as amended, federally funded, constructed, permitted, or licensed projects must take into consideration impacts to federally listed and proposed threatened or endangered species. Nine species listed as threatened, endangered, or candidate species by the National Oceanic and Atmospheric Administration (NOAA) and the United States Fish and Wildlife Service (USFWS) may occur in the action area, and three of those species also have designated or proposed critical habitat that includes the action area (Table 1; NOAA 2022a; USFWS 2022a).

Table 1
ESA-Listed Species and Critical Habitats That May Occur in the Action Area

Species and Scientific Name	ESU/DPS	Listing Status	Agency	Critical Habitat	Preliminary Effects Determination
Fish					
North American green sturgeon (*Acipenser medirostris*)	Southern DPS	Threatened	NOAA	Designated; includes action area	LTAA
Bull trout (*Salvelinus confluentus*)	Coastal-Puget Sound DPS	Threatened	USFWS	Designated; includes action area	LTAA
Chinook salmon (*Oncorhynchus tshawytscha*)	LCR ESU	Threatened	NOAA	Designated; does not include action area	NLAA
	UPR ESU	Threatened	NOAA	Designated; does not include action area	NLAA
Chum salmon (*Oncorhynchus keta*)	CR ESU	Threatened	NOAA	Designated; does not include action area	NLAA
Pacific eulachon (*Thaleichthys pacificus*)	Southern DPS	Threatened	NOAA	Designated; does not include action area	NLAA
Marine Mammals					
Killer whale (*Orcinus orca)*	Southern Resident DPS	Endangered	NOAA	Designated; does not include action area	NLAA
Birds					
Marbled murrelet (*Brachyrhampus marmoratus*)	NA	Threatened	USFWS	Designated; does not include action area	LTAA
Streaked horned lark (*Eremophila alpestrisstrigata*)	NA	Threatened	USFWS	Designated; does not include action area	NLAA
Western snowy plover (*Charadrius alexandrinus nivosus*)	Pacific Coast DPS	Threatened	USFWS	Designated; includes action area	NLAA

The effect of the Proposed Project on these species and critical habitats was determined by documenting environmental baseline conditions and evaluating effects of the Proposed Project on the species and environmental baseline. Species and effect determinations for the Proposed Project are described in Sections 4 through 7.

1.4 ESA-Listed Species Considered but Eliminated from Further Evaluation

Twenty-nine additional ESA-listed species or populations under NOAA or USFWS jurisdiction occur in Washington and are considered by NOAA or USFWS to potentially occur in the action area but are not further addressed in this BA as they are highly unlikely to occur within the action area and/or lack suitable habitat in the action area (Table 2). These 29 species are listed in Table 2 and discussed in Section 1.4.1 with the rationale for eliminating them from this analysis.

Table 2
ESA-Listed Species Eliminated from Further Evaluation

Species and Scientific Name	ESU/DPS	Listing Status	Agency	Critical Habitat	Preliminary Effects Determination
Fish					
Steelhead *(Oncorhynchus mykiss)*	Puget Sound DPS	Threatened	NOAA	Designated; does not include action area	NE
Chinook salmon *(Oncorhynchus tshawytscha)*	Puget Sound ESU	Threatened	NOAA	Designated; does not include action area	NE
Marine Turtles					
Leatherback sea turtle *(Dermochelys coriacea)*	NA	Endangered	NOAA	Designated; does not includes action area	NE
Green sea turtle (*Chelonia mydas*)	East Pacific DPS	Threatened	NOAA	Designated; does not include action area	NE
Loggerhead sea turtle (*Caretta caretta*)	North Pacific Ocean DPS	Endangered	NOAA	Not designated	NE
Olive ridley sea turtle (*Lepidochelys olivacea*)	NA	Endangered	NOAA	Not designated	NE
Marine Mammals					
Humpback whale *(Megaptera novaeangliae)*	Central America DPS	Endangered	NOAA	Designated, does not include action area	NE
	Mexico DPS	Threatened	NOAA	Designated, does not include action area	NE
Fin whale *(Balaenoptera physalus)*	NA	Endangered	NOAA	Not designated or proposed	NE

Species and Scientific Name	ESU/DPS	Listing Status	Agency	Critical Habitat	Preliminary Effects Determination
Sei whale (*Balaenoptera borealis)*	NA	Endangered	NOAA	Not designated or proposed	NE
Blue whale (*Balaenoptera musculus)*	NA	Endangered	NOAA	Not designated or proposed	NE
Sperm whale *(Physeter macrocephalus)*	NA	Endangered	NOAA	Not designated or proposed	NE
Gray whale (*Eschrichtius robustus*)	Eastern and Western North Pacific DPS	Endangered	NOAA	Designated; does not include action area	NE
North Pacific right whale (*Eubalaena japonica)*	NA	Endangered	NOAA	Designated; does not include action area	NE
Guadalupe fur seal (*Arctocephalus townsendi*)	NA	Threatened	NOAA	Not designated	NE
Terrestrial Mammals					
Gray wolf (*Canis lupus*)	Western DPS	Proposed Endangered	USFWS	Not designated	NE
North American wolverine (*Gulo gulo luscus*)	NA	Proposed Threatened	USFWS	Not designated	NE
Yelm pocket gopher (*Thomomys mazama yelmensis*)	NA	Threatened	USFWS	Designated; does not include action area	NE

Species and Scientific Name	ESU/DPS	Listing Status	Agency	Critical Habitat	Preliminary Effects Determination
Birds					
Northern spotted owl *(Strix occidentalis caurina*)	NA	Threatened	USFWS	Designated; does not include action area	NE
Yellow-billed cuckoo (*Coccyzus americanus*)	Western DPS	Threatened	USFWS	Designated; does not include action area	NE
Short-tailed albatross (*Phoebastria albatrus*)	NA	Endangered	USFWS	Not designated	NE
Hawaiian Petrel (*Pterodroma sandwichensis*)	NA	Endangered	USFWS	Not designated	NE
Amphibians					
Oregon spotted frog (*Rana pretiosa*)	NA	Threatened	USFWS	Designated; includes action area	NE
Insects					
Oregon silverspot butterfly (*Argynnis zerene hippolyta*)	NA	Threatened	USFWS	Not designated	NE
Monarch butterfly *(Danaus plexippus)*	NA	Candidate	USFWS	Designated; does not include action area	NE
Taylor's checkerspot (*Euphydryas editha taylori*)	NA	Endangered	USFWS	Designated; does not include action area	NE
Plants					
Golden paintbrush (*Castilleja levisecta*)	NA	Threatened Proposed for Delisting	USFWS	Not designated	NE
Kincaid's lupine (*Lupinus sulphureus* ssp. *kincaidii*)	NA	Threatened	USFWS	Designated; does not include action area	NE
Nelson's checker-mallow (*Sidalcea nelsoniana*)	NA	Threatened Proposed for Delisting	USFWS	Not designated	NE

1.4.1 Rationale for Eliminating ESA-Listed Species from Further Consideration

- Puget Sound steelhead *(Oncorhynchus mykiss)* – Threatened (NOAA).
  - Rationale: Puget Sound distinct population segment (DPS) steelhead are not known to occur in the action area. Because the action area is not designated as critical habitat, the Proposed Project will have no effect on Puget Sound steelhead, and this species is not addressed further.
- Puget Sound Chinook salmon *(Oncorhynchus tshawytscha)* – Threatened (NOAA).
  - Rationale: Puget Sound evolutionarily significant unit (ESU) Chinook salmon are not known to occur in the action area. Because the action area is not designated as critical habitat, the Proposed Project will have no effect on Puget Sound Chinook salmon, and this species is not addressed further.
- Leatherback sea turtle (*Dermochelys coriacea*) – Endangered (NOAA).
  - Rationale: Leatherback sea turtles are occasionally observed off the west coast of Washington and other areas north of Point Conception, California, as they forage for jellyfish during the summer and fall. In the United States, nesting leatherback sea turtles usually occur in Florida, Puerto Rico, and U.S. Virgin Islands (NOAA 2022b). Leatherback sea turtles are not known to nest in Washington, and it is highly unlikely that Grays Harbor provides suitable habitat. Because the action area does not contain suitable habitat and it is highly unlikely they would be swimming off the Washington coast, the Proposed Project will have no effect on leatherback sea turtles, and this species is not addressed further.
- Green sea turtle (*Chelonia mydas*) – Threatened (NOAA).
  - Rationale: Green sea turtles are occasionally observed washed ashore and off the coast of Washington, but in the United States, nesting green turtles are primarily found in the Hawaiian Islands, U.S. Pacific Island territories (Guam, the Commonwealth of the Northern Mariana Islands, and American Samoa), Puerto Rico, the Virgin Islands, and Florida. Nesting also occurs annually in Georgia, South Carolina, North Carolina, and Texas (NOAA 2022c). Green sea turtles are not known to nest in Washington, and it is highly unlikely that Grays Harbor provides suitable habitat. Because the action area does not contain suitable habitat and it is highly unlikely they would be swimming off the Washington coast, the Proposed Project will have no effect on green sea turtles, and this species is not addressed further.
- Loggerhead sea turtle (*Caretta caretta*) – Endangered (NOAA).
  - Rationale: Loggerhead sea turtles are rarely observed off the coast of Washington, but they typically nest in tropical and subtropical areas (NOAA 2022d). In the Pacific, loggerhead sea turtles primarily nest in Japan and in Australia. Loggerhead sea turtles

are not known to nest in Washington, and it is highly unlikely that Grays Harbor provides suitable habitat. Because the action area does not contain suitable habitat and it is highly unlikely they would be swimming off the Washington coast, the Proposed Project will have no effect on loggerhead sea turtles, and this species is not addressed further.

- Olive ridley sea turtle (*Lepidochelys olivacea*) – Endangered (NOAA).
  - Rationale: The olive ridley sea turtle range is not known to include Washington coastal waters, and they primarily nest in tropical and subtropical areas (NOAA 2022e). Olive ridley sea turtles are not known to nest in Washington, and it is highly unlikely that Grays Harbor provides suitable habitat. Because the action area does not contain suitable habitat and it is highly unlikely they would be swimming off the Washington coast, the Proposed Project will have no effect on olive ridley sea turtles, and this species is not addressed further.
- Humpback whale *(Megaptera novaeangliae)* – Endangered (NOAA).
  - Rationale: Humpback whales are found in coastal waters of Washington as they migrate between feeding grounds in Alaska to winter breeding grounds in Mexico. Humpback whales are occasional and temporary visitors to Grays Harbor, with most observations of the species being in the outer harbor; they are only rarely encountered closer to the Project Area. Because it is highly unlikely that humpback whales would enter the inner harbor action area and additional vessel calls resulting from the Proposed Project fall within the normal pre-COVID-19 operational baseline for Port activities, the Proposed Project will have no effect on humpback whale, and this species is not addressed further.
- Fin whale *(Balaenoptera physalus)* – Endangered (NOAA).
  - Rationale: Fin whales have not been documented inside of Grays Harbor. Based on their known distribution and the available information on sightings, fin whales are highly unlikely to enter the inner harbor action area. Because additional vessel calls resulting from the Proposed Project fall within the normal pre-COVID-19 operational baseline for Port activities, the Proposed Project will have no effect on fin whales, and this species is not addressed further.
- Sei whale (*Balaenoptera borealis*) – Endangered (NOAA).
  - Rationale: Sei whales have not been documented inside of Grays Harbor. Based on their known distribution and the available information on sightings, sei whales are highly unlikely to enter the inner harbor action area, and additional vessel calls resulting from the Proposed Project fall within the normal pre-COVID-19 operational baseline for Port activities. Therefore, the Proposed Project will have no effect on sei whales, and this species is not addressed further.

- Blue whale (*Balaenoptera musculus)* – Endangered (NOAA).
  - Rationale: Blue whales have not been documented inside of Grays Harbor. Based on their known distribution and the available information on sightings, blue whales are highly unlikely to enter the inner harbor action area, and additional vessel calls resulting from the Proposed Project fall within the normal pre-COVID-19 operational baseline for Port activities. Therefore, the Proposed Project will have no effect on blue whales, and this species is not addressed further.
- Sperm whale *(Physeter macrocephalus)* – Endangered (NOAA).
  - Rationale: Sperm whales have not been documented inside of Grays Harbor. Based on their known distribution and the available information on sightings, sperm whales are highly unlikely to enter the inner harbor action area, and additional vessel calls resulting from the Proposed Project fall within the normal pre-COVID-19 operational baseline for Port activities. Therefore, the Proposed Project will have no effect on sperm whales, and this species is not addressed further.
- Gray whale (*Eschrichtius robustus*) – Endangered (NOAA).
  - Rationale: The Eastern North Pacific stock of the gray whale, which is found in Washington waters, has been delisted under the ESA. The Western North Pacific stock of gray whales has not recovered and remains listed as endangered. Because Western North Pacific gray whales do not occur in the Pacific Northwest or within the action area and additional vessel calls resulting from the Proposed Project fall within the normal pre-COVID-19 operational baseline for Port activities, this species is not addressed further.
- North Pacific right whale (*Eubalaena japonica)* – Endangered (NOAA).
  - Rationale: North Pacific right whales are rarely found in Washington waters. Critical habitat for North Pacific right whales has been designated in the Gulf of Alaska and Bering Sea. Because North Pacific right whales only rarely occur in the Pacific Northwest or within the action area and additional vessel calls resulting from the Proposed Project fall within the normal pre-COVID-19 operational baseline for Port activities, this species is not addressed further.
- Guadalupe fur seal (*Arctocephalus townsendi*) – Threatened (NOAA).
  - Rationale: Guadalupe fur seal breeding grounds are found almost entirely on Guadalupe Island, Mexico. While they are rarely found in Washington waters, it is highly unlikely that Grays Harbor or the action area provides suitable habitat, and additional vessel calls resulting from the Proposed Project fall within the normal pre-COVID-19 operational baseline for Port activities. Because there is no Guadalupe fur seal critical habitat designated in the Pacific Northwest or within the action area, this species is not addressed further.

- Gray wolf (*Canis lupus*) – Proposed Endangered (USFWS).
  - Rationale: Gray wolves do not occur in the action area (USFWS 2022b), and suitable habitat does not exist in the action area. Gray wolves can be found in forested areas in Washington. Wolf packs are closely monitored by the Washington Department of Fish and Wildlife (WDFW), and the nearest pack is in the Cle Elum area, approximately 140 miles east of the Proposed Project. Because the action area does not contain suitable habitat, the Proposed Project will have no effect on gray wolf, and this species is not addressed further.
- North American wolverine (*Gulo gulo luscus*) – Proposed Threatened (USFWS).
  - Rationale: North American wolverines do not occur in the action area (USFWS 2022c). In Washington, wolverines are found in the Cascade Mountains. The action area does not include suitable habitat for wolverines. Because the action area does not contain suitable habitat, the Proposed Project will have no effect on North American wolverines, and this species is not addressed further.
- Yelm pocket gopher (*Thomomys mazama yelmensis*) – Threatened (USFWS).
  - Rationale: Yelm pocket gophers do not occur in the action area (USFWS 2022d). In Thurston County, Washington, there are two designated critical habitats, one located at Rock Prairie and one located at Tenalquot Prairie. Neither critical area is in proximity to the Puget Sound and Pacific Railroad (PSAP) terminus in Centralia, Washington. Because the rail action area does not contain suitable habitat, the Proposed Project will have no effect on Yelm pocket gophers, and this species is not addressed further.
- Northern spotted owl *(Strix occidentalis caurina*) – Threatened (USFWS).
  - Rationale: Northern spotted owls do not occur in the action area, and suitable habitat does not exist in the action area. Northern spotted owls are typically found in old-growth forests that have a closed canopy with large open flyable areas beneath the canopy, with many downed logs, snags, and other woody debris that serve as nesting sites and for prey habitat (USFWS 2022e). Because the action area does not contain suitable nesting habitat, the Proposed Project will have no effect on northern spotted owls, and this species is not addressed further.
- Yellow-billed cuckoo (*Coccyzus americanus*) – Threatened (USFWS).
  - Rationale: Yellow-billed cuckoos do not occur in the action area and are thought to be extirpated from Washington. Yellow-billed cuckoos are typically found in habitat consisting of forested riparian habitats, especially woodlands with cottonwoods and willow, which are used for foraging and nesting (USFWS 2022f). Because the action area does not contain these habitats, the Proposed Project will have no effect on yellow-billed cuckoos, and this species is not addressed further.

- Short-tailed albatross (*Phoebastria albatrus*) – Endangered (USFWS).
  - Rationale: Short-tailed albatrosses are rarely observed on the Pacific coast of Washington or in the vicinity of the action area. Most of the remaining population breeds and nests on the islands of Japan and Hawaii (USFWS 2022g). Because the action area does not contain suitable nesting habitat, the Proposed Project will have no effect on short-tailed albatrosses, and this species is not addressed further.
- Hawaiian petrel (*Pterodroma sandwichensis*) – Endangered (USFWS).
  - Rationale: Hawaiian petrels are typically observed in deep pelagic environments beyond the continental shelf edge, where they are very rarely observed foraging at the surface of the ocean. This species primarily occurs in the Hawaiian Islands where their breeding grounds occur, and regular migratory patterns have been documented (USFWS 2022h). Hawaiian petrels are not known to breed or regularly migrate away from the Hawaiian Islands. Because the action area does not contain suitable nesting habitat, the Proposed Project will have no effect on Hawaiian petrels, and this species is not addressed further.
- Oregon spotted frog (*Rana pretiosa*) Threatened (USFWS).
  - Rationale: While Oregon spotted frog has designated critical habitat at the Black River in Baker Prairie, Washington, and partially overlaps with the rail action area, it is unlikely that the increase in rail trips proposed by the Proposed Project would have any effect on the species. Because Oregon spotted frogs are almost entirely aquatic in their behavior, it is unlikely that they would leave their habitat in association with the Black River and encounter any additional Project rail traffic (McAllister and Leonard 1997). Because the rail action area does not contain suitable habitat, the Proposed Project will have no effect on Oregon spotted frog, and this species is not addressed further.
- Oregon silverspot butterfly (*Argynnis zerene hippolyta*) – Threatened (USFWS).
  - Rationale: Oregon silverspot butterflies do not occur in the action area (USFWS 2022i), and suitable habitat does not exist in the action area. Oregon silverspot butterflies are likely extirpated in Washington state due to their rare and restricted host plants and habitat type, with four known remaining populations in Oregon. Because the action area does not contain suitable habitat, the Proposed Project will have no effect on Oregon silverspot butterflies, and this species is not addressed further.
- Monarch butterfly (*Danaus plexippus*) – Candidate (USFWS).
  - Rationale: The monarch butterfly is a candidate species and not yet listed. Consultation with USFWS under Section 7 of the ESA is not required for candidate species such as the monarch butterfly (USFWS 2022j). The number of monarch butterflies in Washington is relatively low. Milkweeds are patchily distributed within the Columbia Basin. Monarch butterflies migrating through Washington often concentrate along the large river courses of the Columbia and Snake rivers and east of the Cascade Mountains where milkweed more frequently occurs (WDFW 2022a).

- Taylor's checkerspot (*Euphydryas editha taylori*) – Endangered (USFWS).
  - Taylor's checkerspot are unlikely to occur in the action area. Taylor's checkerspot is dependent on prairie and grassland habitats. It also occupies coastal bluffs and dunes as well as small forest openings (balds) (USFWS 2023b). There are several designated critical habitats in Thurston County, Washington. However, because the rail action area does not contain designated critical habitat, the Proposed Project will have no effect on Taylor's checkerspot, and this species is not addressed further.
- Golden paintbrush (*Castilleja levisecta*) – Threatened, Proposed for Delisting (USFWS).
  - Rationale: Golden paintbrush has recently been proposed for delisting under the ESA because data indicate threats to the golden paintbrush have been eliminated or reduced to the point that the species is not in danger of extinction or likely to become so in the foreseeable future. Because the PSAP rail line action area does not contain suitable golden paintbrush prairie habitat, the Proposed Project will have no effect on golden paintbrush, and this species is not addressed further.
- Kinkaid's lupine (*Lupinus sulphureus ssp. kincaidii*) – Threatened (USFWS).
  - Rationale: Kinkaid's lupine is not likely to occur in the action area. Kinkaid's lupine is typically found in prairie habitat consisting of forested riparian habitats, especially woodlands with cottonwoods and willow, which are used for foraging and nesting (USFWS 2022k). Because the action area does not contain these habitats, the Proposed Project will have no effect on Kinkaid's lupine, and this species is not addressed further.
- Nelson's checker-mallow (*Sidalcea nelsoniana*) – Threatened, Proposed for Delisting (USFWS).
  - Rationale: Nelson's checker-mallow has recently been proposed for delisting under the ESA because data indicate threats to the Nelson's checker-mallow have been reduced to the point that the species is not in danger of extinction or likely to become so in the foreseeable future. Nelson's checker-mallow is not likely to occur in the action area. Nelson's checker-mallow is typically found in open prairie habitats in the Willamette Valley and the Coast Range of Oregon and Washington (USFWS 2023b). Because the PSAP rail line action area does not contain this habitat, the Proposed Project will have no effect on Nelson's checker-mallow, and this species is not addressed further.

1.5 Consultation History

The Proposed Project is not associated with any previous ESA consultations. A preliminary species list was obtained from the NMFS website on October 20, 2022 (NOAA 2022a). A preliminary USFWS species list was obtained from the Information for Planning and Consultation website on October 20, 2022 (USFWS 2022a).

2 Proposed Action

The proposed action pursuant to the ESA includes all construction and operational activities of the Proposed Project and any avoidance and minimization measures, including potential mitigation activities. The following sections include the Proposed Project location and regional setting, a description of the Project Area, land use and existing conditions, a description of the proposed action, and avoidance and minimization measures.

2.1 Project 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 the mouth of the Chehalis River and is approximately 15 miles east from the Pacific Ocean at the mouth of Grays Harbor. The Port is the westernmost port in the State of Washington. The Pacific Ocean is accessed from the Port via the Grays Harbor deep-draft federal navigation channel within Grays Harbor. The Hoquiam River is approximately 1.5 miles slightly northwest of the Port. Rennie Island is just south of the Port and is within Grays Harbor. Bowerman Airport is approximately 4 miles west-northwest of the Port.

2.2 Project Area

The Project Area consists of the area where the proposed facilities would be located, called the On-Site Project Area, and the 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 and consists of on-site facilities at Port-owned properties. All portions of the On-Site Project Area are owned by the Port. The Off-Site Project Area includes off-site transportation corridors used for rail, vessel, and vehicle transportation. This includes the PSAP line from the Port property to the connection with the BNSF Railway and Union Pacific Railroad mainline in Centralia, Washington, and the Grays Harbor federal navigation channel from the Port property, through Grays Harbor, to the Pacific Ocean and up to 3 nautical miles from shore. 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.

2.3 Project Area Conditions

2.3.1 Land Use and Zoning

The Project Area is located in both the cities of Hoquiam and Aberdeen, Washington. The portion located in Aberdeen is zoned as Major Industrial (MI) (City of Aberdeen 2015). The western portion of the Project Area is within the jurisdiction of the City of Hoquiam. This area is zoned by the City of Hoquiam as Industrial District (City of Hoquiam 2010).

Land uses at the Project Area are primarily related to Port import and export activities. To the north of the Project Area there are various commercial, industrial, and retail uses. Farther north, beyond these uses, are residential tracts. To the east, following the geography of the Chehalis River, there are residential, commercial, and retail uses. To the south, the Chehalis River abuts the Project Area. To the west, following the geography of the Chehalis River, there are various commercial and industrial uses.

2.3.2 Existing Port Facilities

Figure 2 depicts the existing conditions at the Project Area. Cargo movements through Grays Harbor include bulk and breakbulk agriculture products, heavy equipment, military equipment, forest products, and liquid bulks, including biodiesel.

The Port has four industrial terminals. Terminal 1 (T1) is a liquid bulk terminal with adjacent upland storage areas. Terminal 2 (T2) operates as a bulk loading facility where AGP is a tenant. Terminal 3 (T3), which is approximately 2.8 miles to the west of T2, offers deepwater access with on-site rail connection (Port of Grays Harbor 2022b). No changes to Infrastructure at or operations of T3 are included in the Proposed Project. T4 is the largest of the Port's terminals. It is 1,400 feet long with two deepwater marine berths supported by 100 acres of uplands, warehousing, and rail.

The Project Area contains Transit Sheds T4-A, T4-B, and T4-C. These were constructed in the 1990s to accommodate diversified cargo movement through T4. The shed construction included connections to road, rail, and marine traffic. The sheds provided shelter for weather-sensitive breakbulk cargo moving through T4 such as steel coils, copper cathodes, aluminum ingots, aluminum tees, plywood, lumber, automobiles, oversize equipment, granite blocks, pulp rolls, and pulp bales.

In 2018, the Port purchased a 50-acre site immediately east of T4 (Figure 2) with the intent of decommissioning a former pontoon casting basin and returning the property to a useable condition for cargo laydown. A 2021 site development plan and feasibility analysis (MFA 2021) identified that decommissioning the casting basin and related infrastructure will be needed to efficiently operate a cargo facility at the site. The site development plan also identified the required steps to return the largest number of acres to useable marine terminal space while minimizing environmental impacts and minimizing initial costs. Currently, the cargo yard site is bifurcated by the casting basin footprint, which is approximately 6 acres in size and 25 feet deep. The casting basin is separated from the water with an existing marine casting basin gate (also referred to as a tide gate).

2.3.3 Transportation to and from the Port

Vessels approach the Project Area via the Chehalis River and Grays Harbor Navigation Channel, which runs east and west from the Pacific Ocean into the Port docks. The navigation channel and turning basin are depicted in Figure 2. USACE maintains the 22-mile-long deep-draft federal navigational channel. The federal navigation channel is 350 feet wide, increasing up to 1,000 feet

wide over the bar east of Rennie Island, with depths ranging from 32 to 36 feet (USACE 2022). Approximately 1.7 million cubic yards are dredged annually (USACE 2022).

Vessels that call on the Port have historically included ships and barges. Available ship and barge records that date back to 1989 show significant fluctuations in traffic volumes over time and from year to year. The recorded annual ship calls during this period range from 8 to 214 annual ship calls, and the recorded annual barge calls during this period range from 0 to 179 annual barge calls.

Since 2002, there have been 1,281 recorded ship calls to the Port for an average of approximately 64 ship calls per year, and there have been 317 recorded barge calls for an average of approximately 20 barge calls per year.[2] Ship trips through the federal navigation channel to and from the Port historically included four main cargo types. Generally speaking, liquid bulk represents trips to and from T1. Dry bulk includes trips to and from T2. The remaining breakbulk and RORO trips are mainly from T4. In recent years, the RORO cargo has declined as destinations for this cargo, especially automobiles, have shifted elsewhere. Anticipated vessel volumes over the analysis period for the No Action Alternative are discussed in the *Project Description Technical Report* (Anchor QEA 2023).

