Appendix H. Draft Habitat, Fish, and Wildlife Report

DRAFT Habitat, Fish, and Wildlife Report

Cascade Renewable Transmission

Skamania County, WA
December 31, 2024

Contents

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Acronyms

Acronyms used more than once in the report text.

AC	alternating current
BGEPA	Bald and Golden Eagle Protection Act
BPA	Bonneville Power Administration
CFR	Code of Federal Regulations
DPS	distinct population segment
Ecology	Washington State Department of Ecology
ESU	evolutionarily significant unit
FMO	foraging, migration, and overwintering
FWHCA	fish and wildlife habitat conservation area
GPS	global positioning system
HDD	horizontal directional drilling
HDR	HDR Engineering, Inc.
HVAC	high-voltage alternating current
HVDC	high-voltage direct current
kV	kilovolt
LCR	Lower Columbia River
MBTA	Migratory Bird Treaty Act
MCR	Middle Columbia River
NHD	National Hydrography Dataset
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
NWI	National Wetland Inventory
ODFW	Oregon Department of Fish and Wildlife
OHWM	ordinary high-water mark
PBF	physical and biological features
PGE	Portland General Electric
RCW	Revised Code of Washington
RM	river mile
ROW	right-of-way
SR 14	Washington State Route 14
UCR	Upper Columbia River
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFS	United States Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WAC	Washington Administrative Code
WA EFSEC	Washington Energy Facility Site Evaluation Council
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington Department of Natural Resources
WRIA	Water Resource Inventory Area
WSDOT	Washington State Department of Transportation

1 Introduction

The proposed Project is a roughly 95-mile 320-kilovolt (kV)/1,100-megawatt (MW) high-voltage direct current (HVDC) electric transmission cable interconnecting the existing Bonneville Power Administration (BPA) Big Eddy 500-kV alternating current (AC) substation located near The Dalles, Oregon, and the existing Portland General Electric (PGE) Harborton 230-kV AC substation located in Portland, Oregon (Figure 1 of Appendix B of the WA EFSEC site application).

As described in Section 1.1 of the Cascade Renewable Transmission Washington Energy Facility Site Evaluation Council (WA EFSEC) Application for Site Certification, most of the cable alignment throughout the length of the entire Project would be installed in the bed of the Columbia River. In Oregon, two converter stations would be constructed, and the cable would be installed landward of the river in The Dalles and Portland. This report presents the existing conditions for fish, wildlife, and habitat for the WA EFSEC site application and is focused on the portion of the Project that is located in Washington, where the buried cable would be routed on land to bypass Bonneville Dam. Findings of the wetland delineations completed on land in Washington are presented in the *Wetlands and Waters Delineation Report* (included as Appendix G of the WA EFSEC site application).

To bypass the dam, locks, juvenile fish passage, and tribal fishing areas at the Bonneville Lock and Dam, the HVDC cable bundle would be brought on land in Washington east of the dam complex, buried primarily within the existing road prism on the Washington side of the Columbia River for approximately 7.5 miles, then re-enter the river west of the dam complex.

1.1 Project Overview

At the eastern end of the Project, a converter station is proposed near the Big Eddy substation with approximately 500 feet of overhead, (500-kV) high-voltage alternating current (HVAC) transmission line to connect the converter station to the substation. From the converter station, the transmission cables would be bundled with associated fiber optic communications cable (cable bundle) in underground conduits to the edge of the Columbia River. The cable bundle would be buried in the bed of the Columbia River in Oregon and Washington from roughly The Dalles to Portland.

To bypass the dam, locks, juvenile fish passage, and tribal fishing areas at the Bonneville Lock and Dam, the HVDC cable bundle would be brought on land in Washington east of the dam complex, buried underground on the Washington side of the Columbia River for approximately 7.5 miles, then re-enter the river west of the dam complex.

To transition the cable bundle from the Columbia River to the landward portion of the proposed alignment through Washington State, a temporary three-sided, wet cofferdam would be placed in the river. From the wet cofferdam, the cable bundle would be installed via horizontal directional drilling (HDD) methods under the riverbed, shorelands, a rail line, and Washington State Route 14 (SR 14) near Stevenson, Washington. Two landing site alternatives, approximately 0.9 acres or 1.4 acres, are proposed for HDD landing and equipment staging (Figure 1, Page 33 of Appendix B of the WA EFSEC site application). From the landing site, the cable bundle would be buried in a trench in the westbound travel lane of SR 14 for approximately 0.6 miles until diverted to Ash Lake Road. The cable would be buried in Ash Lake Road for the entire length, roughly 1.8 miles, and then down to

SR 14 for 3.3 miles. The proposed alignment diverts from SR 14 to the south and onto Dam Access Road (0.1 miles) and continues down to the Columbia River for 1.7 miles along Ft. Cascades Drive. The cable would follow Ft. Cascades Drive until the landing site proposed within the parking area at Hamilton Island Recreation Area. From this landing site, the cable would be placed back in the Columbia River using HDD methods, avoiding the shorelands. Conduit for the subsequent pull-through installation of the HVDC cable into the river would be installed using HDD for approximately 1,100 feet into Columbia River. Another temporary three-sided, wet cofferdam would be established in the river below the Bonneville Lock and Dam to transition from HDD to jet plow methods to bury the cable in the Columbia River. The cable would remain in the river until the next landing site located in Portland, Oregon.

The trench for underground HVDC transmission cable would be approximately 2.5 feet wide by 4.5 feet deep. Within the trench, two 8-inch conduits side by side and one 4-inch fiber optic conduit on top (cable bundle) would be placed within a 6-inch concrete casing. HDD would be used to transition the in-river cables to land, avoiding any shorelands. To cross highways, railroads, or sensitive areas, the transmission line would be placed with HDD. Based on preliminary design, the proposed trench and associated work area would be approximately 12 feet wide and would generally follow the westbound travel lanes of SR 14, Ash Lake Road, Dam Access Road and Ft. Cascades Drive. At these locations, the work area would be restricted to the paved surface of the roadway and would not affect roadway shoulders.

In Portland, the cable would exit the Columbia River north of Hayden Island, be placed beneath the Oregon Slough riverbed via HDD, and landfall near Terminal 6 at the Port of Portland. The western converter station in Portland would be connected to the existing Harborton substation with three-phase, 230-kV transmission cable, installed in a trench in road rights-of-way (ROWs) to the edge of the Willamette River, and approximately 0.5 miles of transmission cable underneath the bed of the Willamette River using HDD.

1.2 Regional Setting

The proposed Project lies within the Cascades (4) level III ecoregion and the Western Cascades Lowlands and Valleys (4a) level IV ecoregion (EPA 2016). The Cascades ecoregion is primarily characterized by mountains underlain by volcanic rock shaped by alpine glaciations. The major landforms within the survey area and surrounding landscape include steep ridges generally less than 3,200 feet in elevation associated with the Cascades Mountain Range, and the relatively narrow Columbia River valley. The climate is wet (60-90 mean annual inches of precipitation) and mild (mean temperature 31-78 degrees Fahrenheit [°F]), promoting coniferous forests comprised mainly of Douglas fir (*Pseudotsuga menziesii*), western hemlock (*Tsuga heterophylla*), western red cedar (*Thuja plicata*), red alder (*Alnus rubra*) and vine maple (*Acer circinatum*) (Thorson et al. 2003).

The Project study area is within Land Resource Region (LRR) A – Northwest Forest, Forage, and Specialty Crop (USDA NRCS 2022). Forest, recreation, and timber production are the main industries in the region. General land uses within and immediately adjacent to the study area include roadway ROW, urban development, utility infrastructure, state, federal and privately held lands, and recreation areas associated with the Columbia River.

The study area is within the Middle Columbia-Hood watershed (Hydrologic Unit Code 17070105) and Washington Water Resource Inventory Areas (WRIA) 28 Salmon-Washougal and 29 Wind-White Salmon.

1.3 Project Study Area

The Project study area in Washington State occurs in Skamania County, in the cities of North Bonneville and Stevenson, and within roadway ROW maintained by the Washington State Department of Transportation (WSDOT) and Skamania County. In general, vegetation and habitats were surveyed within at least 25 feet on either side of the proposed alignment to encompass the project footprint for cable installation. Observations extended farther than 25 feet where ROW and permissions to enter were granted. The survey was restricted to visual field observations in the terrestrial portion of the study area.

2 Methods

This section describes the methodologies HDR biologists used to survey the study area, including a desktop review and field investigations. Environmental resources within the Project and surrounding area were examined through a search of existing publicly available data and an initial reconnaissance-level site visit. This site visit was used to verify general habitat features from the desktop and geographic information system (GIS) map review, as well as document stream crossings and other features that intersect the project corridor. Photographs of the Project area are presented in Attachment A.

2.1 Desktop Review

HDR biologists first completed a review of exiting literature, maps, and other materials from federal, state, and local regulatory resources. The following sources of information were reviewed to support the analysis of fish, wildlife, and vegetation in the study area:

- Aerial photography of the project corridor
- National Marine Fisheries Service (NMFS) Endangered Species Act (ESA) status reviews and listing information
- NMFS West Coast Region species and habitat web map (NMFS 2024a)
- NMFS Essential Fish Habitat web map (NMFS 2024b)
- USFWS Threatened and Endangered Species Critical Habitat Report online mapper (USFWS 2024a)
- USFWS Information for Planning and Conservation (IPaC) report online (USFWS 2024c)
- Statewide Integrated Fish Distribution (SWIFD) data (NWIFC 2024)
- Washington Department of Fish and Wildlife (WDFW) Priority Habitats and Species (PHS) online data (WDFW 2024a)
- WDFW SalmonScape web application (WDFW 2024b)
- WDFW Fish Passage Inventory (WDFW 2024c)
- eBird Northwest (Cornell Laboratory of Ornithology) (eBird 2024)
- WSDOT Habitat Connectivity Investment Priorities Web Map (WSDOT 2024b)

- WSDOT CED Web Map (WSDOT 2024c)
- Washington State GIS (Geographic Information System) Workbench Pollinator Habitat Rankings data layer
- Washington Department of Natural Resources (WDNR) Natural Heritage Program (NHP) Data Explorer (WDNR 2024a)
- Skamania County Noxious Weed List (Skamania County 2024)

2.2 Field Surveys

Wildlife and vegetation surveys were conducted to identify important habitats (e.g., riparian areas, tidal marshes, and woodlands, as well as other areas with which ESA-listed or state-listed species have primary association). Biologists conducted the field investigations mainly by walking the study area within public ROW, and other legally accessible portions of the study area, and documented vegetation communities, evidence of wildlife presence, and potential habitat for ESA-listed species and species of concern.

Field surveys were conducted to document flora and fauna in the vicinity of the project sites, as well as different vegetation communities and habitat. Visual observations were recorded beyond the project corridor where the viewshed from the ROW allowed and included incidental wildlife observations and habitat data. A Trimble DA2 global positioning system (GPS) unit capable of submeter accuracy was used by the biologist field team to assist in identifying the site boundaries and to record site spatial data. Photographs were taken and wildlife observations and vegetation characteristics were documented. The spatial location of some features observed outside of project sites were approximated using field observations and aerial imagery to determine their extent. GIS software was used to analyze data and to produce the habitat map figures in Attachment B.

2.2.1 Wildlife and Vegetation

Surveys for locating or enumerating individual animals or plants were not part of this effort. Field surveys focused on ground-truthing forest habitat from the desktop analysis described above and include incidental observations for species and sign, including nests, burrows, etc. Accessible portions of WDFW priority habitat areas and WDNR high-quality ecosystems in the study area were also visited.

2.2.2 Raptor and Nest Surveys

Reconnaissance level raptor nest surveys were conducted concurrently with the pedestrian wildlife surveys. These surveys were conducted from the ground, including views from public roads outside the Project Boundary in order to gain vantage points on as much of the study area as possible. Occupancy of nests were documented based on observations at the time of the survey and follow-up pre-construction visits may need to be conducted in order to confirm these results, as feasible. In some cases, non-occupancy may not be definitively confirmed, and these nests are conservatively considered occupied for the purposes of assessing potential project impacts.

All special-status wildlife species and uncommon species observed while biologists were conducting surveys were recorded as part of baseline habitat surveys. Observations of general wildlife encounters, including the sighting of individuals, scat, nests, etc., were recorded whenever observed

during habitat surveys and while in-transit to survey locations along the corridor. No surveys were conducted specifically for wildlife species, including raptors, small mammal, or ungulates (i.e., deer and elk).

2.2.3 Waterbodies

HDR biologists conducting the wetland and waters investigations (see *Wetlands and Waters Delineation Report*) identified the ordinary high-water mark (OHWM) and bankfull width on non-tidal waterbodies in the survey area using Ecology's (Anderson et al. 2016) guidance for OHWM identification, which is based on the Shoreline Management Act (Revised Code of Washington [RCW] 90.58.030(2)(c)) and Washington Administrative Code [WAC] 173-22-030(5)). Biologists looked for physical indicators, including, but not limited to, a natural scour line impressed on the bank, distribution of upland and water tolerant vegetation, and drift deposits.

HDR biologists conducting the fish wildlife and vegetation surveys also observed the streams that crossed the project corridor in the context of providing fish habitat and connectivity to the Columbia River.

3 Results

3.1 Landcover and Habitats

HDR mapped habitats within the study area based on surveys conducted on April 20, 2023, and May 30 and 31, 2024, as well as desktop review using National Land Cover Database (NLCD) data (USGS 2024). Figure H-1 (Attachment B) shows the landcover categories mapped in the study area. Habitat types were also adapted from habitat descriptions in Wildlife-Habitat Relationships in Oregon and Washington (Johnson and O'Neil 2001). Surveys conducted in 2023 and 2024 verified land cover types that were mapped by the NLCD and the National Wetland Inventory (NWI) (USFWS 2024) within the majority of the study area. The initial survey in 2023 was a reconnaissance level pedestrian survey conducted from accessible public roads within the study area. Surveys in 2024 were more detailed and mapped observations of vegetation and species on properties outside of public ROW where obtained permissions allowed. The survey area, which is primarily within existing roadway ROW, was almost entirely void of vegetation except for sparce ruderal plant species growing on the road shoulder. The survey area was investigated against the NLCD, which was verified as Developed open space and low-to-high intensity ground cover for existing state and county roads. The study area that extends outside of the road ROW, which includes the landing site, contained vegetation that includes developed open space, mixed forest, woody wetland, and grassland herbaceous and baren land (rock, sand, clay).

To assist in mapping habitat types, the biologists collected GPS points in dominant habitats and changes in habitat type encountered. Dominant plant species and other habitat characteristics observed at these habitat points were recorded to accurately classify and describe habitat types. In addition, the biologists scanned the adjacent landscape from vantage points that allowed views across the landscape to help map habitat boundaries. Habitat boundaries were digitized using ArcGIS software following the field surveys.

