FINDING OF NO SIGNIFICANT IMPACT

ST. HILAIRE FARMS COLUMBIA RIVER PUMP STATION MODIFICATIONS AND DREDGING

REAL ESTATE LEASE AMENDMENT AND NEW TEMPORARY CONSTRUCTION LICENSE

MCNARY LOCK AND DAM

UMATILLA COUNTY, OREGON

DECEMBER 2025

The U.S. Army Corps of Engineers, Walla Walla District, Real Estate Division (USACE) proposes to amend the lease DACW68-2-00-05 between St. Hilaire Brothers Hermiston Farm, LLC (St. Hilaire or JSH Farms) and the East Improvement District, collectively referred to as the "St. Hilaire-East Improvement District (EID)." The amendment would authorize structural modifications to the pump station deck and related infrastructure by issuing a short-term construction license. These modifications pertain to the existing irrigation pump station located at River Mile 301.7 on the Columbia River in Umatilla County, Oregon, which is owned and operated by St. Hilaire-EID.

In 2018, USACE completed an Environmental Assessment (EA) evaluating the environmental effects of expanding the St. Hilaire pump station and constructing a new adjacent pumping station, now operated by the EID. Following the completion of the EA, a Finding of No Significant Impact (FONSI) was issued, and necessary permits and real estate authorizations were granted. Elements of the project were delayed due to logistical and financial constraints, and the permits expired in March 2023. Since then, project requirements have evolved to address sediment accumulation and revised infrastructure needs. The new structural components are summarized as follows:

Expansion of St. Hilaire Pump Station:

- Lift and expand the existing pump deck. The expanded structure would add approximately 751 square feet over water, above the ordinary high-water mark (OHWM), including 544 square feet of concrete decking and 207 square feet of steel grating.

New Structural Components:

- 15 new H-pilings would be installed to support the upgraded structure, ten located below the OHWM and five in the upland area.

Dredging:

- Approximately 360 cubic yards of sediment would be removed from the riverbed in front of the pump station using a barge-mounted suction dredge. The dredged sediment would be discharged underwater within the Columbia River's flow lane, approximately 700 feet northeast of the pump station which would follow the original river channel.

The purpose of the proposed action is to improve the operational performance, structural stability, and maintainability of the existing St. Hilaire-EID Pumping Station and Intake. The proposed action is needed to consolidate Columbia River water rights to a centralized point of diversion for irrigation use, reducing reliance on declining groundwater resources, and to ensure a more sustainable and dependable water supply for agricultural operations in the Lower Umatilla Basin. Collectively, the existing St. Hilaire and EID pumping stations supply irrigation water to approximately 51,200 acres of farmland throughout Umatilla County.

Two alternatives were carried forward for detailed consideration and environmental analysis. This limited range of alternatives was appropriate as the proposed action is applicant-funded and implemented, and USACE's role as landowner is restricted to determining whether to grant the required approvals. Based on the purpose and need (P&N) of the proposed action the only action alternative that satisfied the P&N was Alternative 2 and it was, therefore, the only action alternative carried forward for detailed evaluation. The "No action" alternative was also carried forward, even though it did not satisfy the stated P&N, which was used to provide a baseline for comparing other alternatives, as required by the National Environmental Policy Act (NEPA). The two alternatives are:

- Alternative 1: No Action Alternative
  Under this alternative, USACE would not amend the existing lease. The existing pump station would remain in its current condition, limiting access for maintenance, risking long-term reliability, and reducing operational efficiency due to sediment accumulation.

- Alternative 2: St. Hilaire-EID Lease Amendment for Pump Station Modifications (Proposed Action)
  Under this alternative, USACE would amend the existing lease, issue a temporary construction license, and new regulatory permits for modifications to the existing St. Hilaire pump station. The modifications would include expanding and elevating the pump deck, installing additional H-piles for support, and removing accumulated sediment from the intake area.

The EA analyzed the effects of both alternatives on relevant resource areas including Aesthetics/Visual Resources, Water Quality, Terrestrial Resources (Including Threatened and Endangered Species), Fish and Aquatic Resources (Including Threatened and Endangered Species), Historic Resources, and Noise. USACE considered, but did not identify any potential effects to Air Quality, Geology and Soils, Hazardous/Toxic Materials, Land Use, and Recreation.

For both alternatives, the potential impacts were evaluated, as appropriate. A summary assessment of the potential impacts of the recommended plan are listed in Table 1 below.

Table 1. Summary of Impacts of the Preferred Alternative.

Resource	Less than significant effects	Insignificant effects as a result of mitigation	Resource unaffected by action
Aesthetics/Visual Resources	X	-	-
Water Quality	X	-	-
Terrestrial Resources	X	-	-
Fish and Aquatic Resources	X	-	-
Socioeconomics	X	-	-
Historic Resources	X	-	-
Noise	X	-	-

All practical means to avoid or minimize adverse environmental effects were analyzed and incorporated into the proposed action, and no compensatory mitigation was identified as appropriate. See Table 3-1 in the EA for a list of environmental resources not evaluated in detail and the associated explanation.

Pursuant to Section 7 of the Endangered Species Act (ESA) of 1973, as amended, the U.S. Fish and Wildlife Service issued a Biological Opinion (BiOp), dated September 13, 2023 (Attachment 1), and the National Marine Fisheries Service issued a BiOp dated October 9, 2024 (Attachment 2). The BiOps determined the recommended plan will not jeopardize the continued existence of the following federally listed species or adversely modify designated critical habitat: Bull trout (*Salvelinus confluentus*) and ESA-listed anadromous salmonids potentially present. All terms and conditions, conservation measures, and reasonable and prudent alternatives and measures resulting from these consultations shall be implemented in order to minimize take of endangered species and avoid jeopardizing the species.

Pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, USACE analyzed the potential effects of the alternatives on cultural resources within the proposed action area in the EA and prepared a Cultural Resources Review, which was sent to the Oregon State Historic Preservation Officer (SHPO) and to the treaty tribes associated with the 1855 Walla Walla Treaty for their review and comment. The tribal governments consulted included the Confederated Tribes of the Umatilla Indian Reservation, Confederated Colville Tribes, Nez Perce Tribe, and the Confederated Tribes and Bands of the Yakama Nation on September 2, 2025, for a 30-day review. During this period, no response was received from SHPO or the tribes. USACE determined that the proposed action will result in no adverse effects to historic properties.