Since 2013 (not including the years affected by the COVID-19 pandemic), the Port saw an annual average of approximately 100 ship calls per year, including a peak of 115 ship calls in 2014. During the pandemic, ship call numbers at the Port dropped to an average of approximately 56 ship calls per year. In the years between 2013 and the pandemic, the Port saw an annual average of approximately 16 barge calls per year, including a peak of 31 barge calls in 2013. For the purposes of subsequent environmental analysis, the baseline for comparison is 131 total vessel round trips through the federal navigation channel per year, including 100 ship round trips and 31 barge round trips.

As shown in Figure 2, the Port has two rail loops that run through the existing marine terminals complex. Both of these rail loops serve T2, which does not have on-dock rail. One of the rail loops provides on-dock rail access at T4. The Port is served by a Critical Rural Freight Corridor (designated as a T2 State Highway and an R2 Rail Freight Corridor).[3] Rail service to the marine terminals provides direct access to both Class 1 railroads (BNSF Railway and Union Pacific Railroad) via the PSAP short line railroad. The PSAP short line railroad forms the northern boundary of the Port-owned industrial area. Trains travelling to or from the Port travel along the PSAP short line railroad. From the Port to the east, all trains travel along the Harbor subdivision of the PSAP. Near Elma, Washington, the PSAP splits into two subdivisions including the Bangor Subdivision and the Centralia Subdivision. The Harbor and Centralia subdivisions combined cover a distance of approximately 60 miles and generally parallel U.S. 12 between Centralia and Aberdeen

[2] Ship call records include the years 2002 through 2021. Barge call records include the years 2002 through 2017. Barge data were not available for the year 2018 or beyond.

[3] The Federal Highway Administration defines Critical Rural Freight Corridors as "public roads not in an urbanized area which provide access and connection to the PHFS [Public Highway Freight System] and the Interstate with other important ports, public transportation facilities, or other intermodal freight facilities" (FHWA 2022).

and U.S. 101 in Hoquiam. At Centralia, the PSAP short line railroad terminates where it connects to the BNSF Railway and the Union Pacific Railroad mainlines.

Local road access to the Project Area is provided via Port Industrial Road (PIR). Further access to the Project Area is provided by West Heron Street, East Terminal Road, and West Terminal Way. Both East Terminal Road and West Terminal Way intersect with PIR. Regional highway connections include U.S. 12 and U.S. 101. West Heron Street directly connects to U.S. 101 and is classified as a truck route per Aberdeen Municipal Code Chapter 10.60.

2.3.4 Fry Creek

Fry Creek is the only inland waterbody within the Project Area considered to be fish-bearing by WDFW that would be affected by the Proposed Project. As shown in Figure 2, Fry Creek is at the western end of the Project Area and empties into Grays Harbor. Fry Creek is a narrow channel passing through many culverts and under roadway crossings. Under existing conditions, two rail tracks cross over Fry Creek within the Project Area and another two rail tracks cross over Fry Creek outside of the Project Area. Fry Creek runs through a 110-foot-long culvert that is 11.5 feet in diameter, which allows the railroad tracks to cross Fry Creek where it empties into Grays Harbor. The 28th Street Boat Launch and a public viewing tower is directly next to Fry Creek. Port-owned Warehouse H is adjacent to the two existing rail tracks near Fry Creek.

2.3.5 Stormwater Management

The entirety of the Project Area is currently developed and consists largely of impervious surfaces. Stormwater in the Project Area mainly discharges via the Port's outfalls to the Chehalis River and Grays Harbor; however, certain areas are captured separately and may also be routed to existing municipal systems. Separated catch basins exist at T1 and T2 related to existing tenant use and would not be affected by the Proposed Project.

Within the Project Area at T4, stormwater is separated into two main basins with the Terminal 4B (T4B) area draining to outfalls located to the west of the T4 dock. Stormwater at T4A is handled through an existing sand and gravel permit, involving detention at the existing ponds prior to discharge via separate outfalls to the east of the T4 dock. Stormwater at the T4 dock current drains to Grays Harbor.

As described in the 2021 site development plan and feasibility analysis (MFA 2021), under existing conditions, stormwater at the casting basin is collected into a sump and then conveyed by pumps to the four northern stormwater ponds. The water is then treated in the stormwater ponds and discharged to the ditch on the west side of the casting basin. This biofiltration swale and ditch then discharges water into a stormwater sediment treatment cell in the southwest corner of the casting basin. From there, stormwater is discharged into the Chehalis River.

On the eastern side of the casting basin, there are several biofiltration swales that collect runoff and discharge to the ponds in the southeastern corner of the casting basin. To the east and west of the parking area there are conveyance ditches, The ditches on the western side of the parking area convey stormwater to the same pond in the southeastern corner of the casting basin. The ditch on the eastern side of the parking area discharges into the Chehalis River.

2.3.6 Utilities

Existing utilities at the Project Area include domestic water supply, a sewer line, and electrical connection. Water is supplied by a nearby one-inch domestic water line. The existing sewer line is a four-inch gravity service line. Existing connections to the Grays Harbor Public Utility District electrical grid exist at the Project Area.

2.4 Project Description

As noted in Section 1, the Proposed Project consists of Port-led improvements and the AGP Project. The Port improvements include the following: 1) rail upgrades; 2) T4 cargo yard relocation and expansion; and 3) dock fender and stormwater upgrades. AGP's Project consists of expanding their facilities and operations with shiploading infrastructure by adding a second facility at T4B. Figure 3 presents the configuration of all elements of the Proposed Project identified above and described in detail in the following sections.

Figure 3
Project Elements

2.4.1 Rail Upgrades and Site Improvements

The rail upgrades will increase the efficiency of the movement of goods through the Port. The rail upgrades will increase efficiency of unit train offloading, railcar storage, and unit train assembly. The rail upgrades will increase capacity for all Port users and will ensure that each terminal could operate unimpeded by unit trains on neighboring loops. The rail upgrades and site improvements involve construction of 50,245 linear feet of new rail at the Port's existing loop track facility. The upgrades include the following:

- **New Lead Track Through Terminal:** A new Port-owned rail lead track would be built with connections to the PSAP.
- **New Storage Tracks:** Four new storage tracks will be constructed with connections to the Port-owned lead tracks and the PSAP.
- **Modification of Existing Storage Tracks:** Six existing storage tracks will be extended and aligned with the four new storage tracks, with connections to both Port- and PSAP-owned lead tracks.
- **New Fencing and Security Guard Station:** A new fence will be installed along the northern boundary of the Project Area to separate the PSAP mainline from Port property and tracks. A security guard station will be built at the easternmost point of entry.
- **Rail bridge:** A new rail bridge will be installed at Fry Creek that accommodates a third track over the creek to replace an existing culvert as described in the following section.
- **Rail crossing modifications:** There would be five at-grade crossings modified as part of the Port Project.
- **Access roads and secure site access:** Unpaved access roads will be paved. There will be construction of secured site access and roadway improvements for the safe, secure, and efficient flow of vehicles into and through the Project Area.
- **Stormwater improvements:** Stormwater drainage systems will be constructed to accommodate rail upgrades and new construction. The proposed stormwater improvements may include an additional outfall to the waters of Grays Harbor to be managed under the Port's National Pollutant Discharge Elimination System (NPDES) and Industrial Stormwater permits.
- **Compensatory Mitigation:** A comprehensive mitigation plan will be developed to adequately offset all unavoidable impacts caused by the Proposed Project, including those to wetlands, streams, and their buffers and those caused by creosote-treated pile removal.

Work associated with the new rail upgrades and site improvements includes a new rail bridge at Fry Creek that will replace an existing culvert, road-rail crossing signal updates, and the extension of three existing culverts within the ditch that is parallel to the East Terminal Way, known as East Terminal Way Ditch. The rail upgrades and improvements at Fry Creek will include the addition of a

third track. Further, the existing inner track will be realigned, and the track will be raised 1.5 feet at the proposed bridge crossing. The Fry Creek modifications will be designed to maintain adequate vehicle clearance to allow operational and maintenance access to the area. The new bridge over Fry Creek will be constructed to meet the regulatory requirements for fish passage.

The culverts within East Terminal Way Ditch would be extended approximately 350 feet in length to a total length of 500 feet. The addition in this area will result in additional land coverage by new tracks. The culverts will be extended to maintain the flow of water through the ditch as necessary.

2.4.2 T4A Cargo Yard Relocation and Expansion

The cargo laydown area at T4A will also be redeveloped to further optimize Port operations. The 50-acre former casting basin will be repurposed into a cargo yard, where breakbulk and RORO cargos will be relocated. The work to be performed at the T4A site includes filling the former casting basin and upgrading surface treatments and drainage as necessary to create a cargo laydown yard with a combination of paved and gravel surfaces. After the improvements are made, the site will be suitable for breakbulk and RORO cargo storage.

Filling the casting basin will require up to 290,000 cy of material to return the basin to a flat topographic relief. It is anticipated that the existing stockpile material will constitute approximately 200,000 cy of the required fill material specified above. The on-site stockpile material (that was removed to construct the original casting basin) is generally of relatively poor geotechnical quality. It is anticipated that the stockpiled material will be used in lower sections of the proposed fill prism, with higher-quality import fill material placed closer to the surface and used for the closure berm. The remainder of the required fill material will be imported to the site by truck. All work will be upland of the tide gate. No work is proposed in the water below the high tide line.

The tide gate that separates the casting basin from the harbor will remain in place. The tide gate consists of three 50-ton gate pieces. Each section is 110 feet long, 10 feet tall, and 10 feet thick. This tide gate was designed to withstand water loading from the outside, but not soil loading from the inside. As such, a new soil berm or mechanically stabilized earth wall will be developed just inside of the existing tide gate to allow filling of the majority of the casting basin. Constructing this berm will not place new loads on the existing tide gate and will not require the tide gate to remain watertight. The outside face of the closure berm will be designed to allow full exposure to the river/marine environment. This facing of the closure berm may consist of armor rock or concrete facia. The work to construct the closure berm will be completed within the existing casting basin and will not require in-water work.

In addition to filling the casting basin, drainage at the T4A site will be modified as necessary to meet City of Aberdeen stormwater management requirements. Construction stormwater best

management practices (BMPs) will be defined and installed at the beginning of the Proposed Project to account for the anticipated soft and wet fill soils. Additionally, construction will implement traditional construction stormwater management BMPs to minimize impacts to the river, on-site wetlands, ditches, or other existing riparian vegetated areas located on site. The specific requirements for these BMPs will be documented in the Construction Stormwater General Permit Stormwater Pollution Prevention Plan (SWPPP) associated with this work. The construction will only reconfigure drainage infrastructure in areas where existing infrastructure needs to be relocated based on other proposed program construction (i.e., rail lines being built over the existing north ponds).

Initial work is also anticipated to include demolition and decommissioning of existing drainage infrastructure that will need to be relocated such as the proposed rail tracks that will require removal of existing drainage features. The Proposed Project will utilize the existing stormwater infrastructure, including existing infiltration facilities/stormwater management ponds on the south and east sides of the facility, to the maximum extent practical.

There is a small swale that runs along the north side of the casting basin to Heron Street and a small ditch along the west between the ponds and entrance road. These areas that drain into the northern ponds to be demolished will need to have new drainage infrastructure developed to convey that water to the West Ditch or to existing outfalls to the river.

The existing outfalls will be maintained, as all water will either infiltrate or drain to either the East or West Ditch or to Grays Harbor to the south. The existing north stormwater management ponds (to be demolished) currently drain into the West Ditch. If additional stormwater management ponds are required, it is anticipated that they will discharge to existing outfalls to Grays Harbor or to the West Ditch.

It is anticipated that following construction completion, stormwater management for RORO cargo storage operations will be covered under the City of Aberdeen Municipal Stormwater NPDES Permit.

2.4.3 T4 Dock Fender and Stormwater Upgrades (Port)

The Port is proposing to upgrade the dock fender and stormwater systems at T4. This is referred to as the T4 dock fender and stormwater upgrades. The proposed upgrades will allow for AGP's Terminal Improvement Project (T4B) to support existing and future uses (T4A) and minimize in-water obstructions.

The fender system design will continue to accommodate the mix of vessels that currently call on the terminal, and that mix will be expanded to include the bulk ships that will be loaded with soybean meal. The existing timber-piled fender system will be replaced with a modern pile-supported panel system at Berth A and a modern suspended panel system at Berth B where the shiploader will be

located. Berths A and B have distinctly different structural systems, necessitating piles to support the fender system at Berth A but not at Berth B. Existing fender piles will be removed at the new fender panel locations but maintained between these locations to continue protecting the existing jet array system from river debris and similar sources of potential damage.

The existing structure drains stormwater directly to the river. Stormwater improvements will provide collection and treatment of runoff not currently employed and will be designed and constructed to collect and convey stormwater runoff from the wharf to landside treatment facilities.

For the fender system, work must be coordinated with construction of the new foundations for the AGP shiploader and associated towers to be installed at T4B. Portions of the existing concrete deck at three locations along the dock, along with pre-stressed concrete support piles, will be removed in order to provide space for the new shiploader tower foundation at each of the three locations. The waterside face of each foundation will be in line with the waterside face of the existing dock. The fender system upgrades will be installed along the existing dock including the waterside face of each new foundation, providing a continuous fender system along T4.

Table 3 presents information about in-water pile installation and removal associated with the Port Project.

Table 3
Port Proposed T4 Dock Upgrades: In-Water Pile Installation and Removal

Location	Pile Type and Size	Activity	Removal or Installation Method and Pile Orientation	Number of Piles[1]	Estimated Dates of Activity	Total Days of Operation	Piles Per Day	Vibratory: Hours per Pile	Impact: Strikes per Pile
Permanent Piles									
T4A and T4B	Up to 18-inch timber piles	Removal	Vibratory hammer or direct pull, cut at mudline if extraction not possible	Up to 50	In-water work window (July 16 to February 15)	Up to 12	Up to 10	Up to 0.5	None
T4B	18-inch steel pipe pile	Installation	Vibratory hammer, plumb orientation	Up to 15	In-water work window (July 16 to February 15)	Up to 6	Up to 6	Up to 0.5	None
T4A	Up to 30-inch steel pipe pile	Installation	Vibratory hammer, plumb orientation	Up to 24	In-water work window (July 16 to February 15)	Up to 18	Up to 6	Up to 1	None
Temporary Piles – None									

Notes:
Existing treated timber fender piles and composite (fiberglass and/or plastic) will remain over a larger portion of T4 and be reattached to the face of the dock as the new fender system is installed.
Based on substrate conditions at the site, it is anticipated that most of the existing timber piles will be removed by direct pull. Composite piles will likely be removed by vibratory methods. It is conservatively assumed that the duration of vibratory pile removal will be roughly the same as for vibratory pile installation (i.e., up to 1 hour).
Vibratory pile installation will likely be intermittent and involve multiple starts and stops, as opposed to 1 continuous hour of use.
Fender panels for the barge berthing/mooring portion of Berth A will require vertical support due to panel weight and deck structure limitations. Number of piles shown (24- to 30-inch steel pipe piles) is based an assumed panel spacing that varies between 20 and 40 feet.

1. The exact number of piles to be removed or installed will be determined during construction to accommodate variations in design but will not exceed the number specified.

2.4.4 AGP Project

The AGP Project at T4B involves the construction of facilities to support a new commodity transload facility. These facilities will be integrated with the Port's planned infrastructure improvements to maximize AGP's operational efficiency at T4B. The main components of the AGP Project include rail receiving facilities, track modifications, and a new shiploader. Installation of the shiploader will require additional improvements to the T4B dock, which are also described further in the following sections.

AGP is proposing to construct the following facilities and improvements:

- **Railcar Receiving Facility:** A new Railcar Receiving Building with two receiving pits will be constructed.
- **Shiploader:** A new three-tower shiploader with three spouts at the T4B dock will constructed and will require related dock upgrades.
- **Support Structures:** Several support structures will be constructed, including a landside motor control center, dock side motor control center buildings, and a bulk scale tower.
- **Utilities:** Water, sewer, and electrical system upgrades
- **Lighting:** On-site lighting will be modified.

The AGP Project includes a dual-track commodity transload facility to receive product via railcar and load this product directly to ship. The Railcar Receiving Building consists of two receiving tracks, each equipped with a receiving pit and dedicated conveyance for transfer to the ship. The two lead tracks into the building will hold up to 55 railcars. The Railcar Receiving Building will also include bypass tracks on the north and south sides to allow railcars to bypass the Railcar Receiving Building.

Existing lighting will be maintained along T4A. At T4B, the new shiploader's overhead structure will block the path of light from several of the existing light poles. New lighting will be included as part of the shiploader design to provide safe conditions for ship crews, longshoremen, and supporting staff.

Steel structures for the Railcar Receiving Building, Bulk Scale Tower, and Shiploader will be constructed upon driven pile systems. Pile and foundation systems will be installed utilizing driven pipe pile and reinforced concrete. Piling and foundation systems for constructed structures will last approximately 18 months. More information about the installation of piles can be found in Tables 4 and 5.

AGP will install a new three-tower shiploader with three loading spouts on the T4B dock. Conveyor systems will be installed to convey product from the rail receiving building dump pits to the shiploader.

The existing dock structure lacks both the vertical load capacity and the lateral load capacity to support demands from the three towers for the new shiploader and a tower for the conveyor system proposed for the shiploading facility. To address this issue, AGP will support the vertical weight of each shiploader tower with four vertical legs, exceeding the vertical load-carrying capacity of the existing dock structure at each tower location.

In addition, the existing dock was designed for lateral seismic forces based on a mass equal to 5% of the self-weight of the dock, using 1960s vintage building codes, and does not include the design live loads or equipment loads (such as the shiploader towers and conveyor system) on the dock as part of the mass. Current design codes and standards require designing for lateral seismic forces at least an order of magnitude larger than the 1960s vintage building codes and inclusion of equipment loads, such the shiploader towers. It is not feasible to attach the new tower foundations to the existing structure as this would require a structural upgrade of the entire dock structure to include the towers and their foundations. Instead, the shiploader tower foundations and the conveyor system foundation will be isolated from the existing dock structure.

One conveyor system foundation is also proposed within the existing dock structure. At this location, only local removal of gravel ballast and asphalt concrete paving will occur, followed by sawcutting the existing prestressed concrete deck panels. Approximately 200 square feet of deck system will be removed at this location. Gravel ballast and asphalt concrete paving above the concrete deck will be removed along with the deck elements. Construction limits will be contained within the existing T4B and Berth 4B areas. Construction excavations will be completed with track excavator loading directly to dump trucks. Only asphalt surfaces within the construction limits will be removed.

Minimal water use will be required during construction activities. The largest water consumption will be required for concrete materials provided from off-site material suppliers. Water will also be utilized for cleaning concrete trucks prior to leaving the site. This water will be contained and dealt with in accordance with an approved construction SWPPP.

The estimated number of vehicle trips required to support construction activities will be approximately 50 trips for individual workers and 15 trips for material deliveries per day. Access routes will be through the existing roadway system with access to the Port provided by PIR or Heron Street, depending on construction phasing.

Upland work associated with the AGP Project includes construction of the rail receiving building and conveyor system. Construction of the dumphouse will require subgrade excavation and backfill.

It is assumed there will be one floating derrick barge and up to two material barges accompanied by one ocean-going tug. The derrick barge will vary from 60 to 90 feet in width and from 200 to 300 feet in length and will include a fixed revolving crane or crawler crane. The crane will have a

capacity that could exceed 1,000,000 pounds depending on the crane and boom configurations and the boom radius from the center of crane to lifted load.

Material barges, which will transport in-water piling and other construction materials, will vary in size from 40 to 50 feet in width and 150 to 200 feet in length. During construction, the derrick will be temporarily held in position typically by a combination of up to three "spuds," consisting of a closed steel shape extended down from the deck level into and below the mudline, and mooring lines to temporary anchors set at locations on the bottom away from the derrick barge.

Dock demolition at each of the three shiploader tower foundation locations will occur at the waterside face of the dock. Demolition at each location will be approximately 36 feet wide (parallel to the face of dock) and 45 feet long (transverse to the face of dock). Gravel ballast (nominally 15 inches thick) and asphalt concrete paving (thickness varies) will be locally removed at each tower foundation location, following by sawcutting and removing the concrete deck system (prestressed concrete deck panels and cast-in-place reinforced concrete pile caps). Existing prestressed concrete plumb and batter piles will be separated from the deck system by the pile cap removal. These piles will be broken off below mudline and removed. Approximately 1,600 square feet of concrete deck system will be removed at each location, supported by seven 16.5-inch octagonal prestressed concrete piles (plumb and batter piles, varies by tower location). Gravel ballast and asphalt concrete paving above the concrete deck system will be removed along with the deck elements and piles.

A pile-supported concrete tower foundation to support the shiploader with three individual towers and three individual spouts will be constructed at three locations within the footprint of the existing dock. Each foundation will be cast-in-place reinforced concrete, approximately 5 feet thick by 32 feet wide by 42.5 feet long and supported by fifteen 36-inch-diameter steel pipe piles (plumb and battered). Two additional sections of existing concrete dock will be removed within the interior of the dock. Each section will contain approximately 30 square feet of concrete dock and will include removal of gravel ballast and asphaltic concrete paving above the concrete deck along with the deck elements.

A pile-supported concrete foundation will also be constructed within the existing dock at one location to support the conveyor system. This foundation will consist of a cast-in-place reinforced concrete pile cap approximately 5 feet thick with maximum plan dimensions of 20 feet by 26 feet and supported by four 36-inch-diameter steel pipe piles. Local strengthening of the remaining concrete dock will be required around the perimeter of the existing deck demolition, consisting of reinforced concrete elements constructed below the existing deck soffit.

An additional pile-supported concrete foundation for the conveyor system support will also be provided immediately west of the downstream trestle at T4 Berth B. This foundation will consist of a cast-in-place reinforced concrete pile cap approximately 3 feet thick with maximum plan dimensions of 10 feet by 23 feet and supported by eight 24-inch-diameter steel pipe piles.

Two 24-inch-diameter battered steel pipe piles will be installed at two locations within the existing Berth B concrete deck system. At each location these piles will be attached to the existing deck with a cast-in-place reinforced concrete element approximately 5 feet thick by 4 feet wide by 8 feet long.

Table 4 presents information about landward pile installation that would be part of the AGP Project. All landward piles would be permanent. Landward piles would be transported to the site by truck, and it is assumed that landward work has no restrictions regarding time of year that work may be performed.

Table 5 presents additional details about in-water pile installation and removal associated with AGP's proposed dock upgrades. The assumed in-water work window is defined in Table 5.

Table 4
AGP Proposed Landward Pile Installation

Location	Pile Type and Size	Activity	Installation Method and Pile Orientation	Number of Piles	Estimated Dates of Activity	Total Days of Operation	Vibratory: Hours per Pile	Impact: Strikes per Pile
Indexer and bag house foundations	New 18-inch-diameter steel pipe sections	Installation	Vibratory and impact hammers, plumb orientation	76	No restrictions	15	1	300, not all piles will be impact driven
Receiving building at railroad tracks	New 18-inch-diameter steel pipe sections	Installation	Vibratory and impact hammers, plumb orientation	324	No restrictions	50	1	300, not all piles will be impact driven
Upland motor control center building	New 18-inch-diameter steel pipe sections	Installation	Vibratory and impact hammers, plumb orientation	12	No restrictions	3	1	300, not all piles will be impact driven
Tunnel from receiving building to scale tower	New 18-inch-diameter steel pipe sections	Installation	Vibratory and Impact hammers, plumb orientation	60	No restrictions	15	1	300, not all piles will be impact driven
Scale tower	New 18-inch-diameter steel pipe sections	Installation	Vibratory and Impact hammers, plumb and batter orientation	22	No restrictions	5	1	300, not all piles will be impact driven

Table 5
AGP Proposed T4 Dock Upgrades: In-Water Pile Installation and Removal

Location	Pile Type and Size	Activity	Installation Method and Pile Orientation	Number of Piles	Estimated Dates of Activity	Total Days of Operation	Piles Per Day[1]	Vibratory: Hours per Pile	Impact: Strikes per Pile
Permanent Piles									
T4B	New 36-inch-diameter steel pipe sections	Installation	Vibratory and impact hammers, plumb and batter orientation	Up to 50	In-water work window (July 16 to February 15)	Up to 30	Up to 4	Up to 2	Up to 600
T4B	Existing 12-inch steel H-sections	Removal	Direct pull or vibratory hammer, plumb orientation	Up to 6	In-water work window (July 16 to February 15)	Up to 3	Up to 3	Up to 0.5	None
T4B	Existing 16.5-inch prestressed concrete octagonal sections	Removal	Vibratory hammer, pulling, and/or breaking off near mudline, plumb and batter orientation	Up to 27	In-water work window (July 16 to February 15)	Up to 9	Up to 8	UP to 1.0	None
T4B	New 24-inch steel pipe sections	Installation	Vibratory and impact hammers, batter orientation	UP to 24	In-water work window (July 16 to February 15)	Up to 12	Up to 4	Up to 1.5	Up to 500
T4B	Existing 12-inch steel H-sections	Installation	Vibratory hammer, plumb orientation	Up to 6	In-water work window (July 16 to February 15)	Up to 3	Up to 3	Up to 0.5	None

Location	Pile Type and Size	Activity	Installation Method and Pile Orientation	Number of Piles	Estimated Dates of Activity	Total Days of Operation	Piles Per Day[1]	Vibratory: Hours per Pile	Impact: Strikes per Pile
Temporary Piles									
T4B	Used 24-inch steel pipe sections	Installation	Vibratory hammer, plumb or batter orientation	Up to 24	In-water work window (July 16 to February 15)	Up to 6	Up to 8	Up to 0.5	None
T4B	Used 24-inch steel pipe sections	Removal	Vibratory hammer, plumb or batter orientation	Up to 24	In-water work window (July 16 to February 15)	Up to 6	Up to 8	Up to 0.5	None

Notes:
It is conservatively assumed that the duration of vibratory pile removal will be roughly the same as for vibratory pile installation (i.e., up to 2 hours).
Each steel pipe pile supporting the shiploader towers, conveyor, or existing deck system will be installed with both vibratory and impact hammers due to the nature of the substrate.
Vibratory pile installation will likely be intermittent and involve multiple starts and stops, as opposed to 1 continuous hour of use.
It is likely that impact installation will require fewer than 1,000 impact hammer strikes per day; however, a conservative estimate has been provided to assist the NMFS Section 7 consultation for ESA-listed fish.
A dolphin for an upstream mooring point may be required within the exiting deck, to be constructed similar to the existing downstream dolphin.

1. The exact number of piles to be removed or installed will be determined during construction to accommodate variations in design but will not exceed the number specified.

2.5 Overwater Coverage Summary

The planned upgrades to the T4 dock fender and stormwater system would not result in a net change in the area of overwater structures. AGP's proposed facility and improvements would not result in a net change in the area of overwater structures.