Table 3-1: Habitat Types and Subtypes in the Study Area

Habitat Type	Area (acres)	Percent of Study Area
Agriculture, Pastures, and Mixed Environs	14.4	0.8
Developed/Disturbed	604.8	32.9
Barren Land	23.8	1.3
Deciduous Forest	54.5	3
Evergreen Forest	677.1	36.9
Mixed Forest	102.3	5.6
Grassland / Herbaceous	93.4	5.1
Shrub / Scrub	150.5	8.2
Wetlands	113.2	6.2

3.1.1 Agriculture, Pastures, and Mixed Environs

Agricultural land consists of areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, typically on a perennial cycle (USGS 2024). This land cover is represented in the study area by open grassy areas south of the town of North Bonneville (Attachment A, photo 2). Unimproved pastures are predominantly grassland sites that may or may not be grazed by livestock. Unimproved pastures include rangelands planted to exotic grasses that are found on private land, state wildlife areas, and federal wildlife refuges. These areas provide habitat for many wildlife species including small mammals and insects.

3.1.2 Developed/Disturbed

Developed/disturbed areas include the existing roads (SR-14, Ash Lake Road, Fort Cascades Drive), and open space associated with the Burlington Northern Railroad and the Columbia Gorge Museum (Attachment A, photos 6 and 12). The majority of these areas are impervious soils or open cleared spaces with minimal vegetation growth. Vegetation that occurs within these areas are primarily ruderal species (i.e., species that colonize or thrive in disturbed areas).

Developed land cover in the study area accounts for the second largest component behind evergreen forest. Much of the Project corridor is routed through existing developed areas, primarily roads and roadside gravel areas that offer little to no habitat value to wildlife species. These areas generally lack wildlife habitat features and are a risk to wildlife. Developed unvegetated surfaces without vehicle or foot traffic (e.g., roofs) may have some habitat value because structures may provide cover, perch, and even nesting opportunities.

3.1.3 Barren Land

Baren land is defined as areas of bedrock, desert pavement, scarps, talus, slides, volcanic material, glacial debris, sand dunes, strip mines, gravel pits and other accumulations of earthen material. Generally, vegetation accounts for less than 15% of total cover (USGS 2024). Barren land cover in the study area is the extensive shoreline armoring along the bank of the Columbia River along the tailrace downstream of Bonneville Dam as well as the shoreline banks of the islands that are part of the dam facility. This armoring consists of rock and rip rap, is almost entirely unvegetated, and provides little to no habitat value for wildlife and poorly functioning stream bank habitat for fish. These areas are in the study area but located outside the footprint of the project for trenching and cable installation.

3.1.4 Deciduous Forest

Deciduous forest is defined as areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75% of the tree species shed foliage simultaneously in response to seasonal change (USGS 2024). Patches of deciduous forest in the study area occur in riparian areas along Ash Lake Road, as well as larger areas in the western end of the study area on Hamilton Island and Ives Island (Attachment A, photos 4 and 11). These areas are outside the Project footprint for the trenching and cable installation.

3.1.5 Evergreen Forest

Evergreen forest includes areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75% of the tree species maintain their leaves all year (USGS 2024). Evergreen and mixed forest land cover accounts for the largest portion of landcover adjacent to the project footprint (Attachment A, photos 7 and 9). The project is designed to be installed within existing cleared areas and road prism along the cable route to avoid impacts to forested, riparian, and wetland habitats in the area surrounding the project.

3.1.6 Mixed Forest

Mixed forest is defined as areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. Neither deciduous nor evergreen species are greater than 75% of total tree cover (USGS 2024). Similar to the distribution of deciduous forest, patches of deciduous forest in the study area occur in riparian areas along Ash Lake Road, as well as larger areas in the western end of the study area southeast of North Bonneville, on Hamilton Island, and Ives Island (Attachment A, photos 4 and 8). These areas are outside the Project footprint for the trenching and cable installation.

3.1.7 Grassland/Herbaceous

Grassland and herbaceous vegetation communities include uncultivated areas dominated by gramanoid or herbaceous vegetation, generally accounting for greater than 80% of total vegetation cover (USGS 2024). Areas mapped as grassland include the areas surrounding the Hamilton Island Recreation Area (Attachment A, photos 2 and 3).

This landcover also includes areas along roadways that are maintained for vehicular safety and are regularly mowed. These areas are disturbed regularly with maintenance actions, herbicide application, roadway noise, and pollution. These areas are dominated by nonnative grasses and forbs with scattered scotch broom and blackberry. There is limited habitat structure, and the periodic maintenance causes high disturbance. These areas may provide some browsing habitat for herbivores such as deer, rabbits, and rodents, and some limited foraging habitat for birds.

3.1.8 Shrub/Scrub

Landcover classified as shrub/scrub includes areas dominated by shrubs less than 5 meters tall with shrub canopy typically greater than 20% of total vegetation (USGS 2024). This class includes true shrubs, young trees in an early successional stage, or trees stunted from environmental conditions. Shrubland habitat includes areas where the shrub components account for 5 percent or more of the vegetation cover.

Invasive shrubs dominate some areas, including dense Himalayan blackberry and Scotch broom, often with nonnative herbaceous layer. These areas may be part of the maintained ROW, but invasive shrubs persist. There is low habitat structure and the amount of disturbance is high, making these areas low value habitats for wildlife, although they may provide some cover for small mammals and nesting habitat for birds. Shrubland habitat includes areas on Hamilton Island as well as islands and roadside areas near Bonneville Dam.

3.2 WDFW Priority Habitats

The PHS List, maintained by WDFW, is a catalog of habitats and species considered to be priorities for conservation and management. Priority habitats are habitat types or elements with unique or significant value to a diverse assemblage of species. The PHS online database identified Oak woodlands in the area southeast of the town of North Bonneville near the western end of the study area. In conjunction with other forest types, oak woodlands provide a mix of feeding, resting, and breeding habitat for many wildlife species.

In addition to the federally-listed species, WDFW PHS data documents the occurrence of several priority species that have been documented to occur in and near the study area. These include Pacific lamprey (*Entosphenus tridentatus*), sagebrush sparrow (*Artemisiospiza nevadensis*), western grebe (*Aechmophorus occidentalis*), and the Pacific clubtail dragonfly (*Phanogomphus kurilis*) (WDFW 2024a). Waterfowl concentrations area also noted for Ashes Lake and Rock Creek Cove (see Section 3.3.2 below).

The field investigations were completed generally from west to east along the proposed Project alignment. Results and maps are arranged to begin at Hamilton Island Recreation Area downstream of Bonneville Lock and Dam and end in the City of Stevenson. General observations of the survey area included:

- Variable topography characteristic of foothills in the Cascade Mountains.
- Much of the study area consisted of disturbed habitats including roadsides.
- Hydrology predominantly drained southward toward the Columbia River.
- Roadways effectively impounded and/or concentrated hydrology within the survey area along the north side of the proposed alignment.

Due to an unavoidable georeferencing error, figures may show the proposed Project alignment outside roadway surfaces in some areas; however, the majority of Project activities would remain within paved areas of SR 14, Ash Lake Road, Dam Access Road and Ft. Cascades Drive, and would avoid nearly all wetlands, waters and associated buffers within the survey area.

3.3 Rare and Special Status Plants

HDR conducted a desktop analysis of to create a list of special status plant species with the potential to occur within the study area. Special Status Plants include species listed under the federal ESA (16 U.S.C §1531 et seq.) or state-listed endangered, threatened, candidate, or sensitive vascular plant species as defined by Washington Natural Heritage Program (WNHP). Specific sources of information that were reviewed include:

- USFWS species lists for Skamania County (USFWS 2024a);

- List of Known Occurrences of Rare Plants in Washington by County (WNHP 2024b);
- WNHP Element Occurrences database (WNHP 2024c)
- Washington Vascular Plant Species of Special Concern (WHNP 2019); and
- Field Guide to the Rare Plants of Washington (WNHP 2020d)

Based on the background review, the WNPH Data Explorer Identifies an occurrence of western ladies-tresses (*Spiranthes porrifolia*), a state sensitive species, occurring near [redacted] and in the [redacted]. This observation was made in 1993, and HDR biologists did not observe any individuals growing within the study area. The WNHP (2024) data also includes observations from 2019 of Columbia yellowcress (*Rorippa columbiae*), a state threatened species, located in the [redacted].

The majority of the Project Corridor is located along paved roadways within disturbed ROW. Special status plant surveys were conducted in May and June 2024, concurrently with the habitat verification and mapping surveys. No special status plant species were observed during these surveys.

3.3.1 Noxious weeds

Noxious weed observations were noted concurrently with habitat verification and mapping and special status plant surveys. Surveys conducted in 2024 did not cover the entire Project study area but focused on the ground disturbed area in the project corridor; therefore, other state- and/or county-designated noxious weeds may also occur within the wider study area. Table 3-2 lists the noxious weeds documented in the study area and notes if observed during habitat surveys.

Table 3-2. Documented occurrences of noxious weeds in the Project corridor and vicinity.

Species	Habitat[1]	Class[2]
Bull Thistle *Cirsium vulgare*	Disturbed pastures, hayfields, roadsides, prairies, and ditch banks, as well as logged mountainous areas. Potentially roadside of Fort Cascades Drive and along SR-14.	C
Canada Thistle *Cirsium arvense*	Common in pastures, croplands, disturbed prairies and dunes, as well as wet areas with changing water levels such as stream banks, sedge meadows, and wet prairies. Potentially roadside of Fort Cascades Drive and in wet ditches along SR-14.	C
Common Catsear *Hypochaeris radicata*	Disturbed areas, lawns, roadsides, pastures, waste areas, gardens, and seed fields. Roadside of Fort Cascades Drive and SR-14.	C
Common Reed *Phragmites australis*	Wet areas such roadside ditches, depressions, and wetlands. Potentially present along roadside ditches of Fort Cascade Drive, SR-14, and Ash Lake Road.	B
Common Tansy *Tanacetum vulgare*	Roadsides, waste areas, streambanks, and in pastures. Potentially present along the roadside of Fort Cascade Drive and SR-14.	B
Common Teasel *Dipsacus fullonum*	Open, sunny habitats. Garden areas, riparian edges, abandoned fields, agricultural areas, fallow fields, pasture lands, and disturbed areas. Potentially present along the roadside of Fort Cascade Drive and open roadside of SR-14.	C
Dalmatian Toadflax *Linaria dalmatica ssp. dalmatica*	Roadsides, pastures, rangelands, and waste areas. Roadside of SR-14.	B
Diffuse Knapweed *Centaurea diffusa*	River shores, rangeland, pastures, as well as disturbed habitats such as trails, roadsides, railroad tracks, and vacant lots. Potentially present along roadside of Fort Cascade Drive and SR-14.	B

Species	Habitat[1]	Class[2]
False Brome *Brachypodium sylvaticum*	Forests, forest edges, woodlands, riparian areas, prairies, and roadsides. Potentially present along roadside ditches of Fort Cascade Drive, SR-14, and Ash Lake Road.	A
Garlic Mustard *Alliaria petiolata*	Forested understory areas including urban parks, roadsides, trails, streambanks, fields, slopes and floodplains. Along roadsides and slopes of Ash Lake Road and SR-14.	A
Herb-Robert *Geranium robertianum*	Moist forests with canopy closure and on dry rocky outcrops. Potentially present along shaded, forested areas of Ash Lake Road.	B
Himalayan Blackberry *Rubus armeniacus*	Disturbed sites such as roadsides, railroad tracks, logged lands, field margins, and riparian areas. Dominant weed along roadside of Ash Lake Road. Also present along SR-14.	C
Oxeye Daisy *Leucanthemum vulgare*	Grasslands, overgrazed pastures, waste areas, meadows, and roadsides. Present along roadside of Fort Cascades Drive and SR-14.	C
Poison Hemlock *Conium maculatum*	Roadsides, field margins, ditches, marshes, meadows, and low-lying areas. Along roadside and ditches of Fort Cascades Drive and SR-14.	B
Reed Canarygrass *Phalaris arundinacea*	Roadside ditches, river dikes, shallow marshes, wetlands and meadows. Along roadside ditches of Fort Cascades Drive, SR-14, and Ash Lake Road.	C
Rush Skeletonweed *Chondrilla juncea*	Pastures, rangeland, cropland, roadsides, open and disturbed areas. Potentially along open roadside of Fort Cascades Drive and SR-14.	B
Scotch Broom *Cytisus scoparius*	Roadsides, pastures, grasslands, open areas, and disturbed areas. Along the open roadside of Fort Cascades Drive and SR-14.	B
Shiny Geranium *Geranium lucidum*	Well-shaded woodlands and forest openings, as well as in full to partial sun. Along forested areas of Ash Lake Road.	B
Spotted Knapweed *Centaurea stoebe*	Dry meadows, pastures, rocky areas, hayfields, forest clearings, and disturbed sites, such as roadsides, railroads, airports, and vacant lots. Also grows on sandy or gravelly floodplains of streams and rivers. Roadside of Fort Cascades Drive and SR-14.	B
Spurge Laurel *Daphne laureola*	Forest understories, forest edges, and disturbed sites. such as roadsides and waste lots. Along forested roadside of SR-14, near intersection with Ash Lake Road.	B
Tansy Ragwort *Jacobaea vulgaris*	Open, disturbed areas such as roadsides, pastures, fields, and cleared forested areas. Open roadside of Fort Cascades Drive and SR-14.	B
Tree-of-Heaven *Ailanthus altissima*	Grows in a variety of habitats. Forest edges, woodlands, fence rows, roadsides, old fields, and urban parks. Forest edge and roadside of Ash Lake Road.	C
Ventenata *Ventenata dubia*	Dry, open, and often disturbed habitats, but prefers sites that are inundated in early spring and dried out by late spring. Potentially present on open roadsides of Fort Cascades Drive and SR-14.	C
Wild Carrot *Daucus carota*	Meadows, pastures, roadsides, and waste areas. Potentially present on roadsides of Fort Cascades Drive and SR-14.	C
Wild Chervil *Anthriscus sylvestris*	Roadsides, pastures, forest edges, and waste areas. Potentially present on roadsides of Fort Cascades Drive and SR-14.	B
Yellow Archangel *Lamiastrum galeobdolon*	Sunny or shaded forested areas, greenbelts, and riparian areas. Along forested side of SR-14.	B

Species	Habitat[1]	Class[2]

1. Habitat descriptions from https://www.nwcb.wa.gov/ unless otherwise noted.
2. The Washington State Noxious Weed Control Board describes the classes as follows:
   Class "A" noxious weeds are non-native species that have a limited distribution within Washington State. The priority for these species are eradication of existing infestations and prevention of new ones.
   Class "B" noxious weeds are non-natives with a limited distribution to portions of the state. In areas where they are not located, prevention of new infestations is the primary goal. In areas where they are present, containment is the primary goal. Control of infestations is decided at the local level.
   Class "C" noxious weeds are non-natives that have a widespread distribution in the state or are of special interest to Washington's agricultural industry. Counties can enforce control or provide educational or technical support for eradication and control of weeds. (WSNWCB 2024b).
3. https://www.nps.gov/articles/poison-hemlock.htm
4. https://burkeherbarium.org/imagecollection/taxon.php?Taxon=Daphne+laureola

3.4 Wildlife

This section summarizes special status wildlife species known or expected to occur in the study area, other wildlife observed at the Project (based on baseline wildlife surveys conducted in the study area), and the presence of Fish and Wildlife Habitat Conservation Areas (FWHCA), which are considered Critical Areas under City of North Bonneville 21.10.070.E., Skamania County Code 19.05 FWHCA, and City of Stevenson 18.13.095. Sources of information for the desktop reviews and the results of Project-specific surveys are indicated in each subsection.