Pursuant to the Clean Water Act (CWA) of 1972, as amended, the discharge of dredged or fill material associated with the recommended plan has been found to be compliant with the CWA Section 404(b)(1) Guidelines (40 CFR 230). The proposed action would involve the placement of approximately 360 cubic yards of dredged material below the OHWM in the Columbia River. As a result, the USACE Portland District Regulatory Branch would issue a new individual permit to St. Hilaire–EID under Section 404 of the CWA.

The applicant would comply with the applicable Section 402 Construction General Permit for these site-specific actions. Additionally, because permits under CWA Sections 402 or 404 are necessary, CWA Section 401 water quality certification is also required to ensure that any discharge meets applicable water quality standards. In this case, the Oregon Department of Environmental Quality would provide the CWA Section 401 certification to St. Hilaire–EID. The applicant must incorporate the conditions of the Section 401 certification as appropriate.

In compliance with NEPA, the draft FONSI, EA, and all supporting appendices were made available for a 30-day public review and comment period from October 3, 2025, through November 2, 2025. No comments were received.

Having reviewed the St. Hilaire Farms Columbia River Pump Station Modifications and Dredging EA for the proposed lease amendment and sediment removal associated with the St. Hilaire-EID Pump Station, I find that the document provides adequate analysis of the purpose and need, alternatives, environmental effects, and compliance with applicable laws and regulations. The EA incorporates best scientific information and public input and demonstrates that the proposed action would not have a significant effect on the human environment. Therefore, an Environmental Impact Statement is not required. USACE will proceed with Alternative 2—issuing a Lease Amendment to St. Hilaire-EID for Pump Station Modifications, along with a temporary construction license and new regulatory permits, which is the preferred alternative, at the earliest opportunity.

Dec 8, 2025
Date

box SIGN 4ZRQKQKV-15L77PX7
KATHRYN A. WERBACK
Lieutenant Colonel, EN
Commanding

Attachment 1: U.S. Fish and Wildlife Service Biological Opinion dated September 13, 2023
Attachment 2: National Marine Fisheries Service Biological Opinion dated October 9, 2024

ATTACHMENT 1:
U.S. Fish and Wildlife Service Biological Opinion dated September 13, 2023

Endangered Species Act - Section 7 Consultation
Biological Opinion
for
St. Hilaire Brothers and East Improvement District: Columbia River Pumping Station and Intake Modification Project
Umatilla County, OR

U.S. Fish and Wildlife Service Reference:
Ecosphere Project Species Consultation Code: 2023-0128781
TS #: 23-342
File Number: 2023-F-0023

Federal Action Agency:
The Army Corps of Engineers' (Corps)

Consultation Conducted By:
U.S. Fish and Wildlife Service
La Grande Field Office
La Grande, OR

Marisa Meyer, Field Supervisor Date

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INTRODUCTION

This document represents the U. S. Fish and Wildlife Service's (Service) Biological Opinion based on our review of the proposed St. Hilaire Brothers and East Improvement District: Columbia River Pumping Station and Intake Modification Project in Umatilla County, OR, and its effects on bull trout (*Salvelinus confluentus*) and bull trout critical habitat in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). We received your July 24, 2023, request for formal consultation on the same date. A revised memo style BA was received on August 11, 2023.

This Biological Opinion (Opinion) is based on information provided in your Memo/Amendment to the original 2018 Biological Assessment (BA) for the proposed project, discussions with Corps staff, and other information. A complete record of this consultation is on file at this office.

Consultation History

This Opinion is based on correspondence and discussions with the Corps, consultant for the applicant, and the Service. A brief history of the consultation is included below:

- March 7, 2018 – The Service formally consulted on the original project for the St. Hilaire Brothers and East Improvement District: Columbia River Pumping Station and Intake Project and issued a final Opinion.
- July 24, 2023 – The Service received from the Corps a request to reinitiate formal consultation for a modification to the original project, this request included a memo that serves as an amendment to the original BA with engineer drawings.
- August 2, 2023 – The Service sent the Corps with a cc to NMFS, a request for a complete updated BA for the proposed project, as the information provided (memo and drawings) was incomplete for competing formal consultation for bull trout and bull trout critical habitat.
- August 9, 2023 – The Service conducted a phone call meeting with Eric Campbell, consultant for the proposed Project to discuss the proposed project and ESA consultation needs for bull trout.
- August 10, 2023 – The Service sent the Corps a list of information needed to complete consultation on the project.
- August 14, 2023 – The Corps sent the Service a reply email with information on the proposed action and affects for bull trout as well as consultation documents for the previous project.
- August 23, 2023 – The Service sent an email to Eric Campbell, consultant for the Project with a cc to the Corps asking for clarification on conservation measures to be included in the Opinion for the proposed project.
- August 23, 2023 – Eric Campbell, consultant for the Project sent the Service an email clarifying that the new intake screens and associated conservation measures were a part of the previous project and not the proposed project.
- August 23, 2023 – The Service initiated formal consultation on the proposed action.

BIOLOGICAL OPINION

1.0 DESCRIPTION OF THE PROPOSED ACTION

1.1 Project Overview

The project is to expand the existing St. Hilaire Brothers irrigation pumping station, and to construct a new East Improvement District (EID) irrigation pumping station and associated intake in the Columbia River.

The project would result in the placement of 1,028 cubic yards of material into 0.095 acre of the Columbia River and excavation of 398 cubic yards of material from approximately 0.029 acre of the Columbia River where excavated material would be side cast within the existing easement. The expansion of the St. Hilaire Brothers pumping station would include the installation of three new pumps and a new 42-inch diameter discharge pipe. Additional information is provided in Table 1.

