

4.8 Wildlife

A rich diversity of wildlife species historically inhabited or used the waters of, and terrestrial habitat adjacent to, the Columbia River. Although development along the river has altered the natural environment, many wildlife species occur or depend on habitats found in the study area. Wildlife includes terrestrial and marine mammals, birds, reptiles, amphibians, and invertebrates, including species that are currently protected or proposed for protection under the federal Endangered Species Act (ESA) or other federal and state regulations. Fish species are also covered under the ESA and are discussed in Section 4.7, *Fish*, and the *SEPA Fish Technical Report* (ICF 2017a).

This section describes wildlife in the study area. It then describes impacts on wildlife that could result from construction and operation of the Proposed Action and under the No-Action Alternative. This section also presents the measures identified to mitigate impacts resulting from the Proposed Action.

4.8.1 Regulatory Setting

Laws and regulations relevant to wildlife are summarized in Table 4.8-1.

Table 4.8-1. Regulations, Statutes, and Guidelines for Wildlife

Regulation, Statute, Guideline	Description
Federal	
Endangered Species Act (16 USC 1531 <i>et seq.</i>)	Requires that applicants seeking a federal action, such as issuing a permit under a federal regulation (e.g., NEPA, Clean Water Act, Clean Air Act) undergo consultation with USFWS and/or NMFS. This will ensure the federal action is not likely to jeopardize the continued existence of any listed threatened or endangered animal species or result in the destruction or adverse modification of designated critical habitat. NMFS is responsible for managing, conserving, and protecting ESA-listed marine species. USFWS is responsible for terrestrial and freshwater species. Both agencies are responsible for designating critical habitat for ESA-listed species.
Migratory Bird Treaty Act of 1918, as amended (16 USC 703–713)	Makes it illegal for anyone to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid permit issued pursuant to Federal regulations. Under the regulatory authority of USFWS.
Bald and Golden Eagle Protection Act of 1940, as amended (16 USC 668–668c)	Prohibits the taking of bald eagles, including their parts, nests, or eggs without a permit issued by USFWS, and provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle... [or any golden eagle], alive or dead, or any part, nest, or egg thereof."

Regulation, Statute, Guideline	Description
Marine Mammal Protection Act of 1972, as amended (50 CFR 216)	Protects marine mammals from “take” without appropriate authorization, which may only be granted under certain circumstances. NMFS and USFWS enforce the act. Animals under the jurisdiction of NMFS may be present in the study area. An incidental harassment authorization or letter of authorization (specific authorization to be determined) may be required pursuant to the act.
State	
Washington State Environmental Policy Act (WAC 197-11, RCW 43.21C)	Requires state and local agencies in Washington to identify potential environmental impacts that could result from governmental decisions.
Washington State Growth Management Act (RCW 36.70A)	Defines a variety of critical areas, which are designated and regulated at the local level under city and county critical areas ordinances. These critical areas may include portions of wildlife habitat.
Washington State Shoreline Management Act (RCW 90.58)	Requires cities and counties (through their Shoreline Master Programs) to protect shoreline natural resources.
Washington State Hydraulic Code (RCW 77.55)	WDFW administers the hydraulic project approval program under the state hydraulic code in or near state waters.
Clean Water Act Section 401 Water Quality Certification	Ecology issues permits for in-water construction activities to ensure compliance with state water quality standards and other aquatic resources protection requirements under Ecology’s authority.
Marinas and Terminals in Freshwater Areas (WAC 220-660-160)	Applies to constructing, maintaining, and repairing marinas and terminals in freshwater areas and addresses fish life concerns.
Local	
Cowlitz County SEPA Regulations (CCC 19.11)	Provide for the implementation of SEPA in Cowlitz County.
Cowlitz County Critical Areas Ordinance (CCC 19.15)	Requires the County to designate critical areas such as wildlife habitat conservation areas.
Cowlitz County Shoreline Master Program (CCC 19.20)	Regulates development in the shoreline zone, including the shoreline of the Columbia River, a Shoreline of Statewide Significance.
City of Longview Shoreline Master Program (Ord. 3300)	Regulates development in the shoreline, including the shoreline of the Columbia River. Adopted in September 2015.
City of Longview Critical Areas Ordinance (LMC 17.10)	Regulates activities within and adjacent to critical areas and in so doing regulates fish and wildlife habitat conservation areas.
Notes: USC = United States Code; NEPA = National Environmental Policy Act; USFWS = U.S. Fish and Wildlife Service; NMFS = National Marine Fisheries Service; ESA = Endangered Species Act; CFR = Code of Federal Regulations; RCW = Revised Code of Washington; WDFW = Washington Department of Fish and Wildlife; WAC = Washington Administrative Code; CCC = Cowlitz County Code; SEPA = State Environmental Policy Act; LMC = Longview Municipal Code	

4.8.2 Study Area

The study area for direct impacts on terrestrial species and habitats consists of the project area plus the area extending up to 0.5 mile beyond the project area (Figure 4.8-1). This distance accommodates noise and visual disturbance thresholds set by the U.S. Fish and Wildlife Service (USFWS) for some sensitive species (U.S. Fish and Wildlife Service 2006).

The study area for direct impacts on aquatic species and habitats includes the main channel of the Columbia River and extends approximately 5.1 miles upstream and 2.1 miles downstream from the upstream and downstream ends of the proposed docks (Docks 2 and 3), respectively (Figure 4.8-1). The aquatic study area is based on the distances where underwater noise is estimated to reach harassment levels (Section 4.8.3.3, *Impact Analysis*). These distances represent the in-water “line of site” distances from the ends of the dock with respect to underwater noise.

The direct impacts aquatic study area also includes the various surface and stormwater ditches, ponds, and wetlands found throughout the project area.

The study area for indirect impacts on terrestrial species includes the rail corridors in Washington State that would be used by Proposed Action-related trains to account for potential coal spill and wildlife strike impacts (refer to Chapter 5, Section 5.1, *Rail Transportation*, for rail routes in Cowlitz County and Washington State). The study area for indirect impacts on aquatic species includes the Columbia River downstream from the project area to the mouth of the river to account for potential impacts on marine mammals (Section 4.7, *Fish*, Figure 4.7.2).

4.8.3 Methods

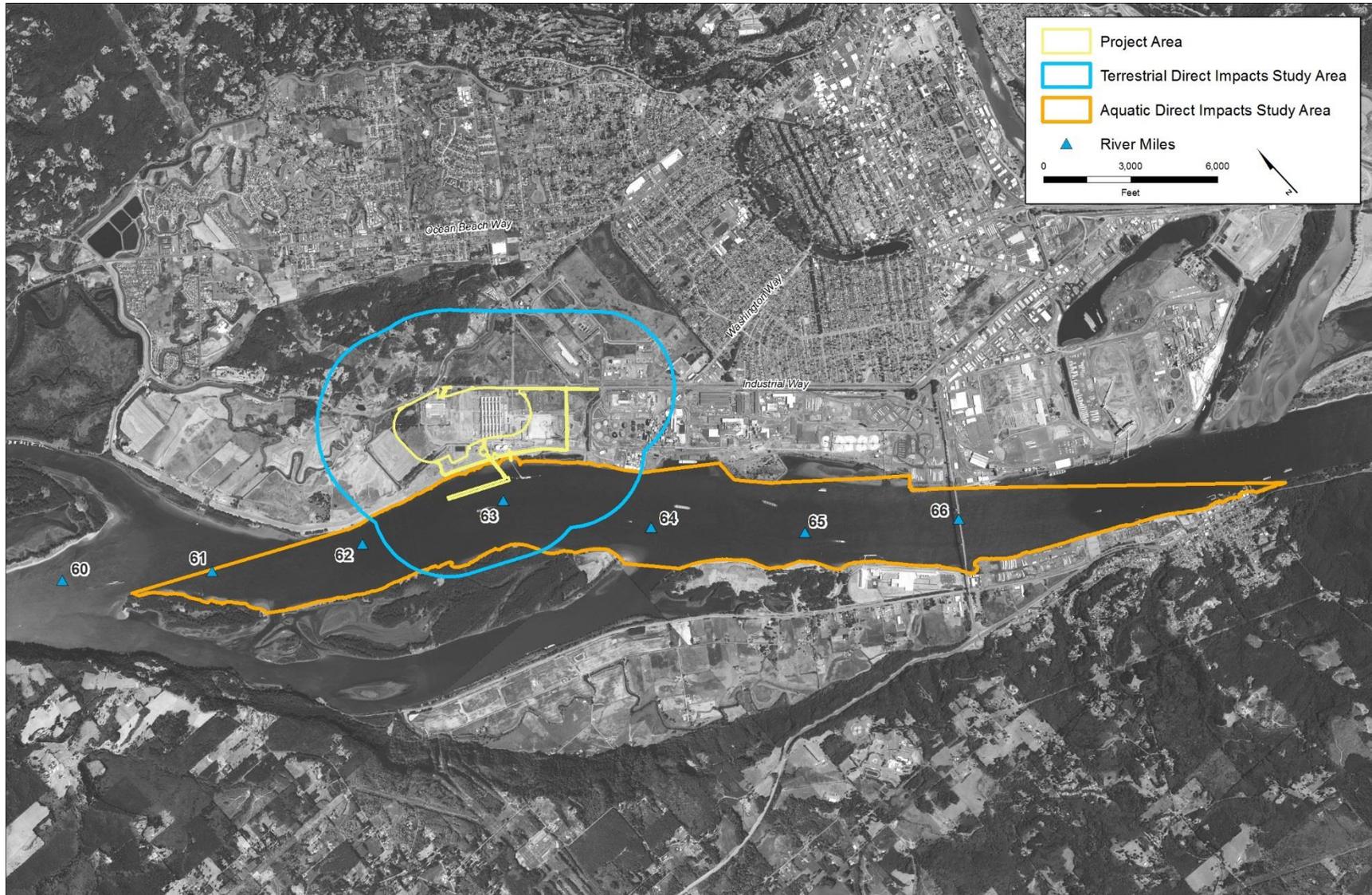
This section describes the sources of information used to evaluate the potential impacts on wildlife and wildlife habitat associated with the construction and operation of the Proposed Action and No-Action Alternative.

4.8.3.1 Information Sources

The following sources of information were used to identify the potential impacts of the Proposed Action and No-Action Alternative on wildlife in the study area. A detailed list is provided in the *SEPA Wildlife Technical Report* (ICF 2017b).

- Two site visits conducted by ICF biologists on April 8, 2014, and December 12, 2014
- Reports prepared by Grette Associates for the Applicant as part of the permit application materials (Grette Associates 2014a through 2014p)
- National Marine Fisheries Service (NMFS) (2015) west coast region species list
- National Oceanic Atmospheric Administration (2016a) technical guidance for assessing the effects of underwater sounds on marine mammals
- USFWS (2015) Information, Planning, and Conservation system online database

Figure 4.8-1. Boundaries for the Terrestrial and Aquatic Study Areas for Direct Impacts of the Proposed Action



The following sources of information were used to define the existing conditions relevant to wildlife and evaluate potential impacts of the Proposed Action and No-Action Alternative in the terrestrial and aquatic study areas. A detailed list is provided in the *SEPA Wildlife Technical Report*.