3.4.1 Raptor and Nest Surveys

The study area is located within the Pacific Flyway and therefore provides habitat for a variety of raptors, land birds, and shorebirds protected under the Migratory Bird Treaty Act (MBTA). The Columbia River is the largest river in the Pacific Northwest. It provides habitat and food for numerous migratory bird species, including bald eagles and the western grebe (*Aechmophorus occidentalis*) (NOAA 2004). No dedicated raptor nest surveys or other aerial surveys occurred as part of this effort; however, incidental observations of raptor or other bird nests in the ROW were recorded during field surveys.

Occupancy of nests were documented based on observations at the time of the survey, and follow-up visits may need to be conducted in order to confirm results as feasible.

A total of 4 adult bald eagles (*Haliaeetus leucocephalus*) and 1 juvenile bald eagle were observed during the field surveys. Two adults and one juvenile were observed flying near [redacted], and the other 2 adults were observed flying then perching in [redacted] (Figure H-2 in Attachment B).

The adults observed may have been mated pairs, but no bald eagle nests were observed during the surveys; however, habitat in the surrounding areas is suitable and some nesting is likely beyond the study areas observed.

Osprey (*Pandion haliaetus*) and occupied osprey nests were observed in areas alongside the Columbia River. During the pedestrian surveys, five active osprey nests were observed, and two other nests were recorded, but these appeared to be inactive (Figure H-2 in Attachment B)

3.4.2 Special Status Wildlife

For purposes of this assessment, the term "special status wildlife" includes species listed under the federal ESA, state endangered species (designated in WAC 220-610-010), state threatened species (designated in WAC 220-200-100), state sensitive species (designated in WAC 220-200-100), state candidate species (designated and reviewed by WDFW per WAC 220-610-010), WDFW priority species (WDFW 2008), and eagles (protected under the Bald and Golden Eagle Protection Act (BGEPA) and WAC 220-610-100 for bald eagles). Nearly all native bird species are protected under the MBTA and therefore these species are addressed under General Wildlife rather than Special Status Wildlife, unless the species are also otherwise designated special status (e.g., state threatened birds).

Project biologists reviewed the list of WDFW priority wildlife and other federally and locally protected species likely to be present in Skamania County and identified species that could be present based on the species' distributions and the habitat types present in the study area. These are listed in Table 3-3. WDFW PHS species documented in the study area include Pacific lamprey (*Entosphenus tridentatus*), sagebrush sparrow (*Artemisiospiza nevadensis*), western grebe (*Aechmophorus occidentalis*), and the Pacific clubtail dragonfly (*Phanogomphus kurilis*) (WDFW 2024a). Waterfowl concentrations area also noted for [redacted] and [redacted].

Table 3-3: WDFW Priority Wildlife Potentially Present in the Study Area

Species	Status	Potential Presence or Suitable Habitat
Amphibians		
Western toad (*Anaxyrus boreas*)	C	This species occurs in a variety of terrestrial habitats including prairies, forests, canyon grasslands and ponderosa pine-Oregon oak habitat. Breeding waters are usually permanent and include wetlands, ponds, lakes, reservoir coves, and the still-water off-channel habitats of rivers, as well as river edges.
Reptiles		
California mountain kingsnake (*Lampropeltis zonata*)	C	The California mountain kingsnake occurs in moist microhabitats in Oregon white oak-ponderosa pine forest, where individuals are usually found under woody debris and rocks. The Washington range is isolated and limited to the southernmost areas of eastern Skamania County and western Klickitat County.
Birds		
Common loon (*Gavia immer*)	S/Priority VA	In winter and during migration, common loons use inland lakes and rivers and marine and estuarine coastal waters. Breeding habitat includes usually clear lakes containing both shallow and deep-water areas. No breeding or nesting anticipated in the study area. The species has been observed in the [redacted] area and the [redacted] in the study area (eBird 2024).
Western grebe (*Aechmophorus occidentalis*)	C/Priority VA	Large freshwater lakes, reservoirs, and marshes are inhabited during the summer breeding season, whereas primarily coastal marine areas with relatively sheltered waters are used in winter. Both types of habitats are occupied during spring and fall migration. Nests are built in emergent vegetation with large areas of open water. The species has been observed in the [redacted] area and the [redacted] in the study area (eBird 2024).
Great blue heron (*Ardea herodias*)	Priority VA	Great blue herons are frequently sighted foraging along stream corridors and along ponds and the river shoreline within the study area (eBird 2024).

Species	Status	Potential Presence or Suitable Habitat
Bald eagle (*Haliaeetus leucocephalus*)	BGEPA	Suitable habitat (coastlines with large trees) is present throughout the study area. No active nest sites identified but bald eagles were observed flying and perching in conifers along the shoreline during field surveys.
Band-tailed pigeon (*Patagioenas fasciata*)	Priority RCTI	Band-tailed Pigeons nest primarily in conifers, occasionally in hardwoods and shrubs, within closed canopy conifer, or mixed hardwood and conifer forests. Food resources include berry- and nut producing trees and shrubs such as cascara, elderberry, wild cherry, huckleberry, and madrone.
Vaux's swift (*Chaetura vauxi*)	Priority VA	Suitable habitat (large hollow snags or live trees) is present in forested areas in the study area. eBird (2024) reports multiple observations of the species in the study area.
Slender-billed white-breasted nuthatch (*Sitta carolinensis aculeata*)	C	This subspecies inhabits oak and oak-conifer woodlands, and are commonly associated with Oregon white oak, as well as black cottonwood and Oregon ash. The slender-billed white-breasted nuthatch often uses naturally occurring cavities, including those made by woodpeckers, in living trees for roosting and nesting. The species has been observed in the [redacted] area and the [redacted] in the study area (eBird 2024).
Cavity nesting ducks (wood ducks, Barrows goldeneye, common goldeneye, bufflehead, and hooded merganser	Priority RCTI	All species commonly documented within the [redacted] and [redacted] in the study area (eBird 2024).
Invertebrates		
Pacific clubtail (*Phanogomphus kurilis*)	C	Pacific clubtail are found in large ponds and lakes in western Washington. Potentially present in study area. Documented in PHS data [redacted] and observed along shoreline armoring throughout study area.
Western bumblebee (*Bombas occidentalis*)	C	Relies on habitats with rich floral resources throughout the nesting season. Require above and below ground micro-sites for overwintering and nesting, including logs, stumps, and abandoned rodent and ground-nesting bird nests. Their habitats must also be protected from insecticides.
Mammals		
California sea lion (*Zalophus californianus*)	MMPA/Priority VA (haulouts)	Seasonally present below [redacted] foraging on returning adult salmon.
Steller sea lion (*Eumetopias jubatus*)	MMPA/Priority VA (haulouts)	Seasonally present below [redacted] foraging on returning adult salmon.
Harbor seal (*Phoca vitulina*)	MMPA/Priority VA (haulouts)	Seasonally present below [redacted] foraging on returning adult salmon.
Townsend's big-eared bat (*Corynorhinus townsendii*)	C/Priority VA	This species inhabits lowland conifer and deciduous forests, montane conifer forest, ponderosa pine forest and woodland, riparian forest, shrub-steppe, and open fields. Maternity and hibernation colonies typically are in caves, mine tunnels, and old buildings. Caves, tunnels, buildings and tree cavities are used as night roosts. Relatively cold places are preferred for hibernation, often near entrances and in well-ventilated areas. No mapped roosting sites in study area (WDFW 2024a)

Species	Status	Potential Presence or Suitable Habitat
Keen's myotis (*Myotis keenii*)	C/Priority VA	Keen's myotis is closely associated with low elevation, moist, mature coastal conifer forests during the active season and may move to hibernacula in mid-elevation caves for winter. Summer roosts are in tree cavities, snags, rock crevices, small caves, and buildings. The few documented maternity sites have been found in caves and trees. Males often roost in large trees or snags. Roost sites may be limiting in some parts of the range. Foraging occurs more frequently in mature and old growth forests than clearcuts or young forests; riparian areas are likely important foraging habitats.
Columbian black-tailed deer (*Odocoileus hemionus columbianus*)	Priority RCTI	Likely present in all terrestrial and riparian habitats in the project area including suburban development with available migration corridors.

Sources: WDFW 2015. WDFW 2024a, eBird 2024
Notes: State listing status: T=Threatened, E= Endangered C= Candidate, S=Sensitive, VA=Vulnerable Aggregations, RCTI=Species of Recreational, Commercial and/or Tribal Importance

The WDFW PHS online mapping data identified a total of two special status wildlife species that have the potential to occur within the study area. These species include the northwestern pond turtle (*Actinemys marmorata*) and the northern spotted owl (*Strix occidentalis caurina*). Neither species was observed within or near the study area, but both have the potential to occur in adjacent habitat. [redacted] areas were observed along the [redacted] that provide potential habitat for frogs and turtles, including the northwestern pond turtle (Attachment A, photo 13). The following sections describe the ESA-listed species with the potential to occur in the general Project vicinity and the likelihood of occurrence in the study area.

The bald eagle is a Federal Species of Concern, in addition to being BGEPA- and MBTA-protected. Eagles are habitat generalists, typically associated with aquatic habitats, preferring forested areas that surround fish-bearing lakes and rivers. The WDFW PHS mapper did not document any bald eagle occurrences or nests in the analysis areas, but eagles were observed during the field surveys.

Table 3-4 lists the special status species that were identified as potentially occurring in the Project Area following a review of the resources listed above. This list includes United States Forest Service (USFS) special status species due to the Project's location in the Columbia River Gorge National Scenic Area, These species were analyzed as part of desktop review and field surveys.

Table 3-4. Federal and State T&E Species that Potentially Occur in the Project Area

Species	ESA Status	WA State Status	USFS Status
Birds			
Northern Spotted Owl *Strix occidentalis caurina*	T	E	None
Streaked Horned Lark *Eremophila alpestris strigata*	T	E	None
Yellow-billed Cuckoo *Coccyzus americanus*	T	E	None
Bald Eagle *Haliaeetus leucocephalus*	None[a]	None	S
Golden Eagle *Aquila chrysaetos*	None[a]	C	None
Ferruginous Hawk *Buteo regalis*	None	E	S (WA)
Sandhill Crane *Grus canadensis*	None	E	None

Species	ESA Status	WA State Status	USFS Status
American White Pelican *Pelecanus erythrorhynchos*	None	T	None
Mammals			
Columbian white-tailed deer *Odocoileus virginianus leucurus*	T	E	None
Western Gray Squirrel *Sciurus griseus*	None	E	S (WA)
Reptiles and Amphibians			
Oregon Spotted Frog *Rana pretiosa*	T	E	None
Northern Leopard Frog *Rana pipiens*	None	E	None
Northwestern Pond Turtle *Actinemys marmorata*	PT	E	S
Invertebrates			
Monarch butterfly *Danaus plexippus*	PT	None	None
Mardon skipper *Polites mardon*	None	E	S
Vascular Plants			
Golden Paintbrush *Castilleja levisecta*	None	T	None
Nelson's Checker-mallow *Sidalcea nelsoniana*	None	E	None
Nonvascular Species			
Marginate Splashzone Moss *Scouleria marginata*	None	T	S (WA)
Burnet's Skin Lichen *Leptogium burnetiae*	None	E	Strategic

Note: C = candidate; E= endangered; S = sensitive; T= threatened; PT = proposed threatened.
[a] Protected under the Bald and Golden Eagle Protection Act

Several species were listed as potentially occurring in the region, but do not occur in the Project vicinity nor is suitable habitat present in the corridor; these species are listed in Table 3-5. These species and their habitats were not included in the surveys for this effort.

Table 3-5. Federal and State T&E Species That Potentially Occur in the Project Region but Do Not Occur or Have Suitable Habitat within the Project Corridor or Vicinity

Species	ESA Status	WA State Status	USFS Status	Notes
Wolverine *Gulo gulo*	T	C	S	Alpine habitats in Cascade mountains. Suitable habitat is not present in the Project area.
Cascade Red Fox *Vulpes vulpes cascadensis*	None	C	None	Alpine and subalpine habitats in the Cascade mountains. Suitable habitat is not present in the Project area.
Gray Wolf *Canis lupus*	E[a]	E	S	Wide ranging individuals in Cascade Range in the central and northern part of the state. Not present in the Project area.

Note: C = candidate; E= endangered; PT = proposed threatened; S = sensitive; T= threatened (USFS).

[a] Although gray wolves throughout the Lower 48 states were delisted in January 2021 (85 *Federal Register* 69778), the IPaC list obtained for the Project (USFWS 2022b) indicated that gray wolves in the Project vicinity are endangered. On February 10, 2022, a U.S. District court restored ESA protections for gray wolves in certain areas of the country, including the Project vicinity.

No wildlife species currently listed, or candidates for listing, under the federal ESA are expected to occur within areas of ground disturbance in the Project footprint. A review of the USFWS IPaC project planning tool indicates seven federally listed wildlife species known or expected to occur in the Project vicinity: gray wolf (*Canis lupus*; federally endangered, state endangered), the North American wolverine (*Gulo gulo luscus*) yellow-billed cuckoo (*Coccyzus americanus*), northern spotted owl (*Strix occidentalis caurina*), northwestern pond turtle (*Actinemys marmorata*), and the monarch butterfly (*Danaus plexippus*) (USFWS 2024). The study area does not overlap with any existing critical habitat designation for any of the listed species, nor is there any suitable habitat present within the survey area. There are currently no wolf packs near the study area. The closest pack is a single wolf territory called the Big Muddy pack, located [redacted] in Washington state (USFWS 2020d; WDFW et al. 2020).

Northern Spotted Owl

The northern spotted owl was federally listed as threatened in June 1990 (55 FR 26114). On December 15, 2020, USFWS found that reclassification of northern spotted owl from a threatened species to an endangered species was warranted; however, reclassification was precluded by higher priority actions (85 FR 81144). On May 3, 2022, USFWS reconfirmed that reclassification of the northern spotted owl as an endangered species is warranted; however, USFWS noted that "uplisting the species to endangered status would not substantively increase protections but would more accurately classify the species given its current status" (87 FR 26173).

Northern spotted owls are believed to have historically inhabited most forests throughout southwestern British Columbia, western Washington and Oregon, and northwestern California, as far south as San Francisco Bay. The primary causes of spotted owl population declines are loss and adverse modification of nesting, roosting, and foraging habitat due to timber harvesting, land conversions, natural disturbances such as fire, windstorms, and insect outbreaks, and competition with encroaching barred owls (USFWS 2024b; WDFW 2024c). An estimated 60 percent reduction in habitat has occurred over the last 190 years. Owl numbers appear to have declined annually since 1985, when many studies began. Range-wide, spotted owls are currently declining at an average rate of 2.9 percent each year (USFWS 2013).