The new pumps would be housed in 42-inch diameter cans connected to the existing 60-inch diameter intake pipe via three 26-inch diameter steel pipes. The new section of 42-inch discharge pipe would then be connected to the pump can via a manifold. The new discharge pipe would extend south toward the shoreline and would be supported above the water on two pipe cradles, each secured to the riverbed by a pair of 12.75-inch diameter steel piles. At each new pump can location, a 60-inch diameter by 7.5-foot-long section of sleeve pipe would be positioned vertically and driven a foot into the riverbed using a vibratory hammer. The sleeve pipe would protect the pump cans from debris and sediment. The riverbed material inside of these sleeve pipes would be suctioned out, approximately 16 cubic yards, and side cast back into the river. The 42-inch diameter discharge pipe would be trenched underground through upland as it leaves the project site and would eventually tie into an existing irrigation pipe approximately 0.5 mile to the south.

The existing station deck would be expanded approximately 15-feet to the east to accommodate the additional pumps. The expanded portion of the station deck would be constructed using metal grates placed over a steel frame and would be supported over the water by 16 new 10-foot by 49-foot steel H-piles. The H-piles would be installed via a vibratory hammer.

The new pumping station would include a new station deck, ten new pumps, a new intake pipe, four new intake screens, and a new discharge pipe. The new pumping station and intake would extend approximately 350-feet from the shoreline of the Columbia River. Each of the four new intake screens would measure 5-feet in diameter by approximately 19-feet in length and affixed with a fish screen. The new intake screens would be mounted on a 78-inch diameter by 70-foot-long steel manifold. The manifold would be supported on five cradles, each secured to the riverbed by a pair of 12.75-inch diameter steel piles. The manifold would transition to an 84-inch diameter by 170-foot-long section of intake pipe that would be supported by another four cradles, each secured by a pair of steel piles. The intake pipe would continue another 38 feet to a second manifold. The manifold would be supported on an additional five cradles, secured between pairs of 10-foot by 54-foot steel H-piles. The manifold would connect the intakes to the ten pump cans, 5 on each side of the manifold, via 30-inch diameter pipes. Each can would be

42-inches in diameter and 21 feet tall. The top of the cans would extend approximately 2 feet above the normal pool elevation.

The area around the second manifold and pump cans would be enclosed on three sides by a sheet pile wall. Approximately 384 cubic yards of bed material would be excavated from inside the sheet pile wall to accommodate the depth of the pump cans. The excavated bed material would be side cast back into the river. Twenty-four (24) 12-foot by 96-foot steel H-piles would be installed inside the sheet pile wall to support a 66-inch diameter by 48- foot-long steel discharge manifold on a lower deck, and the pumps on a second, higher deck. Both decks would be constructed using metal grates placed over a steel frame to allow sunlight penetration. Between the back of the sheet pile wall and the shore thirty (30) 12-foot by 96-foot steel H-piles would be installed to support a 78-inch diameter discharge pipe and a 2,560 square foot concrete deck, of which approximately 1,990 square feet (0.046 acre) would be over water. The 78-inch diameter discharge pipe would be trenched underground through upland as it leaves the project site, and would pass under Highway 730 through a casing, and then proceed south for approximately 9 miles.

Constructed Authorized Activities and Proposed Project Modification: The new East Improvement District (EID) irrigation pumping station and associated intake has been constructed as proposed. The proposed expansion of the St. Hilaire Brothers' existing pumping station was delayed due to funding, supply chain issues, and contractor availability.

Portions of the design have been modified to better incorporate the adjacent EID pumping station infrastructure and to manage recent sediment accumulation. The applicant is requesting to extend the existing Corps permit expiration for five (5) years to complete the remaining project components, including the following proposed design revisions:

- Lift the pump deck approximately 5 feet and expand the structure to approximately 75 feet by 50 feet (3,750 square feet). Approximately 751 square feet (including 544 square feet of concrete decking and 207 square feet of steel grating) would be located overwater. The concrete would be poured over the steel decking and framing.
- Install 10 additional H-pilings to support the expanded pump deck that would be installed using a vibratory hammer.
- Temporary removal of an additional 360 cubic yards of accumulated sediment from below OHW, immediately in front of the existing pump station, to allow for installation of the pump cans and connection to the manifold. The sediment would be removed using a suction dredge operating from a barge. Dredged material would be disposed in the flow lane of the Columbia River, at an in-water dispersive site located approximately 275 feet north of the pump station. A floating pipeline would be used to transport dredged materials to the disposal location.

Table 1. This table reflects the proposed modifications (proposed action) compared to what is currently authorized (previous consultation).

Project Impacts	Fill		Removal	
	Area (acres)	Volume (cubic yards)	Area (acres)	Volume (cubic yards)
Authorized	0.095	1,028	0.029	398
Additional Impacts Proposed	0.041	365 (disposal of dredged material and 10 additional H-piling)	0.041	360 (dredged material)
New Total	0.136	1,393	0.070	758

1.2 Conservation Measures

The Corps proposes the following conservation measures as part of the proposed action:

1. All work conducted below the OHWM of the Columbia River will occur between December 1 and February 28 of the ODFW–preferred in-water work window for the Middle Columbia River (December 1 – March 31).
2. All heavy equipment (i.e., crane and excavator) will access the project site via existing roadways, parking areas, disturbed upland areas, and/or floating barges.
3. All steel piles will be installed with a vibratory hammer, therefore reducing potential hydroacoustic impacts to fish. No impact hammer pile driving will be required.
4. The contractor will initiate daily "soft start" procedures to provide a warning and/or give animals near piling installation and removal activities a chance to leave the area prior to a vibratory hammer operating at full capacity; thereby, exposing fewer animals to loud underwater and airborne sounds.
5. The contractor will initiate noise from vibratory hammers for 15 seconds at reduced energy followed by a 30-second waiting period. The procedure shall be repeated two additional times.
6. All excavated/dredged materials will be suitable and approved for in- water disposal based on the Sediment Evaluation Framework.
7. A Pollution Control Plan (PCP) will be prepared by the Contractor and carried out commensurate with the scope of the project that includes the following:
    a. BMPs to confine, remove, and dispose of construction waste.
    b. Procedures to contain and control a spill of any hazardous material.
    c. Steps to cease work under high flow conditions.
8. All conditions of ODEQ's 401 Water Quality Certification will be followed.
9. Only enough supplies and equipment to complete the project will be stored on site.
10. All equipment will be inspected daily for fluid leaks, any leaks detected will be repaired before operation is resumed.
11. Before operations begin, and as often as necessary during operation, all equipment that will be used below the OHWM will be steam cleaned until all visible oil, grease, mud, and other visible contaminates are removed consistent with the Haz Mat plan.