- Washington Department of Fish and Wildlife (WDFW) Priority Habitat and Species (PHS) Statewide List and Distribution for Cowlitz County (Washington Department of Fish and Wildlife 2015a); PHS spatial data (Washington Department of Fish and Wildlife 2015b)
- Washington State Department of Natural Resources (2015) online Herpetological Atlas spatial database

4.8.3.2 Impact Analysis

Potential wildlife and wildlife habitat that could be affected by the construction and operation of the Proposed Action were determined as described below. For more information on these methods, see the *SEPA Wildlife Technical Report*.

Identifying Resources in the Terrestrial and Aquatic Study Areas

The following species and habitat characteristics were identified and quantified, where possible.

- Documented species occurrences
- Species likely to occur in the terrestrial and aquatic study areas
- Suitable habitat conditions

While impacts on wildlife habitat can be quantified, impacts on wildlife species are qualitatively described. Wildlife species are mobile and their presence and abundance in the terrestrial and aquatic study areas cannot be quantitatively predicted. For documented occurrences, the focus was on wildlife species identified in the WDFW PHS database. Geospatial PHS data containing mapped locations of priority species occurrences and priority habitats were obtained from WDFW (Washington Department of Fish and Wildlife 2014). These data were overlaid with the study area to determine presence of documented priority species and habitat occurrences.

- A list of special-status wildlife species was compiled for the study area, consisting of those species federally listed as threatened, endangered, proposed, or candidate species; wildlife species listed in the WDFW PHS database; and marine mammals.
- A list of federally listed wildlife species for Cowlitz County was generated from the USFWS iPAC online planning tool (U.S. Fish and Wildlife Service 2015).
- A list of state priority species that occur in Cowlitz County was obtained from the WDFW PHS program website (Washington Department of Fish and Wildlife 2013).
- A list of federally protected marine mammals that could occur in the study area was compiled from the NMFS (2015) West Coast Region website.

Assessing Noise and Visual Disturbance

An animal's response to sounds depends on various factors, including noise level and frequency, distance and event duration, equipment type and conditions, frequency of noisy events over time, slope, topography, weather conditions, previous exposure to similar noises, hearing sensitivity,

reproductive status, time of day, behavior during the noise event, and an animal’s location relative to the noise source (Delaney and Grubb 2003 in Washington State Department of Transportation 2015). As sound waves spread out from their source, their energy level decreases. This analysis considers potential terrestrial sound impacts on wildlife and potential underwater sound impacts on diving birds and marine mammals.

Terrestrial Noise and Visual Disturbance

USFWS has established terrestrial distance thresholds at which harassment, as defined under ESA, may occur for some sensitive species in Washington due to construction activity (U.S. Fish and Wildlife Service 2006); these species include the bald eagle (*Haliaeetus leucocephalus*), marbled murrelet (*Brachyramphus marmoratus*), Northern spotted owl (*Strix occidentalis caurina*), and Columbian white-tailed deer (*Odocoileus virginianus leucurus*). Table 4.8-2 presents distances from construction activity at which the USFWS predicts these species may experience harassment. Of the four species, the bald eagle has the lowest threshold for disturbance and, therefore, the greatest protective distance (0.5) mile. Therefore, using a conservative approach, the terrestrial study area for the Proposed Action extends 0.5 mile beyond the project area. While this distance is based on the bald eagle’s sensitivity to noise and visual impacts, it is a reasonable proxy to use for terrestrial wildlife species in the absence of similar information for other terrestrial wildlife species.

Table 4.8-2. Harassment Distances for Federally Listed Species in Washington State

Species	Scientific Name	Activity and Harassment Distance
Bald eagle	<i>Haliaeetus leucocephalus</i>	Noise: 0.25 mile ^a Visual: 0.5 mile
Marbled murrelet	<i>Brachyramphus marmoratus</i>	Pile-driving: 33 feet ^b Visual: 300 feet
Northern spotted owl	<i>Strix occidentalis caurina</i>	Pile-driving: 180 feet
Columbian white-tailed deer	<i>Odocoileus virginianus leucurus</i>	Noise: 0.25 mile

Notes:
^a Noise level disturbance varies on bald eagles. It has been found that visual disturbance is more likely to provoke escape behavior than noise disturbance (U.S. Department of Transportation 2004).
^b Injury would occur at 202 decibels at this distance (Washington State Department of Transportation 2015).
 Source: U.S. Fish and Wildlife Service 2006.

Underwater Noise Disturbance

For underwater impacts on marine mammals and diving birds due to sound, USFWS and NMFS have determined noise-level thresholds that may result in behavioral changes or injury. The distance at which these thresholds would be reached for the Proposed Action is based on the practical spreading loss model as described by Thomsen et al. (2006).

NMFS currently provides regulatory acoustic thresholds for assessing the effects of noise exposure on marine mammal hearing from impulsive (e.g., impact pile driving) and nonimpulsive (e.g., vibratory pile driving) noise sources (Table 4.8-3) (National Oceanic Atmospheric Administration 2016a). These thresholds represent peak and cumulative sound energy levels that may cause a permanent threshold shift (PTS), a physical injury that results in reduced hearing sensitivity, in the hearing of five functional hearing groups of marine mammals.

Table 4.8-3. NMFS Underwater Sound Level Effect Thresholds for PTS Auditory Injury to Marine Mammals

Hearing Group ^a	PTS Onset Acoustic Thresholds (Received Level)	
	Impulsive	Non-impulsive
Low-Frequency (LF) Cetaceans	L _{pk,flat} : 219 dB L _{E,LF,24h} : 183 dB	L _{E,LF,24h} : 199 dB
Mid-Frequency (MF) Cetaceans	L _{pk,flat} : 230 dB L _{E,MF,24h} : 185 dB	L _{E,MF,24h} : 198 dB
High-Frequency (HF) Cetaceans	L _{pk,flat} : 202 dB L _{E,HF,24h} : 155 dB	L _{E,HF,24h} : 173 dB
Phocid Pinnipeds (Underwater)	L _{pk,flat} : 218 dB L _{E,PW,24h} : 185 dB	L _{E,PW,24h} : 201 dB
Otariid Pinnipeds (Underwater)	L _{pk,flat} : 232 dB L _{E,OW,24h} : 203 dB	L _{E,OW,24h} : 219 dB

Notes:
^a Cetacean examples include whales and dolphins; pinniped examples include seals and sea lions.
 Source: National Oceanic Atmospheric Administration 2016a.
 dB = decibel; L_{pk,flat} = Peak Sound Pressure Level (unweighted); L_{E,24h} = Sound Exposure Level, Cumulative 24 hour; PW = Phocids in Water; OW = Otariids in Water

While NMFS' recent technical guidance on underwater noise impacts on marine mammals (National Oceanic Atmospheric Administration 2016a) provides guidance on injury effects of noise to marine mammals, it does not provide revised guidance on behavioral disturbance of noise to marine mammals. NMFS's interim sound threshold guidance for the potential onset of behavioral disturbance or harassment to marine mammals from nonimpulsive (vibratory) and impulsive (impact) pile driving is 120 decibels root mean square (dB_{RMS}) and 160 dB_{RMS}, respectively (National Oceanic Atmospheric Administration 2016B). Because there is an extremely low probability of cetaceans (e.g., whales and dolphins) using the study area, they are not assessed for underwater sound impacts for the Proposed Action. Pinnipeds (e.g., seals and sea lions) may be found in the aquatic study area during construction.

USFWS has established underwater noise level thresholds for behavioral change, auditory injury, and nonauditory injury (i.e., barotrauma) to the federally listed marbled murrelet (U.S. Fish and Wildlife Service 2011). The underwater effect threshold for behavioral disturbance is 150 dB_{RMS}; auditory injury is 202 dB_{SEL}; and nonauditory injury is 208 dB sel. Underwater noise below 150 dB_{SEL} does not cause injury and is recognized by USFWS as effective quiet (Washington State Department of Transportation 2015). While marbled murrelets are not found in the study area, the underwater noise thresholds provide some guidance on potential underwater noise impacts that could be useful for other diving birds potentially present in the study area. In the absence of any federal or state agency criteria for underwater noise impacts on diving birds, these marbled murrelet criteria were used to establish distances at which underwater noise due to impact pile-driving may affect all diving birds in the aquatic study area. There are currently no vibratory pile-driving thresholds identified for marbled murrelet or other diving birds.

The distance at which underwater noise is reduced to the noise level thresholds described for marine mammals and marbled murrelet is calculated using the model currently preferred by USFWS and NMFS, the practical spreading loss model described by Thomsen et al. (2006). Up to four piles

would be driven per day over an 8-hour period. Pile-driving duration and sound source levels measured during construction activities similar to those described for the Proposed Action provide the basis for calculating the distance at which construction-related noise no longer reaches the marine mammal and marbled murrelet noise impact thresholds. Sound attenuation devices would be used during impact pile-driving and are predicted to reduce sound levels by up to 9dB (Grette Associates 2014a). Attenuated sound levels are used in the calculation of the underwater distances at which murrelets and marine mammals may be affected. The calculated distances are presented in Section 4.8.5.1, *Proposed Action, Construction—Direct Impacts*. Specifics about these analysis methods and criteria are provided in the *SEPA Wildlife Technical Report*.

4.8.4 Existing Conditions

This section describes the existing environmental conditions in the terrestrial and aquatic study areas related to wildlife that could be affected by the construction and operation of the Proposed Action and No-Action Alternative.

Extensive modifications of the lower Columbia River (flood control, industrial development, deep-draft vessel traffic) have altered the habitat conditions in the study area available to wildlife species using terrestrial and aquatic habitats. Floodplain habitats have been disconnected from the riverine environment and in some cases eliminated. The shoreline and riparian environment has been substantially altered (armoring and protection, overwater structures, and development), affecting habitat in adjacent upland and riparian zones. Industrial and transportation development inland have further altered the landscape and habitat conditions, thus changing the biological communities associated with these habitats.

4.8.4.1 Terrestrial Habitat

The project area comprises a disturbed industrial site developed with roads and industrial buildings and relatively small and fragmented vegetated areas primarily in the western portion of the project area. Patches of potentially suitable habitat in the undeveloped areas could support foraging and cover for small to large mammals, foraging and nesting for a variety of birds, and foraging, breeding, and nesting for amphibians (Grette Associates 2014c, 2014d, 2014e, 2014h). A segment of the project area where the trestle would be built crosses a levee with managed vegetation and riparian shoreline that borders the Columbia River. The vegetated riparian shoreline area is a very narrow strip of intermittent forest and shrub habitats that likely provides foraging and cover for small and large mammals, foraging and nesting for a variety of bird species, and foraging, breeding, and refuge for amphibians and reptiles (Grette Associates 2014d). Habitat types in the terrestrial study area for direct impacts include developed (i.e., disturbed), uplands (including riparian), and wetlands land cover classifications, which are described in Section 4.6, *Vegetation*.

In general, areas to the north-northeast and around to the southeast of the project area (in a clockwise direction) are already heavily developed by industrial, commercial, and residential land uses that extend to the Cowlitz River and along the Columbia River; immediately upstream of the project area, the heavily developed shoreline lacks suitable habitat and wildlife species are not present. Because the project area is at the western edge of this development, wildlife dispersal or movement through the project area is unlikely because there is no suitable habitat in these developed areas into which wildlife could move or disperse. Existing conditions currently hinder and create an impediment for wildlife movement toward the City of Longview (i.e., upstream of the project area). Immediately downstream of the project area are uplands, wetlands, and riparian

habitats, as well as disturbed areas; habitat conditions for wildlife are less disturbed than the project area with fewer structures. Immediately north of the project area is a triangular area of the Applicant's leased area bordered by Industrial Way to the south and Consolidated Diking Improvement District (CDID) #1 drainage ditches to the east and west. The habitat likely supports foraging and cover for small to large mammals (e.g., voles to deer); foraging and nesting for a variety of birds; and foraging, breeding, and refuge for amphibians and reptiles.

