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CHS

Biological Assessment

Wallula Lake Maintenance Dredge Project

Benton County, Washington

Prepared for

CHS Inc.

SunBasin Growers
901 E Columbia Drive
Kennewick, Washington 99336

Prepared by

Geosyntec Consultants, Inc.
8217 Shoal Creek Boulevard, Suite 200
Austin, Texas 78757

Project: PNG0985

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1. INTRODUCTION

1.1 Project Proponent and Purpose

This Biological Assessment (BA) has been prepared in accordance with Section 402.12 of the Endangered Species Act of 1973, as amended (ESA). The purpose of the BA is "to evaluate the potential effects of the action on listed and proposed species and designated and proposed critical habitat and determine whether any such species or habitat are likely to be adversely affected by the action and is used in determining whether formal consultation or a conference is necessary." Specifically, it will address whether the maintenance dredging and disposal would adversely affect federally listed threatened and endangered (T&E) species within close proximity to the project areas in Lake Wallula.

CHS Inc. (CHS) is proposing to conduct maintenance dredging (Project) on an approximately 0.4-acre area adjacent to an existing docking terminal in Lake Wallula in Benton County, Washington (Figure 1). Dredging would be performed to maintain clearance at the existing barge dock which is used for loading grain. The terminal is in an area where deposition of sediment occurs and therefore periodic maintenance dredging is required to maintain navigational clearance and safety. The dredged material is proposed to be dumped at a U.S. Army Corps of Engineers (USACE) Portland District approved in-water site between Columbia River Miles (RMs) 284 and 285 on the north side of the river (Figure 2).

1.2 Federal Nexus

This project will impact a water of the U.S. triggering a federal nexus and therefore will require permitting under the Clean Water Act by the USACE.

2. PROJECT DESCRIPTION

2.1 Background

CHS owns and operates a grain handling facility on the banks of Lake Wallula located in an industrial area in the Port of Kennewick. There are approximately three (3) warehouses on the Site including a series of grain silos and ancillary grain handling equipment. Grain enters the facility by inbound trucks, is stored on Site, and is shipped off site via barges. The facility handles wheat only and loads barges that are then transported to the export terminals in Portland, Kalama, and Irving. An average shipment is 60 barges per year. To ensure continued safe navigation of barges, CHS intends to perform maintenance dredging immediately adjacent to the dock facility.

CHS has not performed dredging at this location during their ownership. There is a need for periodic maintenance dredging to occur at the dock, but the frequency is likely once per 10 to 15 years dependent upon the USACE's management of the locks and dams on the Columbia River.

2.2 Potential Contaminant Sources and Sediment Characterization at CHS

The Washington State Department of Ecology (Ecology) Toxics Cleanup database was queried for active cleanup sites near the CHS dock, and four were identified within 1 mile. None of the four sites have known or suspected sediment contamination, and the closest site is located upland of, and 0.25 miles south of the CHS dock.

The Site is located to the south of a levee built by the USACE around 1952 to protect the City of Kennewick as a result of the construction McNary Lock and Dam and the resulting formation of Lake Wallula.[1,2] There are no known outfalls that pass through the levee from the Site. According to an Ecology Stormwater Compliance Inspection Report, stormwater at the Site infiltrates and is prevented from leaving the Site by the levee to the north and Burlington Northern and Santa Fe Railway (BNSF) ballast to the south. The stormwater inspection found that the Site does not require an industrial stormwater permit. Also, in the event of a spill at the Site, there would be no overland transport to the Columbia River/Lake Wallula.

Based on the current and historical Site operations not likely to be a source of contamination to Columbia River sediments and results of the Ecology Toxic Cleanup database review of potential sources, the available information indicated the Site to be assigned a Low project rank in accordance with the Dredged Material Evaluation and Disposal Procedures User Manual (DMMP, 2021). However, lack of detailed information about adjacent properties and the lack of sediment physical and chemical data in the vicinity of the Site resulted in assigning a Low-Moderate project rank. Per the project's Low-Moderate rank and guidance provided in the DMMP, CHS proposed a single Dredge Material Management Unit (DMMU). The total volume proposed to be dredged and disposed is up to 5,000 cubic yards (CY). This DMMU is within the required surface sediment volume of 32,000 CY that can be represented by a single DMMU.

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[1] Tri-City Development Council, Columbia River Shoreline Reconveyance Information. https://www.tridec.org/columbia-river-shore-line-reconveyance/

[2] USACE, Dam Safety Update McNary Levee System, 02/12/2015.

CHS coordinated through the Dredged Material Management Office (DMMO) to fully characterize the proposed dredge material for contaminants of concern (COCs) prior to removal. A sediment Sampling and Analysis Plan (SAP) was submitted to the DMMO on September 16, 2022. A pre-sampling meeting with DMMO representatives occurred on September 26, 2022. Confirmation that the SAP was accepted by the DMMO on September 26, 2022. Sediment sampling occurred at the Site October 6, 2022. Seven subsurface core locations were sampled representing the dredge prism and the anticipated post-dredge surface (Z-Layer samples). Sediment from the subsurface core locations were composited to represent one DMMU sample for chemical analysis. Additionally, one sample representing the Z-Layer was archived for possible future testing.

The DMMU sediment sample was chemically analyzed for ammonia, total sulfides, total volatile solids, total organic carbon, grain size, metals, butyltin compounds, polycyclic aromatic hydrocarbons (PAHs), phthalates, phenols, petroleum hydrocarbons, pesticides, and polychlorinated biphenyls (PCBs). As per DMMP guidance and correspondence with DMMO, dioxin/furans were not required to be chemically analyzed based on the Low-Moderate project rank (DMMP, 2021). According to the DMMP prepared by the DMMO, guidelines for dioxin and furan evaluation exist for Grays Harbor and Puget Sound in the State of Washington. Dioxin and furan guidelines have not been developed for other parts of the State and are evaluated by the DMMO on a case-by-case basis based on "reason to suspect" guidance given in Section 8.3.1 of the DMMP (DMMO, 2021). The following "reason to suspect" factors were not identified at the CHS project Site, so dioxin and furan sampling was not triggered by the DMMO:

- Project location within an urban bay;
- Proximity to current or historical point sources;
- Close proximity to certain manufacturing processes or historic fires (e.g., incinerators/boilers/burners, vessel fires, wood treatment operations, bleach process pulp mills, chlorinated solvent manufacturing, and herbicide manufacturing); or
- Proximity to historic samples with elevated levels of dioxins and furans or polychlorinated biphenyls.

Results were submitted in the form of a Sediment Characterization Report (SCR) to the DMMO for review (Geosyntec, 2022). Analytical results were compared to the DMMP Sediment Management Standards (SMS) Screening Levels (SLs) 1 and 2 per the SAP. The majority of analytes tested were non-detect at their corresponding Method Reporting Limits and did not exceed the SMS SLs. All detected concentrations were below their respective SMS SLs. The grain size for the dredge material was characterized as 97.7% sand, 1.6% fines, and 0.7% gravel. As per the SAP, the anticipated post-dredge (Z-Layer) sample was not analyzed because the composite DMMU sample analytical results are all below the DMMP SMS SLs.

On February 15, 2023, CHS received a Suitability Determination Memorandum from the DMMO documenting the consensus regarding the suitability of the proposed dredged material for unconfined aquatic disposal as determined by the DMMP agencies (USACE, Washington Departments of Ecology and Natural Resources, and the U.S. Environmental Protection Agency). The DMMP agencies concluded that all of the characterized material from the CHS Kennewick Grain Dock DMMU is suitable for in-water disposal according to DMMP guidelines.

2.3 Proposed Project and Construction

2.3.1 Project Areas

Geosyntec developed an Alternative Analysis (AA) that provides supporting information for CHS's permit application to the USACE demonstrating the consideration of potentially available practicable alternatives and assessment of the practicability of each alternative (Geosyntec, 2023). Accordingly, the AA was provided to allow USACE to evaluate the Least Environmentally Damaging Practicable Alternative (LEDPA) and comply with its other responsibilities under the 404(b)(1) guidelines (Guidelines). The overall project purpose is used to evaluate practicable alternatives and determine the LEDPA. The Guidelines state that an alternative is practicable if it is available and capable of being done after taking into consideration cost, existing technology, and logistics considering overall project purposes (40 CFR 230.10(a)(2)). This evaluation applies to all waters of the United States, not just special aquatic sites.

Three alternatives were evaluated in accordance with the requirements of the National Environmental Policy Act (NEPA) and the Guidelines. Two Preliminary Action alternatives and the No Action alternative were evaluated using the screening criteria. Project criteria determinations evaluated cost and logistics. No Action, Dredge with Open Water Disposal at Lake Umatilla, and Landfill Disposal were the three alternatives evaluated in the AA. The project criteria determination indicated the open water disposal was more practicable than landfill disposal.

Environmental impacts of the action alternatives were compared. The environmental considerations used to evaluate the alternatives were: Presence of potentially jurisdictional wetlands and Waters of the United States, Presence of endangered species or critical habitat, and Presence of historical or archaeological sites. Temporary impacts were identified for both open water and landfill disposal. For impacts to T&E species, dredge and open water disposal may affect but is not likely to adversely affect listed aquatic species. No impacts to T&E species are associated with landfill disposal. No historical or cultural resources were identified at the previously permitted disposal location or landfill.

2.3.1.1 Dredge Area

The proposed dredge area is located immediately adjacent to the CHS facility terminal loading dock in Lake Wallula in Kennewick, Washington. The proposed dredge footprint extends approximately 50 ft. waterward from the dock face and 243 feet in either direction from the midpoint of the dock (Figure 2). The terminal is equipped with a 200-foot-long enclosed conveyor and catwalk for loading barges. Land use of the surrounding area is primarily industrial and associated with the Port of Kennewick.

2.3.1.2 Disposal Area

CHS has identified two options for dredge material disposal. The preferred alternative is the use of an USACE approved in-water disposal location, however a landfill option is also being considered.