12. Stationary power equipment operated within 150 feet of the Columbia River will be diapered to prevent leaks.
13. Approximately 207 square feet (28 percent) of the proposed St. Hilaire Brothers (SHB replacement pump deck will be grated to allow for 60 percent light penetration.

1.3 Action Area

The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02). In delineating the action area, we evaluated the farthest reaching physical, chemical, and biotic effects of the action on the environment.

For the purposes of this consultation, the action area is defined as an area 300 feet around and 500 feet downstream and upstream of the proposed in-water activities, an expansion to add some pump deck and pilings and remove additional sediment, The project site is located at river mile 301.7 on the Columbia River, near Hermiston, Oregon in Umatilla County. This action area will encompass any temporary, short-term, or long-term effects of the proposed action to bull trout and bull trout critical habitat.

2.0 ANALYTICAL FRAMEWORK FOR THE JEOPARDY AND DESTRUCTION OR ADVERSE MODIFICATION DETERMINATIONS

2.1 Jeopardy

In accordance with our regulations (see 50 CFR 402.02, 402.14(g)), the jeopardy determination in this Biological Opinion relies on the following four components:

1. *The Status of the Species* evaluates the species' current range-wide condition relative to its reproduction, numbers, and distribution; the factors responsible for that condition; its survival and recovery needs; and explains if the species' current range-wide population retains sufficient abundance, distribution, and diversity to persist and retains the potential for recovery (see Endangered Species Consultation Handbook, March 1998, pp. 4-19 to 4-22).

2. *The Environmental Baseline* section of this biological opinion evaluates the past and current condition of the species in the action area relative to its reproduction, numbers, and distribution absent the effects of the proposed action; including the anticipated condition of the species contemporaneous to the term of the proposed action; the factors responsible for that condition; and the relationship of the action area to the survival and recovery of the species.

3. *The Effects of the Action* section of this biological opinion evaluates all consequences to the species that are reasonably certain to be caused by the proposed action (i.e., the consequences would not occur but for the proposed action and are reasonably certain to occur) and how those consequences are likely to influence the survival and recovery of the species.

4. *The Cumulative Effects* section of this biological opinion evaluates the effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation, on the species and its habitat, and how those effects are likely to influence the survival and recovery of the species.

In accordance with policy and regulation, the jeopardy determination is made by formulating the Service's opinion as to whether the proposed Federal action, including its consequences, taken together with the status of the species, environmental baseline, and cumulative effects, reasonably would be expected to reduce appreciably the likelihood of both the survival and recovery of the species in the wild by reducing the reproduction, numbers, or distribution of that species.

NOTE: If recovery units were defined in the final published recovery plan for the species for use in completing jeopardy analyses, pursuant to Service policy (Section 7 Handbook, USFWS 1998, p. 4-36) when an action appreciably impairs or precludes the capability of such a recovery unit of providing both the ongoing survival and recovery function assigned to it, that action may represent jeopardy to the species. Thus, if recovery units were defined in the final published recovery plan for the species for use in completing the jeopardy analysis, the Biological Opinion will include a description of how the action affects not only the recovery unit's capability, but also the relationship of the recovery unit to both the survival and recovery of the listed species as well.

2.2 Destruction or Adverse Modification

A final rule revising the regulatory definition of "destruction or adverse modification" (DAM) of critical habitat was published on August 27, 2019 (84 FR 44976). The final rule became effective on October 28, 2019. The revised definition states:

"Destruction or adverse modification means a direct or indirect alteration that appreciably diminishes the value of critical habitat as a whole for the conservation of a listed species."

In accordance with regulations and regional implementing guidance, the destruction or adverse modification (DAM) determination in this Biological Opinion relies on the following four components:

1. The *Status of Critical Habitat* section evaluates the range-wide condition of the critical habitat (CH) in terms of essential habitat features, primary constituent elements, or physical and biological features that provide for the conservation of the listed species; the factors responsible for that condition; and the intended value of the CH for the conservation of the listed species (see Endangered Species Consultation Handbook, March 1998, pp. 4-19 to 4-22).

2. The *Environmental Baseline* section of this biological opinion evaluates the past and current condition of the CH in the action area absent the effects of the proposed action; including the anticipated condition of the species and its CH contemporaneous to the

term of the proposed action; the factors responsible for that condition; and the conservation value of CH in the action area for the conservation of the listed species.

3. The *Effects of the Action* section of this biological opinion evaluates all consequences to CH that are reasonably certain to be caused by the proposed action (i.e., the consequences would not occur but for the proposed action and are reasonably certain to occur) and how those consequences are likely to influence the conservation value of the affected CH for the species in the action area.

4. *Cumulative Effects* section of this biological opinion evaluates the effects to CH of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation, and how those effects are likely to influence the conservation value of the affected CH for the species in the action area.

In accordance with regulation, the DAM determination is made by formulating the Service's opinion as to whether the effects of the proposed Federal action, taken together with the status of the critical habitat, environmental baseline, and cumulative effects, reasonably would be expected to result in a direct or indirect alteration that appreciably diminishes the value of CH for the conservation of the species.

For purposes of making the DAM determination, the Service evaluates if the consequences of the proposed Federal action on critical habitat, taken together with cumulative effects, when added to the current range-wide condition of critical habitat, are likely to impair or preclude the capacity of critical habitat as a whole to serve its intended function for the conservation of the listed species. The key to making this finding is clearly establishing the role of critical habitat in the action area relative to the value of critical habitat as a whole, and how the effects of the proposed action, taken together with cumulative effects, are likely to alter that role.

Past designations of critical habitat have used the terms "primary constituent elements" (PCEs), "physical or biological features" (PBFs) or "essential features" to characterize the key components of critical habitat that provide for the conservation of the listed species. The new critical habitat regulations discontinue use of the terms "PCEs" or "essential features," and rely exclusively on use of the term "PBFs" for that purpose because that term is contained in the statute. However, the shift in terminology does not change the approach used in conducting a "destruction or adverse modification" analysis, which is the same regardless of whether the original designation identified PCEs, PBFs or essential features. For those reasons, in this Biological Opinion, references to PCEs or essential features should be viewed as synonymous with PBFs. All of these terms characterize the key components of critical habitat that provide for the conservation of the listed species.