Although some potentially suitable conifer forest is present in the study area where noise from vibratory pile driving and HDD may extend, much of the area surrounding most of the Project corridor is highly disturbed with urban and industrial areas, railway and highways, and rural residential and agricultural uses. Small patches of older forest north of SR 14 between Ash Lake Road and Bonneville Dam, as well as north of Greenleaf Creek and North Bonneville, currently function as potential foraging or dispersal habitat for transient spotted owls dispersing across the landscape. These patches include coniferous forest where older trees are interspersed with areas of seral forest that have been logged at different time periods. However, typical nesting habitat is not present. Spotted owl presence, particularly dispersing or foraging individuals, throughout the forested areas surrounding the Project ROW is possible; however, their presence is unlikely.

Yellow-billed Cuckoo

On October 3, 2013, the Western Distinct Population Segment (DPS) of the yellow-billed cuckoo (*Coccyzus americanus*) was proposed as a threatened species under the ESA and was subsequently listed on October 3, 2014 (79 FR 59992). Critical habitat was designated for the yellow-billed cuckoo on May 21, 2021; no critical habitat is designated in Washington or Oregon (86 FR 20798) because the species has been extirpated as a breeder from these states since at least the 1940s (86 FR 20849).

The yellow-billed cuckoo is a slender, long-tailed passerine that formerly occurred on both sides of the Cascades in both Oregon and Washington but is a rare migrant in both states (USFWS 2022d). Yellow-billed cuckoos display a strong preference for large, continuous riparian zones dominated by cottonwoods (*Populus spp*.) and willows (*Salix spp*.) (WDFW 2024d).

Currently, yellow-billed cuckoos are extremely rare summer visitors to Washington (Seattle Audubon Society 2022). Only 20 sightings have been reported since the 1950s, all, or nearly all, of which were likely non-breeding vagrants or migrants (Wiles and Kalasz 2017). Of the 20 sightings, 19 were recorded from 1974 to 2016, and 16 of the total sightings occurred in eastern Washington near the Cascades (Wiles and Kalasz 2017). Although historical observations of yellow-billed cuckoo occurred along the Columbia River in Clark County, Washington, no detections have been documented in the county since 1937 (Wiles and Kalasz 2017).

The yellow-billed cuckoo is not documented to occur in the study area (WDFW 2024c), and the project corridor lacks large, continuous blocks of cottonwood and willow riparian forest.

Northwestern Pond Turtle

On October 3, 2023, the northwestern pond turtle (*Actinemys marmorata*) was proposed as a threatened species under the ESA throughout its range (88 FR 68370). As a result of various recovery actions, including the release of captive-bred and wild-bred head-started turtles, as of 2015, the statewide population has increased to a total of 800-1,000 individuals across six recovery sites. Two recovery sites are located in south Puget Sound and four occur in the Columbia River Gorge (Hallock et al. 2017, WDFW 2023e).

Specific habitat needs include: 1) aquatic features such as ponds, lakes, and streams for breeding, feeding, overwintering, sheltering, and dispersal; 2) basking sites that allow for thermoregulation; and 3) terrestrial or upland features adjacent to aquatic habitat for nesting, overwintering, aestivation, and to provide corridors for dispersal and connectivity between populations (USFWS 2023). In Washington, northwestern pond turtles typically occur in open upland habitats that receive

extensive sun exposure, including prairies in the Puget Sound region, oak-pine savanna and other open forest types in the Columbia Gorge, and pastures (WDFW 2023e). Although the species utilizes a variety of flowing and still-water habitats in other parts of their range, in Washington they are only known to inhabit ponds and lakes (WDFW 2023e).

As noted above, in Washington, northwestern pond turtles are known to occur at two recovery sites in south Puget Sound and four recovery sites in the Columbia River Gorge. It is unlikely that other pond turtle populations have persisted in Washington, although the possibility remains that turtles may exist in areas that have not been accessible for surveys (Hallock et al. 2017).

The population occurring near the study area is at the [redacted] in a mosaic of approximately 200 acres of United States Forest Service (USFS) land and 65 acres of adjacent private lands. The [redacted] site includes an extensive lake, pond, and wetland complex within a forested and pasture environment (Hallock et al. 2017) and is located near [redacted].

Gray Wolf

The gray wolf (*Canis lupus*) has been federally listed as an endangered species since the 1970s. Effective January 4, 2021, USFWS delisted the gray wolf throughout the lower 48 states and relinquished management authority in Washington to WDFW outside of tribal lands (85 FR 69778). However, on February 10, 2022, a U.S. District Court vacated the delisting rule, effective immediately, and restored endangered species protections.

The gray wolf is a carnivorous, opportunistic feeder, whose primary prey are elk, deer, moose, and smaller animals when those prey are not available, such as rabbits, beavers, coyotes, and fish. Wolves are highly social and typically live in packs of 5 to 10 members. Packs establish territories, usually about 200 to 400 square miles in size, and defend these territories from other wolves. From late April until September, pack activity is centered at or near den or rendezvous sites, as adults hunt and bring food back to the pups. At sexual maturity, wolves disperse from their natal pack to search for a mate and to start a new pack; dispersal may be to either nearby or distant unoccupied habitat. Wolves are habitat generalists but mostly occupy forests and nearby open habitats with sufficient prey.

The year-end minimum population count of gray wolves (2022) in Washington was at least 216 known wolves dispersed within 37 known packs, including at least 26 breeding pairs (WDFW 2023). The Big Muddy pack is in the [redacted] and is the closest pack to the Project, located approximately [redacted]. The Big Muddy pack was confirmed as a pack in 2022. According to the annual population survey completed in December 2022, the pack had a minimum count of two wolves and was not considered a successful breeding pair in 2022 (WDFW 2023). The Big Muddy wolf pack is the first wolf pack documented in the South Cascades and Northwest Coast wolf recovery region since wolves returned to Washington (WDFW 2023).

Although denning is not known to occur in the study area, transient individuals, including those associated with the Big Muddy pack, may enter the study area during construction of the Project. However, much of the project near White Salmon is within the Columbia River for cable laying operation, and terrestrial noise and ground disturbance occurs further west by Stevenson, WA. The surrounding areas are generally disturbed with rural residential and heavy traffic on SR 14 and an active rail line, and therefore provide only marginal habitat for gray wolves.

North American Wolverine

On November 30, 2023, the USFWS relisted the North American DPS of wolverine (*Gulo gulo luscus*) as a threatened species under the ESA, effective January 2, 2024 (88 FR 83726). Critical habitat has not been designated.

The wolverine is a carnivore that occupies arctic, alpine, and subalpine habitats in the northern portions of the northern hemisphere (Copeland et al. 2010). The species is wide-ranging, with documented long-distance dispersals across habitats far from the high mountains near the timberline where known populations reside in Washington, Idaho, Montana, and Wyoming (USFWS 2013b). The northern Cascade Range in Washington is the southernmost extent of the current wolverine range along the Pacific Coast, although individual wolverines have been found as far south as California and the species is more widely distributed in Washington than once thought (Aubry et al. 2014).

Wolverines prefer extensive remote wilderness dominated by coniferous forest as well as high elevations above the tree line. The requirement of cold, snowy conditions means that, in the southern portion of the species' range where ambient temperatures are warmest, wolverine distribution is restricted to high elevations (USFWS 2013b).

There is no suitable habitat for wolverines in or adjacent to the project corridor and the study area does not overlap with any documented occurrences.

3.5 Fish

This section describes the presence of fish-bearing streams that intersect the study area and identifies fish that are federally listed under the federal ESA, as well as state-listed and special status fish species that occur in the study area. Sources of information include the field observations from the wetlands and waters delineation conducted for the Project as well as desktop sources cited below. No fish were observed in streams in the Project corridor during the field surveys.

The study area is located on southern facing slopes of the Cascade mountains to the north. The study area ranges in topography from relatively flat to steep and contains many streams and drainage features originating in the Cascade mountains to the north, all of which flow into the Columbia River. These streams drain perpendicular to the study area beneath culverts of varying size, discharging to the Columbia River. The Columbia River flows from east to west roughly parallel to the south of the project route and is within the study area portions where the cable route transitions from water to land.

Review of National Hydrology Dataset (NHD) (USGS 2024) and the Skamania County Mapsifter (Skamania County 2024) online data identified 3 perennial and 6 intermittent/ephemeral streams within the study area. The wetlands and waters delineation conducted in the field by HDR in 2023 (see *Wetlands and Waters Delineation Report*) identified 13 streams and the Columbia River within the study area. Of the 13 streams identified, 9 were determined to be fish bearing or meet the qualifications of a fish bearing stream, based on WDNR water typing criteria (WDNR 2024).

3.5.1 Washington State Priority Fish Species

Information from the WDFW PHS database (WDFW 2024a) on state priority species was referenced to identify state priority fish species that could occur within the study area. Information from the

WDFW PHS List was used to identify priority fish species documented within the study area and includes pink salmon (*Oncorhynchus gorbuscha*), rainbow trout (*Oncorhynchus mykiss*), the resident form of steelhead (*Oncorhynchus mykiss*), cutthroat trout (*Oncorhynchus clarkii*), and white sturgeon (*Acipenser transmontanus*). ESA-listed fish species that are also included in the PHS species list that occur in the study area are described below in Section 3.4.2.

Pink salmon that occur in the Columbia River return to freshwater spawning sites every-other year in odd numbered years. They are not documented or expected to occur in the tributary streams that intersect the Project corridor but migrate through the Columbia River in the study area. Pink salmon spawning adult migration occurs generally from August to October and spawning areas are more prevalent downstream of Bonneville Dam (Wydoski and Whitney 2003). Pink salmon use the lower reaches of tributary streams and areas near river mouths for spawning, and juveniles migrate out to the ocean in their first spring soon after emerging from the gravel.

Cutthroat Trout are widespread throughout small streams in western Washington and are documented to be present in Greenleaf Creek and Rock Creek located to the west and east ends of the study area respectively, as well as the Columbia River (NWIFC 2024; WDFW 2024b). They seek smaller streams with minimal flow and small gravel substrate including sand. They prefer the uppermost portions of these streams, areas that are generally too shallow for other salmonids. They can be anadromous and rear in streams for 2 to 3 years or be resident and remain entirely in fresh water (Wydoski and Whitney 2003). Due to passage restrictions at culvert crossings, Cutthroat Trout that inhabit upstream reaches are likely resident, but anadromous populations could be supported if barrier correction projects occur.

3.5.2 ESA-Listed Fish Species

The Columbia River, to which all the streams in the study area ultimately drain, contains many species of fish, including ESA listed Chinook salmon (*Oncorhynchus tshawytscha*), Chum Salmon (*O. keta*), Coho Salmon (*O. kisutch*), Sockeye Salmon (*O. nerka*), steelhead (*O. mykiss*), and Bull Trout (*Salvelinus confluentus*). Of the 9 identified fish bearing streams (see *Wetlands and Waters Delineation Report*), stream 5 is listed as critical habitat for Lower Columbia River DPS Steelhead (NMFS 2024), while stream 8 is presumed to have Coho Salmon (NWIFC 2024; WDFW 2024b).

NMFS (NOAA Fisheries)–designated critical habitat occurs in the Columbia River for the following Evolutionarily Significant Units (ESUs) and DPSs of salmon and steelhead: Columbia River ESU chum salmon, Lower Columbia River DPS steelhead, Lower Columbia River ESU coho salmon, Lower Columbia River ESU Chinook salmon, Middle Columbia River DPS steelhead, Upper Columbia River spring-run ESU Chinook salmon, Upper Columbia River DPS steelhead, Snake River fall-run ESU Chinook salmon, Snake River ESU sockeye salmon, and Snake River Basin DPS steelhead (Table 3-6; Figure H-3 in Attachment B; USFWS 2024).

Table 3-6. Federally Listed Salmonid Species That May Occur in the Study Area

Species	ESU/DPS	Listing Status	Agency	Critical Habitat
Fish				
Bull Trout (*Salvelinus confluentus*)	Coterminous United States	Threatened	USFWS	Designated in Columbia River in study area
Chinook Salmon *(Oncorhynchus tshawytscha)*	Upper Columbia River spring-run ESU	Endangered	NMFS	Designated in Columbia River in study area
Chinook Salmon *(Oncorhynchus tshawytscha)*	Multiple ESUs[1]	Threatened	NMFS	Designated in Columbia River in study area
Steelhead *(Oncorhynchus mykiss)*	Multiple DPSs[2]	Threatened	NMFS	Designated in Columbia River in study area
Chum Salmon *(Oncorhynchus keta)*	Columbia River ESU	Threatened	NMFS	Designated in Columbia River in study area
Coho Salmon *(Oncorhynchus kisutch)*	Lower Columbia River ESU	Threatened	NMFS	Designated in Columbia River in study area
Sockeye Salmon *(Oncorhynchus nerka)*	Snake River ESU	Endangered	NMFS	Designated in Columbia River in study area
Eulachon *(Thaleichthys pacificus)*	Southern DPS	Threatened	NMFS	Designated in Columbia River in study area

Note: ESU = Evolutionary Significant Unit; DPS = Distinct Population Segment; NA = not applicable; NMFS = National Marine Fisheries Service; USFWS = U.S. Fish and Wildlife Service

[1] Three threatened ESUs for Chinook salmon: Lower Columbia River, Snake River spring/summer run, and Snake River fall run.

[2] Four threatened DPSs for steelhead: Lower Columbia River, Middle Columbia River, Upper Columbia River, and Snake River.

Bull Trout

In November 1999, the USFWS listed all populations of bull trout within the conterminous United States as a threatened species pursuant to the ESA (64 FR 58910). Critical habitat for bull trout was revised in a final rule published on October 18, 2010 (75 FR 63898) and includes the Columbia River in the study area.

Bull trout express both resident and migratory life history strategies (Rieman and McIntyre 1993). Resident forms complete their entire life cycle in the tributary (or nearby) streams in which they spawn and rear. Migratory bull trout spawn in tributary streams, where juvenile fish rear for 1 to 4 years before migrating to either a lake (adfluvial form), a river (fluvial form) (Fraley and Shepard 1989) or, in certain coastal areas, to saltwater (amphidromous) (Brenkman and Corbett 2005).

Bull trout have some of the most demanding habitat requirements of all salmonids (Rieman and McIntyre 1993). To successfully spawn and rear, Bull Trout require the following habitat conditions (USFWS 2015):

- Water temperatures ranging from -2°C to 22°C, depending on life history stage and form, geography, elevation, diurnal and seasonal variation, and local groundwater influence.
- A natural hydrograph including peak, high, low, and base flows within historic ranges or if regulated according to an opinion that supports bull trout populations by minimizing daily and day-to-day fluctuations.
- Migratory corridors with no physical, biological, or chemical barriers between spawning, rearing, overwintering, and foraging habitats.
- An abundant food base including prey items such as macro-invertebrates of aquatic or terrestrial origin and forage fish.
- Permanent water of sufficient quantity and quality such that normal reproduction, growth, and survival are not inhibited.

