PUGET SOUND NAVAL SHIPYARD AND INTERMEDIATE MAINTENANCE FACILITY

BREMERTON, WASHINGTON

BIOLOGICAL ASSESSMENT
AND
ESSENTIAL FISH HABITAT ASSESSMENT

PORT OF BENTON BARGE SLIP
MAINTENANCE DREDGING PROJECT

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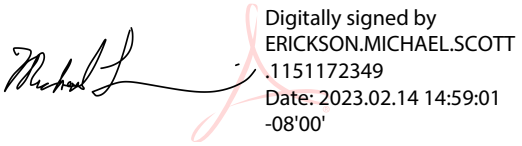

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CONSULTATION SUMMARY

ENDANGERED SPECIES ACT

The Code of Federal Regulations (50 CFR Section 402.14) requires agencies to consult formally with the National Oceanic and Atmospheric Administration - National Marine Fisheries Service (NOAA Fisheries or NMFS) and the United States Fish and Wildlife Service (USFWS) to determine the effects of the Proposed Action upon listed species and their designated Critical Habitat. This Biological Assessment (BA) has been prepared to facilitate coordination between the U.S. Navy – Puget Sound Naval Shipyard and Intermediate Maintenance Facility (PSNS & IMF), NMFS, and USFWS regarding the Port of Benton Barge Slip Maintenance Dredging Project (Project).

Nine species listed as threatened or endangered under the Endangered Species Act (ESA) by NMFS and the USFWS are identified as being potentially present within the vicinity of the Port of Benton Barge Slip (Table CS-1).

TABLE CS-1. ESA-Regulated Species Potentially Present

Common Name	Scientific Name	ESA Status
Upper Columbia River (UCR) Spring-Run Chinook Salmon	*Oncorhynchus tshawytscha*	Endangered
Middle Columbia River (MCR) Steelhead	*Oncorhynchus mykiss*	Threatened
Upper Columbia River (UCR) Steelhead	*Oncorhynchus mykiss*	Threatened
Columbia River Population Bull Trout	*Salvelinus confluentus*	Threatened
Gray Wolf – Western DPS	*Canis lupus*	Threatened
Pygmy Rabbit	*Brachylagus idahoensis*	Endangered
Ute Ladies'-Tresses	*Spiranthes diluvialis*	Threatened
Umtanum Desert Buckwheat	*Eriogonum codium*	Threatened
Western Yellow-Billed Cuckoo	*Coccyzus americanus*	Threatened

DESCRIPTION OF THE ACTION

Puget Sound Naval Shipyard and Intermediate Maintenance Facility has oversight responsibilities for maintenance of a barge slip located within the Columbia River at the Port of Benton in Richland, Washington. The barge slip is used to support shipments of decommissioned defueled reactor compartment disposal (RCD) packages up the Columbia River for disposal at the Hanford Site. The RCD packages are offloaded from a barge at the Port's slip facility to a land haul vehicle and transported to Hanford. The U.S. Army Corps of Engineers (Corps), Seattle District, has issued an authorization for annual barge slip maintenance dredging and fill placement under Nationwide Permit 3 (NWP 3). The current authorization expired March 18, 2022. Therefore, this BA was prepared by the Corps' Walla Walla District to support future maintenance in accordance with renewed authorization under NWP 3.

The Project includes the annual maintenance dredging necessary to maintain the Port of Benton barge

slip. Maintenance includes the annual sediment removal of up to 100 cubic yards of material, and the annual addition of up to 100 cubic yards of clean gravel for a period of 20 years. Maintenance dredging would occur via land-based backhoe/track hoe with an open bucket or clamshell dredge, or land-based suction dredge. Suction dredging would be limited to 25 cubic yards annually within the 100 cubic yard annual limit. Suction dredging is limited to fine sediment that would be unnecessarily disturbed by the clamshell dredge. A silt curtain would not be deployed during the suction dredging. While the authorized amount is 100 cubic yards annually, less than 65 cubic yards has been removed in the past approximately 25 years, so the actual amount which needs to be removed should be much lower and less frequent.

The immediate Project vicinity is relatively undeveloped, dryland habitat. Other land use in the Project vicinity includes a recreational bike/pedestrian trail to the south and a business park (commercial/industrial) to the west. Across the Columbia River (to the east) primary land uses include single-family residential and agriculture. The barge slip is surrounded on all sides by a gravel work area. No mature trees exist at the site.

BIOLOGICAL ASSESSMENT SUMMARY

SPECIES NOT AFFECTED

The Proposed Action would have no effect on gray wolves, pygmy rabbits, Ute ladies'-tresses, Umtanum desert buckwheat, or western yellow-billed-cuckoo. None of these species are known to or are likely to occur in the Action Area. These are all terrestrial species, and the Proposed Action would not affect terrestrial habitat.

SPECIES POTENTIALLY AFFECTED

SALMONIDS

Environmental Baseline Summary

The aquatic habitat utilized by salmon, steelhead, and bull trout in the Columbia River Basin has been drastically altered from its natural state. The construction of hydroelectric dams along the Columbia River has changed the river's natural flow regime, altered thermal patterns, and disturbed riparian environments. Additionally, migrating smolts are often killed or injured during their passage through these dams. The low water velocities created by the dams slow smolt migration to saltwater. Young fish are also exposed to predation by birds and predatory fish such as smallmouth bass and northern pikeminnow that inhabit the slower, deeper habitats. Critical Habitat can be defined as: *Specific areas within the geographical area occupied by the species at the time of listing that contain physical or biological features essential to conservation of the species and that may require special management considerations or protection.*

Effect Analysis Summary

Effects to ESA-listed salmonid species are likely to result from the Proposed Action. However, work would occur during in-water work windows and when the abundance of ESA-listed salmonids is seasonally low. The primary effect of dredging is anticipated to be a short-term increase in noise disturbance and turbidity in the immediate area of the barge slip. Noise would generally result from

construction equipment operated from shore. No pile driving, blasting, or other chronic intense noise would occur.

Turbidity is anticipated to be minimal as a result of coarse sediments and would be contained locally within the barge slip during construction. None of the actions are anticipated to result in harm or harassment of ESA-listed salmonids that may occur in the Action Area. The Proposed Action is anticipated to result in modification to Critical Habitat within the Action Area. The Proposed Action is anticipated to have an adverse effect or result in the destruction or adverse modification of designated Critical Habitat for UCR Chinook salmon, MCR steelhead, and UCR steelhead. The Proposed Action is not anticipated to adversely affect or result in the destruction or adverse modification of designated Critical Habitat for bull trout.

Effect Determination Summaries

Effects of the Proposed Action to ESA-listed species and their designated critical habitat are summarized in Table CS-2. Detailed information regarding each species and the rationale behind the effect determinations is contained within the main body of this document.

TABLE CS-2. Effect Determination Summaries for Each Species Listed by NOAA Fisheries or USFWS as Threatened or Endangered in Relation to the Proposed Action.

ESA-Regulated Species	"May affect, likely to adversely affect"	"May affect, but not likely to adversely affect"	"No effect"
Upper Columbia River (UCR) Spring-Run Chinook Salmon	X		
Middle Columbia River (MCR) Steelhead	X		
Upper Columbia River (UCR) Steelhead	X		
Columbia River Population Bull Trout		X	
Gray Wolf – Western DPS			X
Pygmy Rabbit			X
Ute Ladies'-Tresses			X
Umtanum Desert Buckwheat			X
Western Yellow-billed Cuckoo			X

MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

Section 600.920 50 CFR requires agencies to consult with NOAA Fisheries on activities that may adversely affect Essential Fish Habitat (EFH). The objective of the EFH assessment is to determine whether or not the Proposed Action "may adversely affect" designated EFH for relevant commercially, federally-managed fish species.

The Proposed Action is within an area that provides EFH for species of Pacific salmon that are regulated under the Magnuson-Stevens Act. In addition to Pacific salmon, EFH has been designated for groundfish and coastal pelagic species. No areas of EFH for Pacific coast groundfish or coastal pelagic species occur within the Action Area. The Proposed Action has been identified as having the

potential to affect fish habitat as a result of a temporary increase in turbidity. The short-term increase in turbidity would be minimized through the implementation of conservation measures intended to protect ESA-regulated species.

These actions would also conserve Pacific salmon EFH. The Proposed Action would have an adverse effect on EFH for Pacific salmon.

1.0 INTRODUCTION

The Code of Federal Regulations (50 CFR Section 402.14) requires agencies to consult with the National Oceanic and Atmospheric Administration - National Marine Fisheries Service (NOAA Fisheries or NMFS) and the United States Fish and Wildlife Service (USFWS) (jointly referred to as the Services) to determine the effects of Proposed Actions upon listed species and their designated Critical Habitat. This Biological Assessment (BA) has been prepared to facilitate coordination between the U.S. Navy – Puget Sound Naval Shipyard and Intermediate Maintenance Facility (PSNS & IMF) and the Services regarding the Port of Benton Barge Slip Maintenance Dredging Project (Project).

Nine species listed by the Services are identified as being potentially present within Benton County, WA (Table 1).

TABLE 1. ESA-Listed Species Potentially Present within Benton County,WA.

Common Name	Scientific Name	ESA Status	Critical Habitat Status
Upper Columbia River (UCR) Spring-Run Chinook Salmon	*Oncorhynchus tshawytscha*	Endangered	Designated
Middle Columbia River (MCR) Steelhead	*Oncorhynchus mykiss*	Threatened	Designated
Upper Columbia River (UCR) Steelhead	*Oncorhynchus mykiss*	Threatened	Designated
Columbia River Population Bull Trout	*Salvelinus confluentus*	Threatened	Designated
Gray Wolf - Western Distinct Population Segment (DPS)*	*Canis lupus*	Threatened	None
Pygmy Rabbit	*Brachylagus idahoensis*	Endangered	None
Ute Ladies'-Tresses	*Spiranthes diluvialis*	Threatened	None
Umtanum Desert Buckwheat	*Eriogonum codium*	Threatened	Designated
Western Yellow-Billed Cuckoo**	*Coccyzus americanus*	Threatened	Designated***

*The gray wolf western DPS was relisted due to court ruling February 10, 2022.