A small portion of Lord Island, in the Columbia River is located within the terrestrial direct impacts study area. Previously used for dredged material disposal, the forested island connects to Walker Island, downstream, by a narrow band of sand. Between the two islands lies a tidal marsh and shallows. With the exception of several transmission towers, the island is undeveloped and contains habitat for small and large mammals, and a variety of birds, amphibians, and reptiles. The Columbian white-tailed deer is found here and Lord Island is designated as a recovery area. More detail on Lord Island wildlife species and habitat is provided in the *SEPA Wildlife Technical Report*.

The study area for indirect impacts on terrestrial species and habitats along the rail corridors in Washington State consists of many habitat types, which broadly include lowland and montane forests, sagebrush prairie, and shrub-steppe. Various species of wildlife are associated with each of these terrestrial habitats. See Section 4.8.4.3, *Wildlife Species*, for more information on these habitats and associated wildlife.

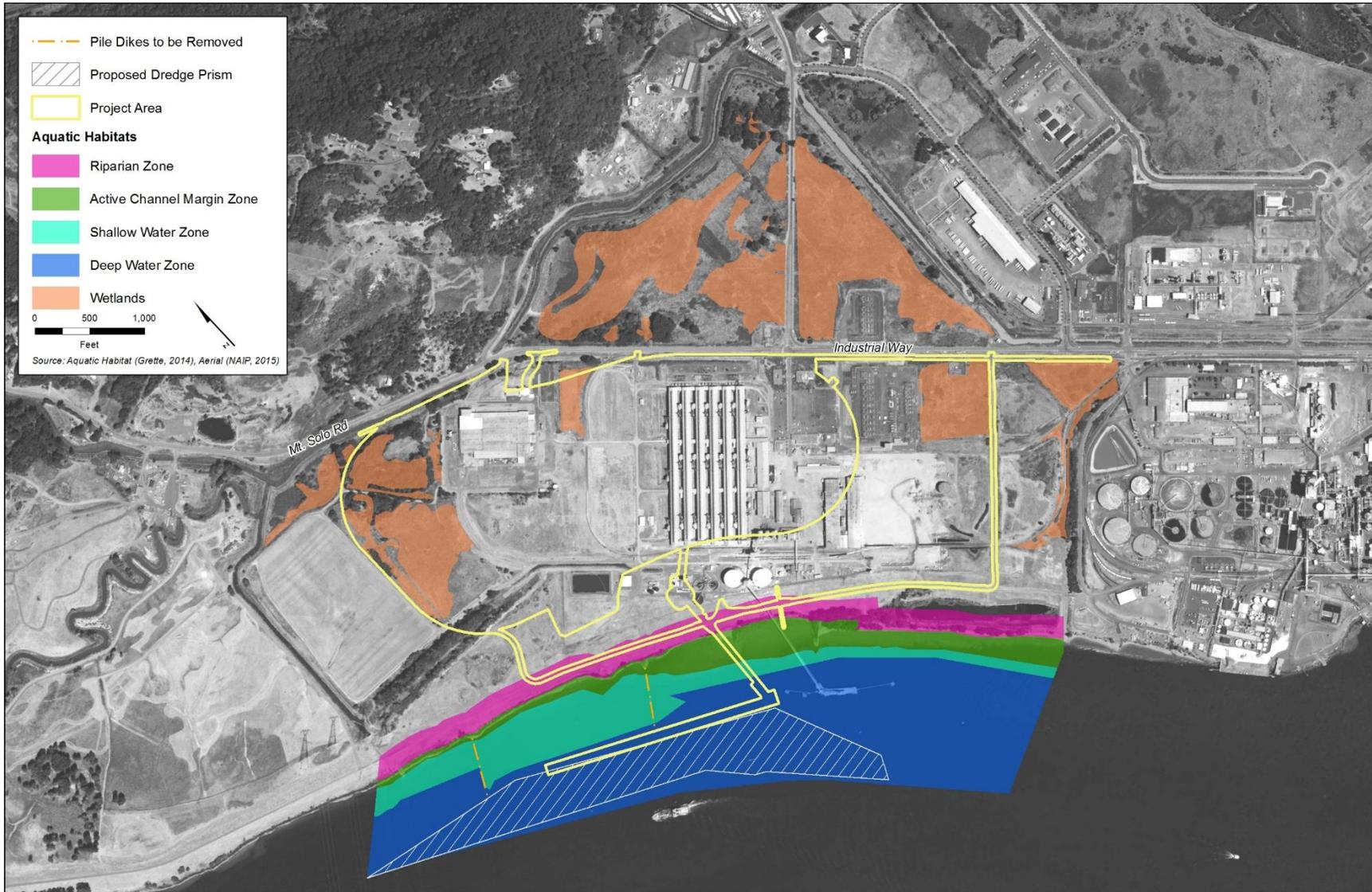
4.8.4.2 Aquatic Habitat

The aquatic direct impacts study area includes the Columbia River smaller areas of open water, including various surface and stormwater ditches and ponds, and wetlands throughout the project area (Section 4.3, *Wetlands*) that provide aquatic habitat. Ditches include those maintained by CDID #1 and privately owned stormwater ditches. The Columbia River supports marine mammals, fish, birds, and a variety of invertebrates (which serve as forage to support wildlife higher on the food chain). Fish are discussed in Section 4.7, *Fish*, other aquatic species are discussed below. Ponds, ditches, and wetlands in the aquatic direct impacts study area could support common species of invertebrates and amphibians as well as small mammals and birds.

Aquatic habitat types in the Columbia River in the aquatic direct impacts study area that could be affected by Proposed Action-related dredging and docks include the deepwater zone (DWZ), shallow water zone (SWZ), and active channel margin habitats (Figure 4.8-2) (Grette Associates 2014i). The active channel margin includes the shoreline and nearshore edge habitat extending from the ordinary high water mark (OHWM), or 11.1 feet Columbia River Datum (CRD), into the river to a depth of 0 feet CRD. In general, the upper shoreline adjacent to the active channel margin and above the OHWM is highly modified by levees and extensive riprap armoring with scattered large woody debris.

The SWZ extends from 0 feet CRD to a depth of -20 feet CRD and is relatively narrow and more steeply sloped than the active channel margin, making it unlikely to support aquatic vegetation (Grette Associates 2014j). The benthic (i.e., river bottom) habitats in the DWZ (-20 feet CRD to -45 feet CRD) of the Columbia River are subject to strong currents and reduced light penetration with depth and, therefore, support little to no aquatic vegetation.

Figure 4.8-2. Aquatic Habitats in the Direct Impacts Study Area Along the Length of the Project Area



Habitat in the aquatic indirect impacts study area includes the open water of the Columbia River from the project area to the river mouth that vessels use where marine mammals could be affected by vessel traffic. Marine mammals that may be found along the vessel route include sea lions and seals, as described in Section 4.8.4.3, *Wildlife Species*. The aquatic habitats along the navigation channel are deepwater habitats that are regularly dredged to depths for safe vessel passage.

4.8.4.3 Wildlife Species

Wildlife species likely to be found in the terrestrial direct impacts study area include common species of birds, rodents, amphibians, reptiles, and invertebrates. Larger and highly mobile species of mammals that are habituated to developed environments may also be present in the study area, including coyote (*Canis latrans*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*) and deer (*Odocoileus* sp.).

Wildlife species likely to be found in the aquatic study areas include common species of birds (waterfowl, raptors, shorebirds, marine birds, and passerine birds), California sea lions (*Zalophus californianus*), Steller sea lions (*Eumetopias jubatus*), harbor seals (*Phoca vitulina*), rodents, frogs, salamanders, snakes, lizards, and invertebrates.

Representative wildlife in the terrestrial indirect impacts study area in Cowlitz County may include black-tailed deer, red fox, coyote, raccoon, striped skunk, beaver, Oregon and grey-tailed vole, red-tailed hawk, Cooper's hawk, Canada geese, mallard and northern pintail ducks, great blue heron, white-breasted nuthatch, chipping sparrow, and a variety of amphibians and reptiles (Commission for Environmental Cooperation 2011). A review of PHS data (Washington Department of Fish and Wildlife 2015c) for terrestrial habitats indicates small areas of oak woodlands in a few places along the rail line; species associated with this habitat include various woodpeckers, migrant birds, reptiles, invertebrates, and the western gray squirrel (Washington Department of Fish and Wildlife 1998). In addition, two osprey point locations are mapped within 300 feet of the rail line (Washington Department of Fish and Wildlife 2015c). No designated critical habitat for federally protected species under USFWS jurisdiction is mapped in the terrestrial environment near the rail line corridor(s) potentially used to transport coal in Cowlitz County. Beyond Cowlitz County, several ecoregions are found between the county and the Washington border, each with various representative wildlife species, which may include mule deer, pronghorn antelope, coyote, black-tailed jackrabbit, ground squirrels, American kestrel, red-tailed hawk, western meadowlark, savanna sparrow, western diamondback rattlesnake, greater sage-grouse, sage sparrows, sage thrashers, pygmy rabbits, black-tailed deer, black bear, beaver, river otter, pileated woodpecker, northern goshawk, cougar, wolverine, yellow bellied marmot, bald and golden eagles, Cooper's hawk, and osprey, in addition to many other birds, mammals, reptiles, and insects (Commission for Environmental Cooperation 2011). The largest ecoregion has dry desert and steppe climates, marked by hot, dry summers and cold winters, and consists of shrub-steppe vegetation communities. Shrub-steppe communities can also support federally protected species, including the pygmy rabbit and Spalding's catchfly. WDFW also considers shrub-steppe a priority habitat under the PHS program. PHS data (Washington Department of Fish and Wildlife 2015c) also indicate various priority habitats and species along the rail line study area beyond Cowlitz County, including talus slope and cliffs/bluffs habitats, bald eagle concentrations and breeding areas, and western pond turtle regular occurrence areas.

Site Visit Observations

During the December site visit, two Columbian black-tailed deer (*Odocoileus hemionus columbianus*) were observed in the forested wetland area (Wetland A) in the northwest portion of project area, and two nutrias (*Myocastor coypus*) were observed on the sloped bank of the CDID #1 Ditch 10, on the north side of Industrial Way. Other signs of mammal presence were observed during both site visits, including several unidentified small mammal scats, a coyote scat along the dike road, a beaver (*Castor canadensis*)-chewed tree in the riparian habitat along the Columbia River, and an unidentified species of sea lion heard barking from the Columbia River navigation channel.

Several common bird species were recorded in the terrestrial direct impacts study area during the site visits, including red-winged blackbird (*Agelaius phoeniceus*), sparrows (*sp.*), robins (*Turdus migratorius*) and other songbirds, American coot (*Fulica Americana*), bufflehead (*Bucephala albeola*), mallards (*Anas platyrhynchos*) and other unidentified ducks, Canada geese (*Branta Canadensis*), cormorants (*sp.*), scaup (*sp.*), gulls (*sp.*), and great blue heron (*Ardea herodias*). A turkey vulture (*Cathartes aura*), red-tailed hawk, kestrel (*Falco sparverius*), and bald eagle (*Haliaeetus leucocephalus*) were observed flying overhead. During the December 2014 site visit, a small flock of Canada geese were observed grazing on wetland grasses in the project area, and several unoccupied raptor nests were observed in the forested habitat adjacent to the stormwater ditches on the southwest side of the project area and in an electrical tower near the west side of the dike road.