The open water disposal location was identified in cooperation with USACE Districts. The site is a USACE permitted open water location in the Columbia River, located between RMs 284 and

285 in Lake Umatilla (Reservoir below McNary Lock & Dam), which is approximately 43 RMs downstream of the CHS dock. The disposal site at Lake Umatilla is on the Washington side of the Columbia River and considered a deep-water location with approximate water depths ranging from 26 to 37 ft in depth. To access the site, the dredge contractor would transport the dredged material via tug and barge. Based on the alternatives analysis, in-water disposal was identified as the most cost effective and least environmentally damaging practicable alternative option for placing dredged materials because placing the material back into the littoral system is beneficial to the environment. Environmental considerations for the alternative analysis were presence of potentially jurisdictional wetlands and waters of the U.S., presence of endangered species or critical habitat, and presence of historical or archaeological sites.

Upland disposal at a permitted landfill facility is generally available for disposal of sediments. The two landfill sites that have been identified are Rabanco Roosevelt Regional Landfill in Klickitat County, Washington, and Waste Management's Columbia Ridge Landfill & Recycling Center near Arlington, Oregon (Figure 3). Both facilities have road (truck) and rail access. They also, indirectly, have barge access via the Columbia River: however, there would be an additional cost to haul the material from the barge dock to the landfill. Additionally, the landfill would potentially be more environmentally damaging because it removes the littoral material from the river entirely.

2.4 Project Construction Details

2.4.1 Dredging

CHS has a need to dredge to an elevation of 319 feet (ft) NGVD29 to obtain a draft depth of 16 feet. To obtain this target elevation, CHS is proposing to dredge up to approximately 5,000 CY of sediment located in front of their Kennewick, Washington dock over an approximately 17,400-square foot (0.4-acre) area. These volumes also account for some side slope material which may slough into the terminal areas and will be removed to achieve the target depth elevations.

The proposed dredge prism extends approximately 50 ft. waterward from the dock face and is approximately 243 ft. upstream and 243 ft. downstream from the midpoint of the dock in a trapezoid shape (Figure 1). Based on a 2021 hydrographic survey, the depths within the dredge prism range from less than 317 ft. NGVD29 up to approximately 325 ft. NGVD29. Site Plans and Drawings present the 2021 survey elevations with the proposed DMMU. To ensure stability and protect the dock face, the dredge cut will not exceed a 1H:1V slope; all other dredge cuts emanating out from the dock will not exceed a 3H:1V slope.

The selected dredge contractor will position the dredge barge with crane and bucket along the dock face working upstream to downstream. The material (scow) barge will be positioned adjacent to the dredge barge and dredged sediments will placed in the material barge working upstream to downstream. The dredge bucket will operate on the downstream end of the dredge barge. Dredged material will be placed in the material barge by swinging the crane/bucket away from the dock. This will be repeated until the target dredge depth is reached throughout the DMMU.

USACE Portland District issued a Section 408 Alteration Determination on June 21, 2023, determining the project will have no impact to the John Day Lock and Dam Project or the Federal Navigation Channel. The material barge will be transported downstream through the McNary Lock and Dam to an approved in-water disposal location located between Columbia River, RMs 284 to 285. The scow barge will release dredged material within the approved disposal location and allow the sediment to naturally deposit on the riverbed. The barge will not anchor during release and will be held on position by a tug.

2.4.2 Equipment

Dredging will be conducted from a floating barge with a clamshell bucket. The barge will be anchored via use of spud barges commonly used for marine construction operations. The barge is moored by steel shafts or through-deck piling, which are essentially pipes driven right into the sediment at the bottom of the water to provide stability. Spuds are typically 24 inches in diameter and provide more stability than anchors that are susceptible to dragging disrupting existing habitat. For this project, when possible, the barges will be moored to the dock by tethering or tying to a fixed object on the dock in place of use of the spuds. When required, spuds will be slowly lowered through the water column and placed onto the sediment surface for anchoring.

The dredged material will be placed in a containerized scow barge for transport to a permitted open water disposal location. The material to be dredged has been characterized and is considered suitable for open water disposal and void of contamination. The Contractor will decant excess water from the dredged material within the barge and discharge back into the river. Best Management Practices (BMPs) will be utilized to minimize resuspension of sediments. The dredging and disposal operations will monitor for turbidity in accordance with a Water Quality Certificate (WQC) issued by Ecology. Conditions within the WQC will be followed and implemented in accordance with the project specific Water Quality Management Plan (WQMP) (Geosyntec, 2023).

Suction dredging was considered, but not feasible. This technology generates a significant volume of water to handle during dredging and post-dredge. The preferred open water disposal site is located too far from the dredge site (through a lock and dam) to safely configure a floating pipeline to move dredged material.

2.4.3 Disposal

Dredged material will be transported away from the dredge area. For open water disposal, the dredge material will be transported via scow barge to an approved open water disposal location and offloaded into the water column. The scow barge used for transporting the dredged material will be watertight and fully sealed and no sediment will be discharged during transit. If any large debris (e.g., submerged logs) are encountered during the dredging operation, they will be removed and either recycled or transported by truck to an appropriate landfill. For landfill disposal, the dredged material will be transported via truck to the identified landfill facility.

2.5 Project Timing

2.5.1 Work Windows

To minimize any impacts to spawning or incubating fish life, dredging will be conducted during the Washington Department of Fish and Wildlife (WDFW) approved in-water work window for the Columbia River, which is August 1 to February 28. Mr. Troy Maikis (WDFW) provided the recommended in-water work window information in a correspondence dated November 3, 2022. Dredging operations would need to be coordinated with CHS based on their vessel schedule.

2.5.2 Description of Project Sequencing

Dredging operations are anticipated to be conducted 12 hours per day, 6 days per week with the 7th day used for equipment maintenance should the project lasts for more than 7 days. The rate of dredging is anticipated to be 1,200 to 1,500 CY per day (4 to 5 days for 5,000 CY). The dump scow has roughly 2,000 CY capacity. Considering the draft restrictions at the USACE maintained McNary Lock and Dam and an assumed material weight of 1.5 tons per CY, the scow will carry approximately 1,800 CY per load. For this project, there is an assumed total of up to three scow barge loads to be dumped at the disposal location. The scow barge will be filled with dredged material and transported to the disposal location on the same day. The scow barge, once dumping is completed, will return to the dredge location in the same day.

2.6 Best Management Practices and Conservation Measures

BMPs to be implemented during the dredging operation to avoid or minimize adverse effects include the following:

- Stockpiling or redistribution of the material on the river bottom at the dredge site will not be allowed.
- Dredging of holes or sumps below the maximum dredging depth will not be allowed.
- Turbidity and Total Suspended Solids will be controlled by reducing the cycling time of the bucket, ensuring that the bucket is closed before raising, not overfilling the bucket, and modifying the bucket size and/or type, if necessary.
- Dredge material will be passively dewatered on the barge by channeling the decant water through a sediment sock, which will capture sediment and prevent it from re-entering the surface water. The use of this BMPs negates the need for a turbidity curtain. Deploying a turbidity curtain in a large river system with strong currents can be problematic and create safety concerns.
- The dredging contractor will use a high-resolution global positioning system (GPS) receiver and software to track areas that have been dredged to ensure that dredging efficiency is maximized.
- Pre- and post-dredge bathymetric surveys will be conducted to confirm that dredging was performed to the authorized maintenance depth.
- Barges used to transport dredged material from the project area will include watertight side boards, containment cells, or similar configuration to prevent any sediment from reentering the river during transport to the in-water disposal location.

- During all barge transport activities, the barge will be loaded such that enough freeboard remains to allow for safe movement of the barge.
- A pollution control plan (PCP) will be prepared prior to start of dredging. Elements of the plan will address spill containment, control and monitoring.
- A WQMP has been prepared to ensure monitoring of turbidity is performed in accordance with the conditions outlined in a Section 401 WQC to be issued by Ecology. Turbidity monitoring will occur at both the dredging and disposal locations. As discussed in Section 2.2, sediment was characterized and determined to be suitable for open water disposal as per the DMMP. Sediment concentrations were below DMMP sediment screening levels (i.e., void of contamination). The water quality parameter to control during dredging and disposal operations is turbidity.

2.7 Scope of this BA

2.7.1 Project Components

The proposed project involves two phases, dredging and disposal of dredged material. No impacts to wildlife are anticipated from selection of the landfill-based disposal alternative based on construction and operating requirements of permitted landfill facilities. Therefore, this BA focuses on species impacts from the dredge action and the in-water disposal alternative.

2.7.2 Action Area

This BA is written with the understanding that the action area should encompass all areas where direct and indirect effects of a proposed action will have the potential to occur, and not merely the immediate area involved in the action. With this understanding, the defined action area for this BA is all area within Lake Wallula and in Lake Umatilla's boundaries, which encompasses portions of the Columbia and Snake Rivers.

Lake Wallula extends from the McNary Lock and Dam upstream to Priest Rapids Dam on the Columbia River and upstream to Ice Harbor Dam on the Snake River. The dredge area is located within the Columbia River portion of the lake.

2.7.3 Species of Concern

This BA concentrates on eight species which are potentially present within the dredge and disposal footprints. These species are federally protected by the U.S. Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service (NMFS). They are included based on their federal protection status, listing within the Priority Habitats and Species List, and on recommendation for inclusion by Troy Makis, the WDFW Area Habitat Biologist for Benton and Franklin Counties. Species of concern include: Bull Trout (*Salvelinus confluentus*), Sockeye Salmon Snake River Fall Run ESU (*Oncorhynchus nerka*), Chinook Salmon Upper Columbia River Spring Run ESU, Snake River Fall Run ESU, Snake River Spring Run ESU (*Oncorhynchus tshawytscha*), Steelhead Trout Upper Columbia River DPS, Middle Colombia River DPS, and Snake River Basin DPS (*Oncorhynchus mykiss*).

Species status and critical habitat designations are outlined in Table 1. Federally listed, terrestrial animals, potentially occurring nearby, but not within the waters of Lake Wallula or Lake Umatilla, will only be given a brief overview.