The mainstem Columbia River, from the mouth upstream to John Day Dam, provides foraging, migration, and overwintering (FMO) habitat for extant populations of Bull Trout in the Lewis, Hood, Klickitat, and Deschutes rivers and is considered essential for maintaining connectivity for amphidromous and fluvial life histories (USFWS 2010a). Bull trout have been documented in the Columbia River and its tributaries; however, no known spawning occurs in the mainstem Columbia River that supports its own local population (USFWS 2010a). Bull trout have been observed in the fish ladders at Bonneville and The Dalles dams; however, bull trout have never been officially recorded on United States Army Corps of Engineers (USACE) fish ladder counts, although it is possible that fish counters may have observed them (USFWS 2010a).

The study area is located in the Coastal Recovery Unit under the Bull Trout recovery Plan (USFWS 2015) and overlaps with The Klickitat, White Salmon and Hood River core areas. It is anticipated that the mainstem Columbia River will have increasing importance as key foraging and overwintering habitat for fluvial bull trout as passage improvements are made at hydroelectric facilities currently isolating individual core areas and as populations improve in status (USFWS 2015).

Bull trout are not expected to be in the rivers and streams in the study are during the proposed in-water work window (November 1 to March 15 upstream of Bonneville Lock and Dam, November 1 to February 28 downstream of Bonneville Lock and Dam) because post-spawned adults are expected to be in natal tributaries resting and preparing to overwinter. No bull trout spawning or rearing occurs in the study area and juvenile bull trout are not expected to occur within the mainstem Columbia River within the study area at any time of the year.

Critical Habitat

Bull trout critical habitat is designated in the mainstem Columbia River including the study area. Critical habitat includes the lateral extent of the river as defined by the bankfull elevation on one bank to the bankfull elevation on the opposite bank, or the OHWM if bankfull elevation is not evident on either bank (USFWS 2010b).

Within designated critical habitat, the physical and biological features (PBFs) for bull trout include those habitat components that are essential for the primary biological needs of foraging, reproducing, rearing of young, dispersal, genetic exchange, or sheltering (USFWS 2010b). The USFWS (2010b) has determined that nine PBFs are essential for the conservation of bull trout. The nine PBFs and their occurrences in the study area are identified below.

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

   Existing Condition: Shallow springs, seeps, and ground water sources may occur sporadically in the mainstem Columbia River. However, the Columbia River in the study area is modified by shoreline development; additionally, the mainstem Columbia River in the study area is identified as temperature-impaired on the 303(d) list (Ecology 2022a). Therefore, this PBF is not fully functioning in the study area.

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

   Existing Condition: No barriers exist downstream of the portion of the study area downstream of Bonneville Lock and Dam that would preclude upstream passage of individuals. Therefore, PBF 2 is properly functioning in this reach of the river and contributes to the function of the Mainstem Lower Columbia River Critical Habitat Unit as a migratory pathway between the Pacific Ocean and upriver spawning and FMO habitat. In the portion of the study area upstream of Bonneville Lock and Dam, PBF 2 is degraded by the partial barrier to upstream migration presented by the dam, necessitating bull trout to use fish ladders to access upstream spawning and FMO habitat.

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

   Existing Condition: The mainstem Columbia River provides an abundant food source for migratory bull trout in the fall, winter, and spring (USFWS 2010b); therefore, PBF 3 is properly functioning and contributes to FMO habitat in the Columbia River.

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

   Existing Condition: Riparian habitat in the study area is degraded and many areas are restricted by highways, rail lines, and other development, as well as shore armoring and riprap, and lacks most of the components of PBF 4. Therefore, this PBF is not fully functioning in the study area.

5. Water temperatures ranging from 36 to 59 degrees Fahrenheit (°F) (2 to 15°C), with adequate thermal refugia available for temperatures that exceed the upper end of this range. Specific temperatures within this range will depend on bull trout life-history stage and form; geography; elevation; diurnal and seasonal variation; shading, such as that provided by riparian habitat; and local groundwater influence.

   Existing Condition: PBF 5 is not fully functioning in the study area. The mainstem Columbia River in the study area is identified as temperature-impaired on the 303(d) list (Ecology 2022a). The river is wide and lacks riparian shading and is slow flowing due to the impoundment by Bonneville Lock and Dam.

6. In spawning and rearing areas, substrate of sufficient amount, size, and composition to ensure success of egg and embryo overwinter survival, fry emergence, and young-of-the-

year and juvenile survival. A minimal amount of fine sediment, generally ranging in size from silt to coarse sand, embedded in larger substrates, is characteristic of these conditions; the sizes and amounts of fine sediment suitable to bull trout will likely vary from system to system.

Existing Condition: Bull trout are not known to spawn or rear in the study area, and the mainstem Columbia River provides only FMO habitat (USFWS 2010b). This PBF is not present in the study area.

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

   Existing Condition: Numerous hydropower projects, including the Federal Columbia River Hydropower System, have created a series of dams that have greatly altered the flow regime of the lower Columbia River. As a result, this PBF is not fully functioning in the study area.

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

   Existing Condition: The baseline condition of this PBF is not fully functioning in the study area. The reach of the Columbia River in the study area is a 303(d)-listed reach for bacteria and water temperature (Ecology 2022a).

9. Few or no non-native predatory (e.g., lake trout [*Salvelinus namaycush*], walleye [*Sander vitreus*], northern pike [*Esox spp.*], smallmouth bass [*Micropterus dolomieu*]), inbreeding (e.g., brook trout [*S. fontinalis*]), or competitive species (e.g., brown trout [*Salmo trutta*]) present.

   Existing Condition: The mainstem Columbia River is inhabited by a large and increasing population of non-native aquatic species, including many non-native fish species, particularly in the Bonneville Pool upstream of the dam. Therefore, this PBF is not fully functioning in the study area.

Chinook Salmon

Chinook salmon from five ESUs occur in the Columbia River in the study area. These include the Lower Columbia River ESU, Upper Columbia River (UCR) spring-run ESU, Snake River fall-run ESU, and Snake River spring/summer-run ESUs. The Columbia River Chinook salmon populations rely heavily on hatchery production and there are few sustained native, naturally reproducing populations (NMFS 2005a).

Chinook salmon runs are designated based on when adults enter freshwater. Early, spring-run Chinook salmon tend to enter freshwater as immature or bright fish, migrate upriver (holding in rivers for several months), and finally spawn in late summer and early autumn. Fall-run Chinook salmon enter freshwater at an advanced stage of maturity, move rapidly to their spawning areas on the mainstem or lower tributaries of the rivers, and spawn within a few days or weeks of freshwater entry (NMFS 2005a). Generally, spring-run Chinook salmon select the upper reaches of tributaries, summer runs use the mouths of tributaries, and fall runs spawn in the mainstems of larger streams (Wydoski and Whitney 2003).

Adult spring-run Chinook salmon return to the Columbia River at 4 to 5 years of age. They typically enter the Columbia River in March and April and generally enter natal basins from March through

June, well in advance of spawning in August and September. Some UCR spring-run Chinook salmon typically arrive a little later in the Columbia River, moving up the river from March through May (UCSRB 2007). Spring-run Chinook salmon typically spawn in headwater areas where higher gradient habitat exists.

Fall Chinook salmon return to the Columbia River at 3 to 4 years of age, although 5-year-old fish are common in some populations. They enter freshwater from August to September, and spawning generally occurs from late September to November, with peak spawning activity in mid-October (NMFS 2005a). Successful spawning depends on sufficient clean gravel of the right size, in addition to adequate flows and water quality (NMFS 2005b).

After emergence, juvenile Chinook salmon rear in freshwater from a few days to several years (Wydoski and Whitney 2003). Juvenile Chinook salmon that remain in freshwater after emergence may migrate to the ocean any time of year, although most Chinook salmon within a population tend to migrate at similar times and ages (Healey 1991). Migration commonly occurs during the night under the cover of darkness, although some fish may migrate during the day (Healey 1991). Chinook salmon fry tend to migrate along the banks and move offshore as they grow (Healey 1991).

Chinook salmon in the lower Columbia River generally follow an ocean-type life history cycle typical of fall-run Chinook salmon, have a short freshwater residence, and make extensive use of the Columbia River estuary nearshore habitat for rearing. Most fall-run Chinook salmon fry rear in freshwater habitat for 1 to 4 months before emigrating to the ocean as subyearlings (age 0). A few fall Chinook salmon remain in freshwater until their second spring and emigrate as yearlings. Before alteration of the Snake River basin by dams, Snake River fall-run Chinook salmon exhibited a largely ocean-type life history, where they migrated downstream during their first year (NMFS 2017b). Today, fall-run Chinook salmon in the Snake River basin exhibit one of two life histories that Connor et al. (2005) called ocean-type and reservoir-type. Juveniles exhibiting the reservoir-type life history overwinter in the pools created by the dams before migrating out of the Snake River.

Fall-run Chinook salmon juveniles make extensive use of estuary habitats, and subyearling Chinook salmon can be found in the Columbia River estuary during every month of the year (NMFS 2013). Juvenile fall-run Chinook salmon are the salmonids that are most likely to inhabit the littoral zone (Dauble et al. 1989; Rondorf et al. 1990). Dauble et al. (1989) conducted a study during the spring outmigration and found that more than half of the subyearling fall-run Chinook salmon were caught within 100 feet of shore in water 5.9 meters deep or less. In contrast, yearling spring-run Chinook salmon tended to be found in deeper water. Subyearling Chinook salmon rear in the littoral zone from approximately March through June (Chapman 2007). As subyearlings grow larger, they move into increasingly deeper water. Their behavioral tendency to use offshore habitats reduces their susceptibility to predators in the littoral zone and hence their vulnerability around docks (Chapman 2007). As the subyearlings begin to move downstream, they continue to use the littoral zone for feeding and resting.

Populations of spring-run Chinook salmon are also present in the lower river, particularly in basins in the upper Columbia Gorge (NMFS 2013) and may move into the mainstem Columbia River or estuary in fall to overwinter. Spring-run Chinook salmon emerge from the gravel earlier than fall-run Chinook salmon, generally in late winter/early spring and normally spend 1 full year in freshwater and emigrate to sea in their second spring (NMFS 2005c). However, some juveniles from Lower Columbia River spring-run Chinook salmon populations migrate downstream from their natal

tributaries in fall and early winter into larger rivers, including the mainstem Columbia River, where they are believed to over-winter before outmigrating the next spring as yearling smolts (NMFS 2013).

Occurrence in the Study Area

Individuals from several populations of Chinook salmon could occur in the study area during the cable installation in-water work window (November 1 to March 15), as described below.

Lower Columbia River (LCR) Chinook salmon are classified as spring, fall, or late fall based on when adults return to fresh water (NMFS 2013), with adults migrating through the lower Columbia River from March through October (Table 3-7). LCR spring-run Chinook salmon spawn primarily in upstream, higher elevation portions of large sub-basins and enter the lower Columbia River from March through June, well in advance of spawning in August and September. Fall-run Chinook salmon spawn in moderate-sized streams and large river mainstems and enter freshwater from August to September. They spawn from late September to November, with peak spawning activity in mid-October. Late-fall Chinook salmon, commonly referred to as "brights," generally return later than tule fall Chinook salmon, are less mature when they enter the Columbia River, and spawn later in the year. Late-fall Chinook salmon enter the Columbia River from August to October and spawn from November to January, with peak spawning in mid-November. Ocean-type (fall-run) juvenile Chinook salmon generally migrate downstream in spring within 3 months of emergence and a brief freshwater rearing period (Healey 1991; Myers et al. 1998). LCR Chinook salmon juveniles are likely to occur in the lower Columbia River in the study area, migrating from February through early August with a peak in mid-April through mid-June. They may rear in the lower Columbia River throughout the year (Table 3-7).

Adult UCR spring-run Chinook salmon migrate upstream through the lower Columbia River from mid-May through June (Table 3-7) and will not be present during the pile installation work window. Adult spring-run Chinook salmon appear to arrive earliest in years with low river discharge and/or warm water temperatures and latest in cold and high-flow years (Keefer et al. 2008). Outmigrating juveniles may occur in the study area during the cable installation work window. Juveniles pass through the lower Columbia River from February through November, with the majority present in mid-May to mid-June (NMFS 2020). UCR spring-run Chinook salmon juveniles also move into upper reaches of the mainstem Columbia River to rear before migrating into the estuary in spring (April through June) (UCSRB 2007) and do not use the lower Columbia River for rearing (NMFS 2020).

Adult Snake River fall-run Chinook salmon migrate through the lower Columbia River from April through October, peaking in August and September (Columbia River DART 2023; NMFS 2017c) (Table 3-7). Adults move quickly through the estuary in deep water, largely using the shipping channels, on their way to upstream holding and spawning areas. Therefore, Snake River fall-run adults are unlikely to be present during the cable installation work window. Based on fish passage data at Bonneville Lock and Dam (Columbia River DART 2023), juvenile Snake River fall-run Chinook salmon migrate in the lower Columbia River from February to November, with a peak in May and June.

Snake River spring- and summer-run Chinook salmon use the Columbia River as a migration corridor within the study area and move quickly through the estuary in deep water, primarily using the shipping channels, on their way to upstream holding and spawning areas. Snake River spring/summer-run Chinook salmon adults migrate through the lower Columbia River from March through September (NMFS 2020), with peak occurrence from mid-April to mid-May for spring-run Chinook salmon and from late-June to mid-July for summer-run Chinook salmon (Matthews and

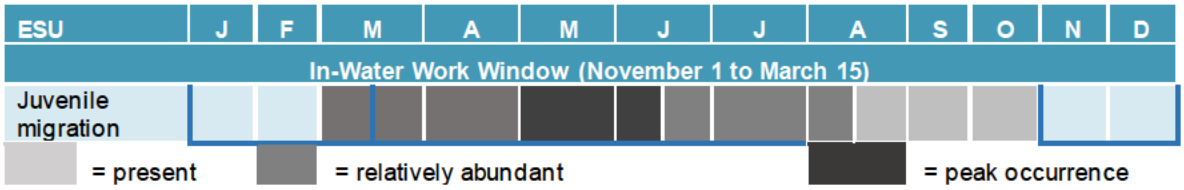
Waples 1991). Migrating adult Snake River spring/summer Chinook salmon are therefore unlikely to be present during the cable installation work window. Juvenile Snake River spring/summer-run Chinook salmon exhibit a stream-type life history and are common in the estuary as yearlings and occasionally as sub-yearlings. They migrate swiftly to the ocean as yearling smolts mainly in spring and migrate as late as October in the study area (NMFS 2020) and are unlikely to be present during the work window. On average, more than 50 percent of Snake River yearling Chinook salmon outmigrants are routinely transported by barge or truck around the Snake River and Columbia River dams and released downstream of Bonneville Lock and Dam.

Chinook salmon spawning habitat includes riffles, tailouts, and the swifter areas in glides containing a mixture of gravel and cobble sizes with flow of sufficient depth for spawning activity (NMFS 2013). Due to the water depth and lack of suitable spawning substrate in the proposed cable route, no Chinook salmon spawning habitat is present in the study area.