Grette Associates biologists conducted surveys for the federally threatened and state endangered streaked horned lark during the breeding season in 2013 and 2014 in the project area. No streaked horned larks were detected; however, 33 other bird species were recorded. A table listing these species is included in the *SEPA Wildlife Technical Report*. A few of these bird species are also special-status species, which are addressed in *Special-Status Wildlife Species*.

Three species of pinnipeds may be present in the aquatic study areas: harbor seal (*Phoca vitulina*), California sea lion (*Zalophus californianus*), and Steller sea lion (*Eumetopias jubatus*) (Jeffries et al. 2000). Because these marine mammals are all protected under the Marine Mammal Protection Act, they are described in more detail in *Special-Status Wildlife Species*. Various bird species, including waterfowl, raptors, and shorebirds are supported by habitats in the aquatic study areas. Freshwater insects and other invertebrate species (i.e., mollusks, crayfish) inhabit the upper layers of the benthos and provide forage for many species of fish and birds. Fish and their habitats, are discussed in Section 4.7, *Fish*.

Special-Status Wildlife Species

Special-status wildlife species are those listed as threatened, endangered, proposed, or candidate species under the ESA or are listed as priority species by WDFW. Table 4.8-4 lists the special-status wildlife species likely to occur in the terrestrial direct impacts study area and aquatic study areas. Further descriptions of each species are provided in the *SEPA Wildlife Technical Report*. Some of the PHS listings are not for individuals of a species (PHS Criteria 1) but for vulnerable aggregations (PHS Criteria 2) of individuals, such as western Washington nonbreeding concentrations.

Table 4.8-4. Special-Status Wildlife Species that Could Occur in the Terrestrial Direct Impacts Study Area and Aquatic Study Areas

Wildlife Species	Potential for Occurrence ^a	Potential Habitat	State Priority Species Criteria ^b	Federal Status ^c	State Status ^d
Mammals					
Columbian black-tailed deer (<i>Odocoileus hemionus columbianus</i>)	Yes	Species documented on project area. Limited habitat on project area. May use forested portions of terrestrial study area.	3	N/A	N/A
Columbian white-tailed deer (<i>Odocoileus virginianus leucurus</i>)	Yes	Species documented on project area. ^e Limited forage and cover on project area. Suitable habitat available on Lord Island.	1	T	E
Harbor seal (<i>Phoca vitulina</i>)	Yes	Present in Columbia River	2	N/A	N/A
California sea lion (<i>Zalophus californianus</i>)	Yes	Present in Columbia River	2	N/A	N/A
Stellar Sea lion (<i>Eumetopias jubatus</i>)	Yes	Present in Columbia River	1, 2	SC	T
Birds					
Streaked horned lark (<i>Eremophila alpestris strigata</i>)	Possibly	Not documented during surveys on project area. Potential suitable habitat on Lord Island.	1	T	E
Bald eagle (<i>Haliaeetus leucocephalus</i>)	Yes	Forested wetlands could provide roosting habitat. Suitable habitat on Lord Island.	1	SC	S
Peregrine falcon (<i>Falco peregrinus</i>)	Possibly	Potential foraging habitat	1	SC	S
Barrows goldeneye (<i>Bucephala islandica</i>)	Possibly (nonbreeding concentrations unlikely)	Open water	2, 3	N/A	N/A
Common goldeneye (<i>Bucephala clangula</i>)	Possibly (nonbreeding concentrations unlikely ^f)	Open water	2, 3	N/A	N/A

Wildlife Species	Potential for Occurrence^a	Potential Habitat	State Priority Species Criteria^b	Federal Status^c	State Status^d
Bufflehead (<i>Bucephala albeola</i>)	Yes (nonbreeding concentrations unlikely ^f)	Open water	2, 3	N/A	N/A
Waterfowl concentrations	Yes	Suitable habitat documented in terrestrial and aquatic study areas	2, 3	N/A	N/A
Vaux's swift (<i>Chaetura vauxi</i>)	Possibly	No large snags for nesting or roosting identified on project area but possible in terrestrial study area.	1	N/A	C
Pileated woodpecker (<i>Dryocopus pileatus</i>)	Possibly	Possible in forested habitat.	1	N/A	C
Purple martin (<i>Progne subis</i>)	Yes	Species documented in terrestrial study area, possible foraging.	1	N/A	C

Notes:

- ^a Potential for individuals to occur based on multiple sources, including PHS data, scientific literature, and agency documents; Potential for vulnerable aggregations based on PHS data only.
- ^b State PHS Species Criteria
 - 1 – State-listed or candidate species
 - 2 – Vulnerable aggregation
 - 3 – commercial, recreational, or tribal importance
- ^c Federal Status under the U.S. Endangered Species Act
 - E = Endangered
 - T = Threatened
 - SC = Species of Concern
- ^d State Status
 - E = Endangered
 - T = Threatened
 - C = Candidate
 - S = Sensitive
- ^e Grette Associates 2014j
- ^f Western Washington Nonbreeding Concentrations
- ^g Willapa Hills Audubon Society 2014

The likelihood of each species or vulnerable aggregations occurring in the terrestrial direct impacts study area and aquatic study areas is listed as follows (Washington Department of Fish and Wildlife 2013).

- *Yes* (known to occur)
- *Possibly* (likely to occur due to presence of suitable habitat, but not documented)
- *Unlikely* (individuals may occur in the terrestrial or aquatic study areas but vulnerable aggregations are not documented in the PHS database)

A listing of *No* does not mean individuals of that species could not occur in the terrestrial direct impacts study area or aquatic study areas, it signifies that there are no documented vulnerable aggregations (the potential for individuals to occur in the terrestrial or aquatic study areas is provided in parenthesis).

Columbian White-tailed Deer (*Odocoileus virginianus leucurus*)

The Columbia River population of the Columbian white-tailed deer is a federally threatened and state endangered species. The Columbia River population is one of only two extant populations in the United States. The Columbia River population inhabits the lower Columbia River floodplain and islands within the river channel. The current range of the Columbian white-tailed deer overlaps with the terrestrial direct impacts study area, including Barlow Point and Fisher, Walker, and Lord Islands (Washington Department of Fish and Wildlife 2013).

WDFW has identified specific locations along the Columbia River for recovery of this population (Washington Department of Fish and Wildlife 2013). The nearest recovery location to the study area is downstream of Longview, which includes Fisher, Hump, Lord, and Walker Islands (Washington Department of Fish and Wildlife 2013). The presence of Columbian white-tailed deer in the terrestrial direct impacts study area has been documented.

Columbian Black-tailed Deer (*Odocoileus hemionus columbianus*)

Columbian black-tailed deer use upland slopes and closed-canopy coniferous forests as they require a mix of forest and openings for cover and forage (Washington Department of Fish and Wildlife 2014). Columbian black-tailed deer have been observed on the project area.

Streaked Horned Lark (*Eremophila alpestris strigata*)

The streaked horned lark is a federally threatened and state endangered species. Streaked horned larks prefer open spaces characterized by flat, treeless landscapes of 300 acres or more, sparse grass/forb vegetation, and few or no shrubs. In the lower Columbia River, they were historically known to nest on sandy beaches and spits. Now, they can be found nesting on dredge spoil depositions. In the project area and the broader terrestrial direct impacts study area, a few small areas contain potentially suitable habitat (low vegetative cover and no woody vegetation) that are located adjacent to the Columbia River: the closed Reynolds landfill and edges of roadbeds. No streaked horned larks were observed during the surveys in the project area during the 2013 and 2014 breeding seasons (Grette Associates 2014j, 2014k).

All critical habitat areas within the lower Columbia River are located downstream from the project area, with the exception of one area located upriver. The closest designated critical habitat is on

Crims Island, approximately 5 miles downstream of the study area. The only critical habitat upstream of the study area is on Sandy Island, Columbia County, Oregon at river mile 76, approximately 13 miles upriver (U.S. Fish and Wildlife Service 2012).

Bald Eagle (*Haliaeetus leucocephalus*)

Bald eagles nest and forage for fish along the lower Columbia River. There are no documented bald eagle nests in the terrestrial direct impacts study area and no suitable nesting habitat exists on the project area. The nearest documented nest sites are located approximately 2 miles downstream and 4 miles upstream of the project area (Washington Department of Fish and Wildlife 2014). The terrestrial direct impacts study area provides foraging habitat for this species. Lord Island also provides suitable habitat that may be used by bald eagles (Pacific Coast Joint Venture 1994). Bald eagles were observed soaring over the terrestrial direct impacts study area during the April 8, 2014 site visit. Bald eagles were also observed in the terrestrial direct impacts study area during the July 12, 2013 streaked horned lark surveys (Grette Associates 2014j).

Peregrine Falcon (*Falco peregrinus*)

Peregrine falcons nest on cliff ledges but also use tall manmade structures such as bridges, overpasses, buildings, and power plants (Oregon Department of Transportation undated). The nearest documented nest location is approximately 3 miles south of the project area (Washington Department of Fish and Wildlife 2014). Peregrine falcons nesting within a few miles of the project area could use the study area for foraging.

Waterfowl

Nonbreeding concentrations of Barrows goldeneye (*Bucephala islandica*), common goldeneye (*B. clangula*), and bufflehead (*B. albeola*) are considered priority species (vulnerable aggregation) by WDFW. A few individual bufflehead were observed resting on open water (both in wetlands and on the Columbia River) in the terrestrial direct impacts study area during the April 8, 2013 site visit. However, within the terrestrial direct impacts study area there are no vulnerable concentrations of waterfowl documented by WDFW in the PHS database (Washington Department of Fish and Wildlife 2014). The nearest documented vulnerable concentration is located approximately 0.25 mile north of the terrestrial direct impacts study area. Lord Island and adjoining Walker Island support waterfowl and suitable habitat is located just outside of the terrestrial direct impacts study area in the tidal marsh area between the islands south of the sand spit (Pacific Coast Joint Venture 1994).

Purple Martin (*Progne subis*)

The purple martin is a state-listed species of concern. Purple martins were observed on the project area during the streaked horned lark surveys in July 2013 (Grette Associates 2014j). Several nest sites are documented in the Coal Creek Slough, approximately 3 to 4 miles downstream of the terrestrial direct impacts study area (Washington Department of Fish and Wildlife 2014).

Vaux's Swift (*Chaetura vauxi*)

The Vaux's swift is a state candidate species. They are summer (June to mid-August) residents in Washington, migrating north to Washington during the spring (April to late May) and south during the fall (mid-August to late September). There is no suitable nesting or roosting habitat on the project area; however, other forested areas in the terrestrial direct impacts study area may contain

suitable habitat. Vaux's swifts may fly through the study area during migrations or while foraging. They are commonly observed at the Mint Farm (Willapa Hills Audubon Society 2014) east of the study area.

Pileated Woodpecker (*Dryocopus pileatus*)

Pileated woodpeckers inhabit mature deciduous or mixed deciduous-coniferous forests. There is no suitable nesting habitat in the project area. Limited foraging habitat may be available in the forested areas onsite. Forested portions of the terrestrial direct impacts study area may contain suitable habitat for nesting and foraging.

Pinnipeds

Three species of pinniped are found in the lower Columbia River in the aquatic study areas: California sea lions (*Zalophus californianus*), Steller sea lions (*Eumetopias jubatus*), and harbor seals (*Phoca vitulina*). Sea lions use the lower Columbia River for foraging on fish and resting at haulout sites. Breeding areas (both mating rookeries and pupping sites) for California sea lions are located in California and Mexico. Steller sea lions are primarily present during the nonbreeding season.