Table 1. ESA-Listed Species Potentially Present Within the County

Common Name	Scientific Name	ESA Status	Critical Habitat Status
Bull Trout	*Salvelinus confluentus*	Threatened	Designated
Sockeye Salmon Snake River ESU	*Oncorhynchus nerka*	Threatened	Designated
Chinook Salmon Upper Columbia River Spring Run ESU	*Oncorhynchus tshawytscha*	Endangered	Designated
Chinook Salmon Snake River Fall Run ESU	*Oncorhynchus tshawytscha*	Threatened	Designated
Chinook Salmon Snake River Spring Run ESU	*Oncorhynchus tshawytscha*	Threatened	Designated
Steelhead Trout Upper Columbia River DPS	*Oncorhynchus mykiss*	Threatened	Designated
Steelhead Trout Middle Columbia River DPS	*Oncorhynchus mykiss*	Threatened	Designated
Steelhead Trout Snake River Basin DPS	*Oncorhynchus mykiss*	Threatened	Designated
Yellow-billed cuckoo	*Coccyzus americanus*	Threatened	Not designated in WA
Gray wolf	*Canis lupus*	Under Review	None
Monarch butterfly	*Danaus plexippus*	Candidate	None

3. ENVIRONMENTAL BASELINE CONDITIONS

3.1 Habitat Description

3.1.1 Dredge Area

Lake Wallulla is an impounded section of the Columbia River which encompasses portions of the Columbia and Snake Rivers. The water is cold and provides migration habitat for many anadromous fishes. Riverside vegetation, where present, is composed of primarily *Populus and Salix* species, as well as *Elaeagnus angustifolia* in the tree layer. In the shrub layer, *Morus alba, Ribes aureum* and *Rosa* species dominate. In the herbs and grasses stratum plants are primarily *Carex, Juncus, Typha, Scirpus, Polygonum,* and *Phalaris* (Comes and Creary 1986). The dredge area is adjacent to the Port of Kennewick and is currently used as a barge dock for grain transport Figure 2.

3.1.2 Disposal Area

The open water disposal site is located between RMs 284 and 285 in Lake Umatilla (Reservoir below McNary Lock & Dam), approximately 43 RM downstream of the CHS dock (Figure 3). The site is on the Washington side of the Columbia River and considered a deep-water location with approximate water depths ranging from 26 to 37 ft in depth. Based on proximity of the disposal area to the dredge location, the same species are anticipated to be present in the surrounding areas.

3.2 Water and Sediment Quality Baseline

3.2.1 Dredge Area

This section of the Columbia River is included on the Washington Department of Ecology's 303(d) Water Quality Assessment for the following Category 4A parameters: temperature, total dissolved gas, and dioxin. It is listed for Category 4C for non-native aquatic plants and for Category 2 for pH. This segment of river is not listed as impaired. The material to be dredged has been characterized and is considered suitable for open water disposal and void of contamination per the limits specified in the 2021 Dredged Material Evaluation and Disposal Procedures User Manual. Additionally, the new surface layer (Z-Layer) was characterized and is also void of contamination (Geosyntec, 2022).

3.2.2 Disposal Area

The disposal area is listed for one Category 4A parameter, dioxin in fish tissue. This area has been approved as a disposal site for clean dredged material and short-term changes to the water or sediment quality are anticipated from the proposed disposal. USACE Portland District issued a Section 408 Alteration Determination on June 21, 2023, determining the project will have no impact to the John Day Lock and Dam Project or the Federal Navigation Channel.

There is a risk of moving non-native aquatic plants from the dredge area to the disposal area. However, the disposal area is an approved disposal site that receives sediments from other areas

and sources and the disposal site itself is listed as Category 4C for non-native aquatic plants.[3] A species of concern is the flowering rush (*Butomus umbellatus L.*). As per the U.S Geological Survey (USGS) Nonindigenous Aquatic Species observation mapping tool, the flowering rush has been identified approximately 2 miles downstream of the CHS dock (1 recorded observation) and approximately 6 miles upstream of the open water disposal location near the McNary Lock and Dam (up to 7 recorded observations).[4] The dredge area is within an active, deep-water dock where shipping occurs. No plants were observed or recorded while processing sediment samples during the sediment characterization activities. Based on the two work locations and time of the planned work at each location (approximately 1 week for dredging and short dumping timeframes), there is expected to be No Effect on moving non-native aquatic plants from the dredge area to the disposal area. Barges and equipment will be inspected daily and cleaned before moving to a new site, as appropriate, if this species is encountered at any point during dredging or disposal operations.

3.3 Fish and Wildlife

3.3.1 Fish

Eight species of salmonids use the Columbia River at Wallula Lake and Umatilla Lake as a migration corridor: Bull Trout, Sockeye Salmon Snake River Fall Run ESU, Chinook Salmon Upper Columbia River Spring Run ESU, Snake River Fall Run ESU, Snake River Spring Run ESU, Steelhead Trout Upper Columbia River DPS, Middle Colombia River DPS, and Snake River Basin DPS. All populations spawning within the Columbia River basin use the Columbia River mainstem and estuary to complete part of their life history, including migration, rearing and smoltification (process where Atlantic salmon parr undergo behavioral, developmental, and physiological changes into smolt). These species are discussed in detail in Section 4.

3.3.2 Wildlife

The USFWS Information for Planning and Consultation tool (IPaC) (Appendix A) identified the that yellow-billed cuckoo, gray wolf, and the candidate monarch butterfly as potentially occurring within the dredge and disposal areas. However, since these terrestrial species do not utilize underwater lacustrine habitats, no effect to these species are expected.

[3] https://apps.ecology.wa.gov/waterqualityatlas/wqa/map
[4] https://nas.er.usgs.gov/viewer/omap.aspx?SpeciesID=1100
USGS website visited July 5, 2023.

4. DESCRIPTIONS OF THE SPECIES AND HABITAT USE

4.1 Introduction

As discussed above, eight species have been identified as species of concern for the purposes of this BA: Bull Trout, Sockeye Salmon Snake River Fall Run ESU, Chinook Salmon Upper Columbia River Spring Run ESU, Snake River Fall Run ESU, Snake River Spring Run ESU, Steelhead Trout Upper Columbia River DPS, Middle Colombia River DPS, and Snake River Basin DPS. The following sections describe the potential presence of these species and the critical habitat present in the dredge and disposal areas.

4.2 Bull Trout

The Bull Trout is listed as endangered by the USFWS at the federal level and was designated critical habitat in the Columbia River on October 6, 2004. Bull trout range throughout the Columbia River and Snake River basins; as well as into Oregon, Montana, Idaho, Canada, and Montana (USFWS, 2010).

4.2.1 Life History

Bull trout have migratory and non-migratory life histories. Stream resident bull trout spawn, rear, and complete their entire life history in tributaries; however, most bull trout are migratory. Migratory bull trout spawn in tributaries, juvenile fish usually rear from 1 to 4 years before migrating to a larger river or lake, returning to tributaries to spawn (USFWS, 2010).

4.2.2 Biological Requirements

Important habitat components for bull trout include cool water temperature, available cover (logs, boulders, undercut banks), channel form and stability, spawning and rearing substrate, and migratory corridors. Large patches of these are required for robust populations (USFWS, 2010). They utilize lakes and large rivers, but primarily inhabit colder streams (Rieman and McIntyre, 1995).

4.2.3 Population Trends and Risks

They were once more widespread than current distribution, which is now more patch like in nature. Often migratory and non-migratory populations once coexisted, but many areas only have non-migratory trout due to habitat loss or migration interruption of migratory trout. Bull trout decline is primarily linked to habitat degradation or fragmentation, blocked migration corridors, poor water quality, and historical fisheries, impoundments and other dams, and non-native species; all of which may be further impacted by Climate Change (USFWS, 2010).

A 5-year review identified six recovery units for the bull trout (USFWS, 2008, p. 45), the project area is not within these recovery units, but lies between the Mid-Columbia and Coastal Units (USFWS, 2010). In some areas, bull trout face little risk. In core areas there are limited, but major threats, but populations are strong in most habitat. Some areas continue to experience severe and systemic threats and have small populations. USFWS recommends the species remain listed in the most recent 5-year review (USFWS, 2015).

4.2.4 Critical Habitat

Both the dredge area and the disposal location are within Critical Habitat for the bull trout according to the USFWS mapper but outside of the recovery units established in 2010 by USFWS (USFWS, 2010).[5] Critical habitat for bull trout was first established in 2004 and revised in 2010. The IPaC report and the NOAA National ESA Critical Habitat Mapper do not indicate critical habitat within the project area for this species (Appendix A).

4.2.5 Environmental Baseline

According to an IPaC report and coordination with the WDFW (pers comms T. Makis) adult bull trout may be present within the project area (Appendix A). They are known to historically utilize Lake Wallula (Rondorf et al. 2010). Because the project area includes the main river channel and lakes, it is unlikely juvenile trout will be present. Resident non-migratory bull trout may occupy the waters, as well as migratory bull trout that are passing through the areas on their way to spawn.

4.3 Sockeye Salmon Snake River Evolutionarily Significant Unit (ESU)

The sockeye salmon is listed as endangered within the Snake River ESU. Critical habitat for this species was established in 2006 (USFWS, 2005). The species historical range included California, Idaho, and Washington.

4.3.1 Life History

Pacific salmon are anadromous, meaning adults migrate from the ocean and spawn in freshwater lakes and streams. Offspring hatch and rear prior to migrating back to the ocean to forage until mature. For spawning; adults pair, lay, and fertilize thousands of eggs in freshwater gravel nests or "redds" excavated by females. Eggs incubate for weeks to months before hatching as "alevins" that exhibit a yolk sack. Once the yolk sack is absorbed, alevins emerge from the gravel as "fry" and begin feeding. Juveniles will then migrate to the ocean, where they will spend one to five years foraging over thousands of miles in the north Pacific before returning to spawn. Most adult fish return to spawn in their natal stream, where they will die post spawning (USFWS 2005).

4.3.2 Biological Requirements

Spawning gravels must be adequately sized and sediment free for successful egg incubation. Eggs require cool, clean, and well-oxygenated water. Juvenile fish need abundant food sources, including insects, crustaceans, and other small fish. Adequate cover such as logs, root wats, boulders, and overhanging vegetation is required for protection from predators (birds and larger fish). Side channels and off-channels are required for protection from high flow events. Cool water sources such as springs and pools provide refuge from warm summer temperatures. Spawning adults generally do not feed in fresh water, but rely on stored energy. As a migratory species adequate passage along their migration routes, as well as adequate intervals of suitable habitat, are necessary for survival (USFWS, 2005).

[5] https://fws.maps.arcgis.com/home/webmap/viewer.html?webmap=9d8de5e265ad4fe09893cf75b8dbfb77

4.3.3 Population Trends and Risks

Pacific salmon are impacted by a wide range of activities; pollutant discharge, water management actions of federal agencies (dams, water allotments for agriculture, etc.), timber harvests, and general habitat loss or alteration (USFWS, 1993).