3.0 STATUS OF THE SPECIES/CRITICAL HABITAT

3.1 Status of the Species

The bull trout was listed as a threatened species in the coterminous United States in 1999 (64 FR 58910-58933). Throughout its range, bull trout are threatened by the combined effects of habitat degradation, fragmentation, and alterations associated with dewatering, road construction and maintenance, mining, grazing, the blockage of migratory corridors by dams or other diversion

structures, poor water quality, incidental angler harvest, entrainment, and introduced non-native species. Since the listing of bull trout, there has been very little change in the general distribution of bull trout in the coterminous United States, and we are not aware that any known, occupied bull trout core areas have been extirpated (U.S. Fish and Wildlife Service 2015, p. 7).

The 2015 recovery plan for bull trout identifies six recovery units within the listed range of the species (U.S. Fish and Wildlife Service 2015, p. 36). Each of the recovery units are further organized into multiple bull trout core areas, which are mapped as non-overlapping watershed-based polygons, and each core area includes one or more local populations. Within the coterminous United States we currently recognize 109 occupied core areas, which comprise 600 or more local populations of bull trout (U.S. Fish and Wildlife Service 2015, p. 34). Core areas are functionally similar to bull trout metapopulations, in that bull trout within a core area are much more likely to interact, both spatially and temporally, than are bull trout from separate core areas. Bull trout core areas are depicted in Appendix B, Figure 1.

The Service has also identified a number of marine or mainstem riverine habitat areas outside of bull trout core areas that provide foraging, migration, and overwintering (FMO) habitat that may be shared by bull trout originating from multiple core areas. These shared FMO areas support the viability of bull trout populations by contributing to successful overwintering survival and dispersal among core areas (U.S. Fish and Wildlife Service 2015, p. 27).
For a detailed account of the status of the species, refer to Appendix A (Status of the Species – Bull Trout).

3.2 Status of Critical Habitat
Past designations of critical habitat have used the terms "primary constituent elements" (PCEs), “physical and biological features” (PBFs) or "essential features" to characterize the key components of critical habitat that provide for the conservation of the listed species. In 2016, revised critical habitat regulations (81 FR 7214; February 11, 2016) discontinued use of the terms “PCEs” or “essential features” to rely exclusively on use of the term PBFs for that purpose because that term is contained in the statute. In 2019, a regulatory definition for PBFs was added at 50 CFR 424.02 (84 FR 45020 17518; August 27, 2019). To be consistent with that shift in terminology and in recognition that the terms PBFs, PCEs, and essential habit features are synonymous in meaning, we are only referring to PBFs herein. Therefore, if a past critical habitat designation defined essential habitat features or PCEs, they will be referred to as PBFs in this document. This does not change the approach outlined above for conducting the ‘‘destruction or adverse modification’’ analysis, which is the same regardless of whether the original designation identified PCEs, PBFs or essential features.

<u>Bull Trout Critical Habitat</u>
On October 18, 2010, the Service issued a final revised critical habitat designation for the bull trout (75 FR 63898; U.S. Fish and Wildlife Service 2010). The critical habitat designation includes 32 critical habitat units in six recovery units located throughout the coterminous range of the bull trout in Washington, Oregon, Idaho, Montana, and Nevada. Designated bull trout critical habitat is of two primary use types: 1) spawning and rearing, and 2) FMO habitat. The conservation role of bull trout critical habitat is to support viable core area populations (75 FR

63943). Critical habitat units generally encompass one or more core areas and may include FMO areas, outside of core areas, that are important to the survival and recovery of bull trout.

The final rule excludes some critical habitat segments. Critical habitat does not include 1) waters adjacent to non-federal lands covered by legally operative incidental take permits for Habitat Conservation Plans (HCPs) issued under the Act, in which bull trout is a covered species on or before the publication of this final rule; 2) waters within or adjacent to Tribal lands subject to certain commitments to conserve bull trout or a conservation program that provides aquatic resource protection and restoration through collaborative efforts, and where the Tribes indicated that inclusion would impair their relationship with the Service; or, 3) waters where impacts to national security have been identified (75 FR 63898).

Bull trout have more specific habitat requirements than most other salmonids (75 FR 63898). The predominant habitat components influencing their distribution and abundance include water temperature, cover, channel form and stability, spawning and rearing substrate conditions, and migratory corridors. The Primary Constituent Elements (PCEs) of bull trout critical habitat, as revised in 2010 (75 FR 63929) are:

1. Springs, seeps, groundwater sources, and subsurface water connectivity (hyporheic flows) to contribute to water quality and quantity and provide thermal refugia.
2. Migration habitats with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and freshwater and marine foraging habitats, including but not limited to permanent, partial, intermittent, or seasonal barriers.
3. An abundant food base, including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.
4. Complex river, stream, lake, reservoir, and marine shoreline aquatic environments, and processes that establish and maintain these aquatic environments, with features such as large wood, side channels, pools, undercut banks and unembedded substrates, to provide a variety of depths, gradients, velocities, and structure.
5. Water temperatures ranging from 2 to 15° C (36 to 59° F), with adequate thermal refugia available for temperatures that exceed the upper end of this range. Specific temperatures within this range will depend on bull trout life-history stage and form; geography; elevation; diurnal and seasonal variation; shading, such as that provided by riparian habitat; streamflow; and local groundwater influence.
6. In spawning and rearing areas, substrate of sufficient amount, size, and composition to ensure success of egg and embryo overwinter survival, fry emergence, and young-of-the-year and juvenile survival. A minimal amount of fine sediment, generally ranging in size from silt to coarse sand, embedded in larger substrates, is characteristic of these conditions. The size and amounts of fine sediment suitable to bull trout will likely vary from system to system.
7. A natural hydrograph, including peak, high, low, and base flows within historic and seasonal ranges or, if flows are controlled, minimal flow departure from a natural hydrograph.
8. Sufficient water quality and quantity such that normal reproduction, growth, and survival are not inhibited.