**Western yellow-billed cuckoo was not included on the species list received for this action on February 1, 2022 and has been extirpated from Washington. However, the Action Area is in the cuckoo's historic range.

***Critical habitat is not designated in Washington.

1.1 PRIOR CONSULTATIONS

- May 5, 2016. Informal consultation was requested of the USFWS for the proposed Project. A letter of concurrence was received from USFWS May 20, 2016 (USFWS Reference 01EWFW00-2016-I-0795)

- May 2, 2016. Informal consultation was requested of NMFS for the proposed Project. A letter of concurrence was received from NMFS August 1, 2016 (NMFS Reference WCR-2016-5174)
- June 8, 2006. USFWS Letter of Concurrence, Reference 13260-2006-I-0220. HUC 17-02-00-16-06 (Upper Columbia/Priest Rapids)
- May 30, 2006. Letter of Concurrence, Endangered Species Act Section 7 Informal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for Minor Maintenance Dredging at the Port of Benton, Benton County,Washington. (Sixth Field HUC: Columbia River – Richland, 170200160602) NMFS Tracking No. 2006/01824

2.0 DESCRIPTION OF THE ACTION

PSNS & IMF has oversight responsibilities for maintenance of a barge slip located within the Columbia River at the Port of Benton in Richland, Washington (Figure 1). The barge slip is used to support shipments of decommissioned defueled reactor compartment disposal (RCD) packages up the Columbia River for disposal at the Hanford Site. The RCD packages are offloaded from a barge at the Port's slip facility to a land haul vehicle and transported to Hanford.

Maintenance of the barge slip is governed by a Washington Department of Fish and Wildlife Hydraulic Project Approval (HPA). Additionally, the U.S. Army Corps of Engineers (Corps), Seattle District, issued an authorization for annual barge slip maintenance dredging and fill placement under Nationwide Permit 3 (NWP 3). The current authorization expired March 18, 2022. Therefore, this BA was prepared by the Corps' Walla Walla District to support future maintenance in accordance with renewed authorization under NWP 3.

2.1 EXISTING CONDITIONS

The Proposed Action is located at the Port of Benton Barge Slip in Richland, Washington, which is located on the western shoreline of the Columbia River at River Mile (RM) 342.8 (Figure 1). The immediate Project vicinity is relatively undeveloped dryland habitat with a thin band of riparian vegetation (Photos 1 - 3). Other land uses in the Project vicinity include a recreational bike/pedestrian trail to the south and a business park (commercial/industrial) to the west. Across the Columbia River (to the east), primary land uses include single-family residential and agriculture (Photo 4). The barge slip is surrounded on all sides by a gravel work area (Photos 1 and 5). Vegetation at the site includes willow (*Salix* spp.), Western St. John's wort (*Hypericum formosum*), rib plantain (*Plantago lanceolata*), white sweet-clover (*Melilotus alba*), bentgrass (*Agrostis* spp.), reed canary grass (*Phalaris arundinacea*), common yarrow (*Achillea millefolium*), dock (*Rumex* spp.), Himalayan blackberry (*Rubus armeniacus*), and poison oak (*Rhus diversilobum*) (Photo 6). Milfoil (*Myriophyllum* spp.) occurs along the outer edges of the barge slip (Photo 7). No mature trees exist at the site.

The barge slip is delineated on the north and west by cellular sheet pile. Concrete debris is present on the south. Water depths within the barge slip average 10 feet from normal water pool elevation (340 feet mean sea level [MSL]). Site Photos 1 through 7 were taken in 2014 but are representative of the

present condition.

FIGURE 1. Vicinity Map

PHOTO 1: Port of Benton Barge Slip looking east-southeast (7/17/2014)

PHOTO 2: Vicinity surrounding Port of Benton Barge Slip, looking northwest (7/17/2014)

PHOTO 3: Vegetation and shrubs surrounding the Port of Benton Barge Slip, looking west (7/17/2014)

PHOTO 4: Single-family residences along the left bank of the Columbia River, looking east (7/17/2014)

PHOTO 5: Port of Benton Barge Slip and surrounding vegetation/gravel, looking north(7/17/2014)

PHOTO 6: Shoreline vegetation along the Columbia River, looking southwest (7/17/2014)

PHOTO 7: Port of Benton Barge Slip with surrounding aquatic vegetation, looking east (7/17/2014)

2.2 PROPOSED ACTION

The authorized Project includes the annual maintenance dredging necessary to maintain the Port of Benton barge slip (Figure 1, Photo 1). This includes the annual removal of up to 100 cubic yards of material from the barge slip, and the annual addition of up to 100 cubic yards of clean gravel for a period of 20 years. Dredge quantities are based on a worst-case scenario. Under the existing authorizations, the barge slip was dredged only twice in approximately 25 years following the extremely high flows in the winter of 1996/1997, and again in 2010. During the 1996/1997 high water event, sand and gravel were deposited within the slip and resulted in the dredging of only 45 cubic yards of sandy gravel. Less than 20 cubic yards were removed via land-based suction dredge in 2010.

A land-based backhoe/excavator with an open bucket or clamshell dredge or land-based suction dredge would be used. The use of a land-based suction dredge was discussed between NMFS and the Corps Regulatory Division in 2009 with no objection from NMFS at that time. Suction dredging would be limited to 25 cubic yards annually within the 100 cubic yard annual limit. Suction dredging is screened, limited to fine sediment that would be unnecessarily disturbed by clamshell dredge, and would be operated with the intake on or below the streambed surface, in addition to working slowly and minimizing turbidity.

All dredged material would be disposed of in an approved upland location off-site. Clamshell dredge sediment dewaters immediately upon and during removal from the slip. Suction dredge sediment is processed in a land-based collection tank wherein dewatered sediment and separated water are both

disposed off-site.

The Project also includes the addition of up to 100 cubic yards of ¾-inch-minus clean, washed gravel annually to level the barge slip as necessary. Typically, less than 2 cubic yards of gravel have been added over the entire bottom of the slip and it is not foreseen that more than 5 cubic yards would normally be required except under extraordinary circumstances. Gravel would be added by use of a land-based crane, suspending a funnel bucket over the water with a tube sleeve extending from the bucket into the water. A diver would direct the placement of the tube sleeve over low spots on the bottom. Gravel fill and raking require good in-water visibility and would be performed in a deliberate manner to reduce turbidity.

The diver would use a handheld rake, similar to a standard garden rake, to smooth the slip bottom as needed to ensure a very flat condition. Hand raking typically involves a few square feet of surface at a time and a few square yards of surface total. The barge slip is approximately 62 feet wide and 150 feet long (9,300 square feet) (Figures 2 and 3).

Turbidity would be monitored during dredging. A silt curtain would be used in the slip for excavator dredging between August 15 and August 30 and December 15 through March 1. This and additional conservation measures are provided in Section 5.1.3.