Risks are identified in the 5-year review as "listing factors". These include habitat (loss and alteration), overutilization (food, science, recreation, education), disease and predation, inadequacy of regulatory mechanisms, and other natural and man-made factors (climate change, water temperature changes, and estuary modifications from wildfires and hatchery operations).

Anadromous, natural reproduction is critical for the recovery of this species, therefore it is considered high-risk biological status, though substantial progress has been made with the captive broodstock-based hatchery program. At this time, natural production remains limited to extremely low levels in Redfish Lake, one of five lakes believed to have historically supported production.

4.3.4 Critical Habitat

The disposal area is located within the Snake River ESU critical habitat for the Sockeye Salmon. Within Washington this area encompasses portions of the Snake and Columbia Rivers from the eastern border of Washington to the mouth of the Columbia River at the Pacific Ocean.

4.3.5 Environmental Baseline

According to coordination with WDFW, although the project area is not a high concern for redds or juvenile salmon (pers comm T Makis), adult sockeye salmon will likely run along the shoreline through the project area in June and July.

4.4 Chinook Salmon Upper Columbia River Spring Run ESU

Chinook Salmon Upper Columbia River Spring-run: Was listed by NOAA as Endangered in March 1999, June 28, 2005 (70 FR 37159) and updated April 14, 2014 (79 FR20802). Critical habitat was designated September 2, 2005 (70 FR 52629). Includes all naturally spawned populations of Chinook in all accessible river reaches in the mainstem Columbia River and its tributaries upstream of Rock Island Dam and downstream of Chief Joseph Dam in Washington, excluding the Okanogan River.

4.4.1 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). Life history is similar to that of other Salmon. However, Chinook salmon have a precocious life history and mature and spawn after only several months in the ocean, referred to as "jacks".

4.4.2 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).

4.4.3 Population Trends and Risks

Listing factors in the 5-year review include habitat (loss and alteration), overutilization (food, science, recreation, education), disease and predation, inadequacy of regulatory mechanisms, and other natural and man-made factors (climate change, water temperature changes, and estuary modifications from wildfires and hatchery operations).

The key limiting factors for this ESU include hydropower projects, predation, harvest, hatchery effects, degraded estuary habitat, and degraded tributary habitat. Ocean conditions, which have also affected the status of this ESU, generally have been poor over the last 20 years and have improved only recently (NMFS 2008). All three populations are at high risk. Natural origin abundance has decreased further since the last review in all areas. There is a downward trend in abundance over the last five years, with an average decline of 48 percent. Ocean survival has been relatively low in recent years, a major factor in recent trends (Ford, 2022; NOAA, 2022).

4.4.4 Critical Habitat

This project will take place in designated Critical Habitat for the Chinook Salmon Upper Columbia River Spring Run ESU. This area stretches from well south of the confluence with the Snake River to far upstream in the Columbia River. It is considered Critical Habitat because it meets the requirements for primary constituent elements for freshwater migration corridors and is located within the historical distribution range of the species. The primary ecological resources needed include: natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels; and juvenile and adult forage, including aquatic invertebrates and fishes, supporting growth and maturation.

4.4.5 Environmental Baseline

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 project area do not support spawning Chinook salmon but do support migration and juvenile rearing. According to coordination with WDFW, although the project area is not a high concern for redds or juvenile salmon (pers comm T Makis), adult summer Chinook salmon will likely run along the shoreline through the project area in June and July.

4.5 Chinook Salmon Snake River Fall Run ESU

Chinook Salmon Snake River Fall Run: Species was listed as Threatened April 22, 1992 (57 FR 14653) and June 28, 2005 (70 FR 37159), and updated April 14, 2014 (70 FR 20802) Critical habitat was designated December 28, 1993 (58 FR 68543). The SR fall-run Chinook ESU includes all naturally spawned populations of fall-run Chinook in the mainstem Snake River below Hells Canyon Dam, and in the Tucannon River, Grande Ronde River, Imnaha River, Salmon River, and Clearwater River subbasins.

4.5.1 Life History

Life history is similar to that of other Salmon. However, Chinook salmon have a precocious life history that mature and spawn after only several months in the ocean, referred to as "jacks".

4.5.2 Biological Requirements

Similar to that of other salmon.

4.5.3 Population Trends and Risks

Risks are identified in the 5-year review as "listing factors". These include present or threatened destruction/modification/curtailment of habitat or range, overutilization (food, science, recreation, education), disease and predation, inadequacy of regulatory mechanisms, and other natural and man-made factors (climate change, rearing and habitat conditions in the Columbia River Estuary, hatchery effects). Limiting factors for this ESU include mainstem hydroelectric projects in the Columbia and Snake Rivers, predation, harvest, hatchery effects, ocean conditions, and poor tributary habitat.

The current risk rating for this species is viable (low risk). There is a low risk rating of abundance/productivity and populations remain unchanged since the last 5-year review. To achieve delisting, the species needs to meet "highly viable" (very low risk). Supplementation and other measures have led to the successful increases in natural-origin returns.

4.5.4 Critical Habitat

This project's dredge material disposal location is within designated Critical Habitat for the Chinook Salmon Upper Columbia River Snake River Fall ESU. This area stretches from well downstream on the Columbia River (including its estuarine areas) and river reaches proceeding upstream to the confluence of the Columbia and Snake Rivers, such as the Snake and Palouse River. It is considered Critical Habitat because it meets the requirements for primary constituent elements for freshwater migration corridors and is located within the historical distribution range of the species. The primary ecological resources needed include: natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels; and juvenile and adult forage, including aquatic invertebrates and fishes, supporting growth and maturation.

4.5.5 Environmental Baseline

According to coordination with WDFW, although the project area is not a high concern for redds or juvenile salmon (pers comm T Makis), adult summer Chinook salmon will likely run along the shoreline through the project area in June and July.

4.6 Chinook Salmon Snake River Spring Run ESU

Critical habitat for this species was established in 2006 (USFWS, 2005). This ESU includes all naturally spawned populations of spring/summer-run Chinook in the mainstem Snake River and the Tucannon River, Grande Ronde River, Imnaha River, and Salmon River subbasins.

4.6.1 Life History

Life history is similar to that of other Salmon. However, Chinook salmon have a precocious life history that mature and spawn after only several months in the ocean, referred to as "jacks".

4.6.2 Biological Requirements

Similar to that of other salmon.

4.6.3 Population Trends and Risks

Risks are identified in the 5-year review as "listing factors". These include present or threatened destruction/modification/curtailment of habitat or range, overutilization (food, science, recreation, education), disease and predation, inadequacy of regulatory mechanisms, and other natural and man-made factors (climate change, rearing and habitat conditions in the Columbia River Estuary, hatchery effects). Limiting factors for SR spring/summer-run Chinook include federal and private hydropower projects, predation, harvest, poor passage through the estuary, ocean conditions, and degraded tributary habitat.

The current risk rating for this species is viable (low risk). There is a low risk rating of abundance/productivity and populations remain unchanged since the last 5-year review. To achieve delisting, the species needs to meet "highly viable" (very low risk). Supplementation and other measures have led to the successful increases in natural-origin returns.

4.6.4 Critical Habitat

Critical habitat was designated for SR spring/summer-run Chinook on October 25, 1999 (64 FR 57399). This project's dredge material disposal location is within designated Critical Habitat for the Chinook Salmon Upper Columbia River Snake River Fall ESU. This area stretches from well downstream on the Columbia River (including its estuarine areas) and river reaches proceeding upstream to the confluence of the Columbia and Snake Rivers, such as the Snake and Palouse River. It is considered Critical Habitat because it meets the requirements for primary constituent elements for freshwater migration corridors and is located within the historical distribution range of the species. The primary ecological resources needed include: natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels; and juvenile and adult forage, including aquatic invertebrates and fishes, supporting growth and maturation.

4.6.5 Environmental Baseline

According to coordination with WDFW, although the project area is not a high concern for redds or juvenile salmon (pers comm T Makis), adult summer Chinook salmon will likely run along the shoreline through the project area in June and July.

4.7 Steelhead Trout Upper Columbia River Distinct Population Segment (DPS)

Steelhead Trout, UCR were listed as Endangered on August 18, 1997 (62 FR 43937); reclassified to Threatened on January 5, 2006 (71 FR 833) and August 24, 2009 (74 FR 42605); updated April 14, 2014 (79 FR 20802). Critical habitat September 2, 2005 (70 FR 52629). This DPS includes all

naturally spawned anadromous steelhead populations below natural and manmade impassable barriers in tributaries in the Columbia River Basin upstream from the Yakima River, Washington, to the Canadian border.

4.7.1 Life History

UCR steelhead are entirely summer-run fish, and use the Columbia River within the action area for migration and holding. Similar to other salmon, but may not perish after initial spawning. This species may make one or more repeat spawning excursions.

4.7.2 Biological Requirements

Similar to that of other salmon.

4.7.3 Population Trends and Risks

Risks are identified in the 5-year review as "listing factors". These include habitat (loss and alteration), overutilization (food, science, recreation, education), disease and predation, inadequacy of regulatory mechanisms, and other natural and man-made factors (climate change, water temperature changes, and estuary modifications from wildfires and hatchery operations) (Ford, 2022; NOAA, 2022). The key limiting factors and threats for this DPS include hydropower projects, predation, harvest, hatchery effects, degraded tributary habitat, ocean conditions, and degraded estuary habitat.

All four populations remain at high risk. Similar to Chinook, natural origin abundance and overall abundance data show a downward trend over the last five years (Ford, 2022; NOAA, 2022).

4.7.4 Critical Habitat

This project will take place in designated Critical Habitat for the steelhead trout Middle Columbia River DPS and Upper Columbia River DPS. This area stretches from well south of the confluence with the Snake River to far upstream in both the Yakima and Columbia Rivers, respectively. It is considered Critical Habitat because it meets the requirements for primary constituent elements for freshwater migration corridors and is located within the historical distribution range of the species. The primary ecological resources needed include: natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels; and juvenile and adult forage, including aquatic invertebrates and fishes, supporting growth and maturation.

4.7.5 Environmental Baseline

According to coordination with WDFW, steelhead trout migrate through the project area.