2.6 Stormwater and Water Quality Improvements Summary

Stormwater drainage systems will be constructed to accommodate rail upgrades and new construction, including new stormwater pipes, catch basins, and maintenance holes. Drainage at the T4A site will be modified as necessary to meet City of Aberdeen stormwater management requirements. Construction stormwater management BMPs will be defined and installed at the beginning of the Proposed Project to account for the anticipated soft and wet fill soils.

Initial work is also anticipated to include demolition and decommissioning of existing drainage infrastructure that will need to be relocated such as the proposed rail tracks that will require removal of existing drainage features. The Proposed Project will utilize the existing stormwater infrastructure, including existing infiltration facilities/stormwater management ponds on the south and east sides of the facility, to the maximum extent practical.

There is a small swale that runs along the north side of the casting basin to Heron Street and a small ditch along the west between the ponds and entrance road. These areas that drain into the northern ponds to be demolished will need to have new drainage infrastructure developed to convey that water to the West Ditch or to existing outfalls to the river.

The existing outfalls will be maintained, as all water will either infiltrate or drain to either the East or West Ditch or to Grays Harbor to the south. The existing north stormwater management ponds (to be demolished) currently drain into the West Ditch. If additional stormwater management ponds are required, it is anticipated that they will discharge to existing outfalls to Grays Harbor or to the West Ditch.

It is anticipated that following construction completion, stormwater management for RORO cargo storage operations will be covered under the City of Aberdeen Municipal Stormwater NPDES Permit.

The Proposed Project will require no in-water work as all work will be conducted behind (upland of) the existing tide gate as described previously. Additionally, construction will implement traditional construction stormwater management BMPs to minimize impact to the river, West Ditch, or other existing riparian vegetated areas located on site. The specific requirements for these BMPs will be documented in the Construction Stormwater General Permit SWPPP associated with this work. The construction will only reconfigure drainage infrastructure in areas where existing infrastructure needs

to be relocated based on other proposed program construction (i.e., rail lines being built over the existing north ponds).

2.7 Project Timing

The phasing of the Proposed Project would be sequenced in a manner that allows rail traffic to continue throughout the construction timeline, and to find the most efficient way of construction moving forward. The construction start date of April 1, 2024, is based off the current National Environmental Policy Act schedule. Some general assumptions about construction include the following:

- Contractor(s) has full workforce and materials to start all work that is available.
- Design and permitting are complete in all 10 work zones.
- All current tenants and Port business have been moved/terminated in work location.

As large construction projects commence, there is always a lead time for workforce and equipment. Weather plays a large factor in the work as well, along with in-water work windows. These two items will dictate the shiploader substructure and fender system construction timeline. These considerations are not included in this narrative but will be referenced once the staging schedule progresses in the future. This will lessen float and potentially extend duration for certain items.

The Project Area has been broken down into work zones, to allow clarity in communication and scheduling. Work will progress in a counterclockwise fashion starting at Work Zone 1.

2.8 Avoidance and Minimization Measures

Avoidance and minimization measures are designed to reduce the impact of a project on the environment. They can be precautionary measures to minimize or eliminate project effects on environmental resources, or they can include avoidance and preservation measures such as timing restrictions or buffers around sensitive habitat types and habitat features that are important to sensitive species and areas. BMPs are methods, facilities, built elements, and techniques implemented or installed to reduce short- and long-term project impacts. To avoid and minimize adverse impacts, the following BMPs will be implemented during construction: All replacement piles used will be 18-inch, 24- to 30-inch, or 36-inch steel pipe or 12-inch steel H-sections.

- All in-water work will occur within the approved in-water work window for the Proposed Project (July 16 through February 15 for marine waters of Grays Harbor – Tidal Reference Area 16; USACE [date unknown]).
- The contractor will be required to retrieve any floating debris generated during construction using a skiff and a net. Excess or waste materials will not be disposed of or abandoned waterward of the ordinary high water mark or allowed to enter waters of the United States or State.

- The construction contractor will inspect fuel hoses, oil or fuel transfer valves, and fittings on a regular basis for drips or leaks in order to prevent spills into surface water.
- The contractor will be responsible for the preparation of a spill prevention, control, and countermeasure (SPCC) plan to be used for the duration of the Proposed Project to safeguard against an unintentional release of fuel, lubricants, or hydraulic fluid from construction equipment. The contractor will be required to maintain at the job site oil-absorbent materials for use in the event of a spill or if any oil product is observed in the water. The plan shall be submitted to the project engineer prior to the commencement of any construction activities. A copy of the plan with any updates would be maintained at the work site by the contractor.
  - The SPCC plan will outline BMPs, responsive actions in the event of a spill or release, and notification and reporting procedures. The SPCC plan shall also outline contractor management elements such as personnel responsibilities, Project site security, site inspections, and training.
  - The SPCC plan will outline what measures shall be taken by the contractor to prevent the release or spread of hazardous materials, either found on site and encountered during construction but not identified in contract documents, or any hazardous materials that the contractor stores, uses, or generates on the construction site during construction activities. These items include, but are not limited to, gasoline, oils, and chemicals.
  - The contractor will maintain, at the job site, the applicable spill response equipment and material designated in the SPCC plan.
  - The contractor will regularly check fuel hoses, oil drums, oil or fuel transfer valves, and fittings for leaks, and shall maintain and store materials properly to prevent spills.
  - No petroleum products, fresh cement, lime, concrete, chemicals, or other toxic or deleterious materials will be allowed to enter surface waters.
  - There will be no discharge of oil, fuels, cleaning solvents or chemicals to surface waters, or onto land where there is a potential for reentry into surface waters.
- Construction of the Proposed Project will comply with water quality restrictions imposed by the Washington State Department of Ecology (Ecology), which state that turbidity in marine waters exceeding state water quality standards will not extend beyond a 150-foot mixing zone radius during construction (Washington Administrative Code 173-201A-210(1)(e)(i)(D)).
- In addition, the following should be regularly employed:
  - A stock of spill-absorbent pads, booms, and socks adequate to contain spills of product would be maintained. When using booms in a drainage channel, the boom should be situated perpendicular to the water flow through the drainage channel and should be securely attached to either side of the channel using rope.
  - Employees would be trained on the proper handling and rapid response of materials that could affect stormwater runoff.

  - As a matter of routine practice, all barrels containing significant materials should be covered and provision for spill control provided.
  - During the rainy season, stormwater outfalls would be regularly inspected and cleaned, when necessary.
- Perform daily operating inspections of areas where potential spills of significant materials or production activities could impact stormwater.
- Perform monthly inspections of stormwater control measures, structures, catch basins, and stormwater weirs.
- Clean, maintain, or repair all materials handling and storage areas and all stormwater control measures, structures, catch basins, and stormwater weirs as needed upon discovery. Cleaning, maintenance, and repair of such systems must be performed in such a manner as to prevent the discharge of pollution.
- Perform an annual inspection of the stormwater control facilities and drainage systems prior to the wet weather period.
- Develop a plan to remove material accumulated in settling ponds, stormwater weirs, and similar facilities at least annually and to store the material in a location that will prevent erosion or discharge to surface waters.
- Pile removal BMPs adapted from the Washington State Department of Natural Resources (WDNR; 2017) will be employed for removal of the piles as follows:
  - Piles will be removed using vibratory extraction methods as much as possible. If a pile is broken or breaks during vibratory extraction, the contractor will use a chain to attempt to entirely remove it. If the entire pile cannot be removed, the pile will be cut below the mudline following WDNR protocol.
  - The contractor will initially vibrate the pile to break the friction bond between pile and soil.
  - To help minimize turbidity, the contractor will engage the vibrator to the minimum extent required to initiate vertical pile movement and will disengage the vibrator once the pile has been mobilized and is moving upward.
  - The contractor will monitor pile removal for visible turbidity and adjust the rate and duration of vibration to minimize in-water turbidity. The contractor will pause work if a visible plume is observed
  - Upon removal from the substrate, the piles will be moved expeditiously from the water to a barge and then offloaded for disposal or recycling if possible. All creosote-treated timber will be properly disposed of at an approved upland facility and will not be reused.
- Pile installation BMPs
  - A standard bubble curtain will be used during impact hammer pile driving to attenuate underwater noise and provide a 5 dB noise reduction.

  - Impact pile driving, which will cause the highest noise levels during construction, will not occur between 10:00 p.m. and 7:00 a.m.
  - The contractor will monitor pile installation for visible turbidity and adjust the rate of impacts to minimize in-water turbidity. The contractor may pause work if a visible plume is observed.
  - A pile block will be used during impact pile driving to reduce noise levels.
- Barge grounding will not be permitted.
- Work surfaces in upland areas, docks, and on barges will have a containment berm for all treated materials removed. Creosote will not be allowed to re-enter the water.
- Nighttime construction will be minimized as much as possible.
- Construction equipment will be required to have manufacturer-approved noise muffling equipment in good working order.
- Equipment idling will be minimized.
- Perform an annual evaluation of areas that can be revegetated to minimize the size of the disturbed areas. Revegetation must take place prior to the onset of rain. Mulching or other stormwater management practices must be implemented to minimize erosion of vegetated areas until the vegetation is established.
- Marine mammal monitoring:
  - A Marine Mammal Monitoring Plan will be developed in coordination with NOAA and submitted as part of the Proposed Project.
  - Monitoring will occur by observing construction activities and the surrounding aquatic environment for signs of marine mammals and potential threats to marine mammals.
  - A temporary stop-work protocol may be triggered either when a marine mammal is observed in the designated exclusion zone area or exhibiting distress or unexpected behavior in the designated harassment zone area.
  - Work will resume once the marine mammal has moved outside of, and is headed away from, the designated exclusion zone area or has not been observed for a predetermined period of time.
- Marbled murrelet monitoring:
  - A Marbled Murrelet Monitoring Plan meeting the USFWS Protocol for Marbled Murrelet Monitoring During Pile Driving (USFWS 2013a) will be developed and submitted as a part of the Proposed Project.
  - Observers will visually monitor the monitoring area (area of potential injury or masking) for marbled murrelets following the protocol provided in USFWS's forthcoming Biological Opinion for the Proposed Project.
  - An appropriate number of qualified marbled murrelet observers will be positioned to provide adequate coverage of the monitoring area without looking farther than 50 meters to ensure no murrelets are in the monitoring area.

- All monitoring will be conducted by observers meeting appropriate qualifications and certified by the USFWS.
- One qualified biologist will be identified as the lead biologist. The lead biologist has the authority to stop pile driving when murrelets are detected in the monitoring area or when visibility impairs monitoring.
- If murrelets are spotted in the monitoring area, pile driving will not resume until the murrelets have left the monitoring area and at least two full sweeps of the monitoring area have confirmed no murrelets are present. If visibility impairs monitoring, pile driving will not resume until effective monitoring can be conducted.
- If weather or sea conditions restrict the observer's ability to observe for marbled murrelets or become unsafe for the monitoring vessels to operate, cease pile installation until conditions allow for monitoring to resume. Monitoring will only occur when the sea state is at a Beaufort scale of 2 or less.

2.9 Mitigation Measures

Construction and operation of the Proposed Project would result in direct and indirect effects on the aquatic and terrestrial environment. To address the anticipated unavoidable adverse effects of the proposed action on aquatic and terrestrial species and their habitats, the Port would implement a suite of environmental compensatory mitigation elements. The following provides a conceptual framework for mitigation to be provided by the Port:

- The Port's approach to mitigation will take a watershed approach to replace lost habitat functions with similar habitat functions as close as feasible to areas that would be impacted by construction and operation of the elements described in Section 2 of this assessment. The selection of mitigation sites will also consider how each action aligns with ecological priorities for the Chehalis Basin. Understanding project impacts is key to selecting the appropriate area within which mitigation can be effectively implemented to serve the same populations and ecological communities that are affected by the proposed action. The geographic focus area for mitigation site selection will consider the immediate project impact area as well as other nearby ecoregions that provide opportunities to replace like functions.
- A comprehensive mitigation plan will be developed to address and identify on-site and off-site mitigation areas, mitigation actions (such as wetland re-establishment, rehabilitation, or enhancement and compensatory pile removal), mitigation ratios for each of the mitigation actions, a mitigation implementation schedule, and mitigation monitoring and performance standards, if necessary.
- At the time this Biological Assessment was prepared, the exact location, type, duration, and size of impacts to wetlands, streams, and their buffers had not yet been fully determined, but some of these impacts, and those related to in-water pile removal and installation, are anticipated to occur. Mitigation for wetlands, streams, and their buffers will be permitted and

comply with current guidance provided by Ecology, USACE, and local jurisdictions. To mitigate for temporary and short-term impacts related to creosote contaminants during in-water pile removal as a part of Project construction, the Port will propose an overall pile removal ratio of 1:1 at minimum, meaning that the number of piles installed as part of the Proposed Project will be equal to the number of piles removed. If the number of piles installed is greater than piles removed, the Port will remove additional derelict creosote-treated piles so that the total piles installed and removed are equal, at minimum, as a mitigation action in proximity to the on-site Project Area.

2.10 Interrelated and Interdependent Actions

An interrelated activity is an activity that is part of the proposed action and depends on the proposed action for its justification. An interdependent activity is an activity that has no independent utility apart from the action under consultation.

There are no identified interrelated/interdependent activities resulting from the proposed action.

3 Status of Listed Species

Listed and proposed endangered and threatened species that could occur in the action area during construction include North American green sturgeon, bull trout, Chinook salmon, chum salmon, Pacific eulachon, marbled murrelet, streaked horned lark, and western snowy plover. ESA-designated critical habitat also occurs within the action area for North American green sturgeon, bull trout, and western snowy plover.

The designation of critical habitat is based on the life history and habitat needs of the species and includes physical or biological features (PBFs) necessary for their conservation where they occur. The designations of critical habitat for species uses the term primary constituent elements (PCEs) or essential features. More recent critical habitat regulations (81 *Federal Register* [FR] 7414) have replaced this term with PBFs. The shift in terminology does not change the approach used in conducting an effects analysis, which is the same regardless of whether the original designation identified PCEs, PBFs, or essential features. This BA uses the terms PCE and PBF interchangeably, based on the usage as they were originally published in the FR.

The following sections briefly summarize relevant life history information for the protected species, ESA listing status and critical habitats, and their utilization of the action area.

3.1 North American Green Sturgeon

3.1.1 Biology and Distribution

North American green sturgeon are a large, slow-growing, anadromous fish that reach maturity at about age 15, can live to be 60 to 70 years old, and may spawn several times throughout their maturity (NOAA 2022h). North American green sturgeon enter Washington estuaries, including Grays Harbor, during summer when water temperatures are more than 2°C warmer than adjacent coastal waters (Moser and Lindley 2007). Adult green sturgeon are common in the seawater and mixing zones of Grays Harbor year-round, but increased presence has been documented during the summer months (Monaco et al. 1990).

3.1.2 Status and Critical Habitat

Southern DPS green sturgeon was first listed by NMFS as threatened on June 6, 2005 (71 FR 17757). The critical habitat for the threatened Southern DPS green sturgeon was listed by NMFS on November 9, 2009 (74 FR 52299). This DPS includes coastal U.S. marine waters within 60 fathoms of depth from Monterey Bay, California (including Monterey Bay), north to Cape Flattery, Washington, and includes Grays Harbor. Critical habitat was designated in three different habitats, including freshwater riverine systems, estuarine areas, and nearshore marine waters. All tidally influenced

waters of Grays Harbor up to the mean higher high water (MHHW) are included under the estuarine areas designation.

The designation of critical habitat is based on the life history and habitat needs of Southern DPS green sturgeon and includes six PCEs necessary for their conservation in estuarine habitats. In the action area, the following five PCEs could be affected by the proposed action (PCE 2 is provided to water flow in the bays and estuaries adjacent to the Sacramento River and excluded from this assessment).

PCE 1: Abundant prey items within estuarine habitats and substrates for juvenile, subadult, and adult life stages.

PCE 3: Water quality, including temperature, salinity, oxygen content, and other chemical characteristics necessary for normal behavior, growth, and viability of all life stages.

PCE 4: A migratory pathway necessary for the safe and timely passage of Southern DPS fish within estuarine habitats and between estuarine and riverine or marine habitats.

PCE 5: A diversity of depths necessary for shelter, foraging, and migration of juvenile, subadult, and adult life stages.

PCE 6: Sediment quality (i.e., chemical characteristics) necessary for normal behavior, growth, and viability of all life stages.

3.1.3 Utilization of the Action Area

While green sturgeon are primarily a benthic species, Grays Harbor provides over-summering habitat for adult and subadult green sturgeon from July through early October (NOAA 2009). Grays Harbor is critical habitat for Southern DPS green sturgeon because in summer months, subadult and adult green sturgeon aggregate in Grays Harbor to forage. Green sturgeon from the Southern DPS are not known to spawn in the Chehalis River or Grays Harbor, and the only known spawning locations are in Oregon and California (Adams et al. 2007). Most green sturgeon will have returned to the ocean before October 1, and all are anticipated to have returned to the ocean by November 1 (Lindley et al. 2008). Southern DPS green sturgeon may be present in Grays Harbor and within the action area, and it's possible that juveniles, subadults, and adults use the shallow nearshore estuarine habitat for shelter, foraging, and migration, but the timing of green sturgeon life stage types and their use of Grays Harbor and other estuarine habitats is poorly understood. The waters of the Project action area provide the previously listed PCEs (food resources, water quality, migratory corridors, a diversity of depths, and sediment quality) that support the designated Southern DPS green sturgeon critical habitat within Grays Harbor.

3.2 Bull Trout

3.2.1 Biology and Distribution

Bull trout exhibit four different life history types: anadromous, adfluvial, fluvial, and resident. Bull trout spawn from late summer through December, typically when water temperatures drop below 48°F (Wydoski and Whitney 2003). Because they have specific cold-water requirements, they are rarely found in waters with temperatures above 64°F (USFWS 2022l). Juvenile bull trout feed on insects and then transition to small fish. Larger bull trout prey predominantly on fish. Anadromous bull trout use nearshore marine areas seasonally (spring and summer) and are typically present near their natal streams in shallow water (Hayes et al. 2011). Habitats used include shorelines adjacent to coastal deposits, sediment bluffs, and low bank areas with mixed substrate (Hayes et al. 2011).

3.2.2 Status and Critical Habitat

The Coastal-Puget Sound population of bull trout was listed by USFWS as threatened on November 1, 1999 (64 FR 58910), and critical habitat was finalized on October 18, 2010 (75 FR 63898–64070). Critical habitat includes the marine shoreline of Grays Harbor, including the action area.

Critical habitat is designated based on the life history and habitat requirements of bull trout. The following PCEs essential to the conservation of the species have been identified in both freshwater and marine habitats.

PCE 1: Springs, seeps, groundwater sources, and subsurface water connectivity (hyporheic flows) to contribute to water quality and quantity and provide thermal refugia.

PCE 2: Migration habitats with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and freshwater and marine foraging habitats, including but not limited to permanent, partial, intermittent, or seasonal barriers.

PCE 3: An abundant food base, including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.

PCE 4: Complex river, stream, lake, reservoir, and marine shoreline aquatic environments and processes that establish and maintain these aquatic environments, with features such as large wood, side channels, pools, undercut banks, and unembedded substrates to provide a variety of depths, gradients, velocities, and structure.

PCE 5: Water temperatures ranging from 2°C to 15°C (36°F to 59°F), with adequate thermal refugia available for temperatures that exceed the upper end of this range. Specific temperatures within this range will depend on bull trout life history stage and form; geography; elevation; diurnal and

seasonal variation; shading, such as that provided by riparian habitat; streamflow; and local groundwater influence.

PCE 6: In spawning and rearing areas, substrate of sufficient amount, size, and composition to ensure success of egg and embryo overwinter survival, fry emergence, and young-of-the-year and juvenile survival. A minimal amount of fine sediment, generally ranging in size from silt to coarse sand, embedded in larger substrates, is characteristic of these conditions. The size and amounts of fine sediment suitable to bull trout will likely vary from system to system.

PCE 7: A natural hydrograph, including peak, high, low, and base flows within historical and seasonal ranges or, if flows are controlled, minimal flow departure from a natural hydrograph.

PCE 8: Sufficient water quality and quantity such that normal reproduction, growth, and survival are not inhibited.

PCE 9: Sufficiently low levels of occurrence of non-native predatory (e.g., lake trout, walleye, northern pike, smallmouth bass), interbreeding (e.g., brook trout), or competing (e.g., brown trout) species that, if present, are adequately temporally and spatially isolated from bull trout.

The waters of the action area are unlikely to be suitable for bull trout spawning because the action area does not provide the following PCEs: groundwater and subsurface connectivity (PCE 1), colder water temperatures required for bull trout spawning habitat (PCE 5), or spawning substrates (PCE 6). In the action area, only nearshore marine and estuarine habitats adequate for foraging and migration are present as they provide for bull trout migration (PCE 2), an abundant food base for foraging (PCE 3), marine shoreline aquatic environments (PCE 4), a natural hydrograph (PCE 7), water quantity and quality (PCE 8), and low levels of competitive species (PCE 9).

3.2.3 Utilization of the Action Area

The mainstem Chehalis River and Grays Harbor in the action area may be used occasionally for foraging, overwintering, and migrating. However, no spawning habitat is present in the action area, and therefore bull trout less than 2 grams in size will not be present. Adult bull trout may be present in Grays Harbor seasonally using shorelines in the action area, but the number of bull trout in the action area is believed to be small to none during the in-water work window for the Proposed Project, which is July 16 through February 15 for marine waters of Grays Harbor – Tidal Reference Area 16.

3.3 Chinook Salmon

3.3.1 Biology and Distribution

Chinook salmon are an anadromous fish and the largest species of Pacific salmon in North America (NOAA 2022f). Adult Chinook salmon spend between 1 and 8 years foraging in the ocean before

returning to freshwater to spawn, after which they complete their life cycle and die. Chinook salmon are known to utilize the estuarine and nearshore marine environments of Grays Harbor as both juveniles and adults.

3.3.2 Status and Critical Habitat

Three Chinook salmon ESUs are likely to be occasionally and temporarily present in the action area: the Lower Columbia River (LCR) ESU, the Upper Willamette River (UWR) ESU, and the Puget Sound ESU.

LCR ESU Chinook salmon were listed as threatened on March 24, 1999 (64 FR 14308), and a final determination of the listing was issued on June 28, 2005 (70 FR 37160). The LCR ESU includes all naturally spawned populations of Chinook salmon from the Columbia River and its tributaries, upstream to and including the Hood River in Oregon and the White Salmon River in Washington. The ESU also includes Chinook salmon in the Willamette River to Willamette Falls but excludes spring-run Chinook salmon from the Clackamas River. Critical habitat was designated for LCR ESU Chinook salmon in 2005 but is not present in the action area (70 FR 52629).

UWR ESU Chinook salmon were listed as threatened on June 28, 2005 (70 FR 37160). The UWR ESU includes all naturally spawned populations of spring-run Chinook salmon originating from the Clackamas River, from the Willamette River and its tributaries above Willamette Falls. Critical habitat was designated for UWR ESU Chinook salmon in 2005 but is not present in the action area (70 FR 52629).

Puget Sound ESU Chinook salmon were listed as threatened on June 28, 2005, and updated on April 14, 2014 (79 FR 20802). Critical habitat was designated in 2005 and but is not present in the action area (70 FR 52698).

While there is no designated critical Chinook salmon habitat in Grays Harbor, unlisted Chinook salmon from the rivers that drain into Grays Harbor, Willapa Bay, or along the Washington Coast are sometimes present, including within the action area. Additionally, some of the salmon in Grays Harbor are LCR ESU and UWR ESU salmon smolts that follow the Columbia River plume into Grays Harbor temporarily during downwelling wind events (Banas et al. 2004). The large-scale winds in this region are predominantly southward and favor upwelling events during the summer and during breaks of fair weather at other times of year, and northward favoring downwelling events during the winter and foul-weather events (Hickey and Banas 2003). However, event-scale reversals in the winds have been observed during every month of the year. A genetic analysis of 161 Chinook salmon caught in the Central Estuary and South Bay showed that 1.2% or about two Chinook salmon per hectare come from the Columbia River (Sandell et al. 2014). Chinook salmon have not been found in the Inner Bay where the Proposed Project is located. PS ESU Chinook salmon are not known to occur in the action area or within Grays Harbor.

The designation of critical habitat is based on the life history and habitat needs of Chinook salmon and includes the following six PCEs necessary for their conservation in freshwater, estuarine, and nearshore marine habitats.

PCE 1: Freshwater spawning sites with the following:

- Water quantity and quality conditions and substrate supporting spawning, incubation, and larval development

PCE 2: Freshwater rearing sites with the following:

- Water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility
- Water quality and forage supporting juvenile development
- Natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks

PCE 3: Freshwater migration corridors free of obstruction with the following:

- Water quantity and quality conditions
- Natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival

PCE 4: Estuarine areas free of obstruction with the following:

- Water quality, water quantity, and salinity conditions supporting juvenile and adult physiological transitions between fresh- and saltwater
- Natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels
- Juvenile and adult forage, including aquatic invertebrates and fishes, supporting growth and maturation

PCE 5: Nearshore marine areas free of obstruction and excessive predation with the following:

- Water quality and quantity conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation
- Natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels

PCE 6: Offshore marine areas with the following:

- Water quality conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation

Other than the occasional and temporary LCR ESU and UWR ESU salmon smolts that follow the Columbia River plume into Grays Harbor during downwelling wind events, Chinook salmon in Grays Harbor or within the action area are not listed for protection under the ESA. The waters of the action area are unlikely to be suitable for both ESA-listed or unlisted Chinook salmon spawning because the action area does not provide the following PCEs: freshwater spawning sites (PCE 1), freshwater rearing sites (PCE 2), and freshwater migration corridors (PCE 3). In the action area, habitats adequate for rearing, foraging, and migration are present and provide opportunity for juvenile and adult Chinook salmon in the estuarine areas (PCE 4), nearshore marine (PCE 5), and offshore marine environments (PCE 6). However, the lack of natural cover, aquatic vegetation, large rocks and boulders, and side channels minimizes quality of PCEs 2, 3, 4, and 5, which in turn limits the likely use of the area by Chinook salmon.

3.3.3 Utilization of the Action Area

Unlisted Chinook salmon are known to utilize the estuarine environments of Grays Harbor and are present as both juveniles and adults. Some fish may occur year-round, but this is less likely. Adults typically migrate offshore into the deeper waters away from the shoreline, whereas juveniles typically migrate in shallow water along shorelines. Juveniles occupy the estuarine and nearshore environment due to the protection from predators this environment provides and availability of prey such as terrestrial insects and marine invertebrates (NMFS 2007).

This BA makes the conservative assumption that threatened juvenile and adult LCR ESU and UWR ESU Chinook salmon may make occasional and temporary use of portions of Grays Harbor, including the action area, for forage, rearing, and migration, but they are unlikely to occur during the in-water work window (which is July 16 through February 15 for marine waters of Grays Harbor – Tidal Reference Area 16 and avoids Chinook salmon peak run times). Studies of Columbia River Chinook have observed considerable variation in the timing of yearling and subyearling use of coastal estuaries and ocean entry (Weitkamp et al. 2015; Hillson et al. 2017), peak timing of ocean entry is concentrated in the late spring and summer months, and is largely avoided by the in-water work window and occurs during a time of the year when downwelling events are less likely to occur.