Surveys conducted in the 1990s identified four haulout sites used by sea lions between the mouth of the Columbia River and its confluence with the Cowlitz River (Jeffries et al. 2000), which is approximately 4.5 miles upstream of the project area. There are no documented sea lion haulout sites in the aquatic direct impacts study area, but individuals likely swim through the aquatic direct impacts study area as they migrate up and down the Columbia River. Harbor seals are the most numerous of the pinnipeds found in Washington waters. Like sea lions, they forage and rest along the lower Columbia River, with dozens of haulout sites identified between the mouth of the river and the aquatic direct impacts study area. There are no documented seal or sea lion haulout sites in the aquatic direct impacts study area, but individuals swim through the aquatic direct impacts study area as they migrate up and down the Columbia River.

4.8.5 Impacts

This section describes the potential direct and indirect impacts related to wildlife and wildlife habitat that could result from the construction and operation of the Proposed Action and the No-Action Alternative.¹ The Applicant identified the following design features and best management practices to be implemented as part of the Proposed Action, and these were considered when evaluating potential impacts of the Proposed Action.

- The Applicant would design the trestle to be long and narrow, and at a height above OHWM to minimize shading in shallow water areas. From shore, the trestle would measure 24 feet in width for 700 feet, and 51 feet in width for the final 150 feet. The top of the deck would be +22 feet CRD and the bottom of the deck +19.5 feet CRD. Therefore, the bottom of the deck would be more than 8 feet above OHWM. This design would minimize overall impacts in shallow water, including impacts on habitat connectivity along the shoreline.
- The Applicant would locate Docks 2 and 3 entirely in deepwater habitat to distance the structure and terminal activities from shallow water areas.

¹ Acreages presented in the impacts analysis were calculated using geographic information system (GIS), thus, specific acreage of impacts are an estimate of area based on the best available information.

- The Applicant would locate the berthing area at depths of at least -20 feet CRD to avoid habitat conversion from shallow to deepwater during dredging.
- The Applicant would locate the berthing area in deepwater closer to the navigation channel to minimize the scope of future maintenance dredging.
- The Applicant would direct lighting for the Proposed Action downward or at structures, and would incorporate shielding to avoid spillage of light into aquatic areas.
- The Applicant would include a pinpoint light source at the end of the shiploading boom, aimed straight down into the ship hold area to avoid a broader beam that could cause light spillage.
- The Applicant would remove the piles associated with the pile dikes slowly to minimize sediment disturbance and turbidity in the water column.
- Prior to pile extraction, the Applicant would break the friction between the pile and substrate to minimize sediment disturbance.

4.8.5.1 Proposed Action

This section describes the potential impacts that could occur in the terrestrial and aquatic study areas as a result of the construction and operation of the Proposed Action.

Construction activities that could affect wildlife include the following.

- Permanent removal of habitat and wildlife mortality in terrestrial and aquatic habitats associated with clearing and construction of the proposed terminal.
- Wildlife displacement and mortality associated with clearing and construction of the coal export terminal.
- Noise and visual impacts on terrestrial and aquatic wildlife associated with operation of construction equipment, general construction related noise and pile driving.
- Spills and leaks associated with construction equipment and materials.

Operation activities that could affect wildlife include the following.

- Noise impacts on wildlife associated with operations such as train movements, transfer of coal, and general industrial operations.
- Spills and leaks from trains, vehicles, or equipment.
- Vessel strikes of marine mammals.
- Underwater vessel noise impacts on pinnipeds and diving birds.
- Removal of habitat during maintenance dredging affecting wildlife and habitat.
- Coal dust deposition affecting terrestrial, wetland, and aquatic habitats and wildlife.

Construction—Direct Impacts

Construction-related activities associated with the Proposed Action could result in direct impacts as described below. As explained in Chapter 2, *Project Objectives, Proposed Action, and Alternatives*, construction-related activities include demolishing existing structures and preparing the site,

constructing the rail loop and dock, and constructing supporting infrastructure (i.e., conveyors and transfer towers).

Temporarily Alter or Permanently Remove Terrestrial Habitat

Construction of the Proposed Action would result in the permanent loss of terrestrial wildlife habitat in the study area (Table 4.8-5 and Section 4.3, *Wetlands*). Construction grading and clearing would permanently remove 201.50 acres of habitat, that is mostly disturbed vegetation. As described in Section 4.8.4.1, *Terrestrial Habitat*, patches of potentially suitable upland habitat in the undeveloped areas in the western portion of the project area could support foraging and cover for some wildlife, including the Columbian white-tailed deer.

Table 4.8-5. Permanent Terrestrial Habitat Loss by Type in the Project Area

Habitat Type	Direct Impact Area (acres)
Disturbed	151.14
Upland	26.26 ^a
Wetland	24.10
Total	201.50

Notes:

^a Includes 0.05 acre of riparian forest. Further information on the different vegetation components of upland is found in Section 4.6, *Vegetation*.

Approximately 24.1 acres of wetland would be permanently filled resulting in permanent loss of wetland function. Based on Ecology's *Washington State Wetland Rating System for Western Washington*, three of the five wetlands in the project area were determined to have moderate habitat function and two wetlands were determined to have low habitat function. Wildlife functions in these wetlands are likely limited to temporary use by passerine birds and waterfowl for foraging, breeding, and refuge. Mitigation would be required to compensate for the loss of these wetlands and their habitat functions as part of the Clean Water Act Section 401 and Section 404 permit process. Habitat functions of wetlands in the project area are described in more detail in Section 4.3, *Wetlands*.

Temporary impacts on aquatic habitat could occur through soil disturbance, stockpiling, and erosion, causing an increase in total suspended sediments in the Columbia River and freshwater ditches on and adjacent to the project area. These types of impacts would be avoided or greatly reduced with the implementation of construction best management practices, avoidance and minimization measures, and compliance with permit requirements, such as those associated with the required 401 Water Quality Certification and hydraulic project approval. Section 4.5, *Water Quality*, describes the potential impacts of the Proposed Action on water quality.

Cause Wildlife Displacement or Mortality

Wildlife present in the project area during construction activities could be displaced, injured, or killed by construction vehicles or equipment, placement of construction materials on the ground, or ground disturbance such as preloading activities. Approximately 151 acres (75%) of the terrestrial habitat in the project area are currently developed and wildlife would likely not be present in these areas due to the lack of suitable habitat. The remaining 50 acres comprise suitable but degraded habitat and animals inhabiting these areas during construction activities

could be affected. Highly mobile wildlife species, such as larger mammals and birds, would likely leave the project area during construction activities and move to adjacent areas of suitable habitat. Some less mobile species, such as burrowing mammals, reptiles, amphibians, and insects, could be injured or killed. Because these potential mortality impacts would only occur during construction and these species would be able to reproduce rapidly and in adjacent suitable habitats, the losses due to mortality would not be expected to affect the viability or fitness of the species on the population scale.

Cause Temporary Physical or Behavioral Responses to Construction Noise and Human Activities

Construction of the Proposed Action could affect both terrestrial and aquatic wildlife because of increased human presence, elevated noise levels, and/or ground-disturbing activities. While wildlife in and around the terrestrial and aquatic study area are likely habituated to human activity and noise levels associated with industrial and developed areas, noise levels at the project area would increase above ambient levels for the duration of construction, especially during impact pile-driving activities associated with dock and trestle construction.

Wildlife species exhibit different hearing ranges and all wildlife do not respond the same way to similar sound sources or levels. Wildlife response to sounds depends on numerous factors, including noise level, frequency, distance and event duration, equipment type and conditions, frequency of noise events over time, slope, topography, weather conditions, previous exposure to similar noises, hearing sensitivity, reproductive status, time of day, behavior during the noise event, and the animal's location relative to the noise source (Delaney and Grubb 2003 in Washington State Department of Transportation 2015). Therefore, an animal's reaction to elevated noise levels could range from mild disturbance with little or no reaction to escape behavior, which would displace individuals by forcing them to abandon the area of elevated noise levels, potentially resulting in significant impairment or disruption of normal behavioral patterns. Such displacement and disruption of behavior could reduce productivity and survival of individuals as the individual would likely expend more energy relocating to new suitable habitat, and would be less familiar with new habitat areas and at an increased risk of predation, potentially limiting survival of individual adults or offspring (e.g., abandoning young). These impacts would be exacerbated where there is no adjacent or nearby suitable habitat that is easily accessible. In addition, visible construction equipment, materials, and an increase in infrastructure could cause displacement because some species would avoid areas within the line-of-sight of construction equipment operations.

Dredging and the associated noise could affect birds, including streaked horned larks, during the nesting season. No studies specifically identify noise sensitivities of the streaked horned lark. However, noise sensitivity studies of the marbled murrelet found that marbled murrelets are very sensitive to underwater noise such as pile driving and to prolonged terrestrial noise that lasts longer than 10 to 15 minutes (Mountain Loop Conservancy 2010). Shorebird sensitivities are more closely related to those of sea lions because they spend most of their time above water and generally stay in the shallow water while hunting (Science Applications International Corporation 2011). Dredging activities have been shown to generate noise of 72 decibels in commercial or industrial areas (Epsilon Associates, Inc. 2006). Noise levels in this range could disturb birds, but would not likely result in injury.

Construction-related noise impacts and the presence of construction equipment and materials would be temporary, occurring over the estimated 6-year construction period. A lower density of development northwest of the terrestrial study area could connect to potentially suitable wildlife habitat where wildlife could relocate during and after construction. Because wildlife in the terrestrial study area are likely habituated to noise levels associated with industrial areas and are generally mobile, construction-related noise could affect individuals of a species, but would not affect a species' whole population or the overall fitness of a population.

Temporarily Alter or Permanently Remove Aquatic Habitat

Construction of the Proposed Action would result in the physical alteration or permanent loss of approximately 77.37 acres of aquatic habitat in the aquatic study area. Dredging to provide vessel access to Docks 2 and 3 would alter approximately 48 acres of benthic deepwater habitat and construction would result in the permanent loss of approximately 5.17 acres of aquatic habitat (ditches and ponds) throughout the terrestrial habitats of the project area and 0.10 acre (4,312 square feet) of Columbia River bottom for the placement of 610 piles (7.07 square feet per pile multiplied by 610 piles). Additionally, the Proposed Action would result in the permanent loss of 24.1 acres of wetland habitat (refer to Section 4.3, *Wetlands*, for further information).

These open areas of freshwater and wetlands support common species of amphibians and may be used by mammals and birds. Mammals and birds are highly mobile species and are expected to leave the vicinity during construction activities. Some mortality of amphibians could occur; however, these species typically reproduce rapidly and any losses due to mortality would not be expected to affect the viability or fitness of the species' populations.

The placement of 610 piles would permanently remove benthic habitat in the Columbia River, where the areas within each pile footprint would cease to contribute toward primary or secondary productivity. Benthic, epibenthic, or infaunal organisms within the pile footprint at the time of pile driving would likely perish.

Construction of the docks and trestle would also create 5.13 acres of new overwater surface area. While these overwater structures would be constructed on top of the 610 piles (i.e., no physical placement of overwater structures within the water column or substrate), the presence of the overwater structures would limit light penetration into the aquatic environment and affect primary productivity.