4.8 Steelhead Trout Middle Columbia River DPS

Middle Columbia River (MCR) steelhead was listed as threatened on March 25, 1999 (64 FR 14517) and January 5, 2006 (71 FR 833); updated April 14, 2014 (79 FR 20802). Critical habitat September 2, 2005 (70 FR 2629). This DPS includes all naturally spawned anadromous steelhead populations below natural and manmade impassable barriers in tributaries from above the Wind River, Washington, and the Hood River, Oregon, upstream to (and including) the Yakima River,

Washington. Steelhead trout were listed as threatened in 1998 (Upper Columbia DPS) and 1999 (Middle Columbia DPS). Critical habitat was designated in 2005 (USFWS, 2005).

4.8.1 Life History

MCR steelhead are predominantly summer-run fish, and use the Columbia River within the action area for migration and holding. Similar to other salmon, but may not perish after initial spawning. This species may make one or more repeat spawning excursions.

4.8.2 Biological Requirements

Similar to that of other salmon.

4.8.3 Population Trends and Risks

Risks are identified in the 5-year review as "listing factors". These include habitat (loss and alteration), overutilization (food, science, recreation, education), disease and predation, inadequacy of regulatory mechanisms, and other natural and man-made factors (climate change, water temperature changes, and estuary modifications from wildfires and hatchery operations) (Ford, 2022; NOAA, 2022). Limiting factors for MCR steelhead include mainstem hydropower projects, degradation and loss of tributary habitat, water storage projects, predation, hatchery effects, harvest, and ocean and estuary conditions.

All four populations remain at high risk. Similar to Chinook, natural origin abundance and overall abundance data show a downward trend over the last five years (Ford, 2022; NOAA, 2022).

4.8.4 Critical Habitat

This project will take place in designated Critical Habitat for the steelhead trout Middle Columbia River DPS and Upper Columbia River DPS. This area stretches from well south of the confluence with the Snake River to far upstream in both the Yakima and Columbia Rivers, respectively. It is considered Critical Habitat because it meets the requirements for primary constituent elements for freshwater migration corridors and is located within the historical distribution range of the species. The primary ecological resources needed include: natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels; and juvenile and adult forage, including aquatic invertebrates and fishes, supporting growth and maturation.

4.8.5 Environmental Baseline

According to coordination with WDFW, steelhead trout migrate through the project area.

4.9 Steelhead Trout Snake River Basin DPS

This DPS includes all naturally spawned anadromous steelhead populations below natural and manmade impassable barriers in tributaries in the Snake River basin of southeast Washington, northeast Oregon, and Idaho. Steelhead trout were listed as threatened in 1998 (Upper Columbia DPS) and 1999 (Middle Columbia DPS). Critical habitat was designated in 2005 (USFWS, 2005).

4.9.1 Life History

SR steelhead are generally classified as summer-run, based on their adult run timing patterns. Similar to other salmon, but may not perish after initial spawning. This species may make one or more repeat spawning excursions.

4.9.2 Biological Requirements

Similar to that of other salmon.

4.9.3 Population Trends and Risks

Risks are identified in the 5-year review as "listing factors". These include habitat (loss and alteration), overutilization (food, science, recreation, education), disease and predation, inadequacy of regulatory mechanisms, and other natural and man-made factors (climate change, water temperature changes, and estuary modifications from wildfires and hatchery operations) (Ford, 2022; NOAA, 2022). Historically, the key limiting factors for SR steelhead include hydropower projects, predation, harvest, hatchery effects, ocean conditions, and tributary habitat.

All four populations remain at high risk. Similar to Chinook, natural origin abundance and overall abundance data show a downward trend over the last five years (Ford, 2022; NOAA, 2022).

4.9.4 Critical Habitat

This project will take place in designated Critical Habitat for the steelhead trout Middle Columbia River DPS and Upper Columbia River DPS. This area stretches from well south of the confluence with the Snake River to far upstream in both the Yakima and Columbia Rivers, respectively. It is considered Critical Habitat because it meets the requirements for primary constituent elements for freshwater migration corridors and is located within the historical distribution range of the species. The primary ecological resources needed include: natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels; and juvenile and adult forage, including aquatic invertebrates and fishes, supporting growth and maturation.

4.9.5 Environmental Baseline

According to coordination with WDFW, steelhead trout migrate through the project area.

4.10 Effects Analysis

The effects of the proposed dredging project on ESA-listed bull trout, and NMFS listed; Bull Trout, Sockeye Salmon Snake River Fall Run ESU, Chinook Salmon Upper Columbia River Spring Run ESU, Snake River Fall Run ESU, Snake River Spring Run ESU, Steelhead Trout Upper Columbia River DPS, Middle Columbia River DPS, and Snake River Basin DPS; and their habitats are described in this section. The 12 major dams located in the Columbia Basin are the primary factors affecting flow conditions in the action area. Consequently, the Columbia River, including the project area, is a highly managed waterbody that resembles a series of slack-water lakes rather than its original free-flowing state. Since the 1800s, USACE has performed dredging throughout the Columbia River estuary in order to maintain the navigation channel (NMFS 2004).

The following sections discuss how dredging and disposal will contribute to improvement, maintenance, or degradation of habitats used by listed species. Measurable indicators of habitat health and potential disturbances to habitat health caused by project activities are evaluated.

The following is a discussion of short-term and long-term direct and indirect effects of project activities in the action area, along with the net effects of those activities. Net effect considers the overall long-term effect on the species or habitat. For example, a short-term negative effect (i.e., increased turbidity as a result of pile removal) could still result in a long-term positive effect (i.e., improved habitat quality). Furthermore, if short-term negative effects occur when few or no individuals of a listed species are present, and then those conditions fade before the listed species return to the area, then this is not considered adverse modification of habitat quality because the listed species was not affected.

4.10.1 Construction Disturbances

Dredging and in-water disposal will produce some amount of noise from the operation of boats and construction equipment. The level will not be significantly greater than that of normal at the site since industrial activity takes place nearby with associated industrial boat traffic, and the effect will be limited to the 4 to 5 days the project is expected to take.

Dredging will include the operation of heavy equipment, including a clamshell dredge and a tug towing a barge. Dredging is recommended to occur between August 1 and February 28 when juvenile salmonids are unlikely to be in the vicinity of the CHS dock. Dependent upon issuance of permits, the projected dredge and disposal project is proposed to occur between December 2023 and January 2024. If permits are not obtained prior to January 2024, the project may be postponed until the “fish window” opens in August 2024.

Entrainment/impingement may occur if fish are trapped in the clamshell bucket during dredging of in-water sediment. 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 (when juvenile salmonids are unlikely to be in the vicinity of the project area), 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 clamshell bucket would allow ample opportunity to avoid or escape any potential entrainment as the shells would move, likely causing fish to spook away from it while it closed if not while being lowered into place. Given clamshell dredging would occur during the winter in-water work window, fish entrainment is unlikely for any method. A study of dredging in Grays Harbor from 1978 to 1989 showed that the highest entrainment rates and numbers of species of fish were observed in hydraulic equipment, specifically hopper dredge samples (McGraw and Armstrong 1990).

In-water construction may create temporary, localized turbidity above ambient levels, potentially resulting in disturbance to fish. The dump scow barge will release the dredged sediment through the bottom either through cable or hydraulically operated doors (or in the case of a split-hulled barge by splitting the barge longitudinally). The scow barge will be relatively low draught and narrow to facilitate movement through confined waterways and maneuvered by a tugboat (or

equivalent). Upon successful completion of dumping the dredged material the bottom doors will slowly close. No entrainment of fish is expected during disposal operations. In the event that a fish was to be entrained in the scow barge upon closing the doors, the tug operator will re-open the doors to release the fish (or fishes). The project is not expected to cause significant impacts to primary productivity or the food web for any of the fish species using the action area. The project may reduce the productivity of plants, algae, and phytoplankton occurring both within the photic zone and beneath overwater structures.

In water noise from these activities could impact protected species. In-water noise analysis for NMFS species is presented here, to act as a reference for subsequent sections. USFWS has allowed NMFS to take the lead on in water noise analysis, and often applies NMFS' criteria to USFWS species. Protected species rely on hearing to perform four basic functions (Richardson et al. 1995):

- Obtain information from their environment
- Communicate
- Detect prey
- Detect predators

Anthropogenic noise may impact protected species in these zones (Richardson et al. 1995):

- Zone of hearing loss, discomfort, injury: Individual may experience injury or discomfort. This may include Temporary Threshold Shift (TTS) or Permanent Threshold Shift (PTS); which are temporary or permanent loss of hearing.
- Zone of masking: Individual experiences interference with natural noise.
- Zone of responsiveness: Individual reacts to the noise.
- Zone of audibility: Individual may hear the noise.

Potential effects of noise on protected species include:

- Tolerance
- Masking
- Disturbance Reactions
- Stranding/Mortality
- Change in Hearing

There are several good sources for received sound levels on clamshell dredgers in the Northwest (Alaska).

- Dickerson et al. (2001) provides sound levels at 150 m for clamshell dredge operations in Cook Inlet, Alaska. These are of limited usefulness because sound source level calculations are typically completed with noise measurements at 1 meter.
- Miles et al. (1987) provides clamshell dredge sound source levels for the Alaskan Beaufort Sea.

We use Miles in our analysis because their levels were measured at 1 meter. We also used the widely used sound source levels from Richardson et al. (1995) for tugs towing a barge.

- Clamshell Dredger 161 dB @ 1 meter with a frequency of 50-3,160 Hz
- Tug Towing Barge 170 dB @ 1 meter with a frequency of 10-5,000 Hz

Using the NMFS Model (https://jmlondon.shinyapps.io/AcousticThresholds/) we have approximated the acoustic thresholds where PTS effects are anticipated:

- Clamshell Dredge < 10 m
- Tug Towing Barge < 1 m

Given these distances and time duration of the work we anticipate no PTS or TTS from the dredging activities.

4.10.2 Barge Transportation

Transportation of the material barge may contribute to overall river traffic, but impacts are expected to be minor and temporary in nature. The shade footprint of moving barges (such as materials and spoils barges) was not included in this analysis. These barges move more or less constantly and on an unpredictable schedule, so it is impossible to quantify the extent or duration of shade cast by these sources. Transportation of the material barge may facilitate movement of non-native species such as flowering rush. Visual observations of the barge will be performed by the dredge contractor prior to relocation, to identify and remove any non-native species that have may have attached themselves to the barge. The scow barge is watertight and sealed; therefore, no release of sediment is expected to occur during transportation to the disposal location.