3.4 Chum Salmon

3.4.1 Biology and Distribution

Chum salmon are an anadromous fish and may have once been the most abundant of all Pacific salmonids (NOAA 2022g). Adult chum salmon spend between 3 to 5 years foraging in the ocean before returning landward to spawn, after which they complete their life cycle and die. Unlisted chum salmon are known to utilize the estuarine and nearshore marine environments of Grays Harbor as both juveniles and adults. Adult chum salmon migrate upstream from October through November

and spawn from November through December. Juveniles typically emerge in the early spring and migrate downstream after a brief rearing period (NMFS 2013).

3.4.2 Status and Critical Habitat

The Columbia River (CR) chum salmon ESU was listed as threatened on March 25, 1999 (64 FR 14507), and a final determination of the listing was issued on June 28, 2005 (70 FR 37160). The CR chum salmon ESU includes all naturally spawned populations of chum salmon in the Columbia River and its tributaries in Oregon and Washington, as well as chum salmon from three artificial propagation programs, all of which have no critical habitat designated within the action area. Critical habitat was designated for the CR chum salmon ESU in 2005 but is not present in the action area (70 FR 52629).

There is no designated CR chum salmon ESU critical habitat in Grays Harbor However, some of the chum salmon in Grays Harbor are CR ESU chum salmon smolts that follow the Columbia River plume into Grays Harbor temporarily during downwelling wind events (Banas et al. 2004). The large-scale winds in this region are predominantly southward and favor upwelling events during the summer and during breaks of fair weather at other times of year, and northward favoring downwelling events during the winter and foul-weather events (Hickey and Banas 2003). However, event-scale reversals in the winds have been observed during every month of the year.

The designation of critical habitat is based on the life history and habitat needs of chum salmon and includes the following six PCEs necessary for their conservation in freshwater, estuarine, nearshore, and offshore marine habitats.

PCE 1: Freshwater spawning sites with the following:

- Water quantity and quality conditions and substrate supporting spawning, incubation, and larval development

PCE 2: Freshwater rearing sites with the following:

- Water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility
- Water quality and forage supporting juvenile development
- Natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks

PCE 3: Freshwater migration corridors free of obstruction with the following:

- Water quantity and quality conditions
- Natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival

PCE 4: Estuarine areas free of obstruction with the following:

- Water quality, water quantity, and salinity conditions supporting juvenile and adult physiological transitions between fresh- and saltwater
- Natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels
- Juvenile and adult forage, including aquatic invertebrates and fishes, supporting growth and maturation

PCE 5: Nearshore marine areas free of obstruction and excessive predation with the following:

- Water quality and quantity conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation
- Natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels

PCE 6: Offshore marine areas with the following:

- Water quality conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation

Spawning chum salmon in Grays Harbor or within the action area are not listed for protection under the ESA. The waters of the action area are unlikely to be suitable for either ESA-listed or unlisted chum salmon spawning because the action area does not provide the following PCEs: freshwater spawning sites (PCE 1), freshwater rearing sites (PCE 2), and freshwater migration corridors (PCE 3). In the action area, habitats for both ESA-listed and unlisted chum salmon rearing, foraging, and migration are present and provide opportunity for juvenile and adult in the estuarine areas (PCE 4), nearshore marine (PCE 5), and offshore marine environments (PCE 6).

3.4.3 Utilization of the Action Area

Unlisted chum salmon are known to utilize the estuarine environments of Grays Harbor and are present as both juveniles and adults. Some fish may occur year-round, but this is less likely. Adults typically migrate offshore into the deeper waters away from the shoreline, whereas juveniles typically migrate in shallow water along shorelines. Juveniles occupy the estuarine and nearshore environment due to the protection from predators this environment provides and availability of prey such as terrestrial insects and marine invertebrates (NMFS 2007).

This BA makes the conservative assumption that threatened juvenile and adult CR ESU Chum salmon may make occasional and temporary use of portions of Grays Harbor, including the action area, for forage, rearing, and migration, but they are unlikely to occur during the in-water work window (which is July 16 through February 15 for marine waters of Grays Harbor – Tidal Reference Area 16 and avoids

chum salmon peak run times). Studies of CR chum salmon have observed less variation in the timing of smolt use of coastal estuaries and ocean entry than for Chinook salmon (Hillson et al. 2017), and peak timing of ocean entry is concentrated in the spring, and is totally avoided by the in-water work window and occurs during a time of the year when downwelling events are only moderately likely to occur.

3.5 Pacific Eulachon

3.5.1 Biology and Distribution

Pacific eulachon are a small anadromous fish feeding primarily on plankton, crustaceans, and other invertebrates. Adults migrate upstream into freshwater rivers to spawn. Eulachon larvae generally hatch within 2 to 4 weeks and then are washed downstream, where they may remain in estuarine waters for several weeks. They then move to nearshore waters, where they remain until they become sexually mature after about 1 to 3 years. Eulachon then return to spawn in freshwater, after which they complete their life cycle and die. In Washington, adult eulachon migrate upstream from January to March, and spawning is completed by early to late April. Juveniles typically emerge in the early to late spring and migrate downstream after a brief rearing period (WDNR 2022).

3.5.2 Status and Critical Habitat

The Southern DPS of Pacific eulachon was listed by NOAA as threatened on March 18, 2011 (75 FR 13012). Critical habitat of Southern DPS eulachon was designated in 2011 (76 FR 65323) and includes naturally spawned populations of eulachon in the Columbia River and its tributaries in Oregon and Washington and the Elwha and Quinault rivers in Washington. No Southern DPS eulachon critical habitat is designated within the action area.

While there is no designated Southern DPS eulachon critical habitat in Grays Harbor, unlisted eulachon from the rivers that drain into Grays Harbor, Willapa Bay, or along the Washington Coast may be sometimes be present, including within the action area.

The designation of critical habitat is based on the life history and habitat needs of Southern DPS eulachon and includes the following three PCEs necessary for their conservation in freshwater, estuarine, nearshore, and offshore marine habitats.

PCE 1: Freshwater spawning sites and incubation sites with the following:

- Water flow, quality, and temperature conditions and substrate supporting spawning and incubation

PCE 2: Freshwater and estuarine corridors free of obstruction with the following:

- Water flow, quality, and temperature conditions supporting larval and adult mobility
- Abundant prey items supporting larval feeding after the yolk sac is depleted

PCE 3: Nearshore and offshore marine foraging habitat with the following:

- Water quality and available prey supporting juveniles and adult survival

There is no designated critical habitat for spawning Southern DPS eulachon in Grays Harbor or within the action area. The waters of the action area are unlikely to be suitable for any eulachon spawning because the action area does not provide the following PCE: freshwater spawning and incubation sites (PCE 1). In the action area, habitats adequate for rearing, foraging, and migration are present and provide opportunity for larval and adult eulachon in the estuarine areas (PCE 2), but the action area does not include nearshore offshore marine environments (PCE 3).

3.5.3 Utilization of the Action Area

While evidence of echelon use of Grays Harbor is limited, this BA makes the assumption that threatened larval and adult Southern DPS echelon may make occasional and temporary use of portions of Grays Harbor, including the action area, for forage, rearing, and migration, but they are less likely to occur during the in-water work window for the Proposed Project, which is July 16 through February 15 for marine waters of Grays Harbor – Tidal Reference Area 16 and avoids eulachon peak run times and the time of the year when downwelling events are most likely to occur.

3.6 Southern Resident Killer Whale

3.6.1 Biology and Distribution

The geographic distribution of Southern Resident killer whales is year-round in the coastal waters off Oregon, Washington, and Vancouver Island and off the coast of central California and the Queen Charlotte Islands (Center for Biological Diversity 2001). In the summer, Southern Resident killer whales are typically found in the Georgia Strait, Strait of Juan de Fuca, and the outer coastal waters of the continental shelf. The Southern Resident DPS contains J pod, K pod, and L pod and was estimated to include approximately 73 individuals as of July 2019, its lowest number in 32 years (NOAA 2023). In the fall, the J pod migrates into Puget Sound, while the rest of the population makes extended trips through the Strait of Juan de Fuca. In the winter, the K and L pods retreat from inland waters and are seldom detected in the core areas until late spring. The J pod generally remains in inland waterways throughout the winter, with most of their activity in Puget Sound. Other winter movements and range of Southern Residents are not well understood (NOAA 2023).

Killer whales use the entire water column, including regular access to the ocean surface to breathe and rest (Bateson 1974; Herman 1991). They remain underwater 95% of the time, with 60% to 70% of their time spent between the surface and a depth of 65 feet (20 meters), while diving regularly to depths of greater than 655 feet (200 meters) (Baird 1994; Baird et al. 1998). Southern Residents spend less than 5% of their time between depths of 20 and 820 feet (60 and 250 meters) (Center for

Biological Diversity 2001). Time-depth recorder tagging studies of Southern Residents have documented that whales regularly dive to greater than 490 feet (150 meters) but that there is a trend toward a greater frequency of shallower dives in recent years (Baird and Hanson 2004).

Resident killer whales tend to feed primarily on fish, whereas transient killer whales prey on other marine mammals (NMFS 2008). Southern Resident killer whales primarily feed on salmon species (Balcomb et al. 1980; Bigg et al. 1987; NMFS 2008; Hanson et al. 2010). Chinook salmon dominate their diet (38%), followed by pink salmon (10%) and other salmon species or unidentifiable salmon species (Ford et al. 1998; Ford and Ellis 2006). Recent studies have indicated that while in their summer range (outside of the action area), Chinook salmon from the Fraser River basin comprised 80% to 90% of the salmonid prey for Southern Resident killer whales, and fish originating in Puget Sound comprised 6% to 14% (Hanson et al. 2010). Other species such as lingcod (*Ophiodon elongates*), halibut (*Hippoglossus stenolepis*), rockfish (*Sebastes* spp.), and Dover sole (*Microstomus pacificus*) were identified as additional prey species and may increasingly contribute to the diet as salmon populations decline (Center for Biological Diversity 2001; Hanson et al. 2010).

3.6.2 Status and Critical Habitat

The Southern Resident DPS of killer whales was listed as endangered on November 18, 2005 (70 FR 69903). Critical habitat was designated on November 29, 2006 (71 FR 69054). Critical habitat does not include Grays Harbor or the action area. In September 2019, NMFS proposed a revision to the Critical Habitat Designation that is currently undergoing review (84 FR 49214). The proposed designated critical habitat would add new areas along the U.S. West Coast, including an inshore (eastern) boundary delineated by a continuous line along the coast at a 20-foot (6.1-meter) depth relative to mean high water. This continuous line crosses river mouths and entrances to semienclosed bays and estuaries such as Grays Harbor, but there are no data from sightings or satellite tags to indicate that Southern Resident killer whales enter river mouths or semienclosed bays and estuaries along the coast (NOAA 2023).

3.6.3 Utilization of the Action Area

Southern Resident killer whales have not been documented inside of Grays Harbor. Based on their known distribution and the available information on sightings, Southern Resident killer whales are highly unlikely to enter the inner harbor or the action area.

3.7 Marbled Murrelet

3.7.1 Biology and Distribution

Marbled murrelet are small seabirds of the family *Alcidae* that occur along the North Pacific coast from Alaska to California. Murrelets forage on small fish and invertebrates in open but somewhat

sheltered marine waters, such as bays or sounds where water depth is less than 330 feet deep (ODFW 2021). The nesting period typically begins in late March and continues through mid-September (Hamer and Nelson 1995). Nesting occurs in mature and old-growth forest (Carter 1984), where large branches or other suitable platforms exist on the trees for nesting. Because of the scarcity of mature forest stands, it is common for murrelets to fly inland many miles to nest, more than 40 miles in some studies (Cooper et al. 2006). Marbled murrelets fly to and from their nest sites during dawn and dusk time periods, spending the daytime hours foraging. The key factors of decline for the species include loss of old-growth forests with suitable nesting sites, mortality from oil spills and fishing nets, a low reproductive rate, and low nesting success and survival (USFWS 1997). In addition, it is believed that forest fragmentation makes nests vulnerable to predation by jays, crows, ravens, and great horned owls.

3.7.2 Status and Critical Habitat

The marbled murrelet was listed as threatened on October 1, 1992 (57 FR 45328). Critical habitat was designated on May 24, 1996 (61 FR 26256), and revised on October 5, 2011 (76 FR 61599). Critical habitat in Washington is located on federal lands designated as Late Successional Reserves as part of the Northwest Forest Plan and some areas of state and county land.

3.7.3 Utilization of the Action Area

There is no designated critical habitat in the action area. Marbled murrelets require old-growth forest to nest and proximity to marine areas for feeding. The action area is within a nearshore marine area, and marbled murrelets may forage in Grays Harbor. The nearest reported area with potential suitable nesting habitat is located approximately 2.4 miles to the southeast of the terminal (WDFW 2022b). Conifer dominant forest stands occur in both the northern and southern portions of the action area defined by in-air noise, and conservatively could contain some potential nesting habitat. The action area is highly urbanized, with port, fishing, and recreational traffic, and lacks abundant forage fish, a primary prey source for marbled murrelets. Although it is unlikely that foraging marbled murrelets would occur in the action area, they have been reported to forage in Grays Harbor and the possibility of their occurrence within the action area cannot be entirely discounted.

3.8 Streaked Horned Lark

3.8.1 Biology and Distribution

Streaked horned lark is a small, ground-dwelling songbird that primarily nests on remnant grasslands and sparsely vegetated areas at airports, sandy islands, and coastal spits (WDFW 2022c). Historically, the streaked horned lark's breeding range extended from southern British Columbia, Canada, south through the Puget lowlands and outer coast of Washington, along the LCR, through the Willamette Valley, and to the Oregon coast.

3.8.2 Status and Critical Habitat

The streaked horned lark was listed as threatened on October 1, 1992 (57 FR 45328). Critical habitat was designated on May 24, 1996 (61 FR 26256), and revised on October 3, 2013 (78 FR 61451). Critical habitat for streaked horned lark was designated on October 3, 2013 (78 FR 61505), and includes a portion of habitat approximately 12 miles west of the Project Area that extends from the Ocean Shores wastewater treatment plant (on the western edge) through the Oyhut wildlife management unit and Damon Point spit.

3.8.3 Utilization of the Action Area

On April 13, 2022, the Streaked Horned Lark Threatened Species Assessment (87 FR 21783) listed the Oyhut streaked horned lark population as extirpated. They have not been recently documented to occur within the in-air noise portion of the action area, and suitable nesting habitat is not present. Streaked horned lark are not anticipated to be present near Project activities.

3.9 Western Snowy Plover

3.9.1 Biology and Distribution

The western snowy plover is a small, ground-nesting shorebird found on broad open beaches and dry mud and salt flats, where vegetation is sparse or absent. Snowy plovers forage on a variety of invertebrates found at coastal intertidal areas and around the margins of lagoons and salt marshes (WDFW 2022d). The Pacific coast breeding population of snowy plovers extends from Washington to northwestern Mexico. Some are found farther south during the winter months. In Washington, the species is found only in Pacific and Grays Harbor counties.

3.9.2 Status and Critical Habitat

The western snowy plover was listed as threatened on March 5, 1993 (58 FR 12864). Revised critical habitat was designated on June 19, 2012 (77 FR 36727).

Critical habitat for Pacific coast western snowy plovers is designated for areas containing the following PCEs essential for the conservation of the species or that require special management considerations. Habitat needs include sandy beaches, dune systems immediately inland of an active beach face, salt flats, mudflats, seasonally exposed gravel bars, artificial salt ponds and adjoining levees, and dredge spoil sites, with the following PCEs.

PCE 1: Areas that are below heavily vegetated areas or developed areas and above the daily high tides.

PCE 2: Shoreline habitat areas for feeding, with no or very sparse vegetation, that are between the annual low tide or low water flow and annual high tide or high water flow, subject to inundation but

not constantly under water, that support small invertebrates, such as crabs, worms, flies, beetles, spiders, sand hoppers, clams, and ostracods, that are essential food sources.

PCE 3: Surf- or water-deposited organic debris, such as seaweed (including kelp and eelgrass) or driftwood located on open substrates that supports and attracts small invertebrates described in PCE 2 for food, and provides cover or shelter from predators and weather, and assists in avoidance of detection (crypsis) for nests, chicks, and incubating adults.

PCE 4: Minimal disturbance from the presence of humans, pets, vehicles, or human-attracted predators, which provide relatively undisturbed areas for individual and population growth and for normal behavior.

These PCEs apply in the shoreline habitat located at Damon Point but do not overlap with the action area within Grays Harbor.

3.9.3 Utilization of the Action Area

Suitable nesting and foraging habitat for western snowy plover is not present within the in-air portion of the action area and will not be impacted by Project construction. Although western snowy plover are documented to occur in Grays Harbor County, suitable nesting habitat does not occur in the action area. Suitable nesting habitats such as Damon Point occur outside of the in-air noise action area along the Pacific coast and outer sand spits of Grays Harbor and include open, sandy areas, a lack of vegetation, and dune-backed beaches. These sandy habitats are not found along the shorelines in the vicinity of the Proposed Project or the action area as defined by in-air noise.

4 Environmental Baseline in the Action Area

The environmental baseline is defined as the past and present impacts of all federal, state, or private actions and other human activities in the action area; the anticipated impacts of all proposed federal projects in the action area that have already undergone formal or early ESA Section 7 consultation; and the impact of state or private actions that are contemporaneous with the consultation of this proposed action (50 CFR 402.02). Any proposed agency action must be evaluated in the context of the existing environmental baseline to determine whether the proposed action, when added to the present and future human and natural contexts, would jeopardize listed species. The environmental baseline of the action area is affected by modifications at the larger scale that influence water quality, water quantity, and habitat connectivity within the action area.

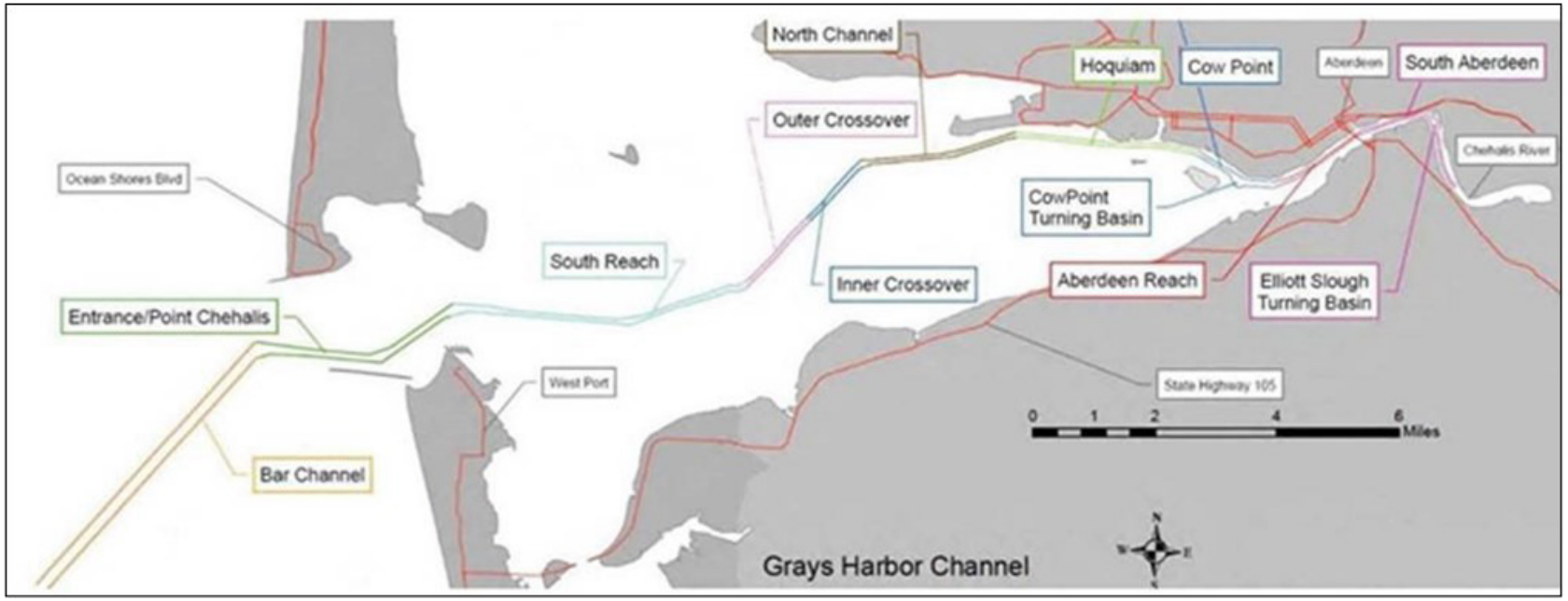
Grays Harbor is an estuarine bay located on the southwest coast of Washington, about 45 miles north of the mouth of the Columbia River and about 110 miles south of the Strait of San Juan de Fuca. Grays Harbor is formed by the Pacific Ocean, the flow from six rivers (Chehalis, Elk, Hoquiam, Humptulips, Johns, and Wishkah), and many smaller creeks and tributaries within the Chehalis River basin. The harbor is approximately 15 miles long and 13 miles wide. The Chehalis River is the largest river flowing onto the bay, providing more than 80% of freshwater contributed to the bay. It enters Grays Harbor at its eastern end near the City of Aberdeen, Washington. The Chehalis River basin is rain dominated, has no glacial source of water, and drains about 2,660 square miles of generally low-lying conifer forests and farmland, 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 and the anticipated high tide line for the Project Area is 12.22 feet mean lower low water (MLLW; Moffatt & Nichol 2022).

The aquatic environments, shorelines, and watersheds of Grays Harbor have been significantly altered by historical human use. Beginning in the second half of the nineteenth century, Grays Harbor became a regional hub for industrial activities including timber logging and milling, shipbuilding and ship breaking, commercial fishing, canning, and the export of locally produced goods by ship. The Port was founded in 1911, and the first deep-draft pier and terminal opened in 1922. Over the last century, much of the shoreline and nearshore terrestrial environments in proximity to the Port have been altered by armoring, diking and construction of additional Port terminals.

The Port's T4 is adjacent to the federal navigation deep-draft channel that runs between the City of Aberdeen and the Pacific Ocean. The channel is 350 feet wide and broadens to over 1,000 feet wide over the bar located at the mouth of Grays Harbor. The recent Grays Harbor Navigation Improvement Project deepened about 14.5 miles of the 27.5-mile-long channel from -36 feet MLLW

to -38 feet MLLW from the South Reach upstream to Cow Point Reach where T4 is located (USACE 2022). Annual maintenance dredging in the vicinity of Port terminal facilities is permitted between July 16 and February 15 and authorized to maintain the channel to a depth of -41 feet MLLW at T4 (with 2 feet of overdredge allowance). The in-water work window downstream of the Proposed Project varies depending on reach and dredge type (Figure 4). Clamshell dredging is permitted to occur in the Inner Harbor (i.e., North Channel, Inner Crossover, and Outer Crossover reaches) between August 1 and February 15. Hopper dredging is permitted to occur in the Outer Harbor (i.e., Outer Crossover, Entrance Point, and Bar Channel reaches) between April 1 and May 31 and in the South Reach between April 1 and June 30. Inner Harbor clamshell dredging uses the South Jetty disposal site or the Point Chehalis in-water disposal site, both of which are located near the mouth of Grays Harbor. Outer Harbor hopper dredging primarily uses the South Beach Beneficial Use site and occasionally uses the Half Moon Bay Beneficial Use site.

Figure 4
Port of Grays Harbor Navigation Channel Reaches



Vessel calls at the Port have fluctuated widely in the last half century, but data provided by the Port indicates an increase over the last 20 years, peaking at 214 total vessel calls in 1992. However, in recent years total vessel calls have decreased, with 56 recorded in 2021, the last full year for which there were data available. The global COVID-19 pandemic may have contributed to decreased vessel calls in 2020 and 2021. Between 2012 and 2019, the Port recorded an average of about 98 vessel calls per year. In 2020 and 2021, the Port recorded an average of about 66 vessel calls per year, a decrease of approximately 33%. The anticipated additional vessel calls resulting from the Proposed Project fall within the normal pre-COVID-19 operational baseline of 131 combined ship and barge calls at the Port (Section 2.3.3). While total vessel calls have recently decreased, the proportion of trips carrying dry bulk materials like soy meal has increased from about 36% in 2014 to nearly 79% in 2021. Recent PSAP rail trip data also indicate wide variation but show a decline in total railcars passing between Centralia, Washington, and the Port from 31,637 in 2020 to 24,854 in 2021, a decrease of about 21%.

Listed species that may be present in the action area include both aquatic species under the authority of NMFS and USFWS and terrestrial species under the authority of USFWS. Therefore, the characterization of the environmental baseline presented in the following sections focuses on aquatic estuarine habitats in Grays Harbor and upland terrestrial habitat within the action area. Photographs of the general upland and aquatic habitat conditions of the Project Area are provided in Appendix A.

4.1 Terrestrial Zone

4.1.1 Topography

Topography in the Project Area is predominantly flat, with the lowest elevations associated with depressional areas, stormwater ponds, streams, and ditches. Within a 3-mile radius of the Project Area, elevation is also 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 Project Area and Grays Harbor.

4.1.2 Vegetation

Vegetation within a 3-mile radius of the Project Area consists of a mix of forested areas, woodlands, shrub and grasslands, parks, and landscaping associated with developed areas. In less developed areas, vegetation communities include forests dominated by Douglas-fir (*Pseudotsuga menziesii*), western red cedar (*Thuja plicata*), western hemlock (*Tsuga heterophylla*), Sitka spruce (*Picea sitchensis*), and red alder (*Alnus rubra*) with adjacent woodland habitats transitioning to grasslands. Shoreline vegetation along the banks of Grays Harbor is limited in areas of development and shoreline modifications. Where less developed conditions occur, vegetated riparian habitats are

present, as well as low-elevation freshwater wetlands and tidal surge plain wetlands with plant species typical of those habitats.

The Project Area is largely developed with minimal vegetation present along the shoreline. Dominant vegetation includes Himalayan blackberry (*Rubus armeniacus*) and various weedy forbs and grasses. Few scattered tree species are present and include Douglas-fir, spruce (*Picea* spp.), pine (*Pinus* spp.), cherry (*Prunus* spp.), and red alder.