Existing creosote-treated piles associated with two pile-dikes would be removed using vibratory extraction or direct-pull methods (Grette Associates 2014n). Removing creosote-treated woodpiles from the Columbia River could improve water quality over the long term; however, removing the piles could cause temporary, short-term increases in suspended sediments, short-term water contamination, and long-term sediment contamination from creosote released during extraction or long-term exposure to the water column.

Creosote and associated chemicals, particularly those that are water-soluble and that persist in the water column are known to bioconcentrate in many aquatic invertebrates (Eisler 1987; Brooks 1997). Creosote contains a mixture 200 to 250 compounds, with primary components composed of polycyclic aromatic hydrocarbons (PAHs) (Brooks 1997; National Marine Fisheries Service 2009). PAHs are known to be toxic to aquatic organisms including invertebrates and fish and can cause sublethal and lethal effects (Eisler 1987; Brooks 1997). Most of the components of

creosote are heavier than water and sink in the water column. PAHs from creosote accumulate in sediments and are likely to persist at the site of pile removal or wherever they settle until they degrade (National Marine Fisheries Service 2009). However, PAHs from sediment are less bioavailable to aquatic species and, thus, these organisms are not likely to bioaccumulate PAHs from sediments (Brooks 1997). Over the long term, the source of creosote would be removed or capped by the sediment falling into the hole left by the extracted pile. Water quality would improve, the concentration of creosote in the sediment would be expected to decrease, and the potential pathway of exposure for wildlife through contamination of prey would be reduced.

Dredging would permanently alter a 48-acre area of deepwater habitat by removing approximately 500,000 cubic yards of benthic sediment. Within the proposed dredge prism (i.e., extent of dredged area), the amount of deepening would vary based on existing depths, from no removal up to a depth of approximately 16 feet of removal. Permits for the Proposed Action, including dredging, would require site-specific sediment sampling to characterize the proposed dredge prism and ensure compliance with a dredged materials management plan.

Most bottom-dwelling benthic organisms are stationary or slow moving and would likely perish during dredging. Benthic organisms typically recolonize disturbed areas within 30 to 45 days. Dredging activities could also affect pinnipeds through collisions with vessels and dredge-related increases in turbidity. Collisions are possible but unlikely given the slow speeds of dredging vessels. Information on turbidity is limited; however, existing research indicates that dredge-related turbidity is not likely to cause substantial impacts on pinnipeds since they often inhabit naturally turbid or dark environments and are likely to use senses in addition to their vision (Todd et al. 2014). Noise could cause masking and behavioral changes but is unlikely to cause auditory damage to pinnipeds (Todd et al. 2014). Localized, temporary increases in turbidity would not likely cause long-term or negative impacts on pinnipeds.

Cause Temporary Physical or Behavioral Responses to Underwater Construction Noise—Pinnipeds

Installation of structural steel piles to support Docks 2 and 3 would generate underwater noise during pile-driving (Grette Associates 2014b) that could exceed the harassment thresholds described in Section 4.8.3.2, *Impact Analysis, Assessing Noise Impacts*. Pile installation and the applicable work windows would be provisioned in the Hydraulic Project Approval. Pile installation would likely occur over two in-water work window construction periods due to the number of in-water piles required for the dock and trestle.

Impact Pile-Driving

PTS auditory injury could occur on phocid pinnipeds (e.g., harbor seals) and otariid pinnipeds within 15,220 feet and 1,109 feet, respectively, of active impact pile driving without any sound attenuation in place. With implementation of a bubble curtain to attenuate noise levels during impact pile driving, there would be a reduction of at least 9 decibels at the source, which would decrease the distance to phocid and otariid PTS injury to 3,822 feet and 279 feet, respectively. Because the Columbia River is approximately 3,281 feet wide at the point where pile-driving would occur, and the aquatic direct impacts study area extends 5.1 miles upstream of the project area and 2.1 miles downstream of the project area, there would be a large area of the river within the aquatic study area that pinnipeds could use and avoid exposure to the area where underwater noise reaching PTS injury levels may occur. Based on the seasonal use patterns for

California sea lion, Steller sea lion, and harbor seals in the study area, presence of individual pinniped species during impact pile driving would be unlikely.

It is estimated that behavioral disturbance could occur for both phocid and otariid pinnipeds up to 17,756 feet from impact pile driving without any sound attenuation devices. With implementation of a bubble curtain to attenuate sounds, it is estimated that there would be a reduction of at least 9 decibels at the source, which would decrease the distance to pinniped behavioral disturbance to 4,459 feet from each pile as it is driven. In the event these pinnipeds pass through the study area during impact pile driving, they would be exposed to sound in excess of the behavioral disturbance threshold. Based on the seasonal use patterns for California sea lion, Steller sea lion, and harbor seals in the study area, presence of individuals of these species during impact pile driving would be unlikely.

Vibratory Pile-Driving

PTS auditory injury could occur for phocid and otariid pinnipeds within 331 feet and 23 feet, respectively, of active vibratory pile driving. Because the Columbia River is approximately 3,281 feet wide at the point where pile driving would occur, there would be a wide area of the river that pinnipeds could use in the aquatic study area and avoid exposure to the area where underwater noise reaching PTS injury levels may occur. Based on the seasonal use patterns for California sea lion, Steller sea lion, and harbor seals in the study area and based on the proposed work window for in-water pile installation, presence of individual pinnipeds during pile driving would be unlikely. In addition, the threshold distances assume pinnipeds would be exposed to 1.2 hours of elevated noise during a day of vibratory pile-driving (four piles/day, 20 minutes/pile). Given the adherence to in-water work windows, the short impact distance, and the ability of pinnipeds to travel outside the area of elevated underwater noise, thereby reducing the duration of their exposure, pinnipeds that could be present in the study area are unlikely to experience PTS auditory injury due to vibratory pile-driving.

Behavioral disturbance due to vibratory pile driving could occur for both phocid and otariid pinnipeds up to 5.1 miles upstream from the project area and 2.1 miles downstream from the project area. These disturbance distances are defined by bends in the Columbia River that effectively intercept the underwater noise that would otherwise result in the disturbance area extending 72 miles. Sound travels in straight lines, and can only travel up to the distances of these river bends. Therefore, behavioral disturbance from vibratory pile driving could only occur within this area (Figure 5.8-1). Sound attenuation devices are not applicable to vibratory pile driving methods so no reduction in noise level is anticipated. Based on seasonal use patterns of the study area by pinnipeds and the proposed in-water work window for pile installation, pinnipeds are unlikely to be present during pile driving.

Cause Temporary Physical or Behavioral Responses to Underwater Construction Noise— Diving Birds

Potential impacts on diving birds in the Columbia River are most likely to occur due to underwater noise generated during in-water installation of piles; specifically impact pile-driving, which would generate the loudest and most intense underwater noise during construction. As described in the previous *Assessing Noise and Visual Disturbance* section, USFWS-established noise thresholds for the marbled murrelet were used to assess underwater noise impacts on all diving birds in the Columbia River. Based on these thresholds and assuming

noise attenuation devices will reduce sound source levels by 9 dB, behavioral disturbance may occur at distances less than 20,701 feet, auditory injury may occur at distances less than 387 feet, and barotrauma injury may occur at distances less than 154 feet from in-water pile-driving.

The reaction of a diving bird that is exposed to underwater noise levels above 150 dB_{RMS} (but below 202 dB_{SEL}) could range from mild disturbance to escape behavior, which would displace individuals by forcing them to abandon the area of elevated noise levels, potentially resulting in impairment or disruption of normal behavioral patterns. Such displacement and disruption of behavior could interrupt feeding and diving, and reduce productivity and survival of individuals, as the individual would likely expend more energy relocating to a new area. However, impact pile-driving noise impacts would be temporary, occurring over 2 years during the approved in-water work window, and it is not anticipated that underwater impact pile-driving noise would affect the overall fitness of diving bird populations.

Cause Temporary Spills and Leaks that Affect Species or Habitat

Construction activities would occur on land as well as in and over waters of the Columbia River. Construction activities could result in temporary water quality impacts from the release of hazardous materials such as fuels, lubricants, hydraulic fluids, or other construction-related hazardous materials. Spills could affect aquatic and terrestrial wildlife near the discharge point, potentially affecting the respiration, growth, or reproduction of these species, or contaminating their habitat. The risk of a spill or release of hazardous materials is low because of the requirements associated with the handling, transfer, use, and storage of most construction-related hazardous materials. The potential risks, impacts, and mitigation measures related to impacts on water quality are addressed in Section 4.5, *Water Quality*. The potential for these types of impacts would be avoided or greatly reduced given protective measures to guard against these risks, including construction best management practices, avoidance and minimization measures, in-water work restrictions, and compliance with regulatory and permit requirements, such as those associated with 401 Water Quality Certification. However, a spill may have potential impacts on wildlife based on the location, weather conditions, and type and amount of material.

Construction—Indirect Impacts

Construction of the Proposed Action would not result in indirect impacts on wildlife or wildlife habitat because construction of the coal export terminal would be limited to the project area.

Operations—Direct Impacts

Operation of the Proposed Action would result in the following direct impacts. Operations-related activities are described in Chapter 2, *Project Objectives, Proposed Action, and Alternatives*.

Cause Periodic Spills or Leaks that Contaminate Terrestrial or Aquatic Habitat

Routine operations at the project area could result in spills or leaks of hazardous materials from vehicles, trains, or equipment. Contaminants could affect terrestrial habitat as well as water quality, thus degrading aquatic habitat in the Columbia River and drainage ditches in the aquatic study area. Training, oil discharge prevention briefings, and regulatory compliance would reduce these risks and the potential for impacts. Additional measures are outlined Section 4.5, *Water Quality*, and Chapter 3, Section 3.6, *Hazardous Materials*.

Cause Periodic Physical or Behavioral Responses to Noise

Operations could result in increased terrestrial noise, which could affect wildlife by causing disturbance or avoidance behavior. Species present in the terrestrial study area are likely habituated to the elevated noise levels associated with industrial, commercial, and residential uses. These species are generally mobile and avoid disturbing noise levels and human activities. Noise generated by the Proposed Action would be similar to the existing, adjacent land uses and would not have a measurable impact on wildlife species in the terrestrial study area.

Generate and Disperse Coal Dust in Terrestrial and Aquatic Habitats

Coal dust and fugitive coal particles could be generated during operation of the Proposed Action through the movement of coal onto the project area, around the project area, and onto vessels. Coal dust could also become airborne from the large stockpiles that would be located within the project area.

The potential extent and deposition rate of coal dust particles less than 75 microns in diameter was modeled as part of the analysis conducted relative to air quality. Based on this modeling, the highest rate of coal dust deposition would be expected in the immediate area surrounding the coal export terminal, but smaller particles would also be expected to deposit in a zone extending around and downwind of the terminal. Deposition rates could range from 1.99 grams per square meter per year ($\text{g}/\text{m}^2/\text{year}$) adjacent to the project area, gradually declining to less than $0.1 \text{ g}/\text{m}^2/\text{year}$ within a few thousand feet from the project area and $0.01 \text{ g}/\text{m}^2/\text{year}$ approximately 2.4 miles from the project area. Based on the models, the zone of deposition would extend primarily northwest of the project area and over the Columbia River. Deposition rates of less than $0.1 \text{ g}/\text{m}^2/\text{year}$ are projected to occur over the forested habitats of Lord Island within the study area, with declining concentrations across the island and to the south and west toward Walker Island.