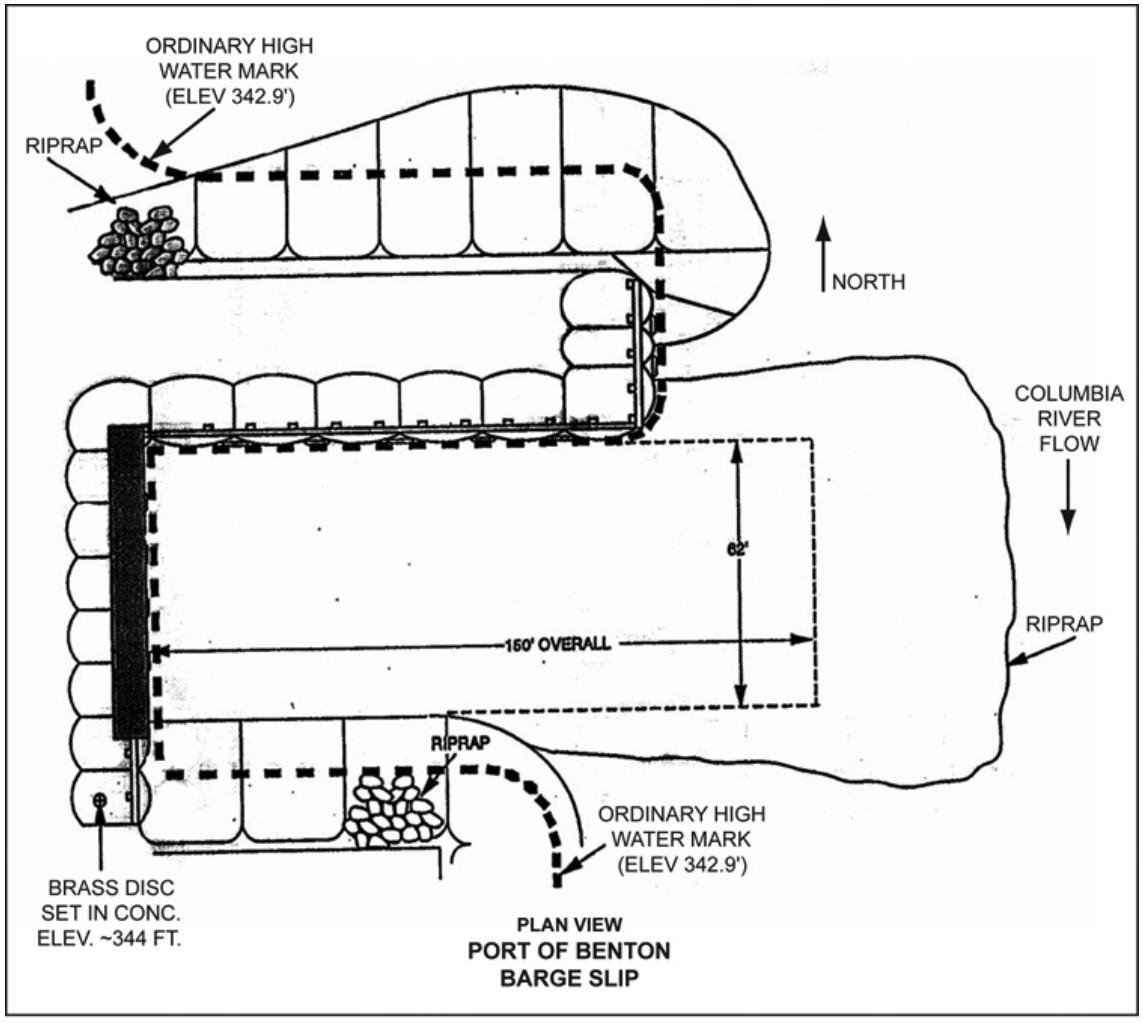

FIGURE 2. Barge Slip Layout

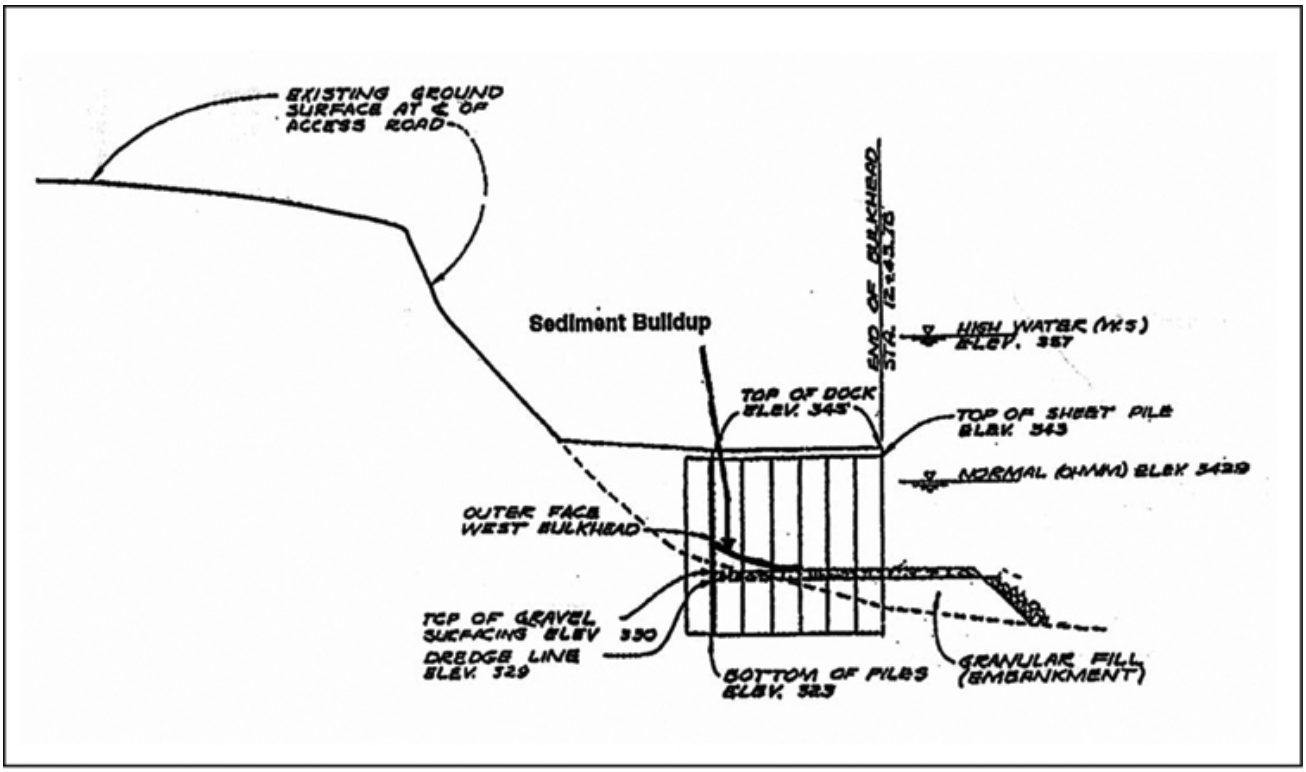

FIGURE 3. Barge Slip Profile

2.3 ACTION AREA

The ESA requires potential effects to listed endangered and threatened species be evaluated in relation to the complete range of area influenced by the Proposed Action (the Action Area – Figure 4) (50 CFR Part 402.02). The Action Area encompasses the complete extent where measurable direct and indirect effects resulting from the Proposed Action are foreseeable and are reasonably certain to occur (USFWS, 1998 and NOAA Fisheries, 1996).

The aquatic Action Area for the Proposed Action would include those portions of the Columbia River from 300 feet upstream of the Project site to one mile downstream (Figure 4). Adult Upper Columbia River (UCR) spring-run Chinook salmon, Middle-Columbia River (MCR) steelhead, and UCR steelhead use the Action Area during their annual upstream migration to spawning grounds. Columbia River Population bull trout may also use the Action Area during winter and when migrating to spawning grounds. This area also serves as migration and rearing habitat for juvenile salmon and steelhead. The Action Area includes designated Critical Habitat for all of these species. The Action Area also extends beyond the construction limits to include terrestrial areas within a one-mile radius of the Project corridor (Figure 4). Effects from noise would be observed below this distance and are most likely to occur on the Benton County side of the Columbia River.

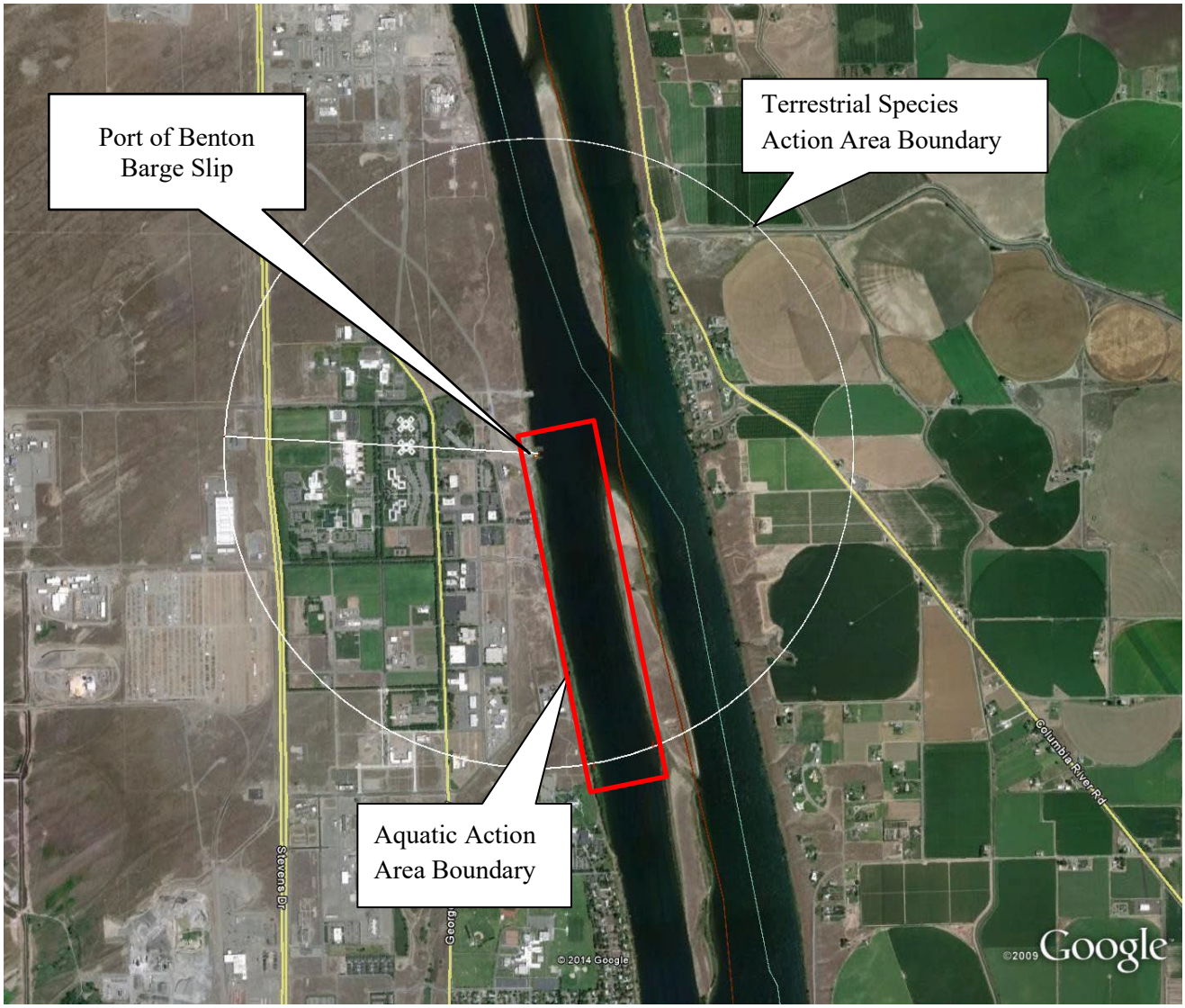

FIGURE 4. Action Area

2.4 ACTION TIMING

Maintenance dredging would occur during a winter in-water work window for ESA-listed fishes from December 15 through March 1 for all dredging methods, or during a summer window from August 15 through August 30. A silt curtain would be deployed during the use of the excavator for dredging.

Gravel placement would occur during the winter in-water work window from December 15 through March 1 and may also occur during the summer from July 1 through August 30.

Hand raking of gravel would occur from December 15 through April 10 and July 1 through October 31 as needed.