9. Sufficiently low levels of occurrence of non-native predatory (e.g., lake trout (*Salvelinus namaycush*), walleye (*Sander vitreus*), northern pike (*Esox lucius*), smallmouth bass (*Micropterus dolomieu*)); interbreeding (e.g., brook trout (*Salvelinus fontinalis*); or competing (e.g., brown trout (*Salmo trutta*)) species that, if present, are adequately temporally and spatially isolated from bull trout.

For a detailed account of the status of critical habitat for the species, refer to Appendix B (Status of Critical Habitat – Bull Trout).

4.0 ENVIRONMENTAL BASELINE

Regulations implementing the Act (50 CFR 402.02) define the environmental baseline as the condition of the listed species or its designated critical habitat in the action area, without the consequences to the listed species or designated critical habitat caused by the proposed action. The environmental baseline includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process. The consequences to listed species or designated critical habitat from ongoing agency activities or existing agency facilities that are not within the agency's discretion to modify are part of the environmental baseline.

4.1 Current Condition of the Species and Critical Habitat in the Action Area

The number of bull trout that may be present in or near the action area during the timing of the proposed action is difficult to determine based on available data. The low abundance of bull trout in the Columbia River makes the detection of bull trout very difficult. Bull trout are known to use the Columbia River as over-wintering area but prefer to over winter in tributaries to the Columbia River. Bull trout in the various tributary river basins along the Columbia River are primarily fluvial migrants that overwinter in the middle or lower mainstem sections of river basins (BioAnalysts, Inc. 2002, Nelson 2004, Starcevich et al. 2012). The closest known local bull trout population to the action area occurs in the North Fork Umatilla River (FWS 2010). The mouth of the Umatilla River is located approximately 10 miles downstream of the action area below McNary Dam. Bull trout population and redd counts have been variable and show a declining trend in this river basin since the mid 1990's to the present (ODFW 2005, FWS 2010).

Additional known bull trout populations occur approximately 20 miles upstream on the Columbia River in the Walla Walla River basin where the most recent population data for the South Fork Walla Walla River indicates bull trout population trends appears stable, however, there is some indication that large migratory individuals may be in decline (e.g., mark recapture trend analysis; redd counts) and there is high variability in survival for this size group. However, given the declining trend in large adults, the long-term stability of the population structure is uncertain and may not reflect the historical population structure and evolutionary history of bull trout (Schaller et al. 2014).

Both subadult and adult bull trout use the lower Walla Walla River during the fall, winter, and spring for rearing and overwintering. Recently, use of the mainstem Columbia River by migratory adults and subadults has also been documented (Anglin et al. 2009a, 2009b, 2010,

2010a cited in Barrows et al. 2012). A significant gap in our knowledge of migratory bull trout life history is associated with use of the mainstem Columbia and Snake rivers. The numbers of bull trout using the mainstem are few when compared to anadromous salmonids. Nearly all of the wild and hatchery-produced salmon and steelhead smolts eventually migrate downstream, through the system to the ocean. A much smaller proportion (i.e., migratory) of the total population of bull trout produced in the Walla Walla Basin actually migrates into the mainstem. Nonetheless, the migratory bull trout that use the mainstem corridors are essential for maintaining gene flow between core area metapopulations and for recolonizing areas where local populations have been extirpated by stochastic events (Barrows et al. 2012).

Movement of bull trout population in both river basins is hindered by poor water quality and instream diversions and dams (ODFW 2005). Given this information, the Service anticipates adult and subadult bull trout may occur in the action area during Project activities. There is no bull trout spawning habitat in the action area, therefore, no bull trout eggs, alevin, fry or juveniles are expected in the action area.

The action area is located within the bull trout mid-Columbia Recovery unit within the Umatilla River critical habitat unit. The Columbia River within this critical habitat unit is important foraging, migration, and over wintering habitat for subadult and adult bull trout (PBF 2). The habitat conditions at the action area do not appear to support preferable habitat conditions for bull trout due to lack of in/over water structures, sandy substrates, and operational disturbance activities at the pumping stations. The shoreline at the project site consists of a steep, sparsely vegetated rip-rap streambank that provides little aquatic habitat complexity. The general topography within the area ranges from relatively level uplands to steep sloping streambanks along the river.

The project site is located along the southern shoreline of the Lake Wallula reservoir on the middle Columbia River, approximately 9.5 miles upstream of McNary Dam. The McNary Dam has created reservoir conditions in the action area, with daily fluctuations in water level. The general topography within the vicinity of the project site ranges from relatively level uplands to steep sloping banks along the river. Specifically at the Project site, there are several separate pump station facilities adjacent to the existing irrigation pump station expansion along the Columbia River shoreline. The shoreline, shallow water habitat, and natural vegetation is altered with in-water structures, rock, and riprap. Much of the project site is comprised of the existing pump station facilities, including the elevated pumps, concrete access pads, control buildings, and a gravel access road.

4.2 Conservation Role of the Action Area

The conservation role of bull trout critical habitat is to support viable core area populations (75 FR 63898:63943 [October 18, 2010]). The core areas reflect the metapopulation structure of bull trout and are the closest approximation of a biologically functioning unit for the purposes of recovery planning and risk analyses. Critical Habitat Units (CHUs) generally encompass one or more core areas and may include FMO areas, outside of core areas, that are important to the survival and recovery of bull trout.

Thirty-two CHUs within the geographical area occupied by the species at the time of listing are designated under the final critical habitat rule. Twenty-nine of the CHUs contain all of the physical or biological features identified in this final rule and support multiple life-history requirements. Three of the mainstem river units in the Columbia and Snake River basins contain most of the physical or biological features necessary to support the bull trout's particular use of that habitat, other than those physical biological features associated with Primary Constituent Elements (PCEs) 5 and 6, which relate to breeding habitat.