Windborne coal could potentially affect wildlife through physical or toxicological means. Coal particles could affect aquatic wildlife in a manner comparable to any form of suspended particulates, such as tissue abrasion, smothering, obstruction, or damage to feeding or respiratory organs, and other effects resulting from reduced quantity or quality of light. Another potential manner in which coal could affect aquatic wildlife is through coal leachates. Unburnt coal can be a source of acidity, salinity, trace metals, hydrocarbons, chemical oxygen demand, and potentially macronutrients if they leach from the coal matrix into aquatic habitats. Toxic constituents of coal include PAHs and trace metals, which are present in coal in variable amounts and combinations dependent on the type of coal. Some PAHs are known to be toxic to aquatic animals and humans. Metals and PAHs could also potentially leach from coal to the pore water of sediments and be ingested by benthic-feeding organisms, providing a mechanism for subsequent ingestion by other organisms throughout the food chain. However, the low aqueous extractability and bioavailability of the contaminants minimizes the potentially toxic effects.

Spill Coal during Operations of the Proposed Action

Direct impacts on the natural environment from a coal spill during operations of the Proposed Action could occur. Direct impacts resulting from a spill during coal handling at the coal export terminal would likely be minor because the amount of coal that could be spilled would be relatively small. Also, impacts would be minor because of the absence of terrestrial and aquatic

environments in the project area and the contained nature and design features of the terminal (e.g., enclosed belt conveyors over water, transfer towers, and shiploaders). Potential physical and chemical effects of a coal release on the aquatic and terrestrial environments that occur adjacent to the terminal are described below.

A coal spill could have physical effects on aquatic environments, including abrasion, smothering, diminished photosynthesis, alteration of sediment texture and stability, reduced availability of light, temporary loss of habitat, and diminished respiration and feeding for aquatic organisms. The magnitude of these potential impacts would depend on the amount and size of coal particles suspended in the water, duration of coal exposure, and existing water clarity (Ahrens and Morrisey 2005). Therefore, the circumstances of a coal spill, the existing conditions of a particular aquatic environment (e.g., pond, stream, wetland), and the physical effects on aquatic organisms and habitat from a coal spill would vary. Similarly, cleanup of coal released into the aquatic environment could result in temporary impacts on habitat, such as smothering, altering sediment composition, temporary loss of habitat, and diminished respiration and feeding for aquatic organisms. The recovery time required for aquatic resources would depend on the amount of coal spilled and the extent and duration of cleanup efforts, as well as the environment in which the incident occurred. It is unlikely that coal handling in the upland portions of the coal export terminal would result in a spill of coal that would affect the Columbia River. This is unlikely because the rail loop and stockpile areas would be contained, and other areas adjacent to the coal export terminal are separated from the Columbia River by an existing levee, which would prevent coal from being conveyed from upland areas adjacent to the rail loop to the Columbia River. Coal could be spilled during shiploading operations because of human error or equipment malfunction. However, such a spill would likely result in a limited release of coal into the environment due to safeguards to prevent such operational errors, such as start-up alarms, dock containment measures to contain spillage/rainfall/runoff, and enclosed shiploaders.

The chemical effects on aquatic organisms and habitats would depend on the circumstances of a coal spill and the existing conditions of a particular aquatic environment (e.g., stream, lake, wetland). Some research suggests that physical effects are likely to be more harmful than the chemical effects (Ahrens and Morrisey 2005).

A coal train derailment and coal spill in Burnaby, British Columbia, in 2014, and subsequent cleanup and monitoring efforts provide some insight into the potential impacts of coal spilled in the aquatic environment. Findings from spill response and cleanup found there were potentially minor impacts in the coal spill study area, and that these impacts were restricted to a localized area (Borealis Environmental Consulting 2015).

Operations—Indirect Impacts

Operation of the Proposed Action would result in the following indirect impacts. Operations-related activities are described in Chapter 2, *Project Objectives, Proposed Action, and Alternatives*. Under the Proposed Action, 1,680 vessel transits a year and 16 trains a day would operate at full build-out.

Cause Periodic Injury or Mortality from Vessel Strike—Pinnipeds

Operations of the Proposed Action would increase vessel traffic in the Columbia River (Chapter 5, Section 5.4, *Vessel Transportation*) by 840 ships a year. Increased vessel traffic related to operations at the project area could increase the risk of vessel collisions with

pinnipeds in the indirect impacts study area. Most available research and literature on marine mammal vessel strikes is associated with vessel-whale collisions at sea. Compared to pinnipeds, whales are typically much larger, slower-moving, and therefore, are assumed more vulnerable to vessel strikes. Vessel strikes on marine mammals are usually described as massive blunt-force trauma (Geraci and Lounsbury 1993 in Horning and Mellish 2009), but are considered extremely rare for pinnipeds (Andersen et al. 2007 in Horning and Mellish 2009). A blunt-force trauma that results from a marine mammal collision with a vessel can result in death or injury.

The potential for a pinniped strike with a vessel in the indirect impacts study area would depend on many factors, including time of year, vessel type, vessel size, pinniped species, vessel location, vessel speed, and location of animal relative to vessel. The behavior of a pinniped in the path of an approaching vessel in the study area is uncertain, but it is likely that an individual would have the ability to avoid and swim away from the vessel. In addition, pinniped vessel strikes are rare; thousands of vessels transit the Columbia River every year. A small number of documented pinniped deaths are attributed to vessel strikes. For example, the *U.S. Pacific Marine Mammal Stock Assessments: 2015* (National Oceanic Atmospheric Administration 2016b) for the Pacific Coast documented two harbor seals (Oregon/Washington Coast Stock) killed by boats between 2007 and 2011 and 13 California sea lions killed by boats between 2008 and 2012. Pinnipeds in the Columbia River would also likely be habituated to existing Columbia River vessel traffic, and vessel speed in the indirect impacts study area would be less than 14 knots. Therefore, the potential risk for a vessel collision with a pinniped in the indirect study area would be generally be considered low.

Cause Periodic Physical or Behavioral Responses to Vessel Noise and Maintenance Dredging—Pinnipeds

Proposed Action-related vessels would increase vessel traffic and underwater noise in the Columbia River (Chapter 5, Section 5.4, *Vessel Transportation*). Studies in the Salish Sea have shown that the greater the ship size, the greater the underwater source level due to cavitation, with the exception of tug vessels that show greater source noise levels underwater while performing activities such as berthing or accelerating a ship (Hemmera Envirochem et al. 2014). While this information is from studies in the Salish Sea, it is expected that noise levels from vessels would be similar in the Columbia River.

The peak hearing sensitivity frequencies of Steller sea lion, California sea lion, and harbor seal are generally outside of the noise frequencies generated by vessels (generally ranging between 10 Hertz and 1 kilohertz (Wright 2008) and these species are habituated to existing Columbia River vessel noise levels. Any response to project-related vessel noise would likely be minimal.

Periodically Remove or Alter Habitat during Maintenance Dredging

Maintenance dredging is anticipated to occur on a multiyear basis; however, it may occur as frequently as annually or following extreme flow conditions to maintain required depths at Docks 2 and 3 and to allow for navigation between the docks and the navigation channel (WorleyParsons 2012). Impacts on the benthic invertebrate community would be similar to those described for initial construction related dredging associated with construction activities (Section 4.8.5.1, *Proposed Action, Construction—Direct Impacts*). Compared to the initial construction dredging, maintenance dredging would remove a relatively small amount of material, including bottom dwelling organisms. Maintenance dredging would result in mortality

of invertebrate organisms in the maintenance dredge prism and temporary disruption of benthic productivity. Benthic productivity is expected to be low in this deepwater habitat (McCabe et al. 1997). Maintenance-related dredging could affect pinnipeds and benthic organisms in a manner similar to the initial construction dredging (Section 4.8.5.1, *Proposed Action, Construction—Direct Impacts*). As mentioned above, benthic organisms typically recolonize in 30 to 45 days following disturbance. Thus, should dredging occur on an annual basis, it would not prevent recolonization of the benthic habitat.

Generate and Disperse Coal Dust in Terrestrial and Aquatic Habitats

Coal dust and fugitive coal particles could be generated during operation of the Proposed Action through the movement of coal by rail along the rail corridor. Coal transported by vessel would be enclosed in cargo holds and is not likely to result in deposition along the vessel route. The potential impacts from coal dust for the indirect impacts study area would be similar to the impacts described previously for the direct impacts study area.

Spill Coal during Rail Transport

The magnitude of the potential indirect impact from a coal spill on the aquatic and terrestrial environments would be similar to those described previously and would depend on the location of the spill, the volume of the spill, and success of efforts to contain and clean up the spill, none of which can be predicted.

The potential impact of a coal spill from a Proposed Action-related train is directly related to the probability of a Proposed Action-related train incident occurring. Chapter 5, Section 5.2, *Rail Safety*, estimates the number of Proposed Action-related train incidents that could potentially occur during coal transport within Cowlitz County and Washington State. In Cowlitz County, the predicted number of loaded coal train incidents is approximately one every 2 years. The predicted number of loaded coal train incidents within Washington State is approximately five per year.

Not every incident of a loaded coal train would necessarily result in a rail car derailment or a coal spill. A train incident could involve one or multiple rail cars, and could include derailment in certain circumstances. The size and speed of the train and the terrain at the location of an incident would influence whether the incident resulted in a coal spill that could have impacts on wildlife. A broad range of spill sizes from a partial rail car to multiple rail cars could occur as a result of a Proposed Action-related train incident.

Additionally, containment and cleanup efforts for coal spills from a rail incident factor into the potential impact on the environment. It is expected that coal spills in the terrestrial and built environments would be easier to contain and clean up than spills occurring in an aquatic environment. Spills occurring on land may have a quicker response time and cleanup in some locations due to their visibility and access for cleanup equipment, as compared to spills into aquatic environments.

Potential physical and chemical effects of a coal release into aquatic and terrestrial environments would be the same or similar to those described above under direct impacts.

Cause Wildlife Strikes along the Rail Corridor in Washington State

Increased rail traffic associated with the Proposed Action could result in an increase in train strikes of wildlife species that occur along the rail corridor.

Dorsey (2011) found that some wildlife may use railroads for movement, which could be considered a positive impact. Wildlife move on or along railroads while foraging, accessing critical resources (e.g., water), migrating, and dispersing. Wildlife tend to move along railroads for at least three reasons, including; railroads are often co-aligned with high quality habitats and natural movement corridors (e.g., valley bottoms and mountain passes); wildlife may move along railroads because foods (i.e., edge vegetation, carrion from strikes, and spilled agricultural grains) are available along rights-of-way or on the railbed, and; the flat railbed provides an easily traversable route particularly apparent in regions receiving significant amounts of snowfall where railroad beds may offer a relatively snow-free travel path.

However, Dorsey (2011) indicated that various factors are likely to contribute to the frequency of wildlife and rail interactions and the potential for train strikes and wildlife mortality. For example, train speed, rail alignment, and train volume—as well as wildlife abundance, behavior and habitat quality and use (i.e., migration or foraging) along rail corridors—could individually, or in combination, affect the likelihood and frequency of train strikes of wildlife. The relative abundance of wildlife along a railroad may be the primary factor affecting strike rates (Dorsey 2011), although Kusta et al. (2014) did not find abundance of roe deer in the Czech Republic and train strikes to be correlated. Dorsey (2011) cited several studies that have documented more herbivore than carnivore mortalities from train strikes, which reflects their relatively greater abundance in most landscapes. Although Dorsey (2011) points out that foods found on and along railroads may also be a factor affecting strikes by increasing the time wildlife spend directly on or adjacent to railroads. Foods found along railroads may consist of natural vegetation, carrion and agricultural products spilled from train cars.