3.0 SPECIES NOT AFFECTED

The Proposed Action would have no effect on gray wolves, pygmy rabbits, Ute ladies'-tresses, Umtanum desert buckwheat, or western yellow-billed cuckoo. These species are listed under USFWS jurisdiction and would not be affected by the proposed action. They do not physically occur within the developed Action Area. Habitat requirements and the environmental baseline for these species are summarized below:

3.1 GRAY WOLF

On May 5, 2011, the USFWS announced they were proposing to delist the gray wolf, in accordance with the April 15, 2011, legislation, reinstating the Service's 2009 decision to delist biologically recovered gray wolf populations in the Northern Rocky Mountains. In Washington, gray wolves that occur outside of the boundaries of this DPS were referred to as the western DPS and remained federally listed as endangered (Including Benton County, Washington) until a final rule published in 2020 delisted the gray wolf nationwide (85 Federal Register 69778). February 10, 2022, a court ruling reinstated protections for the gray wolf western DPS, while the Northern Rocky Mountain DPS remains delisted.

Gray wolves were once common throughout some parts of Washington. Records exist of wolves in the vicinity of the Walla Walla Valley and in southern Grant County. Currently, wolf packs and individuals have been confirmed to span the northern half of Washington State from the northeast Selkirk Mountains to the northern Cascade Mountains, south into the Wenatchee Mountains, and in the southeast Washington Blue Mountains (WDFW, 2022).

Habitat conditions and non-existent prey base in the Action Area make the habitat unsuitable for wolves. Wolves would not be found close to the development and high human population near the Action Area; however, it may be possible for wolves to eventually find their way to the Hanford elk herd as the Washington wolf population expands.

3.2 PYGMY RABBIT

The pygmy rabbit was listed as endangered by emergency rule in 2001. It is the smallest rabbit in North America (0.83-1.1 pounds) and is one of only two rabbits which digs its own burrows (WDFW, 2003). The pygmy rabbit prefers soft soil in areas where tall sagebrush is abundant. Individuals dig burrows with several entrances, usually on hillsides with a north-to-east orientation. The home range of the pygmy rabbit usually entails approximately a 100-foot radius around its burrow.

Pygmy rabbits have not been observed within the Port of Benton or Action Area. There is one historic sighting near Hanford; it occurred relatively far from the Columbia River (Duberstein, personal communication, 2005). Although sagebrush exists within the Project area, the compacted soils adjacent to the barge slip are not suitable for use by pygmy rabbits.

3.3 UTE LADIES'- TRESSES

Ute ladies'-tresses was listed as threatened in 1992. The life history of Ute ladies'-tresses is described in *Endangered and Threatened Wildlife and Plants; Final Rule* (57 Federal Register 12,

June 17, 1992) and is included herein by reference. Ute ladies'-tresses occupies riparian and wetland habitats that meet specific parameters including moisture, slope, and solar exposure. It requires soil moisture at or near the surface throughout the growing season. The water table must be within approximately 10 inches of the surface. This species does not grow on steep slopes or in areas with dense canopy cover. It tolerates full sun to partial shade and is frequently found within openings in shrubby areas with willow saplings.

There is no documented occurrence of Ute ladies'-tresses in the Port of Benton or Action Area (Sackschewsky, personal communication, 2005). No individuals of this species were observed during a site visit on July 17, 2014. Site conditions have not changed since 2014 and no suitable habitat occurs in the immediate Action Area.

3.4 UMTANUM DESERT BUCKWHEAT

Umtanum desert buckwheat was listed as threatened in 2013. This plant is a long-lived, woody perennial, which was discovered in 1995 near the Hanford Nuclear Reservation (Revealet al., 1996). The only known population of Umtanum desert buckwheat occurs in Benton County, Washington, over a narrow 1-mile ridge (Dunwiddie et al., 2001). This population is found on exposed basalt from the Lolo Flow of the Wanapum Basalt Formation. The soils there are classified as Lithosols, which are composed of basalt and pumice (USFWS, 2004). This species has never been observed in the Port of Benton or Action Area, and there is no potential for the Project site to support this plant species.

3.5 WESTERN YELLOW-BILLED CUCKOO

The western yellow-billed cuckoo was listed as threatened in 2014. Western yellow-billed cuckoos breed in large blocks of riparian habitats (particularly woodlands with cottonwoods and willows) (Ehrlich et al., 1988). Dense understory foliage appears to be an important factor in nest site selection, while cottonwood trees are an important foraging habitat in areas where the species has been studied in California (USFWS, 2001). The breeding range of the western yellow-billed cuckoo formerly included most of North America from southern Canada to the Greater Antilles and northern Mexico (USFWS, 2001). In recent years, the species' distribution in the west has contracted. The northern limit of breeding in the coastal states is now in Sacramento Valley, California (USFWS, 2001).

Western yellow-billed cuckoos are heavily dependent on specialized riparian environments, which include dense understory combined with high abundances of mature cottonwood trees. Suitable habitat does not occur within the Action Area. Although western yellow-billed cuckoos have been observed in southeastern and south-central regions of Washington, there are no historical accounts of cuckoos near the Port of Benton or Hanford (Sackschewsky, personal communication, 2005). Furthermore, western yellow-billed cuckoo Critical Habitat was designated in 2014 but revised in 2020 and now excludes Washington State from the designation.

4.0 SPECIES POTENTIALLY AFFECTED

The following species identified by the Services as threatened or endangered are known to occur or utilize habitats within the Action Area. These species are discussed in detail below and include:

- UCR spring-run Chinook salmon
- MCR steelhead
- UCR steelhead
- Columbia River Population bull trout

4.1 UPPER COLUMBIA RIVER SPRING-RUN CHINOOK SALMON

The UCR spring-run Chinook salmon evolutionarily significant unit (ESU) was listed as endangered on March 24, 1999 (64 Federal Register 14308). This ESU includes all natural-origin, stream-type Chinook salmon from river reaches above Rock Island Dam and downstream of Chief Joseph Dam, including the Wenatchee, Entiat, and Methow River Basins, which NMFS has identified as independent spawning populations within this ESU (TRT, 2003). The spring-run components of the following hatchery stocks are also listed: Chiwawa, Methow, Twisp, and White Rivers and Nason Creeks. The UCR spring-run Chinook salmon migrate and rear in the Action Area and may be present in small numbers during the in-water work windows.

4.1.1 Life History

The UCR spring-run Chinook salmon exhibit classic stream-type life-history strategies: emigrating from freshwater as yearling smolts and undertaking extensive offshore ocean migrations. The majority of these fish mature at four years of age and return to the Columbia River from March through mid-May with the majority of adult and juvenile migration occurring April through June (DART, 2022).

4.1.2 Biological Requirements

Range-wide UCR spring-run Chinook salmon biological requirements include food, flowing water (quantity), high quality water (cool, free of pollutants, high dissolved oxygen concentrations, low sediment content), clean spawning substrate, and unimpeded migratory access to and from spawning and rearing areas (adapted from Spence et al., 1996).

4.1.3 Population Trends and Risks

The annual UCR spring-run Chinook return fluctuates across years. For example, adult passage at Priest Rapids was 5,501 in 2020 and 13,105 in 2021 (DART, 2022). The 12-year geometric mean suggests that UCR spring-run Chinook salmon populations are not replacing themselves (SOS, 2020). In recent years, UCR spring-run Chinook salmon abundance has decreased substantially, likely due to poor ocean conditions. The combinations of current abundance and productivity for each population result in a “high” risk rating and the viability of the UCR spring-run Chinook salmon ESU remains at a “high” risk of extinction (Ford, 2022).

4.1.4 Critical Habitat

On September 2, 2005 NOAA Fisheries designated Critical Habitat for 12 ESUs of Pacific salmon and steelhead in Washington, Oregon, and Idaho (70 FR 52629). The UCR spring-run Chinook salmon ESU was included within the 12 ESUs. The Columbia River from Rock Island Dam downstream to the mouth of the Columbia River (Unit 5) contains designated Critical Habitat for rearing juveniles and migration of juveniles and adults.

4.1.5 Environmental Baseline

Chinook salmon use the waters near the Port of Benton as a migratory corridor for both seaward migration and spawning migration. Additionally, this particular reach of the Columbia River could be used for juvenile rearing, holding and foraging habitat. Because of the heavy modification to the Columbia mainstem during the 19th and 20th centuries, reaches of the Columbia similar to the one encompassing the Port of Benton do not support spawning Chinook salmon but do support migration and juvenile rearing.

4.2 MIDDLE COLUMBIA RIVER STEELHEAD

Middle Columbia River (MCR) steelhead were first listed as threatened on March 25, 1999 (64 Federal Register 14517) and reaffirmed as threatened on January 5, 2006 (71 Federal Register 834). Protective regulations were issued on June 28, 2005 (70 Federal Register 37160), and Critical Habitat for this DPS was listed on September 5, 2005 (70 Federal Register 52630). The MCR steelhead Yakima River population migrates and rears in the Action Area.

4.2.1 Life History

Life history characteristics for MCR steelhead are similar to those of other inland steelhead ESUs; however, smolt age is dominated by ages two and three and some of the oldest smolt ages for steelhead, up to seven years, are reported from this ESU (Peven et al., 1994). Generally, MCR steelhead return to freshwater after one year in salt water. Similar to other inland Columbia River Basin steelhead ESUs, juveniles typically out-migrate April through June and adults typically return to the Columbia River between May and October and are considered summer-run steelhead.

Adults may remain in freshwater up to a year before spawning. Unlike Chinook salmon or sockeye salmon, a fraction of steelhead adults attempt to migrate back to the ocean. These fish are known as kelts, and those that survive will migrate from the ocean to their natal streams to spawn again.

4.2.2 Biological Requirements

Range-wide MCR steelhead biological requirements include food, flowing water (quantity), high quality water (cool, free of pollutants, high dissolved oxygen concentrations, low sediment content), clean spawning substrate, and unimpeded migratory access to and from spawning and rearing areas (adapted from Spence et al., 1996).