The primary function of individual CHUs is to maintain and support core areas, which 1) contain bull trout populations with the demographic characteristics needed to ensure their persistence and contain the habitat needed to sustain those characteristics (Rieman and McIntyre 1993, p. 19); 2) provide for the persistence of strong local populations, in part, by providing habitat conditions that encourage movement of migratory fish (The Montana Bull Trout Scientific Group 1998, p. 48-49; Rieman and McIntyre 1993, p. 22-23) are large enough to incorporate genetic and phenotypic diversity, but small enough to ensure connectivity between populations (Hard 1995, p. 314-315; Healey and Prince, p. 182; The Montana Bull Trout Scientific Group 1998, p. 48-49; Rieman and McIntyre 1993, p. 22-23); and 4) are distributed throughout the historic range of the species to preserve both genetic and phenotypic adaptations (Hard 1995, pp. 321-322; The Montana Bull Trout Scientific Group 1998, pp. 13-16; Rieman and Allendorf 2001, p. 763; Rieman and McIntyre 1993, p. 23).

The action area lies within the Mid-Columbia Recovery Unit for bull trout and within the Umatilla River critical habitat unit. The Columbia River within this critical habitat unit is important foraging, migration, and over wintering habitat for subadult and adult bull trout.

Overall, the threats to bull trout in the Umatilla River core area range from minor to severe and are considered ineffective or partially effectively managed. Threats due to small population size, potential catastrophic wildfire, and water quality are rated as the most severe in the core area. Habitat related threats, upland/riparian land management and instream impacts, and the demographic threats, connectivity impairment and fisheries management, are all rated as high severity and partially effective management effectiveness. The two threats related to nonnative fish species, brook trout and predatory warm water species, are minor in severity with partially effective management effectiveness.

4.3 Climate Change

All life stages of the bull trout rely on cold water. Increasing air temperatures are likely to impact the availability of suitable cold-water habitat. For example, ground water temperature is generally correlated with mean annual air temperature and has been shown to strongly influence the distribution of other chars. Groundwater temperature is linked to bull trout selection of spawning sites and has been shown to influence the survival of embryos and early juvenile rearing of bull trout (Baxter et al. 1997, p. 82). Increases in air temperature are likely to be reflected in increases in both surface and groundwater temperatures.

As climate change progresses and stream temperatures warm, thermal refugia will be critical to the persistence of many bull trout populations. Thermal refugia are important for providing bull

trout with patches of suitable habitat during migration through or to make feeding forays into areas with greater than optimal temperatures.

One objective of the final rule was to identify and protect those habitats that provide resiliency for bull trout use in the face of climate change. Over a period of decades, climate change may directly threaten the integrity of the essential physical or biological features described in PCEs 1, 2, 3, 5, 7, 8, and 9. Protecting bull trout strongholds and cold water refugia from disturbance and ensuring connectivity among populations were important considerations in addressing this potential impact. Additionally, climate change may exacerbate habitat degradation impacts both physically (e.g., decreased base flows, increased water temperatures) and biologically (e.g., increased competition with non-native fishes).

There is still a great deal of uncertainty associated with predictions relative to the timing, location, and magnitude of future climate change. It is also likely that the intensity of effects will vary by region (ISAB 2007, p 7). The ability to assign the effects of gradual global climate change to bull trout or to a specific location on the ground is beyond our technical capabilities at this time. For more discussion regarding impacts of climate change, see the status of the species and environmental baseline sections.

5.0 EFFECTS OF THE ACTION

Effects of the action are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (50 CFR 402.02).

5.1 Direct and Indirect Effects to Bull Trout

Effects to bull trout from the Project are largely dependent on the likelihood of fish occurring within the action area, the scope and scale of the excavation activity, and the life stage of the fish. The Service believes there will be very few, if any, adult and/or subadult bull trout present within the action area during Project activities. The Service does not anticipate bull trout egg, alevin, fry, or juveniles within the action area. Project activities implemented near or below the water's edge can potentially cause the most direct and indirect effects to bull trout. Timing and construction activities can also cause potential effects to species from in-water work. Lethal and sub-lethal effects are often unavoidable where in-water work cannot be conducted at a time or in a manner when the species is not present.

Potential direct and indirect effects to bull trout associated with the proposed project may include; 1) entrainment during sediment removal, 2) temporary degraded water quality and minor alteration of substrates associated with sediment removal and piling installation, 3) hydroacoustic impacts associated with vibratory hammer use, and 5) predation associated with expansion of in-water and overwater structures that provides additional overhead cover and velocity refuge that can attract salmonid predators. A further detailed analysis of these potential effects is provided in the sections below.

5.1.1 Entrainment

Entrainment may occur if fish are pulled into a hydraulic intake mechanism during the removal of sediments. The potential for entrainment is largely dependent on the likelihood of fish occurring within the removal area, the scope and scale of the activity, and the life stage of the fish. Given the proposed timing of in-water work (December 1 – February 28), location of proposed removal activities (i.e., near the shoreline), and proposed conservation measures (i.e., operation of the hydraulic intake below mudline); it is reasonably certain that the risk of injury or death of bull trout from proposed sediment removal activities will be minimal, although not discountable. Adult and sub-adult bull trout (if present) will likely avoid the excavation area.

5.1.2 Sediment/Turbidity

Short-term, localized project-related increases in background turbidity levels will likely occur as a result of proposed sediment removal and piling installation activities below the OHWM. Near and instream construction activities required for the proposed action will result in an increase in suspended sediment and possibly contaminants that will cause sub-adult and adult fish to move away from the action area. The soft-start project procedures are also expected to cause bull trout to move away before full construction mode.

Bull trout exposed to suspended sediment are likely to experience gill abrasion, decreased feeding, stress, or be unable to use the action area for a short time, depending on the severity of the suspended sediment release; however, exposure duration is a critical determinant of physical or behavioral turbidity effects. In addition, bull trout have evolved in systems that periodically experience short-term pulses (days to weeks) of high suspended sediment loads, often associated with flood events, and are adapted to seasonal high pulse exposures.

Given the existing substrate conditions (primarily sand), proposed in-water disposal of removed substrates, timing of in-water work (December 1 – February 28), proposed hydraulic techniques, and use of a vibratory hammer for piling installation (minimized noise disturbance, less potential for injury to bull trout), it is anticipated that any project related increases in background turbidity will be limited and highly localized. As such, short-term increases in background turbidity resulting from temporary work below the OHWM are not expected to result in long-term adverse effects to bull trout, or significant net change in function of the in-stream habitat. While increases in turbidity can adversely affect bull trout, it is likely that most fish will move away from this disturbance rather quickly if they have the ability to do so. This is particularly true of adult and subadult bull trout who exhibit extreme sensitivity to sedimentation.