4.2 Aquatic Zone

4.2.1 Substrate and Slope

The aquatic substrate at the Project Area generally consists of poorly sorted silts along the shores of north and south bays and in the Aberdeen-Hoquiam area, transitioning to well-sorted sands in the outer harbor and poorly sorted lag gravel near the channel entrance (Milliman 1963). The sediment depositional pattern in Grays Harbor is dynamic and associated with seasonal fluctuations in estuarine hydrography. Sand and gravel from the Chehalis River and other local tributaries enter Grays Harbor during winter fluvial discharge (Peterson et al. 1984). Sediment also enters Grays Harbor by flood-tidal currents as a marine source from the beaches and nearshore areas adjacent to the harbor entrance. In general, sandy sediments from the Pacific Ocean dominate the outer harbor while mud-rich deposits (greater than 50% silt and clay) dominate the inner harbor and upper estuary (Stantec 2021). The nearshore slope just seaward from Grays Harbor is influenced by ebb-shoal deposits and slightly different than the 0.4% slope farther seaward (Stantec 2021).

Since the early 1900s, the Seattle District has completed a series of engineering constructions and rehabilitations mainly to improve the navigation within Grays Harbor. As such, Grays Harbor contains a federally constructed and maintained navigation channel along with small, naturally occurring channels found intermittently around the harbor. The navigation channel is dredged annually, and the volume removed averages 1.7 million cy annually (USACE 2022). Most recently, USACE initiated annual maintenance dredging of the navigation channel to occur over a 3-year period beginning in January 2021 (USACE 2022). The dredge material has been tested and determined suitable for open water placement either at the South Jetty or the Point Chehalis disposal site.

4.2.2 Wetlands and Streams

HDR performed a wetlands and streams delineation in the Project Area on June 23, July 8, and August 5 and 19, 2022. The study area for this delineation included parcels 317090834001, 029902000101, 029902000103, 317090834004, 317090834003, 029902000102, 029902000200, 056402300000, 052209400001, and 517090732001. The results of the delineations were presented in a November 2022 wetland delineation report titled *Draft Wetland and Stream Delineation Report, Port of Grays Harbor – Terminal 4 Rail Upgrade and Site Improvements* (HDR 2022). The delineations

identified one estuarine wetland (Wetland 1), eight freshwater wetlands (Wetlands 2 through 9), one stream (Fry Creek), and four ditches (East Terminal Way Ditch and Ditches 1 through 3). Fry Creek, East Terminal Way Ditch, and Ditch 1 are tributaries to Grays Harbor. These waters provide fish habitat for salmonid species and other fish and aquatic life.

The National Wetland Inventory maps several wetlands within a 3-mile radius of the Project Area, including forested, scrub-shrub, and emergent wetlands; freshwater ponds; riverine, lacustrine, and estuarine wetlands; and marine wetlands and deepwater (USFWS 2022m). Many of these mapped features are associated with Grays Harbor and portions of the Hoquiam, Wishkah, and Chehalis rivers and their adjacent fringe wetlands, along with smaller streams and drainages.

4.2.3 Water and Sediment Quality

The waters of Grays Harbor have been affected by decades of land use activities and discharges within the contributing upstream basins and to Grays Harbor itself. Ecology's Water Quality Atlas indicates many Clean Water Act (CWA) Section 303(d)-listed waters in the upper portion of Grays Harbor including listings for temperature, dissolved oxygen, and fecal coliform bacteria (Ecology 2022a). A total of five Total Maximum Daily Load water quality improvement projects have been established within the Grays Harbor basin.

Ecology has evaluated and documented sediment quality in Grays Harbor during the previous decades. In May 1988, sediment samples were surveyed and analyzed from 10 sites in the Grays Harbor estuary to assess the occurrence of toxic chemicals in the bottom sediments (Ecology 1989). The results of the 1988 sediment quality study concluded that compared to sediments in Puget Sound and other sites in Washington and Oregon, chemical contamination levels in Grays Harbor sediments are low relative to the threshold that statistically results in a biological effect in receptors (Ecology 1989). Chemicals targeted for analysis included the U.S. Environmental Protection Agency priority pollutants and hazardous substances list compounds, which include approximately 140 different metals and organic compounds. Near the Project Area, sediments had detectable concentrations of arsenic, beryllium, chromium, copper, lead, mercury, nickel, selenium, zinc, and silver, as well as the organic priority pollutants/hazardous substances list compounds polycyclic aromatic hydrocarbons (PAHs), 4-methylphenol, retene, dibenzofuran, phthalate acid esters, and polychlorinated dibenzodioxins (Ecology 1989).

Ecology's Water Quality Atlas web-based map application indicates that sediments at and near the Project Area are within most state sediment quality standards (Ecology 2022a). Ecology also identifies portions of the navigation channel just downstream from the Project Area as having sediments that meet sediment quality standards for such contaminants as arsenic, bis (2-ethylhexyl) phthalate, cadmium, chromium, copper, fluoranthene, lead, mercury, high-molecular weight PAHs, silver, and zinc (Ecology and City of Hoquiam 2016).

4.2.4 Habitat Access and Refugia

The intertidal flats, salt marshes, and open water in Grays Harbor provide essential habitat for a diversity of fish, shorebirds, and other wildlife. Nearshore vegetation communities consist of dunegrass, eelgrass bed, and salt marsh habitats. Deeper water zones provide migratory habitat for salmonids and other ESA-listed fish species; however, at the Project Area, aquatic habitat is limited due to ongoing Port activities and does not provide suitable refugia for such species.

4.2.5 Prey Species and Food Web

Recent and ongoing salmonid trapping and monitoring studies conducted by WDFW beginning in the early 1980s have documented both salmonid and prey species in the Grays Harbor watershed and the Chehalis River basin (Winkowski and Zimmerman 2019; West et al. 2020, 2021). Reports included native fish species such as juvenile Chinook and coho salmon, steelhead and cutthroat trout, dace species (*Rhinichthys* spp.), largescale sucker (*Catostomus macrocheilus*), mountain whitefish (*Prosopium williamsoni*), northern pikeminnow (*Ptychocheilus oregonensis*), Pacific lamprey (*Entosphenus tridentatus*), peamouth chub (*Mylocheilus caurinus*), redside shiner (*Richardsonius balteatus*), three-spine stickleback (*Gasterosteus aculeatus*), and sculpin species. Non-native fish included American shad (*Alosa sapidissima*), bluegill (*Lepomis macrochirus*), largemouth bass (*Micropterus salmoides*), smallmouth bass (*Micropterus dolomieu*), rock bass (*Ambloplites rupestris*), and other unidentified sunfish species.

Results of the monitoring indicate that the Chehalis River supports a higher density of wild coho salmon smolts than any other basin in western Washington, but much lower numbers of Chinook salmon and steelhead. While WDFW monitoring efforts are primarily focused upstream of Grays Harbor in the tributaries of the Chehalis River, many of the fish species recorded will pass through Grays Harbor during part of their life cycle. However, none of these salmonid species are listed under the ESA.

5 Effects of the Proposed Actions

Potential direct and indirect effects to ESA-listed species and critical habitats from the Proposed Project include short-term temporary noise disturbance associated with pile driving and other construction activities, minor and short-term temporary turbidity and suspended sediments released during pile activities and substrate placement, effects on food supply, and long-term water quality and habitat improvements from the removal of creosote-treated piles.

5.1 Stormwater

The Proposed Project has the potential to result in accidental discharge of chemical contaminants, construction and demolition debris, and/or sediment loads to surface waters in the in-water portion of the action area due to Project-related upland construction, in-water and overwater demolition, and in-water construction activities. Project components that may result in stormwater-related impacts include the following:

- Construction of a new rail bridge at Fry Creek (including associated replacement of an existing culvert, new access roads, and storm drainage systems and other associated improvements, including an additional new stormwater outfall, if constructed).
- Filling the former casting basin and upgrading surface treatments and drainage as necessary to create a cargo laydown yard with a combination of paved and gravel surfaces.
- Dock upgrades required to provide foundations capable of supporting new shiploaders. The existing structure drains stormwater directly to the river. Stormwater improvements will be designed and constructed to collect and convey stormwater runoff from the wharf to landside treatment facilities.
- Construction of a new Railcar Receiving Facility with two receiving pits and a new three-spout shiploader at T4 as part of AGP's new commodity transload facility.
- Construction activities within and over surface waters and at nearby upland areas could result in accidental discharge of construction debris; release of various fuels, hydraulic fluids, lubricants, or other chemicals associated with construction equipment; and/or discharge of sediment-laden stormwater resulting from erosive forces associated with construction activities. These sources of potential contaminants could occur throughout construction; however, the risk of contaminants actually entering surface waters is low. The contractor will be required to implement BMPs and avoidance and minimization measures, including an SPCC plan. The Proposed Project will also comply with the provisions of a 401 Water Quality Certification from Ecology, and construction stormwater permits will be procured from Ecology and the City of Aberdeen as appropriate for all phases of construction. Required SWPPPs will be prepared, and appropriate stormwater erosion and sediment control BMPs will be implemented. BMPs will minimize the potential for impacts on aquatic species or habitat.

The Proposed Project is expected to result in a net beneficial effect to stormwater quality because existing infrastructure drains stormwater directly to the harbor and 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.

Potential direct and indirect effects to ESA-listed species and critical habitats from stormwater aspects of the Proposed Project include short-term temporary turbidity and suspended sediments released during construction and chemical pollutants associated with runoff generated during facility operations.

Direct and indirect stormwater impacts during construction will be mitigated through implementation of temporary erosion and sediment control (TESC) BMPs required under the Ecology NPDES construction permitting process.

Direct and indirect effects from stormwater runoff in the in-water portion of the action area generated during facility operations will be mitigated through installation of infrastructure to collect and convey stormwater from the wharf and upland dry bulk transfer operations to state of the art stormwater treatment facilities incorporating vegetated filtration, proven to limit pollutant discharges to receiving waters. The exact types of stormwater treatment systems that will be used for the Proposed Project have not yet been identified; however, they will generally fall into two categories: treatment systems required for development per the City of Aberdeen and treatment systems required to comply with industrial stormwater permits. It is likely that the stormwater systems required by the City of Aberdeen through its Phase II Municipal Stormwater Permit will be designed in accordance with the Ecology *Stormwater Management Manual for Western Washington* (Ecology 2019) as adopted by the City of Aberdeen. The industrial stormwater permit areas will be treated by engineered treatment systems to comply with Ecology-specified industrial stormwater pollutant parameters and will include design elements based on recent mitigation guidance for chemical pollutants such as 6PPD and 6PPD-quinone[4] (Ecology 2022b).

5.2 Turbidity

The proposed action may generate excess turbidity in the in-water portion of the action 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.

[4] N1-(4-Methylpentan-2-yl)-N4-phenylbenzene-1,4-diamine

There are several mechanisms by which suspended sediment could potentially affect ESA-listed fish, including increased potential for gill tissue damage, physiological stress, behavioral changes, and direct mortality. These are discussed briefly below.

Gill Tissue Damage: Suspended sediment can clog fish gills and result in a decrease in their capacity for oxygen exchange. The nature of the sediment particle, concentration, water temperature, duration of exposure, age, and species all affect bull trout and other fish response to suspended sediment. Gill tissue damage occurs at suspended sediment concentrations that far exceed the upper limit from typical dredge operations (NMFS 2002). Therefore, pile removal/installation and other in-water activities are not expected to result in gill tissue damage from suspended sediment.

Physiological Stress: Physiological stress is generally produced by prolonged exposure to high levels of suspended sediments. Suspended sediments have been shown to cause stress in sturgeon, bull trout, and/or Pacific eulachon but at concentrations higher than those typically caused by dredging (NMFS 2002; NOAA Fisheries 2002). Therefore, pile removal/installation and other in-water activities that result even lower concentrations of suspended sediment than dredging and are not likely to have physiological impacts on any listed fish in the Project Area.

Behavioral Changes: Behavioral responses to elevated levels of suspended sediment include feeding disruption and changes in migratory behavior. Migrating green sturgeon, salmonids, bull trout, and/or Pacific eulachon that are exposed to elevated levels of turbidity may modify feeding and/or migratory behavior to avoid areas of high concentration.

Direct Mortality: Elevated turbidity levels at sufficient concentration can result in mortality of juvenile and even adult fish. The concentration that can cause mortality far exceeds those anticipated by the proposed pile removal/installation and other in-water activities. Direct mortality from elevated turbidity levels is not expected to occur during the Proposed Project.

General localized and temporary water quality/turbidity impacts could occur to species and/or critical habitat identified in Section 3. The majority of sediment disturbances will occur during pile removal and installation activities associated with dock upgrades, during demolition and construction of the bridge over Fry Creek, and during culvert replacement and extension activities.

In general, water quality and turbidity impacts from sediment resuspension are anticipated to be minor, localized, and temporary. The geographic extent and duration of any potential short-term decreases in-water quality conditions are expected to be limited, and the conservation measures implemented for the proposed action will be sufficient to minimize any effects. While high levels of turbidity are known to affect salmonid and eulachon physiology and feeding success, the combined background and anticipated Project-related turbidity concentrations are expected to be well below known impact levels (NMFS 2002). BMPs include implementation of a SWPPP and a Water Quality

Monitoring Program to be approved during the CWA Section 401 certification process, in addition to those discussed in Section 2.8. The Proposed Project will also comply with other provisions of a CWA Section 401 Water Quality Certification from Ecology, and construction stormwater permits will be procured from Ecology, the City of Hoquiam, and the City of Aberdeen as appropriate for all phases of construction. Required SWPPPs will be prepared, and appropriate stormwater erosion and sediment control BMPs will be implemented. BMPs will minimize potential impacts on aquatic species or habitat.

The Proposed Project is expected to result in a net beneficial effect to stormwater quality because existing infrastructure drains stormwater directly to the river, and proposed stormwater improvements will be designed and constructed to updated codes to better collect and convey stormwater runoff from the wharf to landside treatment facilities. All future stormwater will be treated before entering the harbor.

Ecology's construction NPDES permit includes measurement and mitigation measures intended to limit stormwater and in-water turbidity effects. Direct and indirect stormwater impacts during construction will be mitigated through implementation of TESC BMPs and compliance with Ecology NPDES construction permit provisions (Section 2.8).

5.3 In-Air Noise

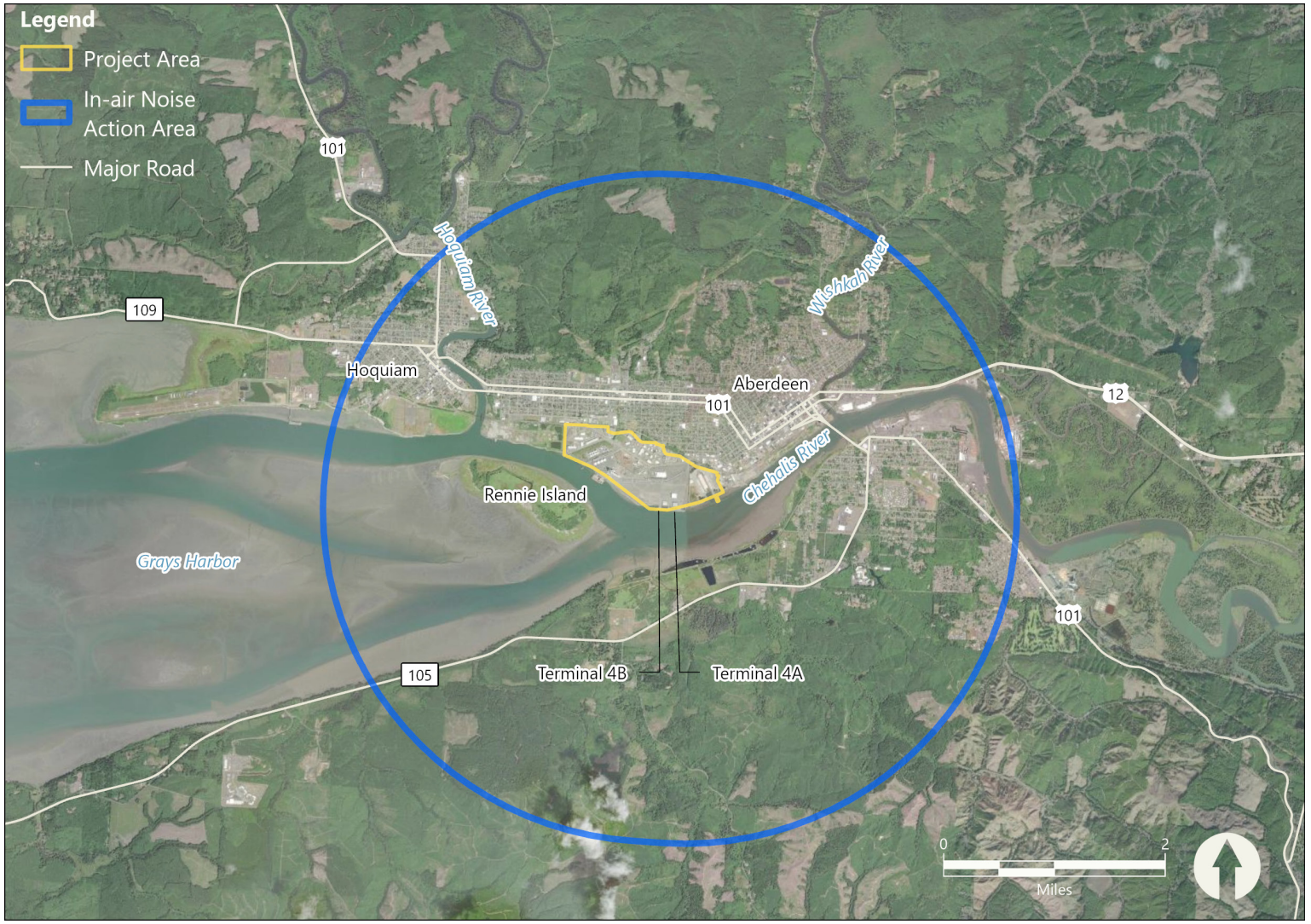
The in-air, or terrestrial, portion of the action area is defined by the area of ground disturbance within the Proposed Project footprint and the geographic extent of visual or noise-related disturbance associated with the Proposed Project (Figure 5). The geographic extent of construction-related noise is calculated based on reference data provided by the *Washington State Department of Transportation Biological Assessment Preparation Manual* (WSDOT 2020). The extent of in-air noise considers the loudest noise-producing activity associated with the proposed action (i.e., pile installation using impact and vibratory hammers). Due to the large number of piles being installed and removed, it is anticipated that multiple pile drivers will be operating simultaneously. The three loudest noise-producing activities under the proposed action consist of an impact pile driver and two vibratory pile drivers. This equipment produces in-air peak noise levels of 105 dB each (WSDOT 2020). These noises, collectively, define the terrestrial (in-air) portion of the action area and have been used to conservatively estimate peak noise levels. Based on the rules of dB addition (WSDOT 2020), the resultant maximum combined noise level from simultaneous pile driving will be 110 dB at 50 feet from the source.

The extent of in-air noise from pile driving activities is defined as the distance at which noise attenuates to ambient conditions. Given the industrial nature of the facility and proximity to heavy truck traffic, rail, and river traffic, ambient in-air sound was estimated at approximately 60 dB (WSDOT 2020). Existing sources of noise within the Project vicinity include industrial activities at the

T4 and Port facility and surrounding properties, heavy truck traffic on PIR, rail traffic on the PSAP railway, cargo ships, and other waterborne vessel traffic in the harbor.

The area within a 1-mile radius of the site is predominantly flat with little to no trees or shrub cover. Although a small portion of the area within 1 mile of the Port supports small patches of forest and street trees, the area is mainly flat and treeless considering the industrial and urban areas surrounding the port. Within these "hard site" conditions, Project-related noise will attenuate at approximately 6 dB per doubling distance from the source beginning at 50 feet (WSDOT 2020). Applying the spherical spreading loss model, which assumes hard site conditions, ambient sound of 60 dB, and a 110 dB equipment noise level, construction noise will attenuate to baseline noise levels within 15,811 feet (3 miles) from the Port and T4 Project Area (Figure 5). This defines the in-air portion of the action area.

Figure 5
In-Air Action Area



5.4 Underwater Noise

The aquatic portion of the action area is defined by the area affected by stormwater (Section 5.1), turbidity (Section 5.2), and underwater noise (Section 5.4) during Project construction. Of these, noise extends the farthest (Figure 6). The extent of underwater noise was calculated for the farthest attenuating noise-producing activity associated with the proposed action. Literature sources of comparable pile driving activities were used to estimate the expected underwater noise levels for impact and vibratory driving of steel piles. Installation of 36-inch steel pipe piles with an impact hammer has the potential to affect the largest underwater area. Using data from recent Incidental Harassment Application (IHA) authorizations, the estimated underwater noise from impact pile driving of 36-inch steel pipe piles is 210 dB peak, and 193 dB root mean square (RMS) measured at 10 meters from the source (NMFS 2022; Navy 2015). 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 (NMFS 2022). In comparison, the estimated underwater noise from vibratory hammer pile driving of 36-inch steel pipe piles is 170 dB peak (NMFS 2022).

Baseline conditions in the vicinity of the Port include anthropogenic underwater noise from barge and cargo ship traffic and regular dredging. T4 is located within an actively used industrial area that supports storage, loading, unloading, and transport of marine-borne cargo. Background underwater noise level data from the Project Area are not available. Therefore, proxy sources were used to estimate ambient sound levels in the in-water portion of the action area. The *Grays Harbor Navigation Improvement Project Supplemental Environmental Impact Statement* (USACE 2014) determined the estimated ambient noise level of 123 dB RMS; however, it was based on the mid-range of ambient noise levels in Puget Sound. Another source reported ambient noise levels measuring 136 dB peak measured at a tidally influenced and ship trafficked area of the Columbia River at river mile 45 (Carlson et al. 2001; NMFS 2010). Subtracting 15 dB from the peak sound measurement yields a crude estimate of RMS value of 121 dB RMS (NMFS 2010). Grays Harbor within the in-water portion of the action area is also tidally influenced, is regularly dredged, and supports a variety of industrial and recreational marine traffic. Based on this information, this analysis will use a conservative estimated ambient noise level of 120 dB RMS.

Using the practical spreading loss model (NMFS 2012; WSDOT 2020) with an ambient sound estimate of 120 dB and in-water noise of 188 dB RMS (considers 5 dB reduction from use of a bubble curtain during impact pile driving), 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 curvature of the Grays Harbor shoreline significantly truncate the distance that underwater noise will travel, because noise transmission will cease when it intersects a land mass (WSDOT 2020). As a result, the area affected by underwater noise will be comprised of an approximately 3.8-mile reach extending northwest from the terminal to the shoreline by Bowerman

Field, and southeast approximately 1.1 miles across the mouth of the Chehalis River with an area totaling approximately 1.2 square miles (Figure 6).

Localized vessel use (including Project tugs and barges) could create underwater noise, but given existing vessel use at the Port, the number of additional vessels associated with the proposed action is not likely to create noise that is measurable above baseline conditions. Operation of the completed Project is anticipated to add up to an additional 60 vessel round trips per year and includes the transit of cargo ships to and from the T4 facility. The Proposed Project would improve shiploading capabilities but would not result in increases in underwater noise from existing conditions where there is currently cargo ship and barge traffic in the in-water portion of the action area.

Sound source levels for impact and vibratory pile installation were estimated using reference data from a recent IHA application for the State Route 520 Pontoon Construction Site (Soncarty 2020) as well as measured levels from commonly used reference projects (Caltrans 2020; Navy 2015). Table 6 lists the method of installation, pile type, and sound source levels for the various types of piles to be installed below the high tide line for the proposed action. The loudest of these pile driving activities is impact installation of 36-inch steel pipe piles. This activity, therefore, was used to define the furthest extent of underwater noise and defines the in-water portion of the action area.

Table 6
Estimates of Underwater Sound Source Levels Generated During Vibratory and Impact Pile Installation and Vibratory Pile Removal

Method and Pile Type	Sound Source Level at 10 Meters			Literature Source
Vibratory Hammer	**dB RMS**			
18-inch creosote timber piles (removal)	162			Naval Facilities Engineering Systems Command Southwest 2022[a]
12-inch steel H-piles (install and removal)	153			Laughlin 2019 as cited in WSDOT 2020
16.5-inch concrete octagonal (remove)	162			Naval Facilities Engineering Systems Command Southwest 2022[a]
18-inch steel piles (temporary install and removal)	158			Caltrans 2020
24-inch steel piles (temporary install and removal)	166			Laughlin 2010a as cited in WSDOT 2020
30-inch steel piles (install)	170			Laughlin 2010b as cited in WSDOT 2020[b]
36-inch steel piles (install)	170			Laughlin 2012 as cited in WSDOT 2020
Impact Hammer	**dB RMS**	**dB SEL**	**dB Peak**	
24-inch steel piles (single strike)	193 (188)[c]	180 (175)	205 (200)	Laughlin 2005
36-inch steel piles (single strike)	193 (188)[d]	183 (178)	210 (205)	Caltrans 2020

Notes:

a. Noise levels were backcalculated to a 10 meter measurement distance assuming a 15 log transmission loss.

b. Unattenuated data is used as reference for 24-inch steel pipe piles driven in sandy/silt substrate. A 5-dB attenuation is applied in parenthesis for the use of a bubble curtain.
c. Unattenuated data used as reference. A 5-dB attenuation is applied in parenthesis for the use of a bubble curtain.
d. It is assumed that noise levels during vibratory pile installation and vibratory pile removal are similar.

Sound waves in water have both a pressure and a particle motion component. While mammal hearing is based on detection of sound pressure, fish and invertebrates (i.e., most aquatic animals) primarily sense sound using particle motion that accompanies the transmission of the sound (Popper and Hawkins 2018). Elevated underwater noise produced by the proposed action, specifically during impact pile installation, has the potential to modify critical foraging or predatory avoidance behaviors and could result in injury if individual fish are in close proximity to the action. Although NMFS has not established injury thresholds from vibratory pile installation (a continuous noise), recent discussions with NMFS for the City of Hoquiam North Shore Levee West Project (Shorin 2022) indicate that NMFS now considers fish responses to cumulative vibratory noise to be negative.

Continuous sound may mask a fish's ability to detect biologically important sounds and may affect predator-prey interactions (Purser and Radford 2011; Luczkovich and Keusenkothen 2008), including effective predatory avoidance in some fish (Popper and Hawkins 2019). Further, continuous sound may stimulate avoidance responses in salmonids where exposed fish swim actively away from the sound source (Carlson et al. 2001) and abandon occupied habitats or behaviors.

NMFS has developed criteria for impact and vibratory pile driving noise impacts that specify both a maximum permitted sound pressure level (SPL) for a single pile driving strike and a maximum accumulated sound exposure level (SEL). NMFS applies the following interim impact (harm or injury) thresholds for fish from impact installation (an impulsive noise):

- Peak noise levels at or above 206 dB
- Cumulative noise levels:
  - Above 183 dB may lead to the injury or death of fish less than 2 grams in size.
  - Above 187 dB may harm fish greater than 2 grams in size (WSDOT 2020).

The proposed action will include both impact and vibratory installation during the July 16 to February 15 in-water work window. As described in Section 4.2, although the underwater noise from impact pile installation has the potential to extend up to 212 miles from the Project Area, the aquatic portion of the action area is truncated by nearby islands and the curvature of the shoreline of Grays Harbor. As a result, the area affected by underwater noise will comprise an approximately 1.2-square-mile area at the eastern end of Grays Harbor north of the mouth of the Chehalis River and east of Bowerman Field (Figure 6).