4.2.3 Population Trends and Risks

MCR steelhead from the Yakima Major Population Group are the only steelhead that should be exposed to the effects of the proposed action. Viability ratings for three of the Yakima River steelhead populations are rated at maintained or viable, and one, the Upper Yakima River, at high risk (Ford 2022). The risk for the Satus Creek, Toppenish Creek, and Naches River populations is moderate, because of changes related to maintaining natural patterns of variation in life history strategies – spawning, rearing, and migration timing – as well as changes in phenotypic or genetic traits, related to altered habitat, particularly flow regimes and water temperature. For the Satus Creek, Toppenish Creek, and Naches River populations, there are also changes in the distribution of spawning. The Upper Yakima River is at high risk based on population spatial structure and diversity

because of loss of spawning areas, decreased life history variation, and possible genetic introgression with planted rainbow trout. Overall, MCR steelhead remain at a moderate risk of extinction with viability ratings unchanged over the last five years.

4.2.4 Critical Habitat

NMFS designated Critical Habitat for Middle Columbia River steelhead in the Upper Yakima, Naches, Lower Yakima, Middle Columbia/McNary Pool, Walla Walla, Umatilla, Middle Columbia/Hood, Klickitat, Upper John Day, North Fork John Day, Middle Fork John Day, Lower John Day, Lower Deschutes, and Trout subbasins, and the Columbia River migration corridor.

4.2.5 Environmental Baseline

MCR steelhead use the waters near the Port of Benton as a migratory corridor for both seaward migration as smolts and spawning migration as adults. Additionally, this particular reach of the Columbia River could be used for rearing and holding. Because of the heavy modification to the Columbia mainstem during the 19th and 20th centuries, reaches of the Columbia similar to the one encompassing the Port of Benton do not support spawning steelhead. Aerial spawning surveys in the past have not documented spawning steelhead near the Port of Benton (Mueller, personal communication, 2005). The closest documented occurrences of steelhead spawning near the Project area took place approximately 2.0 miles upstream.

4.3 UPPER COLUMBIA RIVER STEELHEAD

The UCR steelhead ESU was listed as endangered on August 18, 1997 (62 Federal Register 43937). This ESU includes all natural-origin populations of steelhead in the Columbia River Basin upstream from the Yakima River in Washington to the U.S./Canada border. The Wells Hatchery stock is included among the listed populations. NMFS has identified three important spawning populations within this ESU: the Wenatchee, Entiat, and Methow populations (TRT, 2003). The UCR steelhead migrate and rear in the Action Area.

4.3.1 Life History

Life history characteristics for UCR steelhead are similar to those of other inland steelhead ESUs; however, smolt age is dominated by ages two and three and some of the oldest smolt ages for steelhead, up to seven years, are reported from this ESU (Peven, 1990). Based on limited data, steelhead from the Wenatchee and Entiat Rivers return to freshwater after one year in salt water, whereas Methow River steelhead primarily return after two years in salt water. Similar to other inland Columbia River Basin steelhead ESUs, juveniles typically out-migrate April through June and adults typically return to the Columbia River between May and October and are considered summer-run steelhead.

Adults may remain in freshwater up to a year before spawning. Unlike Chinook salmon or sockeye salmon, a fraction of steelhead adults attempt to migrate back to the ocean. These fish are known as kelts, and those that survive will migrate from the ocean to their natal streams to spawn again.

4.3.2 Biological Requirements

Range-wide UCR steelhead biological requirements include food, flowing water (quantity), high quality water (cool, free of pollutants, high dissolved oxygen concentrations, low sediment content), clean spawning substrate, and unimpeded migratory access to and from spawning and rearing areas (adapted from Spence et al., 1996).

4.3.3 Population Trends and Risks

UCR steelhead populations have decreased in natural origin abundance in the past five years and productivity levels remain low (Ford 2022). The 2021 adult count passing Priest Rapids Dam was under 3,000 fish and only 24 percent of the 10-year average which is nearly 12,000 fish (DART, 2022). The 12-year geometric mean suggests that UCR steelhead populations are not replacing themselves (SOS, 2020). The UCR populations remain at a high risk of extinction due to low abundance and productivity relative to viability objectives and lack of genetic diversity among the populations (Ford 2022).

4.3.4 Critical Habitat

On September 2, 2005, NOAA Fisheries designated Critical Habitat for 12 ESUs of Pacific salmon and steelhead in Washington, Oregon, and Idaho (70 FR 52630). The Upper Columbia River steelhead DPS was included within the 12 ESUs.

The Action Area occurs within Unit 10 (Upper Columbia River/Priest Rapids Subbasin), which contains spawning, rearing, or migration physical and biological features (PBF).

4.3.5 Environmental Baseline

Similar to MCR steelhead, UCR steelhead use the waters near the Port of Benton as a migratory corridor for both seaward migration as smolts and spawning migration as adults. Additionally, this particular reach of the Columbia River could be used for rearing and holding. Because of the heavy modification to the Columbia mainstem during the 19th and 20th centuries, reaches of the Columbia similar to the one encompassing the Port of Benton do not support spawning steelhead. Aerial spawning surveys in the past have not documented spawning steelhead near the Port of Benton (Mueller, personal communication, 2005). The closest documented occurrences of steelhead spawning near the Project area took place approximately 2.0 miles upstream.

4.4 COLUMBIA RIVER BULL TROUT DISTINCT POPULATION SEGMENT

The historical distribution of bull trout extends from northern California to Alaska. In Washington, bull trout are found throughout coastal and inland streams and lakes (WDFW, 1998).

4.4.1 Life History

Columbia River Population bull trout were listed as threatened in 1998. Bull trout have a complex life history. There are two life history forms among bull trout: a resident form and a migratory form. Individuals of the migratory form may be stream dwelling (fluvial), lake-dwelling (adfluvial), or ocean- or estuarine-dwelling (anadromous) (64 FR 58910; USFWS, 1998). Individuals of each form may be represented in a single population; however, migratory populations may dominate where

migration corridors and subadult rearing habitats are in good condition (64 FR 58910; USFWS, 1998).

Bull trout are opportunistic feeders, consuming fish in the water column and insects on the bottom (WDFW, 1998). High quality bull trout habitat is typically characterized by cold temperatures; abundant cover in the form of large wood, undercut banks, and boulders; clean substrate for spawning; interstitial spaces large enough to conceal juvenile bull trout; and stable channels. Redds are dug by females in water 7 to 23 inches deep, in substrate gravels 0.1 to 2 inches in diameter (Wydoski and Whitney, 1979).

4.4.2 Habitat Requirements

Bull trout are found in a variety of habitats, including lakes, reservoirs, large rivers, and small streams, but they primarily inhabit colder streams (Rieman and McIntyre, 1995). Bull trout spawn in streams with clean gravel substrates and cold (less than 48°F) water temperatures (USFWS, 1998).

4.4.3 Critical Habitat

In October 2004, the USFWS designated Critical Habitat for Columbia River Population bull trout (69 FR 59995). The designation was revised in 2010 (75 Federal Register 63898). The mainstem Columbia River is now part of the Critical Habitat designation.

4.4.4 Environmental Baseline

Very few bull trout are likely to use the waters near the Port of Benton as a migratory corridor for overwintering or spawning migration. Columbia River Population bull trout always spawn in the higher elevation headwater habitats of their distributional range. Individuals or relatively small groups of tributary subpopulations may either exhibit some degree of adfluvial movement into the Columbia River reservoirs or be washed out of the tributary into the Columbia River due to a flood or chemical dispersion from agricultural activity. However, it remains unknown whether any tributary population contains a consistent subpopulation component that is adfluvial.

The protected waters surrounding the barge slip would not likely be used for holding but could have some suitability for foraging habitat during the winter. This species is thought to occur only rarely within the Columbia River near the Action Area, mainly during winter (Anglin et al., 2010).

4.5 HABITAT PARAMETERS FOR SALMON AND BULL TROUT

Ideally, reliable scientific information would exist for all populations of listed species that would allow the effects of an action to be quantified in terms of population impacts (NOAA Fisheries, 1999). As stated in the *Habitat Approach*, an August 1999 supplement to the NOAAFisheries guidance document *Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale*, in the absence of population-specific information, an assessment must define the biological requirements of a listed fish species in terms of properly functioning conditions (PFC). PFC is described as the sustained presence of natural habitat-forming processes necessary for the long-term survival of the species through the full range of environmental

variation (NOAA Fisheries, 1999). PFC elements are typically identified as being either:

1. "properly functioning," meaning that element can support healthy populations of fish;

2. "at risk," meaning that functionality is maintained, but there is a likelihood that further degradation would result in a negative response by fish populations; or

3. "not properly functioning," meaning that there are known limitations to those parameters necessary to support healthy salmonid populations.

Indicators of PFC vary in different landscapes based on unique physiographic and geologic features (NOAA Fisheries, 1999). Since aquatic habitats are inherently dynamic, PFC are defined by the persistence of natural processes that maintain habitat productivity at a level sufficient to ensure long-term survival and are not necessarily defined by absolute thresholds and parameters (NOAA Fisheries, 1999).

Pacific salmon, steelhead, and bull trout have several distinct life-history stages, each of which requires specific biological conditions. All three species of salmonids discussed in this BA may utilize areas within the Action Area for rearing and holding habitat, as well as a migration corridor during parts of the year. Both juvenile and adult salmonids require cool temperatures, high dissolved oxygen levels, low turbidity, adequate flow levels, and barrier passage for successful migration. Inadequate conditions in any of these categories may hinder the welfare of adult or juvenile salmonids.

The aquatic habitat utilized by salmon, steelhead, and bull trout in the Columbia River Basin has been drastically altered from its natural state. The construction of hydroelectric dams along the Columbia River has changed the river's natural flow regime, altered thermal patterns, and disturbed riparian environments. Additionally, migrating smolts are often killed or injured during their passage through these dams. The low water velocities created by the dams slow smolt migration to saltwater. Young fish are also exposed to predation by birds and predatory fish such as smallmouth bass and northern pike minnow that inhabit the slower, deeper habitats.