4.10.3 Water Quality Disturbance

Dredging and disposal may produce localized impacts to water quality in the form of elevated turbidity plumes that could last from a few minutes to several hours. The sediment characterization showed that the material to be dredged is predominantly sand (97.7%). Sand and gravel resettle rapidly in the immediate vicinity of the dredge (Schroeder 2009). Increased turbidity from dredging is likely to occur within the dredge prism as well as immediately adjacent and downstream. The extent will be limited by reducing the cycling time of the bucket, ensuring that the bucket is closed before raising, not overfilling the bucket, and modifying the bucket size and/or type, if necessary. Sediments placed into the scow barge during dredging will be contained within the barge. The project has proposed to decant excess water captured in the scow barge and discharge back to the river at the point of dredging. During discharge of the decanted water, sediment will be retained through the use of sediment socks, which are designed to limit the release of suspended sediments during decanting the excess water back to the river.

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 (NTUs). 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.

Increased turbidity is also expected at the disposal location for the time period during and immediately following disposal activities. The dredging and disposal operations will monitor for turbidity in accordance with a WQC issued by Ecology. Conditions within the WQC will be followed and implemented in accordance with the project specific WQMP (Geosyntec, 2023). Effects from turbidity are expected to be discountable. Dredging would occur at a time when use by juvenile salmonids in the project area is at its seasonal low. Turbidity is expected to be limited to the immediate area of the dredging and disposal operations.

4.10.4 Sediment Quality Disturbance

Physical resuspension of the sediments disturbed during dredging will occur, and sediments within the dredge prism will be removed. At the disposal site, introduction of new sediments will occur. Impacts to surrounding sediments will be limited by the BMPs in place to minimize turbidity by limiting transport of sediments from the dredge area. The dredged sediment which will be disturbed has been chemically characterized as void of contaminants, so no change in long term sediment quality will occur from this disturbance. Additionally, the Z-layer (i.e., new surface to be exposed after dredging) was chemically characterized and also void of contaminants. Therefore, the new surface sediment will pose no change in long term sediment quality from this disturbance. Additionally, substrates in these water bodies are coarse sand, which settles in relatively short distances compared to finer sediments.

4.10.5 Habitat and Biota Disturbance

Dredging will result in changes to bathymetry and topography, both at the dredged site and the deposition area. These changes are anticipated to have minimal impact to listed species, as they are relatively minor, and there are thousands of acres of continuous natural habitat available surrounding the project. Additionally, the area is currently utilized as a barge dock and there will be no losses of critical habitat at the dredge site.

Dredging will remove 0.4 acres of benthic habitat and any benthic organisms contained within the dredge spoil. The action will remove existing benthic habitat. Juvenile salmonids will experience a reduction of macroinvertebrate prey originating from benthic habitat, as well as macroinvertebrates. However, this effect is not likely to be significant since the area removed will be small in comparison to the action area, 0.4 acres. Since none of the ESA-listed salmonid species we are concerned with occupy the benthic layer or prey on benthic organisms as adults, they are unlikely to be impacted by this removal. If there are juvenile salmonids present, the small footprint of disturbance will cause a de minimis loss of foraging habitat compared to the overall foraging area within the lake. The dredge site will be recolonized by benthic organisms over time, though it could take more than three years to return to a state where the benthic community is fulfilling the same trophic functions as it was prior to dredging (De La Cruz et al. 2020). Though the trophic structure will take time to reestablish, the community structure will likely remain intact (McCabe et al. 1996).

The mechanical dredging itself is unlikely to entrain many adult fish (Wenger et al. 2017) and as long as the concentration of suspended sediments is kept low, there is minimal risk of mortality from suspended sediments (Wenger et al. 2018). The project may produce turbidity at levels that could cause physiological stress in fish.

Disposal of the dredged material at the disposal site will result in short-term impacts to benthic organisms resulting from transportation of these organisms from the dredge locations to the disposal site further downstream. However, because the dredge and disposal sites are located within the same watershed, transportation of these organisms is unlikely to have more than a de minimis impact. WDFW issued CHS a Hydraulic Project Approval (HPA) on June 2, 2023. A provision in the HPA is that the dredged materials may be dumped while underway or in a series of stationary releases so long as the depth of the newly placed layer of sediment remains 10 inches or less at the USACE-approved disposal location. Placement of the dredged material at the disposal location at 10 inches or less is designed to not "bury" the existing aquatic species (e.g., lamprey).

Juvenile and adult fishes' ability to use habitat will be altered by the presence of temporary structures and fill that alter aquatic habitat. The direct effects include migration behavior modification, while indirect effects include predation. Migration is likely to be affected by the presence of temporary structure in the path of downstream migrating juveniles and upstream migrating adults. The use of barges and dredges may cause juvenile fish to use habitat not usually used (e.g., deep-water) and expose them to indirect effect including but limited to predation. The path of individual migrating adults is likely to change as navigate around in-water structure causing them to use deep-water instead of shallow water habitat or vice versa depending on flows, species behavior, diurnal cycles etc. This may also cause them to slow or pause migration, causing them more vulnerable to predation as well. However, temporary structure will not occupy a large portion of the channel so its ability to alter migration is considered minimal.

4.10.6 Essential Fish Habitat

Essential Fish Habitat (EFH) is present in the project area. EFH is waters and substrate necessary for fish spawning, breeding, feeding, or growth to maturity. This can include areas historically utilized by fish, like a river above a dam. The project area is within Coho and Chinook Salmon ESH for the Upper Columbia-Priest Rapids watershed (dredge area) and Middle Columbia-Lake Wallula watershed (disposal area).

4.11 Net Effects of Action

The net effect of the proposed actions at the Site will be to maintain overall habitat quality for listed salmonids. Short-term localized water quality degradation during dredging and placement at the in-water disposal location will temporarily impact habitat for salmonids because the effects will be short-term and because dredging/disposal will be limited to the WDFW Columbia River in-water work window. Current water quality conditions will be maintained in the long term. There will be short term negative effects to the diversity and density of the benthic community in the dredge area and in-water disposal area. With the implementation of conservation measures/BMPs, the overall effects of the Proposed Action can be summarized below:

- Bull Trout- May affect, likely to adversely affect
- Sockeye Salmon Snake River ESU- May affect, likely to adversely affect

- Chinook Salmon Upper Columbia River Spring Run ESU- May affect, likely to adversely affect
- Chinook Salmon Snake River Fall Run ESU- May affect, likely to adversely affect
- Chinook Salmon Snake River Spring Run ESU- May affect, likely to adversely affect
- Steelhead Trout Upper Columbia River DPS- May affect, likely to adversely affect
- Steelhead Trout Middle Columbia River DPS- May affect, likely to adversely affect
- Steelhead Trout Snake River Basin DPS- May affect, likely to adversely affect
- Essential Fish Habitat – May affect, likely to adversely affect.
- River Traffic – May affect, likely to adversely affect.

"May affect, likely to adversely affect" means that listed resources are likely to be exposed to the action or its environmental consequences and will respond in a negative manner to the exposure.

4.12 Interdependent and Interrelated Actions

The Proposed Action would allow the continued use of the port for operations. Vessel loading, offloading, and lightering would continue. Negative impacts from this activity would focus on potential vessel collisions and the increased traffic of grains. These impacts are currently avoided and minimized by the slow speed vessels operate at the facility. Vessels also reduce lighting, as safety allows, to avoid attracting eiders, during poor weather.

4.13 Cumulative Effects on Habitat

The dredge area is located in heavily utilized industrial port area with substantial docking facilities and associated infrastructure, where significant alteration to salmonid habitat has occurred. The disposal area is a pre-approved USACE site, specifically selected for disposal activities. The effects of the proposed action will have short-term adverse effects on ESA-listed fish for the duration of the dredge project. This Project will not contribute significantly to cumulative adverse effects on habitat.

5. CRITICAL HABITAT EVALUATION

As described in Section 4, critical habitat has been designated within the action area for bull trout, Chinook salmon, sockeye salmon, and steelhead trout. Designated critical habitat within the action area for these species contain one to several Primary Constituent Elements (PCEs) and potential effects are summarized in Table 2.

Table 2. Freshwater Migration Corridor PCEs

Spawning Sites:

- Water quality
  - Direct – Temporary increases to temperature, suspended sediment, and contaminants; decreased dissolved oxygen
  - Indirect – Typical temperatures return and sediment load, reduced contaminants, and increased dissolved oxygen due temporary activities
- Water quantity. No effect

Rearing Activities:

- Forage
  - Direct – Decreased quantity and quality of forage due to increased suspended sediment and contaminants, decreased dissolved oxygen, loss of habitat diversity and benthic disturbance.
- Natural cover. No effect
- Water quality
  - Direct – Direct – Temporary increases to temperature, suspended sediment, and contaminants; decreased dissolved oxygen.
  - Indirect – Typical temperatures return and sediment load, reduced contaminants, and increased dissolved oxygen due temporary activities.
- Water quantity. As noted above

Migration Corridors

- Forage. As noted above.
- Obstruction. Direct – Decrease due to temporary in-water work (clam-shell dredge)
- Natural cover. As noted above
- Water quality. As noted above
- Water quantity. As noted above

Estuarine Areas

- Forage. As noted above
- Obstruction. As noted above
- Natural cover. As noted above

- Water quantity. As noted above
- Water quality. As noted above

6. EFFECTS DETERMINATIONS

The effects determination is the conclusion of the analysis of potential direct or indirect effects of the proposed activity on listed species and critical habitat. Regulatory guidance from the Final Section 7 Consultation Handbook (USFWS and NMFS 1998) was used to make the effects determination for the proposed activity as described below. The range of conclusions that could result from the effects analysis for the effects determination includes:

- No effect – the appropriate conclusion when the proposed action will not affect listed species or critical habitat.
- May affect, is not likely to adversely affect – the appropriate conclusion when effects on listed species are expected to be discountable, insignificant, or completely beneficial. Beneficial effects are contemporaneous positive effects without any adverse effects on the species or habitat. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Discountable effects are those extremely unlikely to occur. Based on best judgment, a person would not: (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur.
- May affect, is likely to adversely affect – the appropriate conclusion if any adverse effect to listed species may occur as a direct or indirect result of the proposed action.