Sound source levels for impact pile driving (Table 7) were input into the NMFS Pile Driving Calculator (NMFS 2009) to estimate distances to noise thresholds for fish injury and disturbance based upon the anticipated project schedule of four piles being installed each day with up to 600 strikes per pile, resulting in a daily total of up to 2,400 impact hammer strikes. Because the piles will be partially installed using a vibratory hammer, it is likely that impact installation may require fewer than 600 hammer strikes to install each pile; however, a conservative estimate has been provided to assist the Services in their evaluation for ESA-listed fish species. Inputs also consider 120 dB RMS as the ambient underwater sound. Based on these inputs, during the installation of four piles per day, cumulative underwater noise from impact installation of 36-inch piles with a bubble curtain could result in physical injury within the in-water portion of the action area at a distance of 450 meters (1,476 feet) for fish larger than 2 grams in size, and 736 meters (2,415 feet) for fish smaller than 2 grams in size (Table 7). Injuries from peak noise levels could occur within 9 meters (30 feet) of each pile being driven.

Table 7
Distances to Impact Thresholds for Fish from Impact Installation of 36-Inch Steel Piles using a Bubble Curtain from the NMFS Calculator (2009)

	Acoustic Metric			
	Peak	**SEL**	**RMS**	**Effective Quiet**
Measured single strike level (dB)	**205**	**178**	**188**	**150**
Distance (meters)	**10**	**10**	**10**	
Estimated number of strikes	**2,400**			
Cumulative SEL at measured distance	**212**			
	Onset of Physical Injury			Behavior
Transmission loss constant	PeakdB	Cumulative SEL dB		RMSdB
15		Fish ≥2g	Fish <2g	
Noise threshold	206	187	183	150
Distance (meters) to threshold	**9**	**450**	**736**	**3,415**

Note:
Noise thresholds of 187 dB is for fish ≥2 g and 183 dB is for fish <2g. It is anticipated that four piles will be installed each day. The estimated number of strikes conservatively assumes that each pile will require up to 600 impact hammer strikes to install.

Although the NMFS Pile Driving Calculator estimates the distance where behavioral thresholds for fish may be exceeded is 3,415 meters, the presence of Rennie Island impedes noise transmission and therefore the actual affected area ensonified for the behavioral threshold for fish is significantly smaller. Impact hammers produce short, intense, pulse-type sounds that are typically considered isolated events or are repeated in succession. Such sounds have the potential to physically injure fish due to their relatively rapid rise in ambient pressure, followed by a period of diminishing oscillating maximal and minimal pressures. The responses of fish exposed to elevated SPLs can range from no

effect to a brief acoustic annoyance, temporary or permanent loss of hearing, behavioral changes and stress, or tissue injuries and barotraumas (Hastings and Popper 2005; Hedges 2011; Ruggerone et al. 2008; Popper and Hawkins 2019; WSDOT 2020). As pressure waves passes through a fish with a swim bladder, the bladder is rapidly squeezed due to the high pressure, and then rapidly expanded as the under-pressure component of the wave passes through the fish. The rapid expansion and contraction of the swim bladder causes damage to both the swim bladder and other organs within close proximity and is referred to as barotrauma (Halvorsen et al. 2011). Typical barotrauma injuries include hemorrhage, hematoma, burst capillaries, and a deflated or ruptured swim bladder (Halvorsen et al. 2011). Depending on the source of such underwater SPLs, the disturbance can also result in temporary stunning of fish, and alterations in behavior that could potentially affect fish feeding and predator evasion in the vicinity of the pile driving activity (Turnpenny et al. 1994; Popper 2003; Hastings and Popper 2005).

Even when an injury is not immediately fatal to a fish, injured fish can be more susceptible to predation. Behavioral changes due to increased noise may include avoidance of the area, changes in migratory routes, and/or interruption of reproduction. Fish may move away from protected shoreline habitat or delay migratory movements due to increased noise, and the noise may also increase predation by masking the sound of approaching predators (Anderson 1990; Purser and Radford 2011; Luczkovich and Keusenkothen 2008). Increased sound pressure waves from impact hammers have the potential to alter the migratory pathway of migrating fish, as noise has the potential to deter adults (e.g., eulachon) from entering spawning habitat and to disturb juvenile fish in rearing habitats.

Pile installation would occur during standard daylight working hours (approximately 8 to 10 hours per day) during the standard marine in-water work window for Grays Harbor (July 16 to February 15). Cumulative sound source levels will be attenuated with a bubble curtain. Although the zones of ensonification (Table 7) for pile strikes for small fish <2 grams and larger juvenile and adult fish >2 grams extend approximately 736 meters and 450 meters, respectively, for physical injury, and 3,415 meters for behavioral impacts, adult and juvenile fish are likely to be swimming past the T4 area and not lingering. Spawning habitat is not present for any listed fish species in the in-water portion of the action area and high-value rearing habitat is also lacking. Therefore, it is expected that individuals will not be exposed to underwater noise for the full duration of pile installation. The NMFS Pile Driving Calculator assumes that fish are stationary and that strikes will occur over a 24-hour period, which is a conservative approach because migrating adults like eulachon are unlikely to remain stationary in the in-water portion of the action area.

Although vibratory installation and removal of piles does not create the intense pulse-type sounds that can cause barotraumas or other injuries (WSDOT 2020), the use of such equipment will produce in-water noise that exceeds ambient underwater sound levels. As stated above, these sound levels can produce behavioral response in fish such as interfering with foraging behavior (Purser and Radford 2011) or

predator avoidance behavior (Luczkovich and Keusenkothen 2008). Although injury directly related to particle motion or noise from vibratory drivers does not typically occur, elevated noise from vibratory pile driving may temporarily displace individuals from migratory corridors or low-value foraging and rearing habitat for the duration of piling installation.

Figure 6
In-Water Action Area

5.5 Visual Disturbances

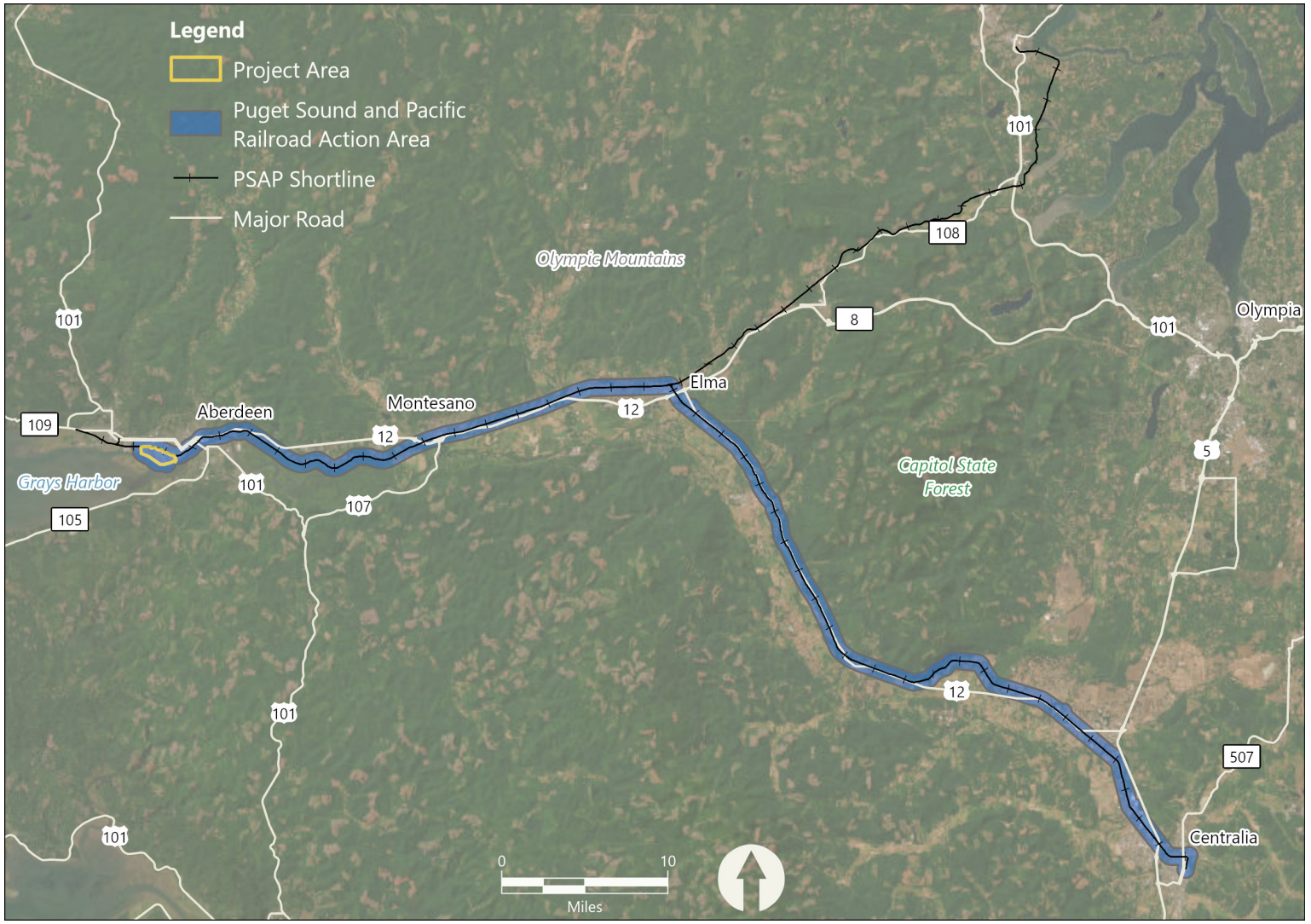
This area includes visual disturbance areas, which are limited to the Project construction areas. Areas within line of sight of the Project construction areas are included in the action area. Because the area has been used as a Port facility and no visual changes or line of sight will be impacted, no effects from visual disturbance to ESA-listed species are anticipated.

5.6 Rail Traffic

Because rail traffic transiting to and from Project Area has the potential to affect ESA-listed species, the action area includes the extent of existing rail lines that will carry increased traffic related to the Proposed Project (Figure 7). For the purposes of this analysis this area includes Port-owned property and PSAP-owned rail lines connecting the Port to Centralia, Washington, as well as a quarter mile wide buffer projected on either side of the PSAP rail line.

The Port anticipates the Proposed Project developments at T4 will increase rail transload capacity from 295 to 434 baseline round trips to 595 to 734 round trips with the Proposed Project.

Figure 7
PSAP Rail Line Action Area



5.7 Vessel Traffic

Because vessels transiting to and from the Project Area have the potential to affect ESA-listed species, the action area includes the vessel shipping routes within the Grays Harbor Navigation Channel (Figure 8).

The Port anticipates that the increased capacity developed at T4 by the Proposed Project will add up to 60 additional vessel calls per year over the low of 56 vessels in 2021, for a total of 116, which is below the baseline of 131. The global COVID-19 pandemic likely contributed to decreased vessel calls in 2020 and 2021. Between 2012 and 2019, the Port recorded an average of about 98 vessel calls per year. In 2020 and 2021, the Port recorded an average of about 66 vessel calls per year, a decrease of approximately 33%. The anticipated additional vessel calls resulting from the Proposed Project fall within the normal pre-COVID-19 operational baseline for Port activities of 131, and therefore no effects from vessel traffic are anticipated from the Proposed Project. Typical vessels will be Panamax- or Handymax-sized vessels that will be at berth approximately 3 to 6 days, but this duration could vary based on vessel size and weather conditions. Upon completion of vessel loading, a vessel will typically depart for its destination port. It is anticipated that the bulk of the vessels will be destined for Southeast Asian ports.

Additional vessel traffic within the Project vessel action area in Grays Harbor and adjacent marine waters will be below baseline numbers and will not increase vessel strikes of ESA-listed marine animals (Figure 8). While most ESA-listed cetaceans have not been documented within Grays Harbor, humpback whales are occasional and temporary visitors, with most observations of the species occurring in the outer harbor. The likelihood of increased vessel collisions with humpback whale or other marine animals related to the Proposed Project is not anticipated because of several factors, primarily because additional vessel calls resulting from the Proposed Project fall within the normal pre-COVID-19 operational baseline for Port activities and also because of the following: 1) U.S. Coast Guard Navigation Rules and Regulations require vessel pilots to proceed at safe speeds to limit collisions (USCG 2014); 2) vessel strikes are relatively rare, low-frequency events in the offshore marine environments of western Washington (Rockwood et al. 2018); and 3) the vessel action area includes only a small portion of the ESA-listed species' total available habitat.

Vessel sound may be audible to whales, but any disturbance from the sound of passing oceangoing vessels is expected to be short-term, transitory, and insignificant. Therefore, acoustic effects of the proposed action will have no effect on marine mammals and marine mammal critical habitat.

Figure 8
Vessel Action Area

5.8 Beneficial Effects

The Proposed Project includes the removal of creosote-treated wood and installation of stormwater treatment systems that will benefit habitat and wildlife species in Project Area. Stormwater and water quality improvements are described in Section 2.6.

Creosote is a brownish black/yellowish dark green oily product that is distilled from crude coal tars and consists of hundreds or thousands of chemical compounds (WHO 2004). There is a potential for toxic and carcinogenic compounds to leach from creosote-treated wood into aquatic habitat as some chemical compounds in creosote are highly water soluble (WHO 2004).

Portions of the existing fender system will be removed along the entire 1,400-foot length of T4. Vertical elements of the fender system, consisting of treated timber and composite plastic fender piles, will be removed at locations where new fender panels will be installed. Horizontal treated timber elements of the existing fender system (continuous timber swales and chocks between fender piles) and rubber fender elements will be modified and removed in some locations. In addition, treated timber ties that are included in the existing T4 dock surface will be removed.

The removal of creosote-treated wood and improvements to stormwater management in the Project Area will reduce the availability of toxic constituents to aquatic habitats and result in beneficial effects to aquatic species.

In addition, work associated with the new rail upgrades and site improvements (Section 2.4.1) includes a new rail bridge at Fry Creek will replace an existing culvert that will result in improved fish passage.

6 Preliminary Species Effects Analysis and Determinations

6.1 Regulatory Basis for ESA Effects Determinations

Table 8 summarizes the results of the effects analyses conducted for the proposed action. Rationale for the effect determinations for species and critical habitat listed in Table 8 are detailed in the following sections.

Table 8
Summary of Effect Determinations for ESA-Listed Species and Critical Habitats

Species	ESU/DPS	Effect Determination	
		Species	Critical Habitat
North American green sturgeon (*Acipenser medirostris*)	Southern DPS	LTAA	LTAA
Bull trout *(Salvelinus confluentus)*	Coastal-Puget Sound DPS	NLAA	LTAA
Chinook salmon *(Oncorhynchus tshawytscha)*	LCR ESU	NLAA	NE
	UPR ESU		
Chum salmon (*Oncorhynchus keta*)	CR ESU	NLAA	NE
Pacific eulachon *(Thaleichthys pacificus)*	Southern DPS	NLAA	NE
Killer whale (*Orcinus orca)*	Southern Resident DPS	NLAA	NE
Marbled murrelet *(Brachyrhampus marmoratus)*	NA	LTAA	NE
Streaked horned lark (*Eremophila alpestrisstrigata)*	NA	NLAA	NE
Western snowy plover *(Charadrius alexandrinus nivosus)*	Pacific Coast DPS	NLAA	NE

6.2 Green Sturgeon

6.2.1 Species Effects Analysis and Determination

Based on the above analysis, the effect determination is that the Proposed Project **may affect and is likely to adversely affect** green sturgeon.

The Proposed Project **may affect and is likely to adversely affect** green sturgeon because of the following:

- Green sturgeon could be present and affected by elevated underwater sound pressure levels during in-water pile removal and installation.
- Green sturgeon could be affected by elevated turbidity caused by pile removal and installation.
- Green sturgeon could be exposed to elevated contamination levels during pile removal.
- Green sturgeon could be exposed to elevated contamination levels due to stormwater runoff.

The potential for impacts to green surgeon is reduced because of the following:

- In-water construction activities will occur within approved in-water work windows.
- Green sturgeon are not expected to remain stationary in areas where sound thresholds exceed levels that could cause physical injury.
- Conservation measures will be employed, as described in Section 2.8, to minimize potential impacts to listed anadromous fish species.
- The Proposed Project will result in long-term nearshore estuarine aquatic habitat restoration benefits such as the improvements to stormwater treatment at T4.
- The Proposed Project will result in a significant reduction in the number of creosote-treated piles in Grays Harbor and corresponding improvements in water quality.

6.2.2 Critical Habitat Effects Analysis and Determination

Critical habitat is designated based on the life history and habitat requirements of green sturgeon. PCEs essential to the conservation of the species have been identified in estuarine habitats. In the action area, estuarine habitats are present; thus, five of green sturgeon PCEs of their critical habitat may be affected but are unlikely to be adversely affected by the proposed action. Table 9 summarizes the PCEs applicable to the Proposed Project and the potential Project effects on green sturgeon PCEs.

Table 9
Potential Project Effect on Green Sturgeon PCEs

Green Sturgeon PCEs Present	Effect from Proposed Action
PCE 1: *Food resources*. Abundant prey items within estuarine habitats and substrates for juvenile, subadult, and adult life stages.	Increased turbidity and resuspension of contaminants will occur during in-water bottom-disturbing activities. These conditions are expected to be localized near the activity, short in duration, and mitigated by conservation measures, but potential short-term and temporary adverse effects during Project construction cannot be entirely discounted. Long-term improvements to water quality and the reduction of pollutants associated with creosote-treated timber piles will benefit green sturgeon prey species.

Green Sturgeon PCEs Present	Effect from Proposed Action
PCE 3: *Water quality*. Water quality, including temperature, salinity, oxygen content, and other chemical characteristics necessary for normal behavior, growth, and viability of all life stages.	Increased turbidity and resuspension of contaminants will occur during in-water bottom-disturbing activities. These conditions are expected to be localized near the activity, short in duration, and mitigated by conservation measures, but potential short-term and temporary adverse effects during Project construction cannot be entirely discounted.
PCE 4: *Migratory corridor*. A migratory pathway necessary for the safe and timely passage of Southern DPS fish within estuarine habitats and between estuarine and riverine or marine habitats.	The Proposed Project does not propose any long-term changes that would affect necessary migratory pathways. Underwater noise will be limited to the in-water work window and conservation measures will be employed, but potential short-term and temporary adverse effects during Project construction cannot be entirely discounted.
PCE 5: *Depth*. A diversity of depths necessary for shelter, foraging, and migration of juvenile, subadult, and adult life stages.	The Proposed Project does not propose any long-term changes that would affect the diversity of depths within Grays Harbor.
PCE 6: *Sediment quality*. Sediment quality (i.e., chemical characteristics) necessary for normal behavior, growth, and viability of all life stages.	Removal of creosote-treated timber piles will improve long-term sediment quality. The proposed stormwater improvements will provide an improvement to existing conditions, but potential short-term and temporary adverse effects during Project construction cannot be entirely discounted

No significant long-term negative habitat effects to the above-mentioned PCEs will result from the Proposed Project, and construction of the Proposed Project will improve overall estuarine habitat at the site, compared to existing conditions.

Based on the above analysis, the effect determination is that the Proposed Project **may affect and is likely to adversely affect** green sturgeon designated critical habitat because of the following:

- Increased turbidity at the Project Area during pile removal and installation will be short-term, localized, and mitigated by conservation measures but cannot be entirely discounted as an adverse effect.
- Removal of creosote-treated timber piles will improve water and sediment quality, but potential short-term and temporary effects to water and sediment quality during Project construction cannot be entirely discounted as an adverse effect.

The potential for impacts to green sturgeon critical habitat is reduced because of the following:

- The Proposed Project will result in long-term nearshore estuarine aquatic sediment and water quality benefits provided by the improvements to stormwater treatment at T4.
- The Proposed Project will result in a reduction in the number of creosote-treated piles in Grays Harbor.

6.3 Bull Trout

6.3.1 Species Effects Analysis and Determination

USFWS provides a calculator to determine the extent of underwater noise that exceeds thresholds for the onset of injury. Using this calculator for the loudest underwater sound-producing activity of impact pile driving 36-inch steel piles produced distances to these thresholds at 341 meters for bull trout less than 2 grams and 209 meters for bull trout larger than 2 grams (Table 10). The mainstem Chehalis River and Grays Harbor in the action area may be used occasionally for foraging, overwintering, and migrating. However, no spawning habitat is present in the action area, and therefore bull trout less than 2 grams in size will not be present during the in-water work window. Any bull trout that may be present would be adults or subadults that are less susceptible to injury from pile driving noise and would likely avoid the area. As described for other salmonid species, these individuals are not expected to remain stationary in the action area for any length of time and are not expected to remain within the 209-meter threshold area where injury may result. Although the potential for adverse effects cannot be completely discounted if an individual lingers in the zone of injury, because the life histories that occur in the action area are mobile and migratory, the effects to bull trout from underwater noise from pile driving will likely be limited to behavioral and avoidance responses.

Table 10
Distances to Impact Thresholds for Bull Trout from Impact Installation of 36-Inch Steel Piles Using a Bubble Curtain from the USFWS Calculator

Distance (meters) to Bull Trout thresholds (SEL)	
Fish ≤2g	Fish >2g
183 dB	187 dB
341 meters	209 meters

Based on the above analysis, the effect determination is that the Proposed Project **may affect but is not likely to adversely affect** bull trout.

The Proposed Project **may affect but is not likely to adversely affect** bull trout because of the following:

- Bull trout are unlikely to be present and affected by elevated underwater sound pressure levels during in-water pile removal and installation.
- Bull trout are unlikely to be affected by elevated turbidity caused by pile removal and installation.
- Bull trout are unlikely to be exposed to elevated contamination levels during pile removal.

- Bull trout are unlikely to be exposed to elevated contamination levels due to stormwater runoff.

The potential for impacts to bull trout is reduced because of the following:

- In-water construction activities will occur within approved in-water work windows.
- Construction of the Proposed Project will not occur when juvenile and adult salmonid species are typically present in nearshore areas.
- Bull trout are not expected to remain stationary in areas where sound thresholds exceed levels that could cause physical injury.
- Conservation measures will be employed, as described in Section 2.8, to minimize potential impacts to listed salmonids.
- The Proposed Project will result in long-term nearshore estuarine aquatic water quality benefits such as the improvements to stormwater treatment at T4.
- The Proposed Project will result in a reduction in the number of creosote-treated piles in Grays Harbor.

6.3.2 Critical Habitat Effects Determination

Critical habitat is designated based on the life history and habitat requirements of bull trout. PCEs essential to the conservation of the species have been identified in both freshwater and marine habitats. In the action area, estuarine habitats are present; thus, six of the PCEs of their critical habitat could be affected by the proposed action. Table 11 summarizes the PCEs applicable to the Proposed Project and the potential Project effects on bull trout PCEs.

Table 11
Potential Project Effect on Bull Trout PCEs

Bull Trout PCEs Present	Effect from Proposed Action
PCE 2: Migration habitats with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and freshwater and marine foraging habitats, including but not limited to permanent, partial, intermittent, or seasonal barriers.	Increased turbidity and resuspension of contaminants will occur during in-water bottom-disturbing activities. These conditions are expected to be localized near the activity, short in duration, and mitigated by conservation measures, but potential short-term and temporary adverse effects during Project construction cannot be entirely discounted.
PCE 3: An abundant food base, including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.	Long-term improvements to water quality and the reduction of pollutants associated with creosote-treated timber piles will benefit bull trout forage fish species, but potential short-term and temporary adverse effects during Project construction cannot be entirely discounted.
PCE 4: Complex river, stream, lake, reservoir, and marine shoreline aquatic environments and	The Proposed Project does not propose any long-term changes that would affect environmental complexity.

Bull Trout PCEs Present	Effect from Proposed Action
processes that establish and maintain these aquatic environments, with features such as large wood, side channels, pools, undercut banks, and unembedded substrates to provide a variety of depths, gradients, velocities, and structure.	
PCE 7: A natural hydrograph, including peak, high, low, and base flows within historical and seasonal ranges or, if flows are controlled, minimal flow departure from a natural hydrograph.	The Proposed Project does not propose any long-term changes that would affect a natural hydrograph in Grays Harbor.
PCE 8: Sufficient water quality and quantity such that normal reproduction, growth, and survival are not inhibited.	Removal of creosote-treated timber piles will improve long-term water quality. The proposed stormwater improvements will provide an improvement to existing conditions, but potential short-term and temporary adverse effects during Project construction cannot be entirely discounted.
PCE 9: Sufficiently low levels of occurrence of non-native predatory (e.g., lake trout, walleye, northern pike, smallmouth bass), interbreeding (e.g., brook trout), or competing (e.g., brown trout) species that, if present, are adequately temporally and spatially isolated from bull trout.	The Proposed Project does not propose any long-term changes that would affect the occurrence of non-native predatory or competing species within Grays Harbor.

No significant long-term negative habitat effects to the above-mentioned PCEs will result from the Proposed Project, and construction of the Proposed Project will improve overall estuarine habitat at the site, compared to existing conditions. However, some potential short-term and temporary Project construction activities cannot be entirely discounted as adverse effects.

Based on the above analysis, the effect determination is that the Proposed Project **may affect and is likely to adversely affect** bull trout designated critical habitat because of the following:

- Increased turbidity at the Project Area during pile removal and installation will be short-term, localized, and mitigated by conservation measures but cannot be entirely discounted as an adverse effect.
- Removal of creosote-treated timber piles will improve water and sediment quality, but potential short-term and temporary effects to water and sediment quality during Project construction cannot be entirely discounted as an adverse effect.

The potential for impacts to bull trout critical habitat is reduced because of the following:

- The Proposed Project will result in long-term nearshore estuarine aquatic sediment and water quality benefits provided by the improvements to stormwater treatment at T4.
- The Proposed Project will result in a reduction in the number of creosote-treated piles in Grays Harbor.

6.4 Chinook Salmon

As described in Section 5.4, underwater noise from percussive pile driving can injure or even kill fish. Pile installation for the proposed action would generate underwater noise that exceeds the threshold limits set by NMFS where sound impulses can induce injury. As discussed in Section 3.3.3, the action area may provide seasonal rearing habitat for LCR Chinook salmon and UWR spring-run Chinook salmon. Spawning habitat is not present in or near the action area and any juveniles that migrate from the Columbia River to Grays Harbor are assumed to be larger than the 2-gram size category used for noise impact thresholds. Rearing juvenile salmon from these populations are more susceptible to elevated levels of underwater noise as they tend to remain longer in the area affected by cumulative pile driving noise. If juveniles remain in the Project vicinity for the duration of the workday, they would be exposed to cumulative levels exceeding the harm thresholds if they are within 450 meters of the driven piles. Habitat in the affected area, however, is relatively degraded and provides low-quality rearing value for these populations.