Table 2 provides a summary of habitat conditions identified by NOAA Fisheries (1996) and USFWS (1998).

TABLE 2. Properly Functioning Condition Indicators for Salmonids

Indicators	Summary
Water	
Temperature	The Columbia River can exceed the 20 ºC threshold water temperatures for salmon and steelhead during mid-July through September (Corps 2021). Preferred temperatures for incubation, rearing, and spawning of bull trout are 2-5 ºC, 4-12 ºC, and 4-9 ºC respectively. Although very few bull trout are expected to utilize the Project area during any season, the Action Area is "**not properly functioning**" for this element.
Sediment	Sediment loading is anticipated to be high in the Columbia River within the Project area due to runoff from adjacent agricultural activity and the impoundment behind McNary Dam. The Action Area is "**not properly functioning**" for this element.
Chemical	The Columbia River appears on the 303(d) list for several parameters and its proximity to the Hanford Nuclear Reservation and intensive agricultural activities appears to indicate the Action Area is "**not properly functioning**" for this element.
Habitat Access	
Physical Barriers	Bonneville Dam, John Day Dam, The Dalles Dam, and McNary Dam all occur downstream of the Project; however, fish ladders and/or downstream juvenile fish passage facilities and dam operations at each of these facilities allow upstream movement of adults and downstream movement of juveniles. The Action Area is "**at risk**" for this element.
Large Woody Debris	Large woody debris is absent from the Project site and the riparian reserves adjacent to the shoreline are essentially devoid of any large woody debris and recruitment is low. It is assumed the Action Area is "**not properly functioning**" for this element.
Substrate	The barge slip contains a constructed floor of leveled gravel where sand and silt can settle out. Sand and silt atop small gravel appear to be the dominant substrate of the undeveloped shoreline within the Project vicinity. The conditions are marginal for juvenile salmonids rearing in the vicinity of the barge slip; therefore, the Action Area is **"at risk"** for this element.
Habitat Elements	
Pool Frequency/Pool Quality	The entire Columbia River from McNary Dam upstream to the Hanford Reach is essentially pool habitat; however, inadequate temperatures and lack of riparian cover limit pool quality. Therefore, the Action Area is **"at risk"** for these elements.
Refugia/Off Channel Habitat	The Action Area is primarily one long, straight channel with some shallow water habitats along the shoreline and adjacent to mid-channel islands. The barge slip probably acts as off-channel habitat offering refuge from high flows. The Action Area is "**at risk**" for this element.
Channel Conditions and Dynamics	
Width/Depth Ratio	Width/depth ratio for the Columbia River is not known; however, it is anticipated that it is > 12/1.The Action Area is "**not properly functioning**" for this element.
Streambank Conditions	Streambanks within the Action Area are relatively stable, primarily due to armoring with riprap and sheet pile. This does not contribute to habitat quality for salmonids because of the lack of riparian vegetation structure and function. Sandy shoreline areas are interspersed both immediately upriver and downriver from the Project area. The Action Area is "**not properly functioning**" for this element.
Floodplain Connectivity	The presence of armoring along the banks within the Action Area limits the amount of floodplain connectivity. The Upper Columbia River dams are also used to control flooding. The Action Area appears to be **"not properly functioning"** for this element.

TABLE 2 Continued. Properly Functioning Condition Indicators for Salmonids

Indicators	Summary
Flow/Hydrology	
Changes in Peak/Base Flows	There are pronounced changes between peak and base flows within the Columbia River due to the operation of hydroelectric dams. Therefore, the Action Area appears to be "**not properly functioning**" for this element.
Increase in Drainage Network	It is likely that the Project area has a moderate increase in drainage network due to roads; thus the Action Area is **"at risk**" for this element.
Watershed Conditions	
Road Density/ Location: Disturbance History and Riparian Reserves	The Project Action Area contains many valley-bottom roads and riparian reserves are almost nonexistent. Development and agricultural activity in the basin appear to indicate the Action Area is **"not properly functioning"** for this element.

5.0 EFFECTS OF THE ACTION

5.1 SALMONID FISH SPECIES

5.1.1 Direct Effects

Dredging may result in direct effects to fish species in several ways as identified by Nightingale and Simenstad (2001). Potential effect pathways include turbidity, entrainment, habitat modification, and noise. Sections 5.1.1.1-5.1.1.3 and 5.1.2 discuss how these effects would be minimal for the proposed dredging work.

Gravel addition and hand raking are not expected to result in direct or indirect effects. The slow, precise placement of clean washed gravel by divers would create negligible turbidity and would not harm fish. These activities must be conducted in clear water conditions for precise placement of small amounts of gravel to create a very smooth slip bottom. The presence of divers in the water during gravel addition and careful hand raking would prevent harm to fish.

Noise and habitat modification effects are less concerning than the dredging work itself, as gravel addition and hand raking is on a much smaller, local, slower time scale than dredging. Adult salmonids have been described as only casual visitors to the slip and all work would be done during periods when juvenile salmonid presence is low (details in section 5.1.3). The only fish that have been observed in or near the slip, prior to or during any work, were common carp (*Cyprinus carpio)*.

5.1.1.1 Turbidity

The Project is anticipated to cause a temporary increase in turbidity as a result of the disturbance of alluvial sediments during dredging of the barge slip; however, turbidity is anticipated to be minor as a result of the coarse substrates within the barge slip. Turbidity beyond the barge slip footprint is not

anticipated. Best management practices include installation of a silt curtain or similar device across the mouth of the barge slip prior to excavator dredging. Also, fish fleeing the inlet may be injured or killed by predators prior to finding suitable habitat in the main channel. Given the very low numbers of juvenile salmon and steelhead anticipated to be present in the inlet, we expect that the risk of fish being injured or encountering predators is low, although it cannot be discounted.

The extent that turbidity affects salmonids depends on many factors including background turbidity, the amount of increase in turbidity, and the duration of increased turbidity (NMFS, 2000). Servizi and Martens (1992 in NMFS, 2000) show that turbidity does not cause direct mortality unless extremely high levels occur. However, other studies have shown that juvenile salmon avoid turbid water when turbidity exceeds their threshold level. Bisson and Bilby (1982 in NMFS, 2000) found that the avoidance threshold for coho salmon was 70 nephelometric turbidity units (NTU). Berg and Northcote (1985 in NMFS, 2000) demonstrated displacement, disruption of feeding and social behavior, and gill flaring of juvenile coho because of pulses of sediment. Nightingale and Simenstad (2001) cite findings where fish mortality occurred at concentrations of 100,000 mg/l. Dissolved oxygen levels may temporarily be reduced with the increase in turbidity. However, Nightingale and Simenstad (2001) state that there is little evidence that reduced dissolved oxygen levels associated with dredging would pose a risk to fish.

Hand raking gravel would occur as needed between December 15 and April 10, and between July 1 and October 31. Raking would be done carefully by divers with a handheld rake and is unlikely to cause measurable turbidity outside of the barge slip.

The addition of gravel would occur between December 15 and March 1 or July 1 and August 30. Few fish would be present in the Action Area during the winter period. The summer period would coincide with adult salmonid upstream migration but would miss the peak timing for all species. Given the careful placement of small quantities of gravel by a diver, no measurable turbidity increase is expected.

Effects from turbidity are expected to be discountable. Dredging would occur at a time when use by juvenile salmonids in the Action Area is at its seasonal low. Turbidity is expected to be limited to the immediate area of the barge slip.

5.1.1.2 Entrainment/impingement from excavator bucket

Dredging would occur between December 15 and March 1 or August 15 through 30 when juvenile salmonids are unlikely to be in the vicinity of the barge slip. Dredging would be accomplished with a land-based backhoe or excavator that uses an open bucket or clamshell dredge or a suction dredge.

Entrainment/impingement may occur if fish are trapped in the bucket of the excavator during dredging of in-water substrates. The potential for entrainment is largely dependent on the likelihood of fish occurring within the dredging area, the scope and scale of the dredging activity, and the life stage of the fish. Given the proposed timing of in-water work, utilization of fish herding and worksite isolation with the turbidity curtain, use of an open bucket excavator, and relatively slow speed of dredging; it is reasonably certain that the risk of injury or lethal take of juvenile ESA-listed fish species from proposed dredging activities will be small, involving very few juvenile fish.

The use of a turbidity curtain in summer would dissuade fish from entering the barge slip while dredging. The open bucket would allow ample opportunity to avoid or escape any potential entrainment. The clamshell would offer similar escape opportunity as the shells would move, likely causing fish to spook away from it while it closed if not while being lowered into place. The suction dredge would be limited to a small area to collect any fines that escaped the other methods. Given excavator dredging would occur during either the winter or the summer in-water work window and behind a silt curtain, fish entrainment is unlikely for any method.

5.1.1.3 Habitat Modifications

Effects to habitat would be discountable. Habitat within the barge slip has been influenced by the past construction of the barge slip and previous maintenance actions, and the quality or quantity of habitat within the barge slip would not change from the present condition. Maintenance would only remove a few cubic feet of material. Gradual side slopes would be maintained, and dredging is not anticipated to create drop-offs, sharp bathymetric changes, or deep-water habitats. A summary of potential effects on salmonid habitat relative to the PFC indicators identified by NOAA Fisheries (1996) and USFWS (1998) is provided in Table 3.