Juvenile active rearing habitat includes relatively slow-water habitat types, often near velocity shears and associated with relatively low-gradient stream channel reaches, including primary pools, backwaters, tailouts, glides, and beaver ponds (NMFS 2013). Inactive rearing habitat includes non-turbulent habitat types, particularly deeper water types within the main channel. Therefore, inactive rearing habitat is present in the study area. Some juveniles from populations migrate downstream from their natal tributaries in fall and early winter into larger rivers, including the mainstem Columbia River, where they are believed to over-winter before outmigrating the next spring as yearling smolts (LCFRB 2010).

Table 3-7. Timing of Chinook salmon life histories in study area

ESU	J	F	M	A	M	J	J	A	S	O	N	D
In-Water Work Window (November 1 to March 15)												
Lower Columbia River												
Adults												
Juvenile rearing												
Juvenile migration												
Upper Columbia River												
Adults												
Juvenile rearing												
Juvenile migration												
Snake River fall-run												
Adults[1]												
Juvenile rearing												
Juvenile migration												
Snake River spring/summer-run												
Adults												
Juvenile rearing												



Source: NMFS 2020; Columbia River DART 2023. Dark blue border indicates proposed in-water work window (November 1 to March 15).
[1] Adult run timing based on occurrence indicated in Snake River fall Chinook salmon recovery plan (NMFS 2017c) and Columbia River DART (2023) because presence indicated in NMFS (2020) is inconsistent with these sources.

Critical Habitat

The in-water portions of the Project are located within designated critical habitat for ESA-listed Chinook salmon populations in the study area. Critical habitat for the LCR Chinook salmon and UCR spring-run Chinook salmon was designated in 2005 (NMFS 2005b), and critical habitat for the Snake River fall and spring/summer runs was designated in 1993 (58 FR 68543). For all ESUs, designated habitat includes the mainstem Columbia River, including the study area. The primary use of the study area is for migration by both adults and outmigrating juveniles, though juveniles expressing the ocean-type life history, which migrate as subyearlings, may remain in shorelines along the lower Columbia River for longer periods as they migrate to the estuary.

Critical habitat consists of six PBFs that are considered essential for the conservation of ESA-listed Chinook salmon. The six PBFs and their occurrence in the study area are identified below.

1. Freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation, and larval development.

   Existing Condition: There is no known spawning habitat within the study area in the Columbia River; therefore, this PBF is not present in the study area.

2. Freshwater rearing sites with water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility; water quality and forage supporting juvenile development; and natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks.

   Existing Condition: Limited freshwater rearing may be provided for Chinook salmon populations expressing the ocean-type juvenile life history. Riparian habitat in the study area is degraded and many areas are restricted by highways, rail lines, and other development as well as shore armoring and riprap, and lacks most of the components of PBF 2. Therefore, this PBF is not fully functioning in the study area.

3. Freshwater migration corridors free of obstruction with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival.

   Existing Condition: The lower Columbia River mainstem is used as migratory habitat for both adults and juveniles migrating to and from the Pacific Ocean and upstream (tributary) spawning and rearing areas. Therefore, PBF 3 is present and properly functioning in the study area.

4. Estuarine areas free of obstruction with water quality, water quantity, and salinity conditions supporting juvenile and adult physiological transitions between freshwater and saltwater;

natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels; and juvenile and adult forage, including aquatic invertebrates and fishes, supporting growth and maturation.

Existing Condition: The study area encompasses an approximately 7-mile reach of the Columbia River extending from approximately river mile (RM) 143 to RM 150. The study area does not include estuarine areas; therefore, this PBF is not present in the study area.

5. Nearshore marine areas free of obstruction with water quality and quantity conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation; and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels.

   Existing Condition: As described above, the study area encompasses an approximately 7-mile reach of the Columbia River extending from approximately RM 143 upstream to RM 150. The study area does not extend to nearshore marine areas; therefore, this PBF is not present in the study area.

6. Offshore marine areas with water quality conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation.

   Existing Condition: The study area does not extend to offshore marine areas; therefore, this PBF is not present in the study area.

Steelhead

Four ESA-listed steelhead DPSs traverse the study area in the lower Columbia River during adult upstream and juvenile downstream migrations: the LCR DPS, Middle Columbia River (MCR) DPS, UCR DPS, and Snake River DPS.

Unlike many salmonid species, *O. mykiss* exhibit complex and variable life history characteristics, such that their offspring can exhibit different life-history forms from the parental generation (NMFS 2009a). For example, offspring of resident fish may migrate to sea, and offspring of anadromous steelhead may remain in streams as resident fish (Burgner et al. 1992). Unlike Pacific salmon, steelhead are iteroparous, or capable of spawning more than once before they die. However, it is rare for steelhead to spawn more than twice before dying, and those that do are usually females (Busby et al. 1996).

Over their entire range, West Coast steelhead spawning migrations occur throughout the year, with seasonal peaks of migration activity varying by location. However, even in a given river basin, there might be more than one seasonal migration peak, typically referred to as winter, spring, summer, and fall steelhead runs. Although there are generally four migration seasons, steelhead are typically divided into two basic reproductive ecotypes (summer and winter), based on the state of sexual maturity at the time they enter freshwater and the duration of spawning migration (Burgner et al. 1992). The summer, or stream maturing, type enters freshwater in an immature condition between May and October and matures in freshwater over several months. The winter, or ocean maturing, type enters freshwater in a mature condition between November and April and spawns shortly thereafter (NMFS 2009a). Spawning typically occurs between March and June (NMFS 2009a).

Steelhead spawn in clear, cool streams with suitable gravel size, depth, and current velocity (NMFS 2009a). Productive steelhead habitat is characterized by complexity, primarily in the form of large and small wood. They need cover in the form of overhanging vegetation, undercut banks, submerged vegetation, submerged objects such as logs and rocks, floating debris, deep water,

turbulence, and turbidity (NMFS 2009a). Adult steelhead may enter streams and arrive at spawning grounds weeks or even months before they spawn (NMFS 2013).

Depending on water temperature, steelhead eggs may incubate for 1.5 to 4 months before hatching. Young steelhead typically rear in streams for 2 or more years before migrating to the ocean as smolts. Summer rearing takes place primarily in the faster parts of pools, although young-of-the-year are abundant in glides and riffles. Winter rearing occurs more uniformly at lower densities across a wide range of fast and slow habitat types (NMFS 2009a).

Steelhead smolts have been shown to migrate at ages ranging from 1 to 5 years throughout the Columbia River basin, but most steelhead generally smolt after 2 years in freshwater (NMFS 2009a, 2013). Some juveniles move downstream to rear in larger tributaries and mainstem rivers. Downstream migration generally occurs between March and June (NMFS 2009a). Once in the ocean, steelhead tend to migrate directly offshore during their first summer, rather than migrating nearer the coast. Most steelhead spend 2 years in the ocean (range 1 to 4 years) before migrating back to their natal streams (NMFS 2009a, 2013).

Individuals from several ESA-listed populations of steelhead could occur in the study area during the pile installation work window. Table 3-8 displays the typical seasonal timing of adult and juvenile steelhead from the five DPSs that migrate through the study area, overlain with the proposed in-water work window for cable installation and cofferdam sheetpile installation and removal (November 1 to March 15).

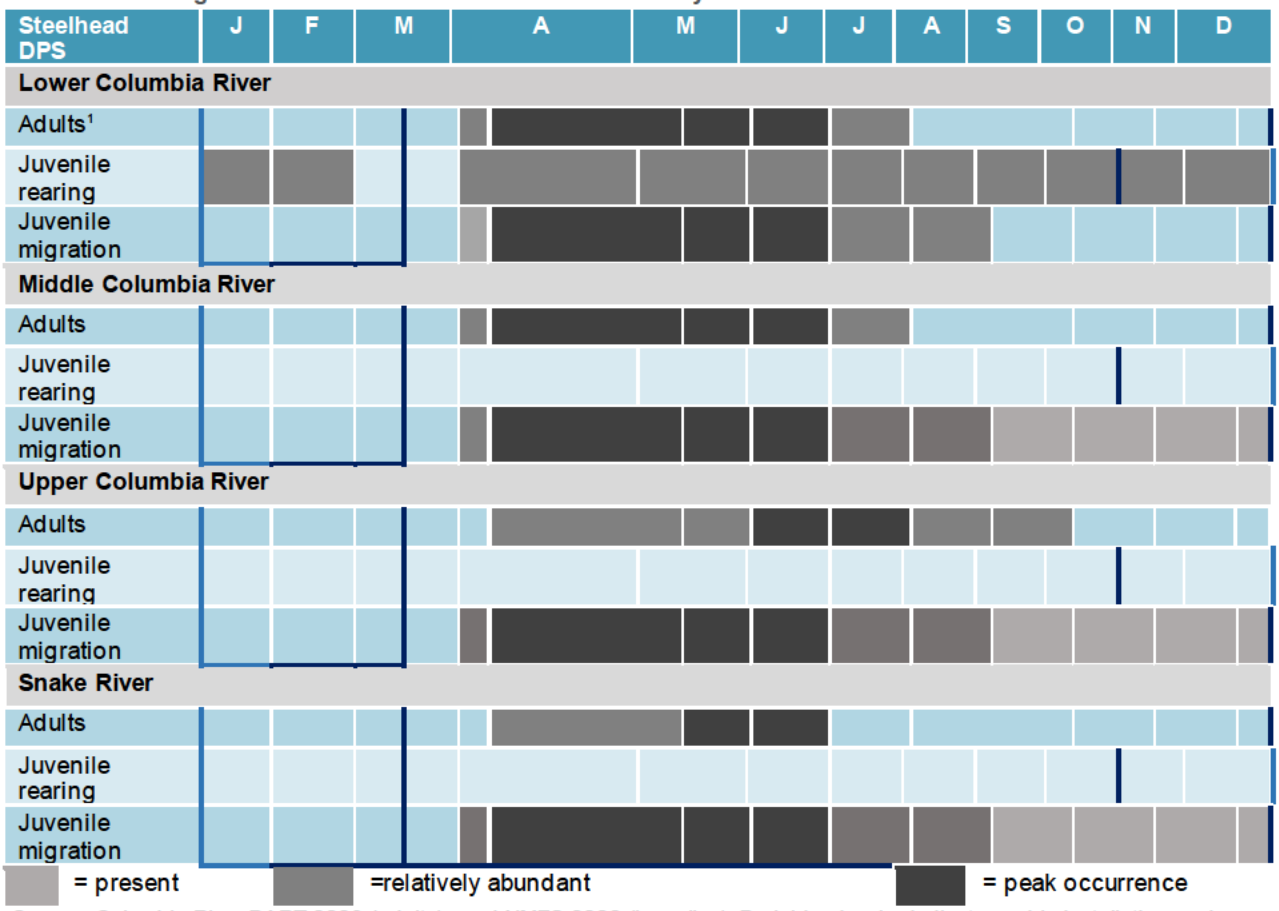
LCR steelhead exhibit two distinct run timings: summer and winter, although most are winter run (Myers et al. 2006). Most winter-run steelhead populations in this DPS persist at low abundances (NMFS 2016). Summer-run LCR steelhead migrate through the study area between mid-April and mid-June (Table 3-8) and spawn in tributaries (outside of the study area) between January and June (Myers et al. 2006). In contrast, adult winter steelhead enter the lower Columbia River and pass the study area between December and May, and spawn in tributaries outside the study area between February and June. Both summer and winter steelhead are capable of repeat spawning and may return to the ocean via the Columbia River following spawning. Therefore, based on adult run timing, adult LCR winter-run steelhead could be present in the study area during cable installation. Downstream migration of both summer-run and winter-run steelhead kelts through the lower Columbia River begins in March, peaks in April and May, and declines through July (Dawley et al. 1986). Juvenile LCR steelhead rear throughout the year (NMFS 2020) and therefore may be present in the study area during cable installation.

Most adults from the MCR DPS migrate upstream through the Columbia River from mid-April through mid-June, with a peak in abundance from late April through mid-June (Table 3-8). In addition, several populations have later runs that enter freshwater in August and continue in the lower Columbia River through October or November. The winter runs to the Klickitat River and Fifteenmile Creek typically enter freshwater beginning in January. Based on this information, it appears that at least some adult fish from this DPS could occur in the study area from November through December during the cable installation work window. Juvenile downstream migration through the lower Columbia River occurs from March through mid-October, with peak abundance occurring from late April through mid-June, and therefore early outmigrants may occur in the study area during the work window for cable installation. Juvenile rearing does not occur in the study area (NMFS 2020).

UCR steelhead enter the Columbia River from mid-April to mid-July with the peak occurrence in late May and early June (Table 3-8). Juvenile downstream migration through the lower Columbia River occurs from March through mid-October, with peak abundance occurring from late April through mid-June; therefore, they may occur in the study area during the latter part of the cable installation work window (Table 3-8). Juvenile rearing does not occur in the study area (NMFS 2020).

Snake River steelhead typically enter the Columbia River from mid-April through mid-June, with peak migration from mid-May through mid-June (Table 3-8). Based on adult run timing, it is unlikely that adult Snake River steelhead would be present in the study area during the work window. Snake River steelhead juveniles outmigrate through the Columbia River from March through October, with a peak from mid-April to mid-June (NMFS 2020); therefore, early outmigrants may be present in the study area during the latter part of the cable installation window. Only yearling fish use the lower Columbia River and estuary (Fresh et al. 2005); yearling rearing is unlikely to occur in the study area.

Table 3-8. Timing of ESA-Listed Steelhead DPSs in the Study area



Source: Columbia River DART 2023 (adults)[1] and NMFS 2020 (juveniles). Dark blue border indicates cable installation work window (November 1 to March 15).
[1] Although winter run LCR steelhead may occur in study area, because they persist at low abundance (NMFS 2016), timing is not indicated in the table.

Critical Habitat

Critical habitat for the four DPSs of steelhead that occur in the study area was designated in 2005 (NMFS 2005b). Critical habitat for all steelhead populations in the Columbia River includes all the

basins supporting the populations and the mainstem Columbia River, including the lower Columbia River, which is designated as a migration corridor (NMFS 2005b). Critical habitat PBFs in the study area are the same as those for Chinook salmon described above in Section 3.4.2.2. The study area is located within the designated migration corridor for both adult and juvenile steelhead (PBF 3). Riparian habitat in much of the study area is generally degraded by the proximity of development, highways, and rail lines, and areas of armoring and riprap that lacks most of the components of PBF 2. However, there are some areas at the west end and by Pierce Island that include vegetated and natural shorelines that may support a diversity of aquatic organisms for PBF 2. PBFs 1 and 4 through 6 are not present in the study area.

Columbia River Chum Salmon

The Columbia River chum salmon ESU was listed as threatened on March 25, 1999, and was reaffirmed in 2005 (NMFS 2005a). The ESU includes all the naturally spawned populations of chum salmon in the Columbia River and its tributaries in Oregon and Washington and three chum salmon artificial propagation programs (NMFS 2005a).

Columbia River chum salmon once were widely distributed throughout the lower Columbia River basin and spawned in the mainstem Columbia River and the lower reaches of most of the lower Columbia River tributaries. Historically, spawning occurred as far upstream as the Umatilla and Walla Walla rivers, but it now is restricted largely to tributary and mainstem areas downstream of Bonneville Lock and Dam (NMFS 2013).