A key factor in making an effect determination and distinguishing between a significant and insignificant effect is determining if the effect would be significant enough to cause a take. "Take," as defined by the ESA, includes such activities that harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct [ESA §3(19)]. "Harm" is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. "Harass" is further defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns that include, but are not limited to, breeding, feeding, or sheltering (50 CFR §17.3).

6.1 Effects Determinations of Species

Based on the guidance and definitions provided above and the previously discussed project effects, this project may affect, likely to adversely affect listed fish species. Justification for this determination is provided below.

Dredging work will occur during the in-water work window when listed salmonids are not expected to be present in large numbers, but some adult fish may be present. Therefore, the project may affect, likely to adversely affect listed fish species, because:

- Benthic prey items will be disturbed during dredging. This effect will be short-term and temporary, and no long-term modifications of salmonid prey species habitats are expected. These effects are therefore considered insignificant.

- Localized impacts on water quality could result in the form of short-term increases in water column turbidity. The water quality is not expected to create direct fish mortality; however, stress from suspended sediment and the abundance of prey items in the water column are expected to be affected. Additionally, turbidity is anticipated to be minor as a result of the coarse substrate (>97% sand). These effects are expected to be short-term.
- There is a potential direct impact related to entrainment by the clamshell bucket; however, there is ample opportunity to avoid or escape any potential entrainment as the shells would move, likely causing fish to spook away from it while it closed if not while being lowered into place. Further, dredging would occur during the in-water work window when juvenile salmonids are unlikely to be in the vicinity of the dredging and in-water placement area. BMPs, such as slow speed of dredging, it is reasonably certain that risk of if injury or lethal take of juvenile ESA-listed fish species from proposed dredging and in-water placement activities will be small, involving very few juvenile fish.

6.2 Effects Determinations of Critical Habitats

Based on the guidance and definitions provided above and the previously discussed project effects, this project may affect, but is not likely to adversely affect, designated critical habitat for bull trout, sockeye salmon, Chinook salmon, and steelhead trout. Justification for these determinations is provided below.

The project may affect, likely to adversely affect designated critical habitat because:

- Juvenile and adult fishes' ability to use habitat will be altered by the presence of temporary structures and fill that alter aquatic habitat. Fish passage effects would be limited to the duration of dredging, which will occur during the Columbia River in-water work window when salmonids are not expected to be present. The direct effects include migration behavior modification, while indirect effects include predation. Migration is likely to be affected by the presence of temporary structure in the path of downstream migrating juveniles and upstream migrating adults. The use of barges and dredges may cause juvenile fish to use habitat not usually used (e.g., deep-water) and expose them to indirect effect including but limited to predation. The path of individual migrating adults is likely to change as navigate around in-water structure causing them to use deep-water instead of shallow water habitat or vice versa depending on flows, species behavior, diurnal cycles etc. This may also cause them to slow or pause migration, causing them more vulnerable to predation as well. However, temporary structure will not occupy a large portion of the channel so its ability to alter migration is considered minimal.
- There will be no effect on water quantity or water flow.
- Impacts to water column habitat are expected to be localized and short-term, and no long-term water quality effects are expected. Water column prey items are not expected to be affected by the anticipated level of water quality effects; therefore, these effects are considered short-term.

- There will be no effect on the availability of natural cover because none is present.
- The action will remove existing benthic habitat. Juvenile salmonids will experience a reduction of macroinvertebrate prey originating from benthic habitat, as well as macroinvertebrates. However, this effect is not likely to be significant since the area removed will be small in comparison to the action area, 0.4 acres.
- Use of spuds (24 inch diameter) to anchor during dredging will likely effect benthic habitat in the area of placement; however, the duration of spud placement will be short-term. Additionally, the spuds will likely be placed within the footprint to be subsequently dredged. Therefore, the area affected by spuds will be removed during dredging.
- The placement of dredged sediments will placed at the in-water location to not exceed 10 inches of cover, so as not to "bury" existing benthic invertebrates.

The benthic community will be recolonized beginning immediately, with benthic macroinvertebrate, biomass and energy content increasing steadily over time (De La Cruz 2020).As described above, critical habitat will not be permanently negatively impacted. The effects of this project will not affect the conservation value of the action area over the long term, though they may temporarily lower the value of water quality and fish passage within the action area.

Table 3. Effect Determination Summaries for Listed Species That May Occur Within the Project

Species	Scientific Name	Effect Determination	Critical Habitat Effect Determination
Bull Trout	*Salvelinus confluentus*	May affect, likely to adversely affect	May affect, likely to adversely affect
Sockeye Salmon Snake River ESU	*Oncorhynchus nerka*	May affect, likely to adversely affect	May affect, likely to adversely affect
Chinook Salmon Upper Columbia River Spring Run ESU	*Oncorhynchus tshawytscha*	May affect, likely to adversely affect	May affect, likely to adversely affect
Chinook Salmon Snake River Fall Run ESU	*Oncorhynchus tshawytscha*	May affect, likely to adversely affect	May affect, likely to adversely affect
Chinook Salmon Snake River Spring Run ESU	*Oncorhynchus tshawytscha*	May affect, likely to adversely affect	May affect, likely to adversely affect
Steelhead Trout Upper Columbia River DPS	*Oncorhynchus mykiss*	May affect, likely to adversely affect	May affect, likely to adversely affect
Steelhead Trout Middle Columbia River DPS	*Oncorhynchus mykiss*	May affect, likely to adversely affect	May affect, likely to adversely affect
Steelhead Trout Snake River Basin DPS	*Oncorhynchus mykiss*	May affect, likely to adversely affect	May affect, likely to adversely affect

7. REFERENCES

Comes, R. D., & McCreary, T. (1986). Approaches to Revegetate Shorelines at Lake Wallula on the Columbia River, Washington-Oregon. ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MS.

DART (Data Acquisition in Real Time). 2022. Adult Passage Graphics & Text. Columbia Basin Research, University of Washington. Available at: http://www.cbr.washington.edu/dart/query/adult_graph_text. 8 February 2022

De La Cruz, S. E., Woo, I., Hall, L., Flanagan, A., & Mittelstaedt, H. (2020). *Impacts of periodic dredging on macroinvertebrate prey availability for benthic foraging fishes in central San Francisco Bay, California* (No. 2020-1086). US Geological Survey.

Dickerson C., Reine K J. & Clarke D.G. (2001). Characterization of underwater sounds produced by bucket dredging operations. USAERDC, DOER Technical Notes Collection ERDC TN-DOER-E14. Accessed May 19, 2020 at https://apps.dtic.mil/sti/pdfs/ADA394275.pdf

Ford, M.J. (Ed.), T. Cooney, P. McElhany, N. Sands, L. Weitkamp, J. Hard, M. McClure, R. Kope, J. Myers, A. Albaugh, K. Barnas, D. Teel, P. Moran and J. Cowen. 2011. Status Review Update for Pacific Salmon and Steelhead Listed Under the Endangered Species Act: Pacific Northwest. U.S. Department of Commerce, NOAA Technical Memorandum NOAA-TM-NWFSC-113. November 2011.

Geosyntec Consultants (2022). Sediment Characterization Report, Columbia River, CHS, Inc. – Maintenance Dredging. December 2022.

Geosyntec Consultants (2023a). Water Quality Monitoring Plan, Columbia River, CHS, Inc. – Maintenance Dredging. DRAFT July 2023. Under Review by WA Department of Ecology.

Geosyntec Consultants (2023b). Alternative Analysis, Columbia River, CHS, Inc. – Maintenance Dredging. May 12, 2023.

McCabe, G. T., Hinton, S. A., & Emmett, R. L. (1998). Benthic invertebrates and sediment characteristics in a shallow navigation channel of the lower Columbia River, before and after dredging. Northwest science., 72(2), 116-126.

McGraw, K. and D. Armstrong. 1990. Fish entrainment by dredges in Grays Harbor, Washington. Pages 113-131 in C.A. Simenstad, editor. Effects of dredging on anadromous Pacific coast fishes. University of Washington Sea Grant.

Miles, P.R., C.I. Malme and W.J. Richardson. 1987. Prediction of Drilling Site-Specific Interaction of Industrial Acoustic Stimuli and Endangered Whales in the Alaskan Beaufort Sea. OCS Study MMS87-0084. Report No. 6509

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

NMFS. 2000. United States Department of the Interior, National Marine Fisheries Service, Northwest Region, Washington State Habitat Branch Endangered Species Act – Section 7, Biological Opinion, Kennedy Memorial Bridge Replacement Project, WSB-00-092, for the Federal Highway Administration, Date Issued, October 17, 2000.

NMFS. 2004. Critical Habitat Analytical Review Team (CHART) Report. Department of Commerce, National Oceanographic and Atmospheric Administration

NMFS. 2008. Supplemental Comprehensive analysis of the federal Columbia River power system and mainstem effects of the upper Snake and other tributary actions. National Marine Fisheries Service, Northwest Region, Portland,

Nightingale, B. and C. Simenstad. 2001. White Paper. Dredging Activities: Marine Issues. Submitted to the Washington Department of Fish and Wildlife, Washington Department of Ecology, and Washington Department of Transportation.

NOAA. 2022. 5-Year Review: Summary & Evaluation of Upper Columbia River Spring-run Chinook Salmon and Upper Columbia River Steelhead.

Richardson, W.J., C.R. Greene, C.I. Malme, and D.H. Thomson. 1995. Marine Mammals and Noise. Academic Press, Inc., San Diego, CA.

Rieman, B.E., and J.D. McIntyre. 1995. Occurrence of bull trout in naturally fragmented habitat patches of varied size. Transactions of the American Fisheries Society. 124:285-296.

Rondorf, D. W., Rutz, G. L., & Charrier, J. C. (2010). Minimizing effects of over-water docks on federally listed fish stocks in McNary Reservoir: a literature review for criteria.

Schroeder, P. R. 2009. USACE technical guidelines for predicting the 3Rs of environmental dredging. Proceedings of the Western Dredging Association Twenty-ninth Technical Conference and 40th Annual Texas A&M Dredging Seminar. Tempe, Arizona.