TABLE 3. Matrix of Pathways and Indicators

Pathways:	**Environmental Baseline**			**Effects of the Action(s)**		
Indicators	Properly Functioning	At Risk	Not Properly Functioning	Restore	Maintain	Degrade
Water Quality						
Temperature			**X**		**X**	
Sediment			**X**		**X**	
Chemical			**X**		**X**	
Habitat Access						
Physical barriers		**X**			**X**	
Habitat Elements						
Substrate		**X**			**X**	
LWD			**X**		**X**	
Pool frequency		**X**			**X**	
Pool quality		**X**			**X**	
Refugia			**X**		**X**	
Off-channel habitat			**X**		**X**	
Channel Conditions/Dynamics						
Width/Depth ratio			**X**		**X**	
Streambank condition			**X**		**X**	
Floodplain connectivity			**X**		**X**	
Flow/Hydrology						
Peak/Base flows			**X**		**X**	
Drainage network increase		**X**			**X**	
Watershed Conditions						
Road density and location			**X**		**X**	
Disturbance history			**X**		**X**	
Riparian reserves			**X**		**X**	

5.1.1.4 Noise

Fish utilize sound cues to hunt for prey, to avoid predators, and for social interaction (Nightingale and Simenstad, 2001). Chronic sound disturbance may affect growth rates, fat stores, and reproduction, decrease detection of approaching predators, or permanently damage fish hearing (Nightingale and Simenstad, 2001).

Ambient noise levels in-river are affected by boat, barge, and train traffic (Ingraham et al., 2014), bathymetry, and water temperature (Hawkins et al., 2015). For example, ambient sound pressure noise level (SPL) in the Ice Harbor Dam tailrace ranges between 105-115 decibels (dB) re 1 micro-Pascal (µPa) with most measurements being below 106 dB re 1 µPa (Ingraham et al., 2014). Therefore, underwater noise levels would need to be greater than 106 dB before fish behavior may be affected near the dam, for example.

Heavy equipment has potential to transmit vibration and noise into the river; however, this surface noise is unlikely to penetrate the water surface to a degree that may disrupt fish (Hawkins et al., 2015). Furthermore, continuous source exposures such as recreational boating noise (which is assumed to be similar to equipment operation) have been found to affect salmonid behavior only moderately with little potential for injury or mortality (Hawkins and Loughine Ltd., 2015).

Disturbance otherwise may be caused by hand-raking gravel between December 15 and April 10 or July 1 and October 31. Noise and the presence of the divers would deter out-migrating juvenile fish from entering the barge slip, but noise levels are expected to be similar to or less than ambient conditions.

Similarly, the addition of gravel between December 15 and March 1 or July 1 and August 30 may disturb adult salmonids. Few fish would be in the Action Area during the winter window. The summer window would coincide with adult salmonid upstream migration but would miss the peak timing for all species. Given the careful placement of small quantities of gravel by a diver, fish would be deterred from entering the barge slip, but noise levels are expected to be similar to or less than ambient conditions.

Noise as a result of the proposed dredging would be temporary and primarily limited to engine noise from equipment operating above the water line. The proposed maintenance would not require pile driving or blasting or other types of intensive, chronic disturbance. The proposed maintenance would occur when salmonids and their forage species are less likely to be present. Therefore, it is unlikely that fish in the vicinity of the barge slip would experience more than insignificant effects from noise.

5.1.2 Indirect Effects

Fish species within the immediate vicinity of the barge slip may be temporarily displaced from their habitats due to increased disturbance during dredging activities. Displacement away from preferred habitat could result in increased exposure to predators; however, habitats in the immediate vicinity of the barge slip are disturbed and highly modified. Work would occur when the seasonal abundance of ESA-listed fish is low. Densities of fish in proximity to the proposed maintenance are anticipated to be low and the potential for displacement is anticipated to be discountable.

5.1.3 Conservation Measures

a. The in-water work window for dredging would be December 15 - March 1. If additional dredging is required after the spring run-off, then dredging would be performed between August 15 and August 30. Dredging would not be performed at any other time.

b. Dredged materials would be deposited in approved upland sites such that they do not reenter surface waters.

c. A silt curtain would be used in the slip for excavator dredging. “Silt curtain deployment would be along the western or northern face of the sheet pile bulkhead. It would be dragged outward toward the river and secured waterward of the dredging footprint, to flush fish out of the slip. The curtain would be in place whenever the excavator is used.”

d. Turbidity would be monitored during dredging.

e. Suction dredging would be limited to 25 cubic yards annually within the 100 cubic yard annual limit. The intake would be placed at or buried in the substrate when suction dredges are working, and no more than 3.0 feet above the substrate for the minimum time necessary to clean or purge the intake.

f. Suction dredge sediment is processed in a land-based collection tank wherein dewatered sediment and separated water are both disposed off-site.

g. Clean, washed gravel may be added in small quantity after dredging to level the slip bottom. To avoid unnecessary disturbance, turbidity, or possible direct fish injury, gravel would be added by use of a land-based crane, suspending a funnel bucket over water with a tube sleeve extending from the bucket into the water. A diver would direct the placement of the tube sleeve and the release of small amounts (e.g., 5 gallons) at a time.

h. The addition of small amounts of gravel and hand raking would not occur during the peak of juvenile or adult fish migrations.

i. Fish removal is accomplished by the presence and movement of the divers within the small volume of the slip. Divers and shore personnel would check for the presence of salmonids in areas impacted by the work. Use of the silt curtain for excavator dredging between August 15 – August 30 and December 15 through March 1 would exclude fish that may be in the area.

j. Spill prevention measures would be taken to prevent any petroleum product, chemicals, or other toxic or deleterious materials from entering the water. Staging areas and equipment storage areas in support of dredging operations would be set back at least 50 feet from the shoreline.

5.1.4 Effect Summary for Salmonid Species

Anticipated effects to ESA-listed salmonid species are not likely to result from the Proposed Action. Work would occur when abundance of ESA-listed salmonids is seasonally low. The primary effect of dredging is anticipated to be a short-term increase in noise disturbance and turbidity in the immediate area of the barge slip. Noise would generally result from construction equipment operated from

shore. No pile driving, blasting, or other chronic intense noise would occur. Turbidity is anticipated to be minimal as a result of coarse sediments and contained locally within the barge slip during construction. None of the actions are anticipated to result in harm or harassment of ESA-listed salmonids that may occur in the Action Area. The Proposed Action is not anticipated to result in modification to PFC elements within the Action Area (Table 3). The Proposed Action is anticipated to likely adversely affect or adverse modify or destroy designated Critical Habitat for UCR Chinook salmon, MCR steelhead, and UCR steelhead. The Proposed Action is not anticipated to adversely affect or adverse modify or destroy designated Critical Habitat for bull trout.

5.2 INTERRELATED AND INTERDEPENDENT ACTIONS

The Proposed Action described in this assessment is a stand-alone Project. The Project description includes all activities necessary for PSNS & IMF to conduct the required maintenance dredging for the foreseeable future. No other actions that are interrelated with, or interdependent on, the Proposed Action are known at this time.

5.3 CUMULATIVE EFFECTS

Cumulative effects are those effects of future state or private activities, not involving federal activities, that are reasonably certain to occur within the Action Area, that are not subject to consultation (50 CFR 402.02). PSNS & IMF is not aware of any proposed non-federal projects in the vicinity of the Action Area that could contribute to cumulative effects on listed species. All future activities within the Action Area and elsewhere that would directly affect the Columbia River (dock, pier, or wharf construction, dredging, bank armoring, etc.) are under the jurisdiction of the Corps and, as such, would be federal actions that would require independent ESA evaluations. Similarly, any work proposed by PSNS & IMF in the Action Area would also be a federal action that would require independent ESA evaluation.

6.0 EFFECTS DETERMINATIONS SUMMARY AND RATIONALE

6.1 LISTED SPECIES

6.1.1 Upper Columbia River Spring-run Chinook Salmon

The proposed Port of Benton dredging Project **"may affect, and is likely to adversely affect"** UCR spring-run Chinook salmon.

A "may affect" determination is warranted based on the following rationale:

1. There is potential for UCR spring-run Chinook salmon to be present, foraging in shallow waters of the Columbia River during the dredging work windows.

A "likely to adversely affect" determination is warranted based on the following rationale:

1. It is anticipated that fish would avoid the barge slip during dredging. There may be increased exposure to predators by fish fleeing from proposed activities. In addition, the dredging would occur when UCR spring-run Chinook salmon are less likely to be present.

2. The short-term increase in turbidity resulting from the dredging is expected to be

minimized by the short duration of maintenance dredging.

3. Entrainment/impingement may occur if fish are trapped in the bucket of the excavator during dredging of in-water substrates.

4. Forage species are similarly expected to occur in the shallower areas surrounding the Port of Benton and are not expected to be affected.

6.1.2 Middle Columbia River Steelhead

The proposed Port of Benton dredging Project "**may affect, and is likely to adversely affect"** MCR steelhead.

A "may affect" determination is warranted based on the following rationale:

1. There is potential for MCR steelhead to be present, foraging in shallow waters of the Columbia River during the dredging work windows.

A "likely to adversely affect" determination is warranted based on the following rationale:

1. It is anticipated that fish would avoid the barge slip during dredging. There may be increased exposure to predators by fish fleeing from proposed activities. In addition, the dredging would occur when MCR steelhead are less likely to be present.

2. The short-term increase in turbidity resulting from the dredging is expected to be minimized by the short duration of maintenance dredging.

3. Entrainment/impingement may occur if fish are trapped in the bucket of the excavator during dredging of in-water substrates.

4. Forage species are similarly expected to occur in the shallower areas surrounding the Port of Benton and are not expected to be affected.

6.1.3 Upper Columbia River Steelhead

The proposed Port of Benton dredging Project "**may affect, and is likely to adversely affect"** UCR steelhead.

A "may affect" determination is warranted based on the following rationale:

1. There is potential for UCR steelhead to be present, foraging in shallow waters of the Columbia River during the dredging work windows.

A "likely to adversely affect" determination is warranted based on the following rationale:

1. It is anticipated that fish would avoid the barge slip during dredging. There may be increased exposure to predators by fish fleeing from proposed activities. In addition, the dredging would occur when UCR steelhead are less likely to be present.

2. The short-term increase in turbidity resulting from the dredging is expected to be minimized by the short duration of maintenance dredging.

3. Entrainment/impingement may occur if fish are trapped in the bucket of the excavator during dredging of in-water substrates.