Of the 17 populations that historically occupied the Columbia River, all but two populations are extirpated or nearly extirpated (NMFS 2005a; 2013). Most natural spawning in the Columbia River occurs in the Grays River basin and the lower Gorge (Wind River and Little White Salmon River basins) (NMFS 2013).

Most chum salmon remain in the ocean between 3 and 5 years before reaching maturity and migrating to coastal rivers and streams to spawn. Although chum salmon are strong swimmers, they rarely pass river blockages and waterfalls that pose no hindrance to other salmon or steelhead and therefore they spawn in low-gradient, low-elevation reaches and side channels (ODFW 2010). Adult chum salmon enter freshwater from mid-October through November. They spawn from early November to late December and require clean gravel for spawning (NMFS 2013).

Chum salmon fry emerge from the gravel from March through May and are usually in freshwater for only a few days after emerging, before they promptly migrate downstream to the Columbia River estuary, where they rear anywhere from weeks to months prior to moving into ocean waters (NMFS 2013). Chum salmon fry can adapt to seawater soon after emergence from gravel (LCFRB 2010). Their small size at emigration is thought to make them susceptible to predation mortality during this life stage (LCFRB 2010). Shallow, protected habitats such as salt marshes, tidal creeks, and intertidal flats serve as significant rearing areas for juvenile chum salmon during estuarine residency (LCFRB 2010). Chum salmon fry generally have a longer residence time in estuaries then other Pacific salmon. Some fry remain in shallow sublittoral habitats with gravel or cobble beaches within the estuary, but most disperse into tidal creeks and sloughs (Wydoski and Whitney 2003).

Columbia River chum salmon could occur within the study area during cable installation downstream of Bonneville Lock and Dam. Adult chum salmon return to the Columbia River from mid-September through December (NMFS 2020) and spawn from early November to late December (NMFS 2013), which overlaps with the in-water work window for cable installation.

Juvenile chum salmon rear in the Columbia River estuary (i.e., lower 23 miles of the river [Johnson and O'Neil 2001]) from January through mid-May before beginning long-distance ocean migration (NMFS 2020).

Critical Habitat

Critical habitat for Columbia River chum salmon was designated in 2005 (NMFS 2005b) and includes the mainstem Columbia River upstream to the White Salmon River, including the study area. The PBFs of critical habitat for Columbia River chum salmon are the same as those previously discussed for Chinook salmon (Section 5.2.7). The portion of the Columbia River in the study area supports primarily migration habitat (PBF 3). Lower portions of the river near the estuary (i.e., outside the study area) also support juvenile rearing habitat.

Lower Columbia River Coho Salmon

The LCR coho salmon ESU was listed as threatened under the ESA on June 28, 2005 (NMFS 2005a). The ESU includes all naturally spawned populations of coho salmon in the lower Columbia River and its tributaries, from the mouth of the Columbia River upstream to and including the Hood River (in Oregon), the White Salmon River (in Washington), and the Willamette River up to Willamette Falls (NMFS 2005a). The ESU also includes coho salmon from 25 artificial propagation programs (NMFS 2005a, 2013).

Coho salmon occur along the Pacific coast from Monterey Bay, California, north to Alaska. In Washington, spawning adults are found in most streams of the Columbia River coastal and Puget Sound drainages (Wydoski and Whitney 2003). Most coho salmon spend 3 years living in the ocean before returning to spawn, while a small percentage of males, called jacks, return to natal waters at age 2 (NMFS 2013). Most spawning occurs from November to January, but some occurs as late as March (NMFS 2013). Coho salmon generally occupy intermediate positions in tributaries and typically spawn in small to medium, low- to moderate-elevation streams from valley bottoms to stream headwaters, favoring small, rain-driven, lower-elevation streams characterized by relatively low flows during late summer, and increased river flows and decreased water temperatures in winter (LCFRB 2010; ODFW 2010). On their return, adult fish often mill near the river mouths or in lower river pools until the first fall freshets occur (LCFRB 2010). Coho salmon construct redds in gravel and small cobble substrate in pool tailouts, riffles, and glides, with sufficient flow depth for spawning activity (NMFS 2013).

Eggs incubate over late fall and winter for about 45 to 140 days, depending on water temperature (NMFS 2013). Juveniles typically rear in freshwater for more than a year. Coho salmon fry rear in low-velocity areas, preferring pool habitat, and quiet backwaters, side channels, and small creeks with riparian cover and woody debris (NMFS 2013). Juvenile coho salmon normally spend 1 year rearing in freshwater before they become smolts and migrate to the ocean in spring.

LCR coho salmon are typically categorized into early- and late-returning stocks. Adult coho salmon enter the Columbia River from June through February (NMFS 2020); therefore, adult coho salmon could be present within the study area during the work window for in-river cable installation.

Coho salmon juveniles outmigrate through the lower Columbia River from March through mid-June and rear in the lower Columbia River throughout the year (NMFS 2020). Therefore, other than a few potential early outmigrants, it is unlikely that juvenile coho salmon would be present in the study area during the in-water work window for cable installation.

Critical Habitat

Critical habitat for LCR coho salmon was designated in 2005 (NMFS 2005b) and includes the same PBFs as those discussed for Chinook salmon (Section 5.2.7). Designated habitat includes the entirety of the mainstem Columbia River in the study area. The study area functions primarily as a migratory corridor for adults and juveniles (PBF 3). PBFs 1 and 4 through 6 are not present in the study area.

Snake River Sockeye Salmon

The Snake River sockeye salmon ESU was listed as threatened under the ESA in June 2005, and that status was reaffirmed in 2005 (70 FR 37160). The ESU includes populations of anadromous sockeye salmon in the Snake River basin, Idaho (extant populations occur only in the Stanley basin in Redfish Lake), as well as one captive propagation hatchery program (NMFS 2005a).

Sockeye salmon are found along the Pacific coast from the Klamath River in California north to the Yukon River in Alaska. Sockeye salmon in the Columbia River constitute the southernmost major run in North America (Wydoski and Whitney 2003). The decline of the Snake River sockeye salmon ESU is the result of widespread habitat degradation, impaired mainstem and tributary passage, historical commercial fisheries, chemical treatment of Sawtooth Valley lakes in the 1950s and 1960s, and poor ocean conditions (NMFS 2015). Today, the last remaining Snake River sockeye salmon spawn in Sawtooth Valley lakes, in the Salmon River drainage of central Idaho in the Snake River basin. Five lakes in the Sawtooth Valley historically contained anadromous Sockeye Salmon: Alturas, Pettit, Redfish, Stanley, and Yellowbelly lakes (Bjornn et al. 1968; NMFS 2015). Currently, only the Redfish Lake population, supported by a captive broodstock program, is considered extant. However, reintroduction efforts have been ongoing in Redfish Lake since 1993, Pettit Lake since 1995, and Alturas Lake since 1997 (Hebdon et al. 2004). While few sockeye salmon currently follow an anadromous life cycle, the small remnant run of the historical population migrates 900 miles downstream from the Sawtooth Valley through the Salmon, Snake, and Columbia rivers to the ocean (NMFS 2015).

Sockeye salmon differ from other species of salmon in that most stocks require a lake environment for part of their life cycle. Spawning occurs over gravel in streams, and the fry migrate upstream or downstream to a lake soon after they emerge and continue to rear in the lake environment (Wydoski and Whitney 2003). Snake River sockeye salmon inhabit the Sawtooth Valley and generally display an anadromous life history strategy. They spawn in gravel areas in lakes, where the juveniles rear for 1 to 3 years (Groot and Margolis 1991). Other populations have adopted a resident life history pattern, remaining in freshwater to mature and reproduce. Sockeye salmon fry spawned in lake tributaries typically exhibit a behavior of rapid downstream or upstream migration to the nursery lake after emergence, whereas lake/beach spawned sockeye salmon rapidly migrate to open limnetic waters after emergence. Lake-rearing juveniles typically spend 1 to 2 years in their nursery lake before emigrating to the marine environment (Gustafson et al. 1997).

After rearing in nursery lakes, anadromous sockeye salmon begin migrating to the sea as smolts during spring, and peak emigration to the ocean occurs in mid-April to early May. They remain at sea for an additional 1 to 3 years before returning to natal areas to spawn (Bjornn et al. 1968; Groot and Margolis 1991).

Outmigrating Snake River sockeye salmon tend to use deeper water; less than 3 percent have been found to use waters that are less than 6 meters deep (Dauble et al. 1989). Snake River sockeye

salmon, like other stream-type salmonids, move relatively quickly through the estuary, probably passing through the area within 2 to 3 days. Juveniles enter the estuary at a large size as a result of the long time they spend in their natal lakes. Although they experience significant mortality in the Columbia River estuary, juvenile Snake River sockeye salmon are presumably affected to a lesser degree by limiting factors and threats in the estuary because of their shorter residency times in the reach (NMFS 2011a).

Most adult sockeye salmon enter the Columbia River from approximately mid-April through mid-July (NMFS 2020). Outmigrating sockeye salmon juveniles migrate in spring and tend to reach the lower river from March to mid-July, peaking in May, with low numbers occurring through mid-October (NMFS 2020). Therefore, early migrating sockeye salmon are anticipated to potentially overlap with the later part of the in-river cable installation work window in March.

Critical Habitat

Critical habitat for the Snake River sockeye salmon was designated in 1993 (58 FR 68543). The designated critical habitat includes the mainstem Columbia River, including the study area, which is used as migration habitat. PBFs for Snake River sockeye salmon critical habitat are the same as those described above for Chinook salmon (Section 5.2.7), and the river in the study area is used as a migratory corridor for both adults and juveniles (PBF 3).

Eulachon

Eulachon are an anadromous forage fish endemic to the northeastern Pacific Ocean. In March 2010, NMFS listed the Southern DPS of Pacific eulachon as threatened under the ESA (75 FR 13012) and in 2017 completed a federal recovery plan for the Southern DPS of eulachon (NMFS 2017d). The Southern DPS of eulachon is comprised of fish that spawn in rivers south of the Nass River in British Columbia to, and including, the Mad River in California (NMFS 2017d). The Columbia River has been identified as one of the primary spawning rivers of the Southern DPS of eulachon (WDFW 2020).

Eulachon are small ocean-going fish that occur in offshore marine waters and return to tidal portions of rivers to spawn. After spending 3 to 5 years in the ocean, adult eulachon return to freshwater in the lower reaches of rivers to spawn. Like most salmonids, both male and female adults die after spawning. Eulachon are broadcast spawners, and spawning events typically occur over coarse, sandy substrates or pea-sized gravels (WDFW and ODFW 2001; Willson et al. 2006). Eulachon eggs have been observed in water from 8 to 20 feet in depth. Females typically produce between 7,000 and 60,000 eggs that are distributed downstream by river currents (Gustafson et al. 2010; WDFW and ODFW 2008; Willson et al. 2006). The fertilized eggs sink to the bottom and adhere to the sand or gravel, where they incubate for 20 to 40 days before hatching (NMFS 2017d; Parente and Snyder 1970; WDFW and ODFW 2001). After hatching, larvae have little mobility and are carried downstream and dispersed widely by estuarine and ocean currents.

Larval eulachon are about 4 to 8 millimeters in size and drift with the bottom currents as they develop, ultimately entering the ocean (NMFS 2017d). Estuarine currents may entrain larvae for a brief period; however, strong tidal fluctuations facilitate rapid mixing and dispersal. Estuarine vegetation like sedges and grasses provide shelter from predators and opportunities to forage for food. Eulachon typically utilize this estuarine environment during their juvenile life stage (8 weeks to 12 months) (Cambria Gordon Ltd. 2006).

In the Columbia River, eulachon typically spawn in January, February, and March (NMFS 2017d), but small runs (often referred to as “pilot runs”) can occur as early as November or December (Emmett et al. 1991; NMFS 2017d; WDFW and ODFW 2001). Larval outflow collection data from the Lower Columbia River (RM 34) indicated a minor peak in mid-January, which is associated with adults arriving in late-November through December (Langness et al. 2020). Therefore, adult eulachon could occur in the study area downstream of Bonneville Lock and Dam during the in-work window for cable installation (November 1 to March 15).

The lower Columbia River basin supports one of the largest spawning runs of eulachon, with most spawning activity occurring in the mainstem of the Columbia River and the Cowlitz River (Howell et al. 2002). Although no eulachon spawning has been documented within the study area, substrates suitable for egg adhesion may occur in the study area.

Critical Habitat

Critical habitat for eulachon was designated on October 20, 2011 (76 FR 65324) and includes the Columbia River from the mouth upstream to Bonneville Lock and Dam at RM 146, and therefore, includes the study area. The lateral extent of critical habitat is the OHWM.

The PBFs essential to the conservation of the Southern DPS fall into three major categories reflecting key life history phases of eulachon: (1) freshwater spawning and incubation sites with water flow, quality, and temperature conditions and substrate supporting spawning and incubation, and with migratory access for adults and juveniles; (2) freshwater and estuarine migration corridors associated with spawning and incubation sites that are free of obstruction and with water flow, quality, and temperature conditions supporting larval and adult mobility, and with abundant prey items supporting larval feeding after the yolk sac is depleted; and (3) nearshore and offshore marine foraging habitat with water quality and available prey, supporting juveniles and adult survival (76 FR 65333). Eulachon are known to spawn in the mainstem Columbia River, and the study area contains substrates that may provide for suitable egg adhesion; therefore, PBF 1 is present in the study area. PBF 2 is also present in the study area.

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Attachment A: Site Visit Photos

Photo 1: Columbia River shoreline near west end of Project terrestrial corridor, looking southwest. May 2024.

Photo 2: View of upland grass and herbaceous habitat north of the Project corridor along Fort Cascades Drive, looking west. Photo taken May 30, 2024.

Photo 3: North side of Forst Cascades Drive where proposed cable route is located, looking west. May 2024.

Photograph 4: Deciduous dominant mixed forest stand along south side of Fort Cascades Drive west of Bonneville Dam, looking southwest. May 2024.

Photo 5: Looking east along Dam Access Road west of Bonneville Dam. The proposed cable route is along the north side of the road prism. May 2024.

Photo 6: Looking west along SR14 proposed cable route on north side of SR 14. May 2024.