USACE. Dredged Material Evaluation and Disposal Procedures. User Manual. Dredged Material Management Program. Prepared by Dredged Material Management Office. July 2021.

USACE. Assessment of Impacts to Critical Habitat for ESUs of Pacific Salmon and Steelhead in Washington Designated December 28, 1993 and September 2, 2005

USFWS, 1993. Designated Critical Habitat; Snake River Sockeye Salmon, Snake River Spring/Summer Chinook Salmon, and Snake River Fall Chinook Salmon. Federal Register 58(247)

USFWS, 2005. Endangered and Threatened Species; Designation of Critical Habitat for 12 Evolutionarily Significant Units of West Coast Salmon and Steelhead in Washington, Oregon, and Idaho. Federal Register 70(170)

USFWS. 2008. Bull Trout (*Salvelinus confluentus*) 5-Year Review: Summary and Evaluation.

USFWS. 2010. Endangered and Threatened Wildlife and Plants; Revised Designation of Critical Habitat for Bull Trout in the Coterminous United States. Federal Register 75(200).

USFWS. 2015. 5-Year Review Short Form Summary (bull trout).

Wenger, Amelia S., Euan Harvey, Shaun Wilson, Chris Rawson, Stephen J. Newman, Douglas Clarke, Benjamin J. Saunders et al. "A critical analysis of the direct effects of dredging on fish." Fish and Fisheries 18, no. 5 (2017): 967-985.

Wenger, A. S., Rawson, C. A., Wilson, S., Newman, S. J., Travers, M. J., Atkinson, S., ... & Harvey, E. (2018). Management strategies to minimize the dredging impacts of coastal development on fish and fisheries. Conservation Letters, 11(5), e12572.

FIGURES

Legend

- Proposed Dredge Prism
- Upland Property Boundary
- Parcel Boundary
- City Limits
- OHWM (340 ft NGVD29)

Notes:
The OHWM is equal to Lake Wallula Normal Pool Elevation 340 ft NGVD29. US Army Corps of Engineers. https://www.nwd-wc.usace.army.mil/dd/common/projects/www/mcn.html
OHWM = Ordinary High Water Mark
NGVD29 = National Geodetic Vertical Datum of 1929

N

0 250 500 1,000 Feet

Dredge Site Location

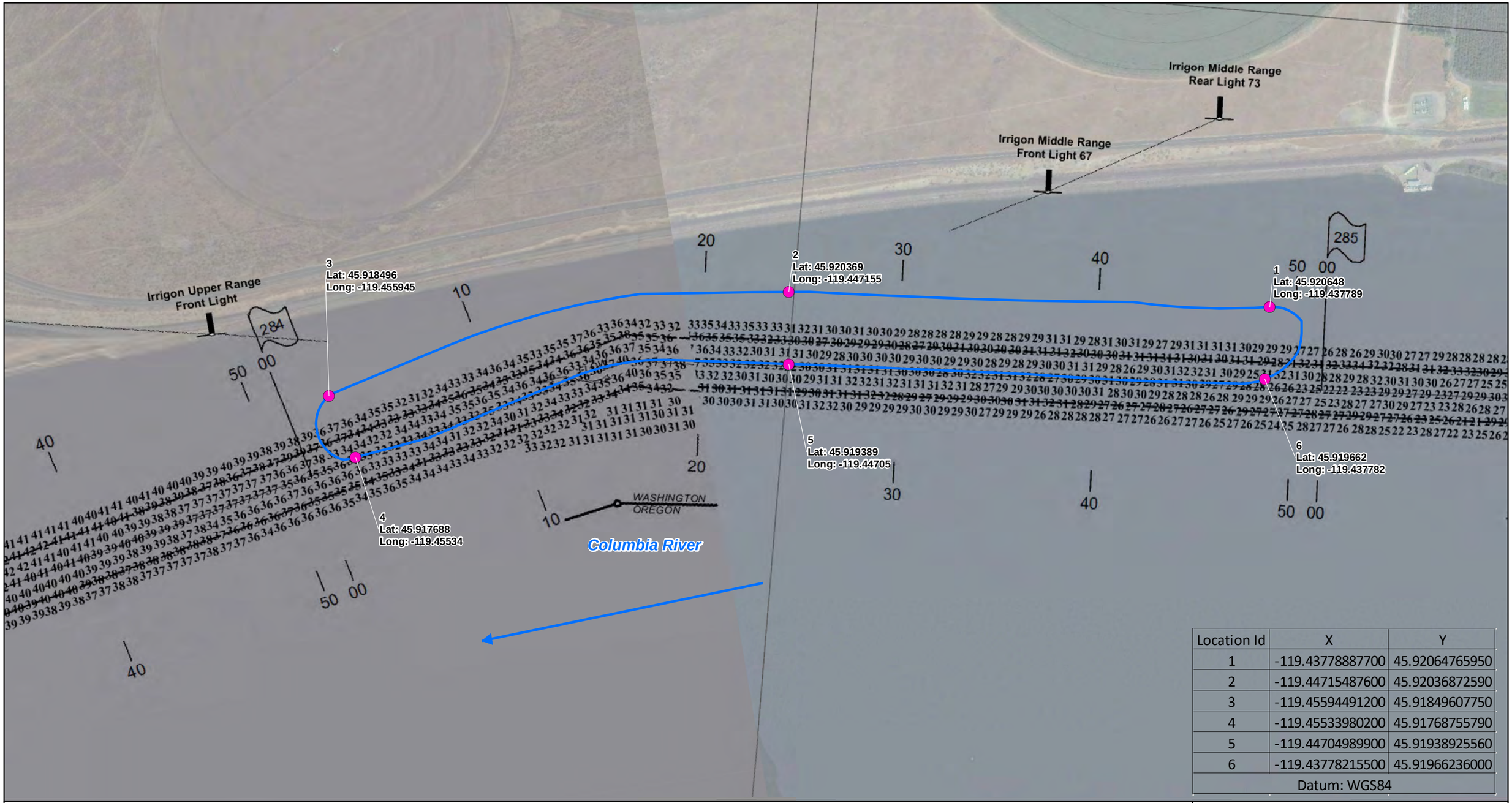
CHS SunBasin Growers,
901 East Columbia Drive,
Kennewick, Washington 99336

Geosyntec consultants

PNG0985-01	July 2023

Figure 1

P:\CAD_GIS\Projects\NCP2022-4311_Kennewick\MXDs\Figures0050323\Figure 2 Dredge Site Location.mxd 5/5/2023 10:52:43 AM



Location Id	X	Y
1	-119.43778887700	45.92064765950
2	-119.44715487600	45.92036872590
3	-119.45594491200	45.91849607750
4	-119.45533980200	45.91768755790
5	-119.44704989900	45.91938925560
6	-119.43778215500	45.91966236000
Datum: WGS84		

Legend

- Coordinate Location
- Authorized In-Water Disposal Location (~42 acres)
- Flow Direction

Notes:
Horizontal Coordinate System:
North American Datum of 1983 (NAD83), projected to the State Plane Coordinate System (SPCS), Oregon North Zone. Distance units in U.S. Survey Feet.
Vertical Datum:
Soundings and elevations are shown in feet and are referred to a datum plane which is 260.2 feet (Minimum Pool Elevation) above North American Vertical Datum of 1988 (NAVD 88).
River mileage conforms to the River Mile Index of the Hydrology and Hydraulics Committee, Pacific Northwest River Basins Commission, July 1972.

The information depicted on this map represents the results of a survey conducted on the date indicated and can only be considered to represent the general channel conditions existing at that time and is in support of channel maintenance only.
Target placement of dredged material is approximately 10 inches.
Two figures were from the 2017 USACE survey were georeferenced to create the background soundings image.
The coordinate system for the Coordinate Locations are in the WGS84 Datum.

N

0 500 1,000 2,000 Feet

Approximate Disposal Location
CHS SunBasin Growers,
901 East Columbia Drive,
Kennewick, Washington 99336

Geosyntec consultants

PNG0985-01 | July 2023

Figure 2

P:\CAD_GIS\Projects\NCP2022-4311_Kennewick\MXDs\Figures0050323\Figure 3 Approximate Disposal Location at River Miles 284 to 285.mxd 5/4/2023 8:54:25 AM

Legend

- CHS Site
- Selected and USACE Portland District Approved In-water Disposal Option
- Landfill Option #1
- Landfill Option #2
- McNary Lock and Dam

N

0 5 10 20 Miles

Locations of Alternative Disposal Sites

CHS SunBasin Growers,
901 East Columbia Drive,
Kennewick, Washington 99336

Geosyntec consultants

Figure 3

PNG0985-01 | July 2023

P:\CAD_GIS\Projects\NCP2022-4311_Kennewick\MXDs\Figures0050323\Figure 1 Disposal Sites.mxd 5/5/2023 10:50:18 AM

APPENDIX A
USFWS IPaC

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Washington Fish And Wildlife Office
510 Desmond Drive Se, Suite 102
Lacey, WA 98503-1263
Phone: (360) 753-9440 Fax: (360) 753-9405

In Reply Refer To:
Project Code: 2023-0018750
Project Name: Lake Wallula Dredge

November 23, 2022

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological

evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see https://www.fws.gov/birds/policies-and-regulations.php.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds.php.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/birds/policies-and-regulations/executive-orders/e0-13186.php.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Washington Fish And Wildlife Office
510 Desmond Drive Se, Suite 102
Lacey, WA 98503-1263
(360) 753-9440

Project Summary

Project Code: 2023-0018750
Project Name: Lake Wallula Dredge
Project Type: Disposal Dredge Material
Project Description: Maintenance dredging
Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@46.2136645,-119.10126168858108,14z

Counties: Benton County, Washington

Endangered Species Act Species

There is a total of 3 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Birds

NAME	STATUS
Yellow-billed Cuckoo *Coccyzus americanus* Population: Western U.S. DPS There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3911	Threatened

Fishes

NAME	STATUS
Bull Trout *Salvelinus confluentus* Population: U.S.A., conterminous, lower 48 states There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8212	Threatened

Insects

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

IPaC User Contact Information

Agency: Geosyntec
Name: Laura Springer
Address: 8217 Shoal Creek Blvd Ste 200
City: Austin
State: TX
Zip: 78757
Email laura.springer@geosyntec.com
Phone: 5129446532