As discussed in Section 3.3.3, ESA-listed Columbia River Chinook salmon were found in the South Bay and the Central Estuary but were not found in the Inner Bay (Sandell et al. 2014) or in the underwater noise portion of the action area. The large-scale winds in this region are predominantly southward and favor upwelling events during the summer and during breaks of fair weather at other times of year, and northward favoring downwelling events during the winter and foul-weather events (Hickey and Banas 2003). Because the timing of ESA-listed LCR and UWR Chinook salmon smolts ocean entry is concentrated during the spring and summer and co-occurs with weather conditions that favor upwelling events, it is unlikely that LCR Chinook salmon smolt or UWR spring-run Chinook salmon smolt will be present in the action area during the in-water work window. The potential for some ESA-listed Chinook salmon individuals to occur in the action area during the in-water work window from July 16 to February 15 cannot be completely discounted, but Chinook salmon densities during this time period are relatively low, and the proportion of ESA-listed individuals is even lower (Sandell et al. 2014).

Individual Chinook salmon within the area of harm or the wider area where behavioral responses can occur during pile driving activities would be displaced from the area or may be harmed or killed from trauma induced by the sound impulses. Noise from vibratory installation of piles can also produce behavioral responses in any individuals that may be present in the action area including interfering with foraging behavior or predator avoidance behavior.

6.4.1 Species Effects Analysis and Determination

Based on the above analysis, the effect determination is that the Proposed Project **may affect but is not likely to adversely affect** LCR and UWR Chinook salmon.

The Proposed Project **may affect but is not likely to adversely affect** LCR and UWR Chinook salmon because of the following:

- LCR and UWR Chinook salmon have been documented to occur in outer Grays Harbor but not in the action area and are unlikely to be present and affected by elevated underwater SPLs during in-water pile removal and installation.
- LCR and UWR Chinook salmon are unlikely to be present and affected by elevated turbidity caused by pile removal and placement of substrate.
- LCR and UWR Chinook salmon are unlikely to be present and exposed to temporarily elevated contamination levels during pile removal.

The potential for impacts to LCR and UWR Chinook salmon is reduced because of the following:

- Juveniles less than 2 grams would not be in Grays Harbor.
- Adult LCR and UWR Chinook salmon are very unlikely to venture into the action area because there isn't good habitat for foraging or rearing and they would not be migrating through.
- In-water construction activities will occur within approved in-water work windows.
- Construction of the Proposed Project will not occur when juvenile and adult salmonid species are typically present in nearshore areas.
- Conservation measures will be employed, as described in Section 2.8, to minimize potential impacts to listed salmonids.
- The Proposed Project will result in long-term nearshore estuarine aquatic habitat restoration benefits such as the improvements to stormwater treatment at T4.
- The Proposed Project will result in a reduction in the number of creosote-treated piles in Grays Harbor and corresponding improvements in water quality.

6.4.2 Critical Habitat Effects Analysis and Determination

The designation of critical habitat is based on the life history and habitat needs of LCR and UWR Chinook salmon and includes six PCEs necessary for their conservation in freshwater, estuarine, and nearshore marine habitats. In the action area PCEs 4, 5, and 6 are present. Table 12 summarizes the PCEs applicable to the Proposed Project and the potential Project effects on Chinook salmon PCEs.

Table 12
Potential Project Effect on Chinook Salmon PCEs

Chinook Salmon PCEs Present	Effect from Proposed Action
PCE 4: Estuarine areas free of obstruction with the following: • Water quality, water quantity, and salinity conditions supporting juvenile and adult physiological transitions between fresh- and saltwater	Increased turbidity and resuspension of contaminants will occur during in-water sediment-disturbing activities, but these conditions are expected to be short-term and localized near the activity. Removal of creosote-treated timber piles will improve sediment and water quality.

Chinook Salmon PCEs Present	Effect from Proposed Action
• Natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels • Juvenile and adult forage, including aquatic invertebrates and fishes, supporting growth and maturation	
PCE 5: Nearshore marine areas free of obstruction and excessive predation with the following: • Water quality and quantity conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation • Natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels	Increased turbidity and resuspension of contaminants will occur during in-water sediment-disturbing activities, but these conditions are expected to be short-term and localized near the activity. Removal of creosote-treated timber piles will improve sediment and water quality.
PCE 6: Offshore marine areas with the following: • Water quality conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation	Increased turbidity and resuspension of contaminants will occur during in-water sediment-disturbing activities, but these conditions are expected to be short-term and localized near the activity. Removal of creosote-treated timber piles will improve sediment and water quality.

No significant long-term negative habitat effects to the above-mentioned PCEs will result from the Proposed Project, and construction of the Proposed Project will improve overall estuarine habitat in the Project Area, compared to existing conditions.

The Proposed Project will have **no effect** LCR and UWR Chinook salmon designated critical habitat because of the following:

- Neither the action area or Grays Harbor is mapped as designated critical habitat for LCR or UWR River Chinook salmon.

6.5 Columbia River Chum Salmon

As described in Section 5.4, underwater noise from percussive pile driving can injure or even kill fish. Pile installation for the proposed action would generate underwater noise that exceeds the threshold limits set by NMFS where sound impulses can induce injury. As discussed in Section 3.4.3, the action area may provide seasonal rearing habitat for CR chum salmon. Spawning habitat is not present in or near the action area and any juveniles that migrate from the Columbia River to Grays Harbor are assumed to be larger than the 2-gram size category used for noise impact thresholds. Rearing juvenile salmon from these populations are more susceptible to elevated levels of underwater noise as they tend to remain longer in the area affected by cumulative pile driving noise. If juveniles remain in the Project vicinity for the duration of the workday, they would be exposed to cumulative levels exceeding the harm thresholds if they are within 450 meters of the driven piles. Habitat in the

affected area, however, is relatively degraded and provides low-quality rearing value for these populations.

As discussed in Section 3.4.3, ESA-listed CR chum salmon were found in the South Bay and the Central Estuary but were not found in the Inner Bay (Sandell et al. 2014) or in the underwater noise portion of the action area. The large-scale winds in this region are predominantly southward and favor upwelling events during the summer and during breaks of fair weather at other times of year, and northward favoring downwelling events during the winter and foul-weather events (Hickey and Banas 2003). Because the timing of ESA-listed CR chum salmon smolts ocean entry is concentrated during the spring and co-occurs with weather conditions that favor upwelling events, it is unlikely that CR chum salmon smolt will be present in the action area during the in-water work window. The potential for some ESA-listed CR chum salmon individuals to occur in the action area during the in-water work window from July 16 to February 15 cannot be completely discounted, but chum salmon densities during this time period are relatively low, and the proportion of ESA-listed individuals even lower (Sandell et al. 2014).

Individual chum salmon within the area of harm or the wider area where behavioral responses can occur during pile driving activities would be displaced from the area or may be harmed or killed from trauma induced by the sound impulses. Noise from vibratory installation of piles can also produce behavioral responses in any individuals that may be present in the action area including interfering with foraging behavior or predator avoidance behavior.

6.5.1 Species Effects Analysis and Determination

Based on the above analysis, the effect determination is that the Proposed Project **may affect but is not likely to adversely affect** CR chum salmon.

The Proposed Project **may affect but is not likely to adversely affect** CR chum salmon because of the following:

- CR chum salmon have been documented to occur in Grays Harbor and are unlikely to be present and affected by elevated underwater SPLs during in-water pile removal and installation.
- Chum salmon are unlikely to be present and affected by elevated turbidity caused by pile removal and placement of substrate.
- Chum salmon are unlikely to be present and exposed to temporarily elevated contamination levels during pile removal.

The potential for impacts to CR chum salmon is reduced because of the following:

- In-water construction activities will occur within approved in-water work windows.

- Construction of the Proposed Project will not occur when juvenile and adult salmonid species are typically present in nearshore areas.
- Conservation measures will be employed, as described in Section 2.8, to minimize potential impacts to listed salmonids.
- The Proposed Project will result in long-term nearshore estuarine aquatic habitat restoration benefits such as the improvements to stormwater treatment at T4.
- The Proposed Project will result in a reduction in the number of creosote-treated piles in Grays Harbor and corresponding improvements in water quality.

6.5.2 Critical Habitat Effects Analysis and Determination

The designation of critical habitat is based on the life history and habitat needs of CR chum salmon and includes six PCEs necessary for their conservation in freshwater, estuarine, and nearshore marine habitats. In the action area PCEs 4, 5 and 6 are present. Table 13 summarizes the PCEs applicable to the Proposed Project and the potential Project effects on Chinook salmon PCEs.

Table 13
Potential Project Effect on Columbia River Chum Salmon PCEs

Chum Salmon PCEs Present	Effect from Proposed Action
PCE 4: Estuarine areas free of obstruction with the following: • Water quality, water quantity, and salinity conditions supporting juvenile and adult physiological transitions between fresh- and saltwater • Natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels • Juvenile and adult forage, including aquatic invertebrates and fishes, supporting growth and maturation	Increased turbidity and resuspension of contaminants will occur during in-water sediment-disturbing activities, but these conditions are expected to be short-term and localized near the activity. Removal of creosote-treated timber piles will improve sediment and water quality.
PCE 5: Nearshore marine areas free of obstruction and excessive predation with the following: • Water quality and quantity conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation • Natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels	Increased turbidity and resuspension of contaminants will occur during in-water sediment-disturbing activities, but these conditions are expected to be short-term and localized near the activity. Removal of creosote-treated timber piles will improve sediment and water quality.

Chum Salmon PCEs Present	Effect from Proposed Action
PCE 6: Offshore marine areas with the following: • Water quality conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation	Increased turbidity and resuspension of contaminants will occur during in-water sediment-disturbing activities, but these conditions are expected to be short-term and localized near the activity. Removal of creosote-treated timber piles will improve sediment and water quality.

No significant long-term negative habitat effects to the above-mentioned PCEs will result from the Proposed Project, and construction of the Proposed Project will improve overall estuarine habitat in the Project Area, compared to existing conditions.

The Proposed Project will have **no effect** on CR chum salmon designated critical habitat because of the following:

- Neither the action area nor Grays Harbor is mapped as designated critical habitat for CR chum salmon.

6.6 Pacific Eulachon

While the Southern DPS of Pacific eulachon occurs primarily in the lower portion of the Columbia River and its tributaries such as the Cowlitz River, there is some evidence that Pacific eulachon use the estuarine waters of Grays Harbor. Descriptions of their abundance in the action area are inconsistent, with some older reports calling them "common" (Monaco et al. 1990) and more recent publications do not mention their presence at all (Sandell et al. 2014).

6.6.1 Species Effects Analysis and Determination

Based on the above analysis, the effect determination is that the Proposed Project **may affect but is not likely to adversely affect** Pacific eulachon for the following reasons:

- Pacific eulachon have been documented to occur in Grays Harbor and are unlikely to be present and affected by elevated underwater SPLs during in-water pile removal and installation.
- Pacific eulachon are unlikely to be present and affected by elevated turbidity caused by pile removal and placement of substrate.
- Pacific eulachon are unlikely to be present and exposed to temporarily elevated contamination levels during pile removal.

The potential for impacts to Pacific eulachon is reduced because of the following:

- In-water construction activities will occur within approved in-water work windows.

- Construction of the Proposed Project will not occur when juvenile and adult Pacific eulachon are typically present in nearshore areas.
- Conservation measures will be employed, as described in Section 2.8, to minimize potential impacts to Pacific eulachon.
- The Proposed Project will result in long-term nearshore estuarine aquatic habitat restoration benefits such as the improvements to stormwater treatment at T4.
- The Proposed Project will result in a reduction in the number of creosote-treated piles in Grays Harbor and corresponding improvements in water quality.

6.6.2 Critical Habitat Effects Analysis and Determination

The Proposed Project will have **no effect** on Pacific eulachon designated critical habitat because neither the action area nor Grays Harbor is mapped as designated critical habitat for Pacific eulachon.

6.7 Southern Resident Killer Whale

Based on the analysis in Section 4, the effect determination is that the Proposed Project **may affect but is not likely to adversely affect** Southern Resident killer whale.

The Proposed Project **may affect but is not likely to adversely affect** Southern Resident killer whales because of the following:

- There is no evidence of Southern Resident killer whale occurrence within Grays Harbor.
- Construction activities have negligible potential to affect ESA-listed Chinook salmon, an important prey source.

The potential for impacts to Southern Resident killer whales is reduced because of the following:

- The Proposed Project will result in long-term marine aquatic habitat restoration benefits that will improve Chinook salmon habitat, a prey resource for Southern Resident killer whales.
- Construction of the Proposed Project will not occur when juvenile and adult Chinook salmon are abundant in nearshore areas.
- BMPs will be employed, as described in Section 2.8, to minimize potential impacts to listed and non-listed salmonids.
- The Proposed Project will result in long-term nearshore estuarine aquatic habitat restoration benefits such as the improvements to stormwater treatment at T4.
- The Proposed Project will result in a reduction in the number of creosote-treated piles in Grays Harbor and corresponding improvements in water quality.

6.7.1 Critical Habitat Effects Determination

Critical habitat for Southern Resident killer whales is designated for areas containing the physical and biological habitat features, or PCEs, essential for the conservation of the species or that require special management considerations. PCEs include water quality, prey species, and passage conditions. Table 14 summarizes the PCEs applicable to the Proposed Project and the potential Project effects on killer whale PCEs.

Table 14
Potential Project Effect on Southern Resident Killer Whale PCEs

Killer Whale PCEs Present	Effect from Proposed Action
PCE 1: Water quality to support growth and development.	Short-term and localized turbidity and resuspension of contaminants will occur during in-water bottom-disturbing activities, but these conditions are expected to be localized near the activity, where killer whales are not expected to occur. If present, the duration of exposure to potentially resuspended chemicals will be short, and it is unlikely that resuspension would result in water column contaminant concentrations that would pose a risk to killer whales or their prey or would have long-term effects to water column critical habitat.
PCE 2: Prey species of sufficient quantity, quality, and availability to support individual growth, reproduction, and development, as well as overall population growth.	The Proposed Project may affect Chinook salmon, the killer whales' favored food source. However, the Proposed Project is not anticipated to have significant effects from turbidity or underwater sound to Chinook salmon because these fish are unlikely to be present in the action area during the work window when sediment disturbing activities and pile driving are proposed to occur.
PCE 3: Passage conditions to allow for migration, resting, and foraging.	If present, killer whale passage within critical habitat is unlikely to be affected because whales are not anticipated to occur in the vicinity of the Proposed Project where the most elevated sound levels are expected to occur.

No significant long-term negative habitat effects to the above-mentioned PCEs will result from the Proposed Project, and construction of the Proposed Project will improve overall marine habitat at the site, compared to existing conditions.

The Proposed Project will have **no effect** on Southern Resident killer whale designated critical habitat because neither the action area nor Grays Harbor is mapped as designated critical habitat for Southern Resident killer whale. Additionally, the Proposed Project will result in long-term Chinook salmon estuarine habitat enhancement benefits compared to existing conditions.

6.8 Marbled Murrelet

Although it is unlikely that foraging marbled murrelets would occur in the action area, they have been reported to forage in Grays Harbor. The area around the Port is noisy with ship and human activity and foraging near this part of inner Grays Harbor is unlikely, particularly during the in-water

construction window. However, if any individuals were foraging in the action area, they could be susceptible to harm from in-air and underwater noise. A calculator developed by the USFWS (USFWS 2020) was used to determine the geographic extent of Project-related pile driving in-air noise to established injury and barotrauma thresholds for murrelets. Using this calculator and considering the loudest underwater noise-producing activity for the proposed action (i.e., impact driving 36-inch steel pipe piles), the calculator indicates marbled murrelets foraging underwater in areas within 21 meters of the pile being driven could experience physical harm and within 8 meters could experience barotrauma (Table 15). It is highly unlikely that any marbled murrelet individuals would be foraging this close to active Project activities such as pile installation.

Table 15
Distances to Impact Thresholds for Marbled Murrelet from Impact Installation of 36-Inch Steel Piles Using a Bubble Curtain from the USFWS Calculator

Distance (meters) to Marbled Murrelet Thresholds			
Masking Zone	**Masking Zone**	**Auditory Injury (SEL)**	**Barotrauma (SEL)**
Piles <36-inch	Piles ≥36-inch	202	208
42	168	21	8

The USFWS calculator also estimates threshold distances for behavioral effects, specifically masking of marbled murrelet calls when they are on the water and engaged in foraging. A potential behavioral impact from elevated sound levels to foraging marbled murrelets is masking of their vocalizations (USFWS 2013b). Marbled murrelets typically forage in groups of at least two or more individuals and are highly vocal and use acoustic communication for their social foraging strategy. If sound levels limit vocalization recognition within 30 meters, then foraging efficiency is expected to be impaired (USFWS 2013b). The masking zone for driving 36-inch piles extends out to 168 meters and 42 meters for driving all other piles less than 36 inches in diameter (Table 15). These distances are in close proximity to the Port and construction activities surrounding the pile driving. This part of inner Grays Harbor has ship and barge traffic on the water as well as rail and heavy truck traffic near the shoreline and it is not expected that any marbled murrelets would forage in this area particularly while construction activities are occurring. The area along the shoreline of Grays Harbor between the Hoquiam River westward along Bowerman Field consists of wide, shallow intertidal mudflats. During low tides these areas are exposed and not suited to foraging by marbled murrelets throughout much of the tidal cycle. Consequently, the Proposed Project will not have behavioral or physical harm impacts to foraging marbled murrelets from elevated noise levels during pile driving and Project construction.

6.8.1 Species Effects Analysis and Determination

Based on the above analysis, the effect determination is that the Proposed Project **may affect and is likely to adversely affect** marbled murrelets.

The Proposed Project **may affect and is likely to adversely affect** marbled murrelets because of the following:

- The presence of marbled murrelets within the action area is expected to be low, but not entirely discountable, given the surrounding environment and land use.
- Sound levels at the Project Area will exceed disturbance and injury thresholds for marbled murrelets, and the birds may be present during construction activities.

The potential for impacts to marbled murrelet is reduced because of the following:

- Conservation measures such as marbled murrelet monitoring will be employed, as described in Section 2.8, to minimize potential impacts to listed species.
- It is unlikely a marbled murrelet would enter the injury zone during impact pile installation at the Project Area.
- There is a low likelihood that marbled murrelets will occur in the action area during pile driving or removal activities and can easily relocate farther from the work zone. Also, the action area contains low abundance of their prey species.

6.8.2 Critical Habitat Effects Analysis and Determination

The Proposed Project will have **no effect** on marbled murrelet critical habitat as it not designated within the action area.

6.9 Streaked Horned Lark

Streaked horned larks are not documented to occur within the in-air noise portion of the action area, and suitable nesting habitat is not present. Streaked horned lark occurrences during the breeding season have been reported in the past at the mouth of Grays Harbor on the southern end of the Point Brown peninsula (a portion of which is designated critical habitat for streaked horned lark) over 12 miles from the terminal (Anderson and Pearson 2015; WDFW 2022c). If any transient individuals are moving through the area, construction activities and in particular pile driving noise, may cause them to move away temporarily. However, considering the large areas of paved surface and the lack of suitable habitat at the Port, noise-related effects from pile driving and construction of the Proposed Project would be limited to occasional migrants and are not anticipated to result in nest abandonment or measurable changes to sensitive life histories and behaviors. Non-breeding larks within the action area may perceive elevated in-air noise and temporarily alert to the noise source. However, significant alterations in behavior or displacement from occupied nesting habitats are not expected.

6.9.1 Species and Critical Habitat Effects Analysis and Determination

The Proposed Project **may affect and is likely to adversely affect** streaked horned lark and have **no effect** on streaked horned lark critical habitat. On April 13, 2022, the Streaked Horned Lark Threatened Species Assessment (87 FR 21783) listed the Oyhut streaked horned lark population as extirpated.

The potential for impacts to streaked horned lark is reduced because of the following:

- Conservation measures will be employed, as described in Section 2.8, to minimize potential impacts to listed species.
- Because the local population at Oyhut Wildlife Recreation Area is thought to be extirpated, it is unlikely a streaked horned lark would enter the injury zone during impact pile installation at the Project Area.
- While critical habitat is designated at Oyhut Wildlife Recreation Area, it is outside of the action area.

6.10 Western Snowy Plover

Suitable nesting and foraging habitat for western snowy plover is not present within the in-air portion of the action area and will not be impacted by Project construction. Although western snowy plover are documented to occur in Grays Harbor County, suitable nesting habitats do not occur in the action area. Suitable nesting habitats occur outside of the action area along the Pacific coast and outer sand spits of Grays Harbor and include open, sandy areas; a lack of vegetation; and dune-backed beaches. These sandy habitats are not found along the shorelines in the vicinity of the Proposed Project or the action area as defined by in-air noise.

Considering the lack of suitable nesting or foraging habitat in the Project Area, nesting, foraging, or transiting individuals are not expected to occur within the in-air portion of the action area. The area surrounding the Proposed Project has regular human activity and noise from the existing dock facility, rail lines, as well as a wood processing facility. Noise and activity from these operations further detract from the use or transit of the action area by western snowy plover. Therefore, western snowy plover are not expected to occur in the areas impacted by construction noise and the potential for adverse effects from the proposed action is considered discountable.

6.10.1 Species Effects Analysis and Determination

Based on the above analysis, the effect determination is that the Proposed Project **may affect but is not likely to adversely affect** western snowy plover.

The Proposed Project **may affect but is not likely to adversely affect** western snowy plover because of the following:

- The presence of western snowy plover within the action area is expected to be low, given the surrounding environment and land use but cannot be discounted.
- While sound levels at the Project Area will exceed disturbance and injury thresholds for western snowy plover, the birds are unlikely to be present during construction activities.

The potential for impacts to western snowy plover is reduced because of the following:

- Conservation measures will be employed, as described in Section 2.8, to minimize potential impacts to listed species.
- It is unlikely a western snowy plover would enter the injury zone during impact pile installation at the Project Area.
- There is a low likelihood that western snowy plover will occur in the action area during pile driving or removal activities and can easily relocate farther from the work zone. Also, the action area contains low abundance of their prey species.

6.10.2 Critical Habitat Effects Analysis and Determination

The Proposed Project will have **no effect** on western snowy plover critical habitat as it not designated within the action area.

7 Essential Fish Habitat Assessment

The objective of this EFH assessment is to determine whether the proposed action "may adversely affect" designated EFH for relevant commercially, federally managed fisheries species within the action area. This section provides a description and assessment of EFH in the Project Area; the potential impacts on these habitats; and describes conservation and mitigation measures proposed to avoid, minimize, or otherwise offset potential adverse effects to designated EFH resulting from the proposed action.

7.1 EFH Background

The 1996 Sustainable Fisheries Act (Public Law 104-297) amended the MSA requires federal agencies to consult with NOAA Fisheries on activities that may adversely affect EFH.

EFH is defined as "those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 *United States Code* 1802(10)). Waters include aquatic areas (marine waters, intertidal habitats, and freshwater streams) and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate. Substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities. Necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem. Spawning, breeding, feeding, or growth to maturity covers a species' full life cycle (50 CFR 600.10). The MSA promotes the protection of these habitats through assessment and mitigation of activities that may adversely affect these habitats.

The EFH mandate applies to all species managed under a Fishery Management Plan. In Washington, Oregon, and California, there are three Fishery Management Plans covering groundfish, coastal pelagic species, and Pacific salmon. Federal agencies must consider the impact of a proposed action on all three types of EFH.

The action area for the Proposed Project includes the EFH for Pacific salmon, coastal pelagic species, and Pacific coast groundfish species. In addition, EFH guidelines identify Habitat Areas of Particular Concern (HAPCs) as types or areas of habitat within EFH that are identified based on special characteristics. Two HAPCs for the Pacific Groundfish EFH have been identified in the Project action area: Estuaries and Seagrass, as well as the state-wide Area of Interest that includes all waters and sea bottoms within 3 nautical miles of the MHHW. These habitats may occur within the action area, which extends out to the mouth of Grays Harbor.

7.2 Potential Effects of the Proposed Project

The definition of Adverse Effect is "any impact that reduces quality and/or quantity of EFH, including direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey or reduction in species fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions" (50 CFR 600.810).

For the Proposed Project, the effects of the action have been discussed in the ESA effects analysis for green sturgeon, bull trout, Chinook salmon, and other species and their respective critical habitats, and collectively these would apply to EFH. The potential effects of the action include short-term potential increases in noise, turbidity, and disturbance during construction as well as long-term benefits from removal of creosote-treated timber and stormwater improvements. While the types of stormwater treatment systems that will be used for the Proposed Project have not yet been identified, stormwater systems will be designed in accordance with Ecology-specified requirements and parameters as discussed under Section 5.1 and will have a substantial improvement in water quality.

7.2.1 Pacific Salmon EFH

Pile driving activities will propagate sound that could affect Pacific salmon EFH by changing fish behavior and potentially affecting adult migration behavior. Pile driving activities will also disturb sediments and temporarily increase turbidity within proximity of the Project Area. While these activities are of short duration, they may have temporary effects to migratory behavior.

Long-term effects will be slightly beneficial to Pacific salmon EFH because stormwater facility improvements and creosote pile removal will reduce pollutant loads in Grays Harbor and improve the nearshore habitat and food webs.

Overall, there will be temporary and short-term adverse effects on Pacific salmon EFH during construction, but long-term benefits to Pacific salmon EFH after Project completion.

The Proposed Project **may adversely affect** Pacific salmon EFH in the short term.

7.2.2 Coastal Pelagic EFH

Pile driving activities will propagate sound that could affect coastal pelagic EFH by changing fish behavior and potentially affecting adult migration behavior. Pile driving activities will also disturb sediments and temporarily increase turbidity within proximity of the Project Area. While these activities are of short duration, they may have temporary effects to migratory behavior.

Long-term effects will be slightly beneficial to coastal pelagic EFH because creosote pile removal and stormwater facility improvements (as discussed under Section 5.1) will reduce pollutant loads in Grays Harbor and improve the nearshore habitat and food webs.

Overall, there will be temporary and short-term adverse effects on coastal pelagic EFH during construction, but long-term benefits to coastal pelagic EFH after Project completion.

The Proposed Project **may adversely affect** coastal pelagic EFH in the short term.

7.2.3 Pacific Coast Groundfish EFH

Pile driving activities will propagate sound that could affect Pacific coast groundfish EFH by changing fish behavior and potentially affecting adult migration behavior. Pile driving activities will also disturb sediments and temporarily increase turbidity within proximity of the Project Area. While these activities are of short duration, they may have temporary effects to migratory behavior.

Long-term effects will be slightly beneficial to Pacific coast groundfish EFH because creosote pile removal and stormwater facility improvements (as discussed under Section 5.1) will reduce pollutant loads in Grays Harbor and improve the nearshore habitat and food webs.

Overall, there will be temporary and short-term adverse effects on Pacific coast groundfish EFH during construction, but long-term benefits to Pacific coast groundfish EFH after Project completion.