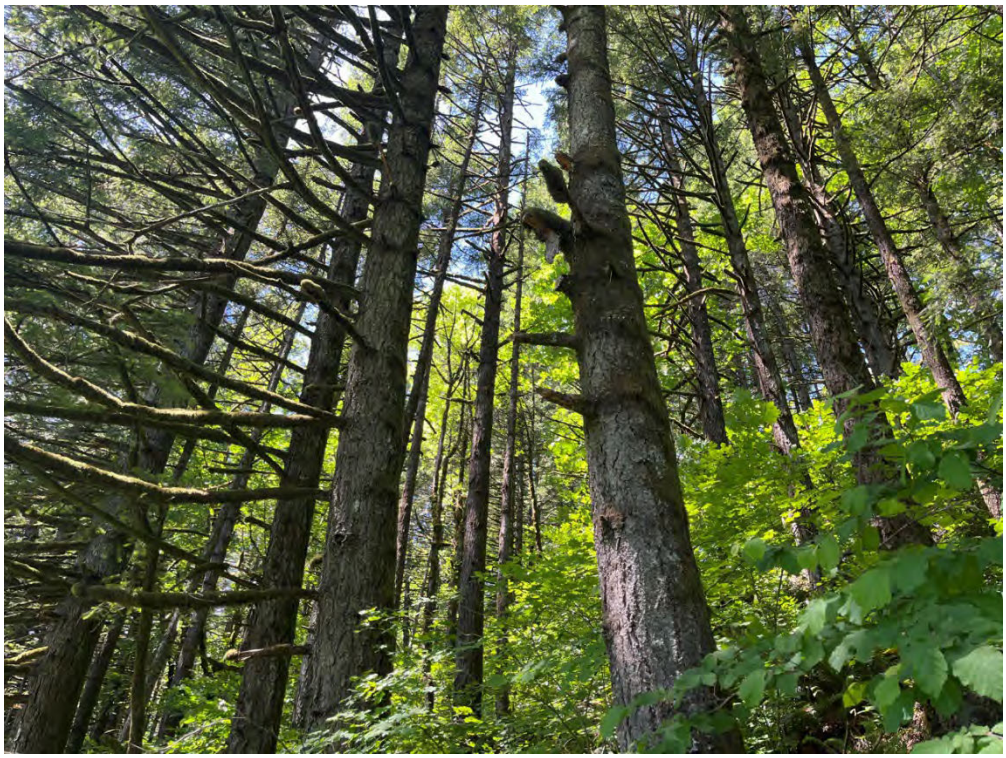


Photo 7: Conifer dominant mixed forest along north side of SR 14. May 2024.

Photo 8: Proposed cable route along road prism on the north side of SR 14 looking west from Ash Lake Road. May 2024.

Photo 9: Steep hillslope along east side of Ash Lake Road in conifer dominant mixed forest.

Photo 10: Steep embankment and narrow mature tree strip along the south side of Ash Lake Road. Photo looking east, May 2024.

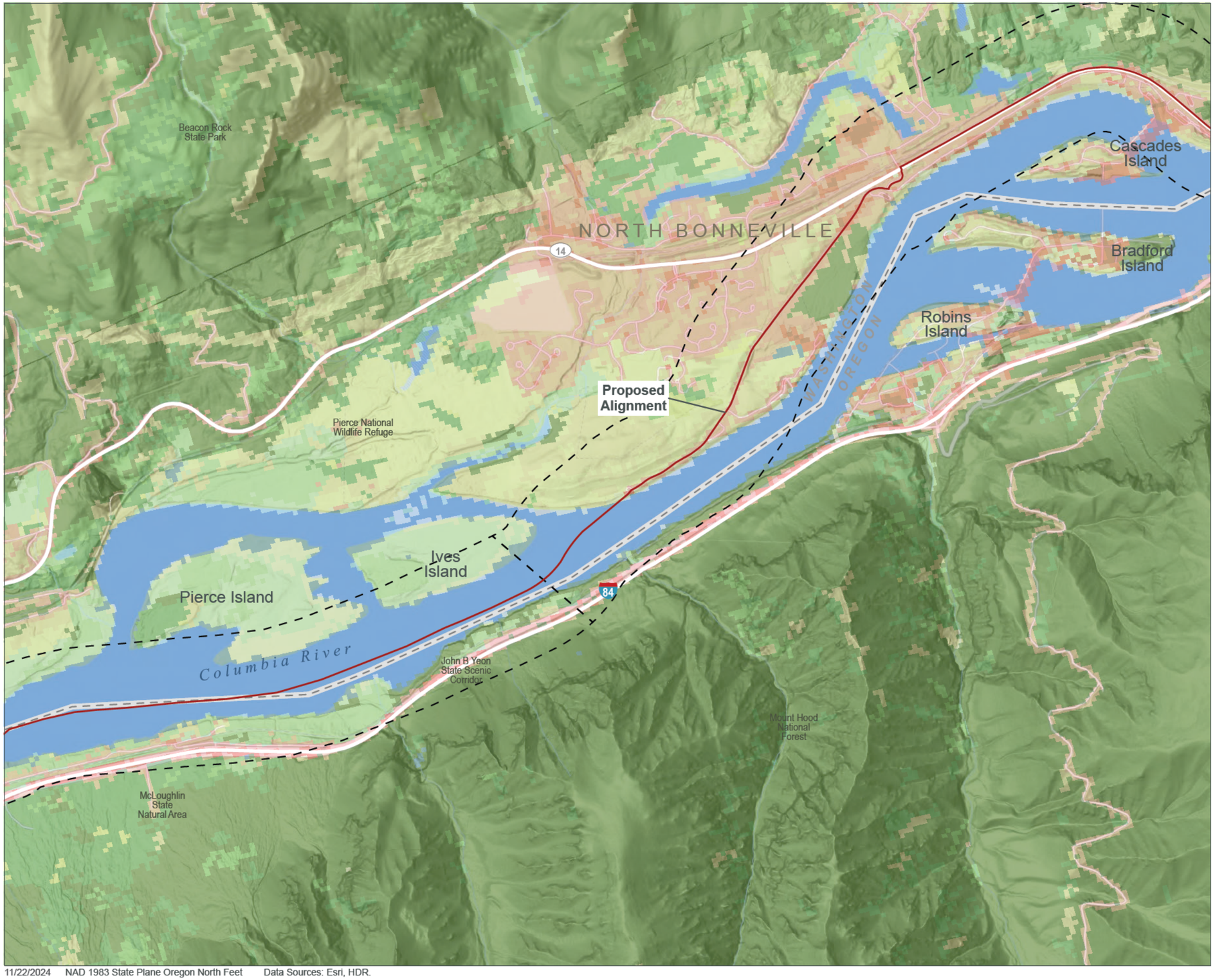
Photo 11: Looking east near east end of Ash Lake Road. Narrow cottonwood stand in riparian corridor between the road and the Columbia River. May 2024.

Photo 12: Disturbed open field at location of landing for HDD by the Columbia Gorge Museum in Stevenson, at east end of terrestrial corridor. Photo looking southwest. April 2023.

Photo 12: Ponded area with basking habitat suitable for turtles and frogs on [redacted]. Photo looking northwest. May 2024.

Attachment B: Figures

FIGURE H-1
LANDCOVER MAP
PAGE 1 OF 2



FOR INFORMATION ONLY - CONCEPT DRAWING

- PROPOSED ALIGNMENT
- STATE BOUNDARY
- STUDY AREA

NLCD LAND COVER

- OPEN WATER
- DEVELOPED OPEN SPACE
- DEVELOPED LOW INTENSITY
- DEVELOPED MEDIUM INTENSITY
- DEVELOPED HIGH INTENSITY
- BARREN LAND
- DECIDUOUS FOREST
- EVERGREEN FOREST
- MIXED FOREST
- SHRUB/SCRUB
- GRASSLAND/HERBACEOUS
- PASTURE/HAY
- CULTIVATED CROPS
- WOODY WETLANDS
- EMERGENT HERBACEOUS WETLANDS

CASCADE RENEWABLE TRANSMISSION

0 0.5 mi

1:24,000

11/22/2024 NAD 1983 State Plane Oregon North Feet Data Sources: Esri, HDR.

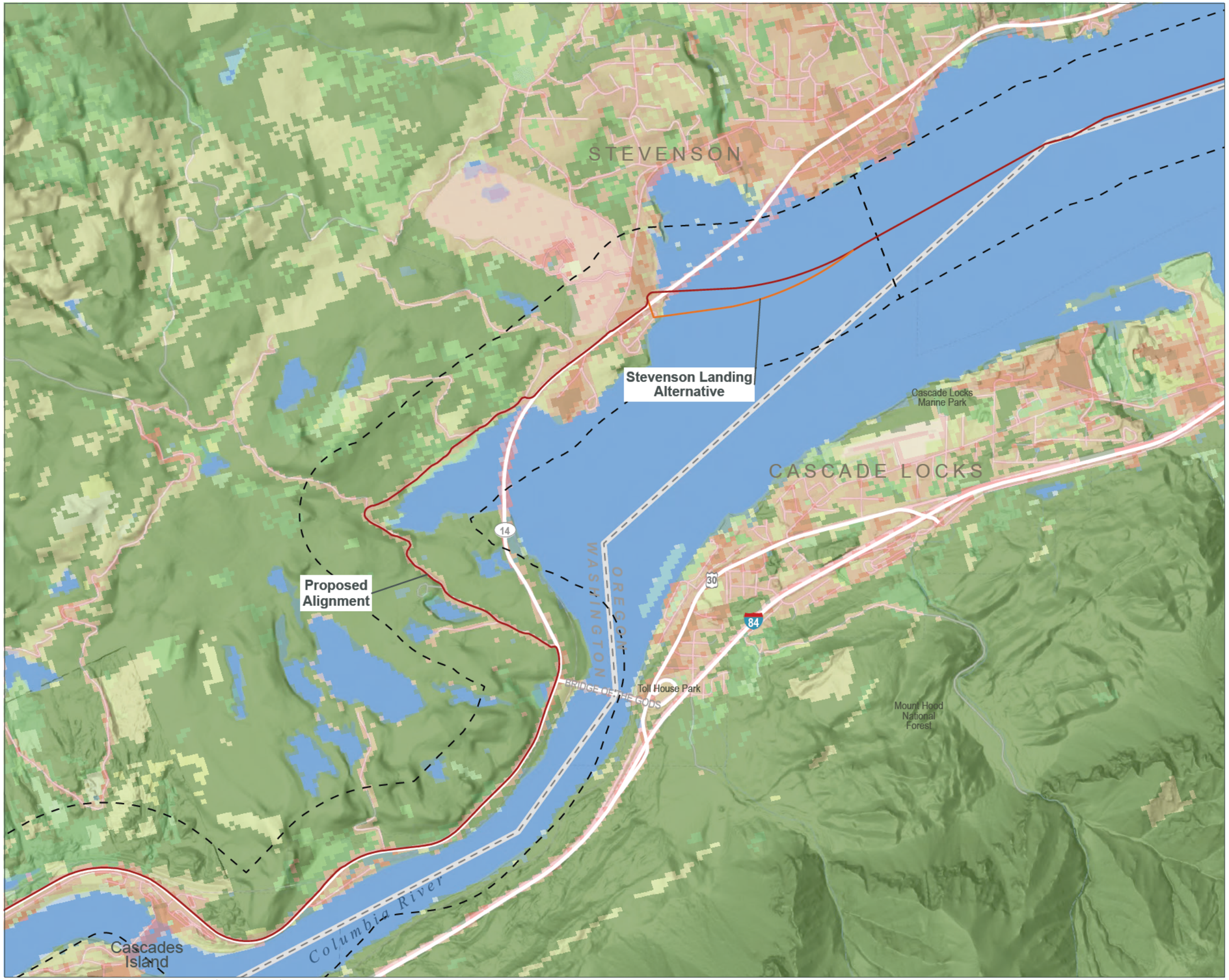
FIGURE H-1
LANDCOVER MAP
PAGE 2 OF 2

FOR INFORMATION ONLY - CONCEPT DRAWING

- PROPOSED ALIGNMENT
- ALTERNATIVES
- STATE BOUNDARY
- STUDY AREA

NLCD LAND COVER

- OPEN WATER
- DEVELOPED OPEN SPACE
- DEVELOPED LOW INTENSITY
- DEVELOPED MEDIUM INTENSITY
- DEVELOPED HIGH INTENSITY
- BARREN LAND
- DECIDUOUS FOREST
- EVERGREEN FOREST
- MIXED FOREST
- SHRUB/SCRUB
- GRASSLAND/HERBACEOUS
- PASTURE/HAY
- CULTIVATED CROPS
- WOODY WETLANDS
- EMERGENT HERBACEOUS WETLANDS



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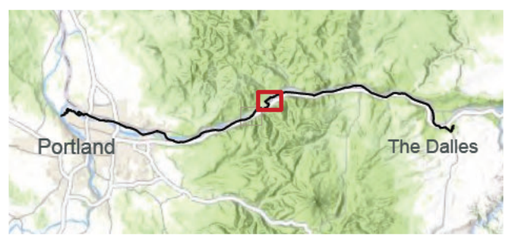


HDR

0 0.5 mi

1:24,000

FIGURE H-2
FIELD SURVEY RESULTS
PAGE 1 OF 3

FOR INFORMATION ONLY - CONCEPT DRAWING

- PROPOSED ALIGNMENT
- TEMPORARY HORIZONTAL DIRECTIONAL DRILLING (HDD) AREA
- TEMPORARY 3-SIDED WET COFFERDAM
- STATE BOUNDARY

FIELD SURVEY

- NESTS
- INCIDENTAL OBSERVATIONS
- HABITAT AREA

CASCADE RENEWABLE TRANSMISSION

0 0.3 mi

1:14,400

1/16/2025 NAD 1983 State Plane Oregon North Feet Data Sources: Esri, HDR.

FIGURE H-2
FIELD SURVEY RESULTS
PAGE 2 OF 3

FOR INFORMATION ONLY - CONCEPT DRAWING

- PROPOSED ALIGNMENT
- TEMPORARY HORIZONTAL AUGER BORE (HAB)
- STATE BOUNDARY

FIELD SURVEY

- NESTS
- INCIDENTAL OBSERVATIONS
- HABITAT POINT
- HABITAT AREA

CASCADE RENEWABLE TRANSMISSION

0 0.3 mi

1:14,400

FIGURE H-2
FIELD SURVEY RESULTS
PAGE 3 OF 3

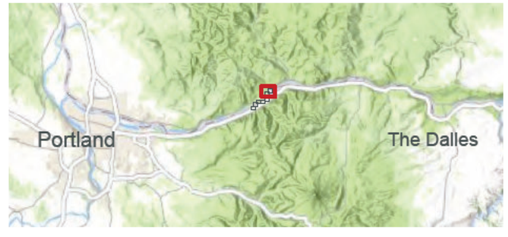
FOR INFORMATION ONLY - CONCEPT DRAWING

- PROPOSED ALIGNMENT
- ALTERNATIVES
- TEMPORARY HORIZONTAL DIRECTIONAL DRILLING (HDD) AREA
- TEMPORARY 3-SIDED WET COFFERDAM
- STATE BOUNDARY

FIELD SURVEY

- NESTS
- INCIDENTAL OBSERVATIONS
- HABITAT POINT
- HABITAT AREA

CASCADE RENEWABLE TRANSMISSION



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1/16/2025 NAD 1983 State Plane Oregon North Feet Data Sources: Esri, HDR.

FIGURE H-3
ESA CRITICAL HABITAT MAP

FOR INFORMATION ONLY - CONCEPT DRAWING

- PROPOSED ALIGNMENT
- ALTERNATIVES
- STATE BOUNDARY
- NORTHERN SPOTTED OWL CRITICAL HABITAT
- ANADROMOUS FISH DISTRIBUTION
- ESA-LISTED FISH CRITICAL HABITAT (NMFS)
- BULL TROUT (USFWS)

CASCADE RENEWABLE TRANSMISSION

0 1.2 mi

1:60,000

12/30/2024 NAD 1983 State Plane Oregon North Feet Data Sources: Esri, HDR.