Overall, the Proposed Action would increase the number of trains traveling through Washington State by approximately 16 trains per day at full build-out (8 loaded trains arriving and 8 empty trains leaving each day). This increase in train traffic from the Proposed Action through Washington State would increase the risk of wildlife strikes by trains.

4.8.5.2 No-Action Alternative

Under the No Action Alternative, the Applicant would not construct the Proposed Action. Current operations would continue, and the existing bulk product terminal site would be expanded. However, any expansion would be limited to activities that would not require a permit from the U.S. Army Corps of Engineers (Corps) or a shoreline permit. Therefore, no construction impacts on aquatic habitats would be expected to occur as a result of an expansion of the existing bulk product terminal under the No-Action Alternative.

Growth in the region would continue, which would allow continued operation of the coal export terminal and the adjacent bulk terminal site within the 20-year analysis period (2018 to 2038). New construction, demolition, or related activities to expand the bulk product terminal could occur on previously developed upland portions of the project area. This could affect upland areas and terrestrial habitats that provide suitable wildlife habitat. The specific extent cannot be determined at this time.

Cleanup activities, relative to past industrial uses, would continue to occur. These could affect developed areas and associated disturbed upland habitats. Vessel traffic would continue and any aquatic wildlife disturbance or injury associated with vessel movements would continue at levels similar to current conditions.

4.8.6 Required Permits

The Proposed Action would require the following permits for wildlife.

- **Endangered Species Act Consultation—U.S. Fish and Wildlife Service and National Marine Fisheries Service.** The Proposed Action could affect wildlife species or designated critical habitats protected under the ESA. In accordance with Section 7(a)(2) of the ESA, as amended, any action that requires federal authorization or funding, or is carried out by a federal agency, must undergo consultation with the USFWS and/or NMFS to ensure the action is not likely to jeopardize the continued existence of any listed threatened or endangered animal species or result in the destruction or adverse modification of designated critical habitat.
- **Clean Water Act Authorization, Section 404—U.S. Army Corps of Engineers.** Construction and operation of the Proposed Action would affect waters of the United States, including wetlands. Because impacts would exceed 0.5 acre, Individual Authorization from the Corps under Section 404 of the Clean Water Act and appropriate compensatory mitigation for the acres and functions of the impacted wetlands would be required.
- **Clean Water Act, Section 401 Water Quality Certification—Washington State Department of Ecology.** The Proposed Action would result in the construction and operation of a facility that would discharge into the navigable waters and would require a Clean Water Act, Section 401 water quality certification. This certification is administered by Ecology. The dredged materials management plan requires site-specific sediment sampling to characterize sediments and determination of suitability of dredged material for disposal.
- **Local Critical Areas and Construction Permits—Cowlitz County.** The Proposed Action would require local permits related to clearing and grading of the project area and relative to impacts on regulated critical areas. Cowlitz County would issue a fill and grade permit, and would review the Proposed Action for consistency with the County's critical areas ordinance.
- **Hydraulic Project Approval—Washington Department of Fish and Wildlife.** The Proposed Action would require a hydraulic project approval from WDFW because project elements would affect and cross the shoreline of the Columbia River.

The following were identified by the Applicant as measures that would be implemented during construction and/or operations. These measures are assumed conditions or requirements of permits identified above that would be issued for the project, and thus are described here.

The following measures were considered when evaluating the potential impacts of the project.

- While the Applicant would plan to limit construction for an 8- to 10-hour day, 5 days per week, on occasion, dredging may occur 7 days per week to complete work within specific fish windows.
- The Applicant would limit the impact of turbidity to a defined mixing zone and would otherwise comply with WAC 173-201A.
- The Applicant would not stockpile dredged material on the river bottom surface.

- The Applicant would contain all dredged material in a barge prior to flow lane disposal; dredged material would not be stockpiled on the riverbed.
- During hydraulic dredging, the Applicant would not operate the hydraulic pumps unless the dredge intake is within 3 feet of the bottom.
- The Applicant would remove any floating oil, sheen, or debris within the work area as necessary to prevent loss of materials from the site. The contractor would be responsible for retrieval of any floating oil, sheen, or debris from the work area and any damages resulting from the loss.
- For material being transported to flow lane disposal sites, the Applicant would remove all debris (larger than 2 feet in any dimension) from the dredged sediment prior to disposal. Similar-sized debris floating in the dredging or disposal area would also be removed.
- The Applicant would dispose materials to the flow lane using a bottom-dump barge or hopper dredge. These systems release material below the surface, minimizing surface turbidity.
- The Applicant would limit all construction activities to daylight hours to ensure that construction noise levels would be controlled and within local and state noise limits.
- The Applicant would install and maintain a noise-monitoring station at an appropriate location on or near the site boundary to create 24-hours-per-day noise record during construction. The measurements would be recorded and monitored on a real-time basis, and the contractor would take actions to halt or alter construction activities that exceed noise levels.
- To reduce the sound along the rail line, the Applicant would work with the Longview Switching Company to convert both the Oregon Way and Industrial Way crossings to quiet crossings and would fund such improvements to the rail line as necessary to achieve this mitigation.
- The Applicant would plan construction for an 8- to 10-hour day, 5 days per week. On occasion, it may be necessary to work 6 or 7 days per week depending on the nature of the task. For example, dredging may occur 7 days per week to complete work within specific fish windows.
- The Applicant would use activity-specific work windows designed to minimize specific impact mechanisms that may affect individual species (or populations within those species) of concern. These proposed work windows would protect species of concern while providing feasible construction periods for the in-water portion of construction over a 2-year schedule.
- The Applicant would conduct impact pile-driving using a confined bubble curtain or similar sound attenuation system capable of achieving approximately 9 decibels of sound attenuation.
- Where possible, the Applicant would keep extraction equipment out of the water to avoid “pinching” pile below the water line in order to minimize creosote release during extraction.
- During pile removal and pile driving, the Applicant would place a containment boom around the perimeter of the work area to capture wood debris and other materials released into the waters as a result of construction activities. The Applicant would collect all accumulated debris and dispose of it upland at an approved disposal site. The contractor would deploy absorbent pads should any sheen be observed.
- The Applicant would provide a containment basin on the work surface on the barge deck or pier for piles and any sediment removed during pulling.
- Upon removal from substrate, the Applicant would move the pile expeditiously from the water into the containment basin. The contractor would not shake, hose, strip, or scrape the pile, nor

leave it hanging to drip or any other action intended to clean or remove adhering material from the pile.

4.8.7 Proposed Mitigation Measures

This section describes the proposed mitigation measures that would reduce impacts related to wildlife from construction and operation of the Proposed Action. These mitigation measures would be implemented in addition to project design measures, best management practices, and compliance with environmental permits, plans, and authorizations that are assumed as part of the Proposed Action.

4.8.7.1 Applicant Mitigation

The Applicant would implement the following mitigation measures to mitigate impacts on wildlife.

MM FISH-2. Implement a “Soft-Start” Method during Pile-Driving.

To minimize underwater noise impacts on fish during pile driving, the Applicant will commence impact pile-driving using a “soft-start,” or other similar method. The “soft-start” method is a method of slowly building energy of the pile driver over the course of several pile strikes until full energy is reached. This “soft-start” method cues fish and wildlife to pile-driving commencing and allows them to move away from the pile-driving activity.

MM FISH-3. Monitor Pile-Driving and Dredging Activities for Distress to Fish and Wildlife.

To minimize the potential harm to marine mammals, diving birds, or fish, a professional biologist will observe the waters near pile-driving and dredging activities for signs of distress from fish and wildlife during these activities. If any of fish or wildlife species were to show signs of distress during pile driving, the biologist will issue a stop work order until the species are recovered, moved, or relocated from the area. The Applicant will immediately report any distressed fish or wildlife observed to the appropriate agencies (i.e., Washington Department of Fish and Wildlife, U.S. Fish and Wildlife Service, and National Marine Fisheries Service) and determine the appropriate course of action.

MM CDUST-1. Monitor and Reduce Coal Dust Emissions in the Project Area.

To address coal dust emissions, the Applicant will monitor coal dust during operation of the Proposed Action at locations approved by the Southwest Clean Air Agency (SWCAA). A method for measuring coal dust concentration and deposition will be defined by SWCAA. If coal dust levels exceed nuisance levels, as determined by SWCAA, the Applicant will take further action to reduce coal dust emissions. Potential locations to monitor coal dust concentration and deposition will be along the facility fence line in close proximity to the coal piles, where the rail line enters the facility and operation of the rotary dumper occurs, and at a location near the closest residences to the project area, if agreed to by the property owner(s). The Applicant will conduct monthly reviews of the concentration and deposition data and maintain a record of data for at least 5 years after full operations, unless otherwise determined by SWCAA. If measured concentrations exceed particulate matter (PM) air quality standards, the Applicant will report this information to SWCAA, Cowlitz County and Ecology. The Applicant will gather 1 year of fence line data on PM2.5 and PM10 prior to beginning operations and maintain the data as reference. This data will be reported to the SWCAA, Cowlitz County, and Ecology.

MM CDUST-3. Reduce Coal Dust Emissions from Rail Cars.

To address coal dust emissions, the Applicant will not receive coal trains unless surfactant has been applied at the BNSF Railway Company (BNSF) surfactant facility in Pasco, Washington for BNSF trains traveling through Pasco. While other measures to control emissions are allowed by BNSF, those measures were not analyzed in this EIS and would require additional environmental review. For trains that will not have surfactant applied at the BNSF surfactant facility in Pasco, before beginning operations, the Applicant will work with rail companies to implement advanced technology for application of surfactants along the rail routes for Proposed Action-related trains.

MM-WQ-2. Develop and Implement a Coal Spill Containment and Cleanup Plan

To limit the exposure of spilled coal to the terrestrial, aquatic, and built environments during coal handling, the Applicant will develop a containment and cleanup plan. The plan will be reviewed by Cowlitz County and Ecology and implemented prior to beginning export terminal operations. In the event of a coal spill in the aquatic environment by the Applicant during export terminal operations, action will be taken based on the specific coal spill, and the Applicant will develop a cleanup and monitoring plan consistent with the approved containment and cleanup plan. This plan will include water quality and sediment monitoring to determine the potential impact of the coal spill on the aquatic habitat and aquatic species. The Applicant will develop the cleanup and monitoring plan in coordination with Cowlitz County, Ecology, and the Corps. The cleanup and monitoring will be similar in scope to the monitoring completed for the Aquatic Impact Assessment (Borealis 2015) associated with a coal spill in British Columbia, Canada in 2014.

4.8.7.2 Other Measures to Be Considered

The co-lead agencies recommend BNSF identify and monitor wildlife-train collision and migration barrier hotspots along the rail corridors to determine whether current and projected levels of rail traffic would result in levels of mortality or migration barrier effects that could measurably affect the status of local wildlife populations. If levels of collision mortality and delays to wildlife movement are determined to have a measurable effect on the status of local wildlife populations, suitable wildlife crossing structures and other measures, such as fencing, should be considered as appropriate. BNSF should consult with WDFW and USFWS in designing approaches to identify and monitor hotspots and in identifying suitable crossing structures and other measures.

4.8.8 Unavoidable and Significant Adverse Environmental Impacts

Compliance with laws and implementation of the voluntary measures and mitigation measures described above would reduce impacts on wildlife. There would be no unavoidable and significant adverse environmental impacts.