4. Forage species are similarly expected to occur in the shallower areas surrounding the Port of Benton and are not expected to be affected.

6.1.4 Columbia River Bull Trout Distinct Population Segment

The proposed Port of Benton dredging Project **"may affect, but is not likely to adversely affect"** the Columbia River Population bull trout.

A "may affect" determination is warranted based on the following rationale:

1. There is potential for Columbia River Population bull trout to be present, foraging in shallow waters of the Columbia River during the winter dredging work windows.

A "not likely to adversely affect" determination is warranted based on the following rationale:

1. The dredging may occur during the winter when individual adfluvial bull trout are most likely to be in the vicinity of the Action Area. However, it is anticipated that these would be larger adult fish capable of actively avoiding the dredging areas. Bull trout are less likely to be present in the dredging area during the summer work window.

2. The short-term increase in turbidity resulting from the dredging is expected to be minimized by the short duration of maintenance dredging.

3. Forage species are similarly expected to occur in the shallower areas surrounding the Port of Benton and are not expected to be affected.

6.1.5 Gray Wolf Western DPS

The proposed Port of Benton dredging Project would have **"no effect"** on the gray wolf western DPS based on the following rationale.

1. Gray wolves have not been documented in the Action Area and suitable habitat was not identified during a site survey.

2. The Project would not impact gray wolf habitat.

6.1.6 Pygmy Rabbit

The proposed Port of Benton dredging Project would have **"no effect"** on the pygmy rabbit based on the following rationale.

1. Pygmy rabbits have not been documented in the Action Area and suitable habitat was not identified during a site survey.

2. The Project would not impact potential pygmy rabbit habitat.

6.1.7 Ute Ladies'-tresses

The proposed Port of Benton dredging Project would have **"no effect"** on Ute ladies'-tresses based

on the following rationale.

1. Ute ladies'-tresses have not been documented in the Action Area and suitable habitat was not identified during a site survey.

2. The Project would not impact Ute ladies'-tresses habitat.

6.1.8 Umtanum Desert Buckwheat

The proposed Port of Benton dredging Project would have **"no effect"** on Umtanum desert buckwheat based on the following rationale.

1. Umtanum desert buckwheat has not been documented in the Action Area and suitable habitat was not identified during a site survey.

2. The Project would not impact Umtanum desert buckwheat habitat.

6.1.9 Western Yellow-billed Cuckoo

The proposed Port of Benton dredging Project would have **"no effect"** on western yellow-billed cuckoobased on the following rationale.

1. Western yellow-billed cuckoos have not been documented in the Action Area and suitable habitat was not identified during a site survey.

2. The Project would not impact western yellow-billed cuckoo habitat.

6.2 DESIGNATED CRITICAL HABITAT

The Project is located within designated Critical Habitat for UCR spring-run Chinook, MCR and UCR steelhead, and Columbia River Population bull trout. As part of the Proposed Action, up to 9,300 square feet of channel bottom within the barge slip may be dredged (in-water work). As a result, the Project would include habitat impacts within this designated Critical Habitat area. The Project warrants a "may affect" determination due to the fact that portions would occur within designated Critical Habitat in the Columbia River. A "likely to adversely affect" determination for designated Critical Habitat is justified based on the following effects of the action:

1. Substrate of approximately 9,300 square feet of near-shore, shallow-water benthic habitat will be disrupted by dredging the barge slip. Approximately 20-100 cubic yards of substrate will be dredged and hauled away. Increased turbidity from project activities will result in sediment deposition; however, the sediment suspended will likely settle out in the barge slip itself. Water velocities are relatively low in the action area and the silt curtain is expected to confine the turbidity to the barge slip. Sediment deposition in the barge slip has the potential to adversely affect primary and secondary productivity (Spence et al. 1996) for a short time period during and immediately following in-water work. Excess fine sediment in the action area is expected to occur over a small area confined by the silt curtain. The scale of impact will be minimal relative to the rearing habitat in the action area, and will not meaningfully change the conservation value of the substrate PBF.

2. The proposed action will have a short-term (3 days) negative effect on water quality by increasing suspended sediment and turbidity during construction and upon removal of the silt curtain.

Suspended sediments are expected to be released as a result of the dredging and turbidity levels in the enclosed work area will increase. During and immediately following these activities, turbidity will be isolated to the barge slip where in-water work will occur. We anticipate the suspended sediment will quickly settle back down to the riverbed within a day after disturbance. Sediment trapped by the silt curtain will become suspended during the removal process. The suspended sediment is expected to increase turbidity up to 250 feet downstream of the work area for a short period of time.

3. The use of heavy equipment may result in very small amounts of pollutants entering waterways. However, proper implementation of various BMPs (e.g., storage of fuels or lubricants and refueling of equipment in designated areas, etc.) will reduce the risk of contaminants entering the Columbia River. Through the use of these measures, it is unlikely chemical contamination will have more than a minimal effect to water quality. Given the proposed conservation measures, the effects to water quality will not meaningfully decrease the function of this PBF in the action area. The purpose of the Project is to remove only those substrates necessary to allow barge entry and offloading of RCD packages (less than 100 cubic yards predicted no more than once every few years,typically following a period of high water flow).

4. A gravel substrate floor would remain within the barge slip. The proposed action will have a short-term negative effect on benthic macroinvertebrates by crushing, covering, or displacing them during dredging. We expect nearby benthic macroinvertebrates will begin to recolonize within several days to weeks, and will fully recolonize the area within a few months after project completion (Fowler 2004; Griffith and Andrews 1981; Harvey 1986; Harvey and Lisle 1998). The alteration of this amount of habitat could have some localized effects to forage for out-migrating and rearing juvenile salmonids and steelhead that use this nearshore area during construction, and for up to several months after project completion. However, we do not anticipate the localized reduction in available forage will have a long-term impact to the quality of habitat.

5. The dredging would likely remove milfoil from within the barge slip. Milfoil can be dense and provides cover for predators.

6. The frequency of maintenance dredging is expected to be low based on historic dredging records from the site but over the 20-year period it could occur twice a year during the work windows. That possibility is low but not impossible as high flows are unpredictable and dependent on weather. However, over the past 25 years, the site was dredged once following extremely high flows in 1996/1997 and not again until 2010 when a land-based suction dredge was used to remove less than 20 cubic yards.

7. The proposed action will not alter the area for fish passage, except during the few days where the silt curtain is installed when dredging. This dredging will occur at a time when very few fish of any species will be migrating either upstream or downstream and will occupy only a small footprint, around which migration in either direction will be unimpeded. Fish present in the action area will likely be impeded from migrating through or utilizing the habitat within the area during times of active construction; installing the silt curtain will likely cause any fish present to flee the area. Once the silt curtain is deployed, any fish not hazed from the active construction area may become trapped in the area until the curtain is removed. The action will not appreciably alter the safe passage after

construction.

7.0 ESSENTIAL FISH HABITAT ASSESSMENT

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) requires federal agencies to consult with NOAA Fisheries on activities that may adversely affect Essential Fish Habitat (EFH). Essential Fish Habitat is defined in the MSA Provisions Section 600.10 50 CFR as "those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity."

The objective of this EFH assessment is to determine whether or not the Proposed Action "may adversely affect" designated EFH for relevant commercially, federally-managed fisheries species within the Action Area. It also describes conservation measures proposed to avoid, minimize, or otherwise offset potential adverse effects to designated EFH resulting from the Proposed Action. Subsection 600.920(f) 50 CFR specifies that EFH consultation should be consolidated with existing environmental review procedures required by other statutes, such as ESA, when appropriate. For the purpose of this assessment, the Proposed Action for the EFH assessment and Biological Assessment includes the same Project elements. A detailed description of the Proposed Action is included in Section 2 of this BA.

The Proposed Action occurs within an area that provides habitat for species of Pacific salmon. EFH for the Pacific salmon fishery includes those waters and substrate necessary for salmon production to support a long-term sustainable salmon fishery and salmon contributions to a healthy ecosystem. EFH includes all those streams, lakes, ponds, wetlands, and other currently viable water bodies and most of the habitat historically accessible to salmon in the Columbia River.

7.1 POTENTIAL EFFECTS OF PROPOSED ACTION

7.1.1 Adverse Effects to Salmon EFH

The Proposed Action would have an **"adverse effect"** on EFH for Pacific salmon. The Proposed Action has been identified as having the potential to affect fish habitat as a result of bottom disturbance, temporary increases in turbidity, and potential water quality impacts. The short-term disturbance to the bottom, limited increase in turbidity, and the potential for the release of toxic materials would be minimized through the implementation of conservation measures intended to protect ESA-regulated species. Typically, the assessment and conservation measures afforded Chinook salmon directly and indirectly protect steelhead. Potential effects to Pacific salmon EFH for UCR Chinook salmon are discussed in Section 5 of this BA. UCR fall Chinook salmon are not addressed specifically in the BA; however, for the purpose of EFH, potential effects to fall Chinook would be similar to potential effects to UCR spring-run Chinook salmon habitat discussed in Section 5 of this BA.

7.1.2 Adverse Effects to Coastal Pelagics EFH

No areas of EFH for coastal pelagic species occur within the Action Area. Therefore, no adverse effects to this EFH would occur as a result of the Proposed Action.

7.1.3 Adverse Effects to Pacific Coast Groundfish EFH

No areas of EFH for Pacific coast groundfish occur within the Action Area. Therefore, no adverse effects to this EFH would occur as a result of the Proposed Action.

7.2 EFH CONSERVATION MEASURES

The measures implemented for the Proposed Action in relation to the conservation of ESA- regulated species described in Section 5.1.3 would also avoid or minimize the potential adverse effects to designated EFH described above.

7.3 EFH CONCLUSION

The potential impacts to EFH would be the same as the potential impacts to other types of fish habitat as described in Section 5.1. The Proposed Action would have an adverse effect on EFH for Pacific salmon.

8.0 LIST OF PREPARERS

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