The Proposed Project **may adversely affect** Pacific coast groundfish EFH in the short term.

7.3 Conservation Recommendations

The following sections provide Project-specific conservation recommendations that are necessary to avoid, minimize, mitigate, or otherwise offset the impact of the proposed action on EFH.

7.3.1 Pile Removal and Installation

To minimize the impacts of pile removal and installation, it is recommended that the following measures are implemented:

- Piles should be encircled with a silt curtain that extends from the surface of the water to the substrate, where appropriate and feasible.
- Piles should be driven during low tide periods when substrates are exposed in intertidal areas, where appropriate and feasible. This minimizes the direct impacts to fish from sound waves and minimizes the amount of sediment resuspended in the water column.
- Vibratory pile removal and installation should be used in place of impact driving as much as possible.

7.3.2 Over- and In-Water Structures

To avoid the impacts of over- and in-water structures, it is recommended that the following measures are implemented:

- Any cross or transverse bracing should be placed above the plane of MHHW, where appropriate and feasible, to avoid impacts to water flow and circulation.

To minimize the impacts of over- and in-water structures, it is recommended that the following measures are implemented:

- The footprint of the upgraded overwater structure should be restricted to the current footprint.
- The use of floats should be minimized to the extent practicable and should be restricted to terminal platforms placed in deep water, where appropriate and feasible, and when they will not be a navigation hazard.

7.3.3 Stormwater

To minimize the impacts of stormwater, it is recommended that the following measures are implemented:

- Construction of the Proposed Project will comply with water quality restrictions imposed by Ecology, which state that turbidity in marine waters exceeding state water quality standards will not extend beyond a 150-foot mixing zone radius during construction (Washington Administrative Code 173-201A-210(1)(e)(i)(D)).
- Direct and indirect stormwater impacts during construction will be mitigated through implementation of TESC BMPs required under the Ecology NPDES construction permitting process.
- The contractor will be responsible for the preparation of a SPCC plan to be used for the duration of the Proposed Project to safeguard against an unintentional release of fuel, lubricants, or hydraulic fluid from construction equipment. The contractor will be required to maintain oil-absorbent materials at the job site for use in the event of a spill or if any oil product is observed in the water. The plan shall be submitted to the project engineer prior to the commencement of any construction activities. A copy of the plan with any updates would be maintained at the work site by the contractor.
- The design of the proposed stormwater system and any additional outfalls should include BMPs and treatment strategies to minimize the discharge of stormwater pollutants such as metals and organic contaminants, such as PAHs, 6PPD, and 6PPD-quinone.

8 References

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

Adams, P.B., C. Grimes, J.E. Hightower, S.T. Lindley, M.L. Moser, and M.J. Parsley, 2007. "Population Status of North American Green Sturgeon, *Acipenser medirostris*." *Environmental Biology of Fishes* 79:339–356. DOI: 10.1007/s10641-006-9062-z.

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

Baird, R.W., 1994. *Foraging Behavior and Ecology of Transient Killer Whales*. PhD thesis. Burnaby, British Columbia, Canada. Simon Fraser University.

Baird, R.W., and M.B. Hanson, 2004. *A Progress Report on Diving Behavior of Southern Resident Killer Whales*. Contract report under Order No. AB133F-03-SE-1070. Available from M.B. Hanson, NWFSC, 2725 Montlake Blvd. East, Seattle, Washington 98112.

Baird, R.W., L.M. Dill, and M.B. Hanson, 1998. "Diving Behavior of Killer Whales." Abstract of a paper presented at the World Marine Mammal Conference (Monaco); January 1998.

Balcomb, K.C., J.R. Boran, R.W. Osborne, and N.J. Haenel, 1980. *Observations of Killer Whales (*Orcinus orca*) in Greater Puget Sound, State of Washington*. NTISPB80- 224728, U.S. Department of Commerce, Springfield, Virginia.

Banas, N.S., B.M. Hickey, P. MacCready, and J.A Newton, 2004. "Dynamics of Willapa Bay, Washington: A Highly Unsteady, Partially Mixed Estuary." *Journal of Physical Oceanography* 34:2413–2427. DOI: 10.1175/JPO2637.1.

Bateson, G., 1974. "Observations of a Cetacean Community." *Mind in the Waters*. Editor, J. McIntyre. New York: Charles Scribner's Sons, Sierra Club Books; pp. 146–165.

Bigg, M.A., G.M. Ellis, J.K.B. Ford, and K.C. Balcomb, 1987. *Killer Whales: A Study of Their Identification, Genealogy, and Natural History in British Columbia and Washington State*. Nanaimo, British Columbia, Canada: Phantom Press.

Caltrans (California Department of Transportation), 2020. *Technical Guidance for the Assessment of Hydroacoustic Effects of Pile Driving – 2020 Update*. Accessed December 28, 2022. Available at: https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/hydroacoustic-manual-a11y.pdf.

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.

Center for Biological Diversity, 2001. *Petition to List the Southern Resident Killer Whale (Orcinus orca) as an Endangered Species Under the Endangered Species Act*. Center for Biological Diversity, Berkeley, California.

City of Aberdeen, 2015. "Zoning Map." Accessed December 2022. Available at: https://www.aberdeenwa.gov/DocumentCenter/View/159/Zone-Map-PDF.

City of Hoquiam, 2010. "City of Hoquiam Zoning Map." Accessed November 7, 2022. Available at: https://cityofhoquiam.com/wp-content/uploads/2022/10/HoquiamZoning_2010.pdf.

Cooper, B.A, M.G. Raphael, and M.Z. Peery, 2006. "Trends in Radar-Based Counts of Marbled Murrelets on The Olympic Peninsula, Washington, 1996–2004." *The Condor* 108:936–947.

Ecology (Washington Department of Ecology), 1989. *Survey of Chemical Contaminants in the Bottom Sediments of Grays Harbor Estuary*. Water Body No.: WA-22-4010-; WA-22-0030; WA-22-0020, Segment No.: 10-22-03; 10-22-04. December 1989. Available at: https://apps.ecology.wa.gov/publications/documents/89e28.pdf.

Ecology, 2019. *2019 Stormwater Management Manual for Western Washington*. Publication No. 19 10-021. July 2019.

Ecology, 2022a. "Water Quality Atlas." Web-based map application. Accessed November 16, 2022. Available at: https://apps.ecology.wa.gov/waterqualityatlas/wqa/map.

Ecology, 2022b. *6PPD in Road Runoff, Assessment and Mitigation Strategies*. Publication No. 22-03020.

Ecology and City of Hoquiam, 2016. *Westway Final Environmental Impact Statement*. September 30, 2016.

FHWA (Federal Highway Administration), 2022. "National Highway Freight Network." U.S. Department of Transportation Federal Highway Administration Freight Management and Operations. Accessed September 27, 2022. Available at: https://ops.fhwa.dot.gov/Freight/infrastructure/nfn/index.htm.

Ford, J.K.B., and G.M. Ellis, 2006. "Selective Foraging by Fish-Eating Killer Whales *Orcinus orca* in British Columbia." *Marine Ecology Progress Series* 316:185–199.

Ford, J.K.B., G.M. Ellis, L.G. Barrett-Lennard, A.B. Morton, R.S. Palm, and K.C. Balcomb, 1998. "Dietary Specialization in Two Sympatric Populations of Killer Whales (*Orcinus orca*) in Coastal British Columbia and Adjacent Waters." *Canadian Journal of Zoology* 77:2000.

Hamer, T.E., and S.K. Nelson, 1995. "Nesting Chronology of the Marbled Murrelet." *Ecology and Conservation of the Marbled Murrelet, General Technical Report PSW-GTR-152*. Albany, California: U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station; pp. 49–56.

Hanson, M.B., R.W. Baird, J.K.B. Ford, J. Hempelmann-Halos, D.M. Van Doornik, J.R. Candy, C.K. Emmons, G.S. Schorr, B. Gisborne, K.L. Ayres, S.K. Wasser, K.C. Balcomb, K. Balcomb-Bartok, J.G. Sneva, and M.J. Ford, 2010. "Species and Stock Identification of Prey Consumed by Endangered Southern Resident Killer Whales in Their Summer Range." *Endangered Species Research* 11:69–82. March 10, 2010.

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

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.

Hayes, M.C., S.P. Rubin, R.R. Reisenbichler, F.A. Goetz, E. Jeanes, and A. McBride, 2011. "Marine Habitat Use by Anadromous Bull Trout from the Skagit River, Washington." *Marine and Coastal Fisheries: Dynamics, Management, and Ecosystem Science* 3:394–410. DOI: 10.1080/19425120.2011.640893.

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

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

Herman, L.M., 1991. "What the Dolphin Knows, or Might Know, in its Natural World." *Dolphin Societies: Discoveries and Puzzles*. Editors, K.W. Pryor and L.S. Norris. Berkeley, California: University of California Press; pp. 349–363.

Hickey, B.M., and N.S Banas, 2003. "Oceanography of the U.S. Pacific Northwest Coastal Ocean and Estuaries with Application to Coastal Ecology." *Estuaries* 26:1010–1031. DOI: 10.1007/BF02803360.

Hillson, T., K. Bentley, D. Rawding, and J. Grobelny, 2017. *Lower Columbia River Juvenile Chum Salmon Monitoring: Abundance Estimates for Chum, Chinook, Coho, and Steelhead.* FPT 17-02. Washington Department of Fish and Wildlife, Olympia, Washington.

Laughlin, J. 2005. *Underwater Sound Levels Associated with Pile Driving at the Bainbridge Island Ferry Terminal Preservation Project*.

Lindley, S.T., M.L. Moser, D.L. Erickson, M. Belchik, D.W. Welch, E.L. Rechisky, J.T. Kelly, J. Heublein, and A.P. Klimley, 2008. "Marine Migration of North American Green Sturgeon." *Transactions of the American Fisheries Society* 137:182–194. DOI: 10.1577/T07-055.1.

Luczkovich, J.J., and M.A. Keusenkothen, 2008. "Can Longspine Squirrelfish Hear Bottlenose Dolphin?" *Bioacoustics* 17:75–77.

McAllister, K.R., and W.P. Leonard, 1997. *Washington State Status Report for the Oregon Spotted Frog.* Washington Department of Fish and Wildlife. Olympia, Washington.

MFA (Maui Foster & Alongi, Inc.), 2021. *East Terminal 4 Cargo Yard Expansion Plan 2021 Feasibility Study Findings*. Prepared for Port of Grays Harbor. July 26, 2021.

Milliman, J.D., 1963. *Recent Marine Sediments in Grays Harbor, Washington*. University of Washington. Available at: https://pubs.usgs.gov/ds/2006/182/source_metadata/Milliman_MS_1963/Milliman_MS_1963.html.

Moffatt & Nichol (Moffatt & Nichol Engineers), 2022. *Port of Grays Harbor Terminal 4 HTL and OHWM Determination.* Job No. :221760. Dated November 3, 2022.

Monaco, M.E., R.L. Emmett, D.M. Nelson, and S.A. Hinton, 1990. *Distribution and Abundance of Fishes and Invertebrates in West Coast Estuaries, Vol. I: Data Summaries.* ELMR Rep. No. 4. NOAA/NOS Strategic Environmental Assessments Division. Silver Spring, Maryland.

Moser, M.L., and S.T Lindley, 2007. "Use of Washington Estuaries by Subadult and Adult Green Sturgeon." *Environmental Biology of Fishes* 79:243–253. DOI: 10.1007/s10641-006-9028-1.

Naval Facilities Engineering Systems Command Southwest, 2022. *Acoustic and Marine Protected Species Interim Monitoring Report for the Navy's Pier 6 Replacement Project at Naval Base San Diego, California*. July 2022.

Navy (U.S. Navy), 2015. "Proxy Source Sound Levels and Potential Bubble Curtain Attenuation for Acoustic Modeling of Nearshore Marine Pile Driving at Navy Installations in Puget Sound." Prepared by Michael Slater, Naval Surface Warfare Center, Carderock Division, and Sharon Rainsberry, Naval Facilities Engineering Command Northwest. Revised January 2015.

NMFS (National Marine Fisheries Service), 2007. *Status Review of Puget Sound Steelhead*. NOAA Technical Memorandum NMFS-NWFSC-81. June 2007.

NMFS, 2008. *Recovery Plan for Southern Resident Killer Whales (*Orcinus orca*)*. National Marine Fisheries Service, Northwest Region, Seattle, Washington. January 2008.

NMFS, 2009. NMFS Pile Driving Calculator. Last updated January 26, 2009. Accessed November 15, 2022. Available at: https://wsdot.wa.gov/sites/default/files/2021-11/ENV-FW-BA-NMFSpileDrivCalcs.xls.

NMFS, 2010. *Endangered Species Act Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat (EFH) Consultation Recommendations for the Columbia River Crossing (Federal #: HPP S001(250), Lower Columbia–Clatskanie Rivers (4th field HUC 17080003), Lower Columbia River (4th field HUC 17080006), and Lower Willamette River (4th field HUC 17090012), Oregon and Washington.* NMFS Consultation Number 03196.

NMFS, 2012. *Guidance Document: Sound Propagation Modeling to Characterize Pile Driving Sounds Relevant to Marine Mammals*. NMFS Northwest Region and Northwest Fisheries Science Center. January 31, 2012.

NMFS, 2013. *ESA Recovery Plan for Lower Columbia River Coho Salmon, Lower Columbia River Chinook Salmon, Columbia River Chum Salmon, and Lower Columbia River Steelhead*. Prepared by the National Marine Fisheries Service, Northwest Region. June 2013. Available at: https://repository.library.noaa.gov/view/noaa/16002.

NMFS, 2022. NMFS Southeast Region Pile Driving Calculator. Version 1.1 Multi-Species: 2022. Accessed November 15, 2022. Available at: https://www.fisheries.noaa.gov/southeast/consultations/section-7-consultation-guidance.

NOAA (National Oceanic and Atmospheric Administration), 2009. *Endangered and Threatened Wildlife and Plants: Final Rulemaking to Designate Critical Habitat for the Threatened Southern Distinct Population Segment of North American Green Sturgeon*. 50 CFR 226. October 9, 2009.

NOAA, 2019. *Endangered and Threatened Species: Critical Habitat for the Southern Resident Killer Whale Distinct Populations Segment*. Proposed Rule NOAA-NMFS-2014-0041-0278. Posted September 18, 2019. Accessed January 30, 2023. Available at: https://www.regulations.gov/document/NOAA-NMFS-2014-0041-0278.

NOAA, 2022a. "ESA Threatened and Endangered Species Information." Accessed November 23, 2022. Available at: https://www.fisheries.noaa.gov/species-directory/threatened-endangered.

NOAA, 2022b. "Leatherback Turtle." Accessed November 23, 2022. Available at: https://www.fisheries.noaa.gov/species/leatherback-turtle.

NOAA, 2022c. "Green Turtle." Accessed November 23, 2022. Available at: https://www.fisheries.noaa.gov/species/green-turtle.

NOAA, 2022d. "Loggerhead Turtle." Accessed November 23, 2022. Available at: https://www.fisheries.noaa.gov/species/loggerhead-turtle.

NOAA, 2022e. "Olive Ridley Turtle." Accessed November 23, 2022. Available at: https://www.fisheries.noaa.gov/species/olive-ridley-turtle.

NOAA, 2022f. "Chinook Salmon." Accessed November 23, 2022. Available at: https://www.fisheries.noaa.gov/species/chinook-salmon.

NOAA, 2022g. "Chum Salmon." Accessed November 23, 2022. Available at: https://www.fisheries.noaa.gov/species/chum-salmon-protected.

NOAA, 2022h. "Green Sturgeon." Accessed October 20, 2022. Available at: https://www.fisheries.noaa.gov/species/green-sturgeon.

NOAA, 2023. "Protected Species: Southern Resident Killer Whale." Accessed January 30, 2023. Available at: https://www.fisheries.noaa.gov/species/killer-whale.

ODFW (Oregon Department of Fish and Wildlife), 2021. *Biological Assessment of the Marbled Murrelet (*Brachyramphus marmoratus*) in Oregon and Evaluation of Criteria to Reclassify the Species from Threatened to Endangered Under the Oregon Endangered Species Act*. Report prepared for the Oregon Fish and Wildlife Commission. Oregon Department of Fish and Wildlife, Salem, Oregon. June 2021.

Peterson, C., K.F. Scheidegger, P.D. Komar, and W. Niem, 1984. "Sediment Composition and Hydrography in Six High-Gradient Estuaries of the Northwestern United States." *Journal of Sedimentary Research* 54(1):86–97.

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.

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.

Port of Grays Harbor, 2022a. "PIDP Grant Application FY 2022 Small Port, Large Project – Project Narrative."

Port of Grays Harbor, 2022b. "Terminal Info." Accessed October 27, 2022. Available at: https://www.portofgraysharbor.com/terminal-info.

Port of Grays Harbor, 2023. "About the Port of Grays Harbor." Accessed January 22, 2023. Available at: https://www.portofgraysharbor.com/about-the-port-of-grays-harbor.

Purser, J., and A.N., Radford, 2011. "Acoustic Noise Induces Attention Shifts and Reduces Foraging Performance in Three-Spined Sticklebacks (*Gasterosteus aculeatus*)." *PLoS One* 6:e17478.

Rockwood, R.C., J. Calambokidis, and J. Jahncke, 2018. "Correction: High Mortality of Blue, Humpback and Fin Whales from Modeling of Vessel Collisions on the U.S. West Coast Suggests Population Impacts and Insufficient Protection." *PLoS One* 13(7):e0201080.

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.

Sandell, T., J. Fletcher, A. McAninch, and M. Wait, 2014. *Grays Harbor Juvenile Fish Use Assessment: 2013 Annual Report*. Available at: https://www.coastsalmonpartnership.org/document_library/grays-harbor-juvenile-fish-use-assessment-2013-annual-report/.

Shorin, Bonnie (National Marine Fisheries Service), 2022. Personal communication with HDR, Inc. October 18, 2022.

Soncarty, C., 2019 [Revised 2020]. *SR 520 Pontoon Construction Site – Marine Piling Removal Project, Incidental Harassment Authorization Request*. Prepared for Washington State Department of Transportation, Aberdeen, Washington, by Confluence, Seattle, Washington.

Stantec (Stantec Consulting Services), 2021. *Twin Harbors Sediment Dynamics – Final Report*. Prepared for Grays Harbor Conversation District. February 26, 2021. Available at: https://wacoastalnetwork.com/wp-content/uploads/2021/04/Twin_Harbors_Sediment-Study_Final_Report_20210226.pdf.

Turnpenny, A.W.H., and J.R. Nedwell, 1994. *Consultancy Report: The Effects on Marine Fish, Diving Mammals and Birds of Underwater Sound Generated by Seismic Surveys*. Fawley Aquatic Research Laboratories, Limited. October 1994. Accessed December 28, 2022. Available at: https://www.pge.com/includes/docs/pdfs/shared/edusafety/systemworks/dcpp/turnpenny_and_nedwell_1994_the_effects_on_marine_fish_diving_mammals_and_birds_of_seismic_surveys.pdf.

USACE (U.S. Army Corps of Engineers), [date unknown]. *Approved Work Windows for Fish Protection in All Marine/Estuarine Areas Excluding the Mouth of the Columbia River (Baker Bay) by Tidal Reference Area*. Accessed December 28, 2022. Available at: https://www.nws.usace.army.mil/Portals/27/docs/regulatory/ESA%20forms%20and%20templates/work_windows_-_all_marine_&_estuarine.pdf.

USACE, 2014. *Grays Harbor, Washington Navigation Improvement Project, General Investigation Feasibility Study, FINAL Limited Reevaluation Report; Appendix C: FINAL Supplemental Environmental Impact Statement*. June 2014.

USACE, 2022. "Grays Harbor." Accessed December 13, 2022. Available at: https://www.nws.usace.army.mil/Missions/Civil-Works/Navigation/Navigation-Projects/Grays-Harbor/.

USCG (U.S. Coast Guard), 2014. *Navigation Rules and Regulations Handbook*. August 2014 edition.

U.S. Department of Transportation, 2023. RAISE Program Persistent Poverty Dataset. Accessed January 22, 2023. Available at: https://datahub.transportation.gov/Administrative/RAISE-Persistent-Poverty/mmgn-pg9s.

USFWS (U.S. Fish and Wildlife Service), 1997. "Recovery Plan for the Threatened Marbled Murrelet (*Brachyramphus marmoratus*) in Washington, Oregon, and California." Portland, Oregon. 203 pp.

USFWS, 2013a. "Protocol for Marbled Murrelet Monitoring During Pile Driving (Revised 10/30/2013)." October 30, 2013.

USFWS, 2013b. "Conducting Masking Analysis for Marbled Murrelets & Pile Driving Projects." Presentation for WSDOT Biologists and Consultants. November 19, 2013. Presented by Emily Teachout, USFWS, WFWO.

USFWS, 2020. Sound Exposure Level Calculator for Marbled Murrelet and Bull Trout. Accessed November 15, 2022.

USFWS, 2022a. "IPaC Information for Planning and Consultation." Accessed November 23, 2022. Available at: https://ecos.fws.gov/ipac/.

USFWS, 2022b. "Gray Wolf (*Canis lupus*)." Accessed November 23, 2022. Available at: https://ecos.fws.gov/ecp/species/4488.

USFWS, 2022c. "North American Wolverine (*Gulo gulo luscus*)." Accessed November 23, 2022. Available at: https://ecos.fws.gov/ecp/species/5123.

USFWS, 2022d. "Yelm Pocket Gopher (*Thomomys mazama yelmensis*)." Accessed November 23, 2022. Available at: https://ecos.fws.gov/ecp/species/7257.

USFWS, 2022e. "Northern Spotted Owl (*Strix occidentalis caurina*)." Accessed November 23, 2022. Available at: https://ecos.fws.gov/ecp/species/1123.

USFWS, 2022f. "Yellow-Billed Cuckoo (*Coccyzus americanus*)." Accessed November 23, 2022. Available at: https://ecos.fws.gov/ecp/species/3911.

USFWS, 2022g. "Short-Tailed Albatross *(Phoebastria (=Diomedea) albatrus)*." Accessed November 23, 2022. Available at: https://ecos.fws.gov/ecp/species/433.

USFWS, 2022h. "Hawaiian Petrel *(Pterodroma sandwichensis)*." Accessed November 23, 2022. Available at: https://ecos.fws.gov/ecp/species/6746.

USFWS, 2022i. "Oregon Silverspot Butterfly (*Speyeria zerene hippolyta*)." Accessed November 23, 2022. Available at: https://ecos.fws.gov/ecp/species/6930.

USFWS, 2022j. "Monarch Butterfly (*Danaus plexippus*)." Accessed November 23, 2022. Available at: https://ecos.fws.gov/ecp/species/9743.

USFWS, 2022k. "Kinkaid's Lupine (*Lupinus sulphureus ssp. kincaidii*)." Accessed November 23, 2022. Available at: https://ecos.fws.gov/ecp/species/3747.

USFWS, 2022l. "Bull Trout (*Salvelinus confluentus*)" Accessed November 23, 2022. Available at: https://ecos.fws.gov/ecp/species/8212.

USFWS, 2022m. National Wetlands Inventory Wetlands Mapper. Accessed November 23, 2022. Available at: http://www.fws.gov/wetlands/Data/Mapper.html.

USFWS, 2023a. "Taylor's Checkerspot (*Euphydryas editha taylori*)." Accessed January 23, 2023. Available at: https://ecos.fws.gov/ecp/species/5907.

USFWS, 2023b. "Nelson's Checker-Mallow (*Sidalcea nelsoniana*)." Accessed January 23, 2023. Available at: https://ecos.fws.gov/ecp/species/7340.

West, D., J. Winkowski, and M. Litz, 2020. *Chehalis River Smolt Production, 2019*. FPA 20-05. Washington Department of Fish and Wildlife. Olympia, Washington.

West, D., J. Winkowski, T. Seamons, and M. Litz, 2021. *Chehalis River Smolt Production, 2020*. FPA 21-06. Washington Department of Fish and Wildlife, Olympia, Washington.

WDFW (Washington Department of Fish and Wildlife), 2022a. "Monarch Butterfly (*Danaus plexippus*)." Accessed November 23, 2022. Available at: https://wdfw.wa.gov/species-habitats/species/danaus-plexippus.

WDFW, 2022b. "Marbled murrelet (*Brachyramphus marmoratus*)." Accessed November 23, 2022. Available at: https://wdfw.wa.gov/species-habitats/species/brachyramphus-marmoratus.

WDFW, 2022c. "Streaked Horned Lark (*Eremophila alpestris strigata*)." Accessed November 23, 2022. Available at: https://wdfw.wa.gov/species-habitats/species/eremophila-alpestris-strigata.

WDFW, 2022d. "Western Snowy Plover (*Charadrius nivosus*)." Accessed November 23, 2022. Available at: https://wdfw.wa.gov/species-habitats/species/charadrius-nivosus.

WDNR (Washington Department of Natural Resources), 2017. "Derelict Creosote Piling Removal Best Management Practices for Pile Removal and Disposal." Accessed November 23, 2022. Available at: https://www.dnr.wa.gov/publications/aqr_rest_pileremoval_bmp_2017.pdf.

WDNR, 2022. "Eulachon or Pacific Smelt – *Thaleichthys pacificus*." Accessed November 23, 2022. Available at: https://www.dnr.wa.gov/Publications/em_fs13_019.pdf.

Weitkamp L.A., D.J. Teel, M. Liermann, S.A. Hinton, D.M. Van Doornik, and P.J. Bentley, 2015. "Stock-Specific Size and Timing at Ocean Entry of Columbia River Juvenile Chinook Salmon and Steelhead: Implications for Early Ocean Growth." *Marine and Coastal Fisheries: Dynamics, Management, and Ecosystem Science* 7(7):370–392. DOI: 10.1080/19425120.2015.1047476.

WHO (World Health Organization), 2004. *Coal Tar Creosote*. Concise International Chemical Assessment Document 62, World Health Organization. Geneva, Switzerland.

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

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

Wydoski, R.S., and R.R. Whitney, 2003. *Inland Fishes of Washington*. Seattle, Washington: University of Washington Press.

Appendix A
Project Area Photographs

Appendix A
Project Area Photographs

Photograph 1
Offsite Ditch West of Port. Photograph Taken Facing North from Public Boat Launch, 10/14/2022.

Photograph 2
Rail Lines, Rail Crossing and Culvert at Fry Creek. Photograph Taken Facing Northeast near the Boat Launch Viewing Pavilion, 10/14/2022.

Photograph 3
Shoreline of Grays Harbor and Existing Rail Lines. Photograph Taken Facing East About 150 Feet East of Fry Creek Outlet, 10/14/2022. Terminal 2 and Shiploader Is Visible in Background.

Photograph 4
Existing Terminal 4 Dock and Shoreline of Grays Harbor. Photograph Taken Facing East, 10/14/2022.

Photograph 5
East Terminal Way Ditch. Photograph Taken Facing South of Existing Rail Crossing, 10/14/2022.