5.1.3 Chemical Contamination

Equipment operating near and over the river channel within the action area represent potential sources of chemical contamination. Accidental spills of construction materials or petroleum products would adversely affect water quality and potentially impact bull trout. Development and implementation of a Pollution Control Plan (PCP) that will include containment measures and spill response for construction-related chemical hazards will significantly reduce the likelihood for chemical releases within the action area. In addition, The Portland Sediment Evaluation Team (PSET) granted a No-Test Exclusion for sediments based on the small volume of material to be removed, the coarseness of the material (sand), and the distance of the project site from potential or known sources of contamination.

5.1.4 Alteration of Substrates

The proposed project will result in the alteration of in-water substrates associated with sediment removal and installation of the new pilings. Proposed project activities at the pumping station will result in approximately 1,393 cubic yards of permanent fill, and 758 cubic yards of permanent removal below the OHW of the Columbia River, resulting in a net fill of 635 cubic yards. As discussed above, to offset the displacement of shallow water habitat along the shoreline, proposed mitigation activities included the removal of an additional 3,450 square feet of existing in-water concrete and asphalt debris from below the OHW of middle Columbia River. The resulting exposed substrates (sand and cobble) under the removed debris were left in place. In general, the environmental baseline within the project action area has been degraded by development and human activity and provides very little habitat complexity for adult and sub-adult bull trout. The resulting exposed substrates (sand and cobble) under the removed debris will be left in place. The debris removal will expose the native substrate and provide for improved salmonid feeding habitat.

The removal of an additional 360 cubic yards of sediment is expected to produce turbidity (at no more than 10 percent above background levels, tested every 4 hours, per Oregon Department of Environmental Quality (ODEQ) requirements) from the project site as far downstream as 500 feet. This level of turbidity is expected to be less than would otherwise occur because of the following BMPs. We anticipate that adult and subadult bull trout migrating through this area would experience gill abrasion, disorientation, etc., but they will only be exposed for a short period of time. Minor gill abrasion is common in systems that flood in the winter and salmonids are known to heal quickly at the expected levels (NMFS 2011). Therefore, any adverse effects are expected to be temporary and are not expected to result in injury or death of any adult or subadult bull trout.

Forage quantity for bull trout may be temporarily reduced within the immediate in-water work area as benthic organisms become disturbed by piling installation and excavation; however, recolonization of benthic organisms will likely occur within a month following project completion (NMFS 2009).

Given the existing baseline conditions and substrates (primarily coarse sand), proposed timing of in-water work (outside the peak migration stages), relative size of the action area, and proposed sediment removal techniques; it is reasonably certain that the proposed alteration of existing substrates will not result in long-term adverse effects to bull trout or their designated critical habitat.

5.1.5 Hydroacoustics

Sound generated by pile driving can affect fish in several ways including behavioral modifications, physical injuries, and ultimately, mortality from those injuries. Pile driving activities can increase underwater ambient noise, pressure, and water particle motion (Carlson et al. 2001, Popper and Hasting 2009). These increases may cause sub-lethal and/or lethal effects on bull trout in the immediate vicinity of this activity. A host of sub-lethal effects to fish have been documented under experimental conditions with pile driving activities (Carlson et al. 2001, Hastings and Popper 2005, Popper and Hastings 2009), including, but not limited to, physical injury (e.g., auditory damage, tissue/vessel damage, blood gases increase) and behavioral

changes (e.g., interference with migration/movement, foraging, predator avoidance). Lethal effects (immediate or delayed mortality) can also occur depending on the fish species/life stage, site specific activities, the intensity of the sound, the distance to the fish, and the physical characteristics and mass of the individual fish (Hastings and Popper 2005).

The use of a vibratory hammer is proposed for the installation of all steel pilings. Compared to impact hammers, vibratory hammers produce sounds of lower intensity, with a rapid repetition rate and longer duration, and with more energy in the lower frequencies (Carlson et al. 2001, and Nedwell et al. 2003, as cited in NMFS 2008). NMFS's current pile driving thresholds for "physical injury" to fish include a peak pressure of 206 dB and an accumulated SEL of 187 dB for fish greater than 2 grams, and 183 dB for fish less than 2 grams. In addition, a 150 dB RMS "harassment" threshold is applied for potential behavioral effects. Peak sound levels associated with vibratory hammer use can exceed 150 decibels, however, the rise time is relatively slow and fish do not appear to habituate to these sounds (i.e., the sound elicits an avoidance response), even after repeated exposure (Dolat 1997, and Knudsen et al. 1997, as cited in NMFS 2008). Hydroacoustic monitoring conducted for a prior project utilizing a vibratory hammer for pile driving along the Columbia River near Boardman (river mile 271.3), showed that the sound level did not exceed 132 dB when measured a few feet from the pile (Pers. comm. with Paul Wattenburger, PE, March 19, 2014). Therefore, we expect any bull trout present in the action area to move away from the area instead of sustaining injury. Moving away from an activity like this is not expected to result in death or injury because bull trout routinely change position and locations.

Average unattenuated sound pressures for vibratory driver installation of 12-inch steel pipe and H-type piles can be as much as 171 dB, 155 RMS average and 150 SEL (Caltrans 2015). Using the NMFS Pile Driving Impacts Calculator and associated technical guidance (NMFS 2016), this results in no instantaneous impacts and no cumulative impacts to adult fish (2 grams or greater) outside an 18 meter radius or to juvenile fish (less than 2 grams) outside a 22 meter radius of the pile being driven, assuming a full work day of continuous pile driving (See Appendix A of the Corps BA for more information). If bull trout were to be present in the action area during pile driving, they would be subject to potential injury were they to remain within 22 meters of a pile being driven for sufficient time for repeated small effects to result in injury. However, several authors have suggested that fish attempt to evade areas of high sound pressure (cv Engås and Løkkeborg 2002, Slotte et al. 2004, all summarized in Hastings and Popper 2005) and fish that were present would not be expected to remain in the work area. Bull trout present in the action area may have adverse behavioral responses to the sounds of pile driving, including avoidance, but it would be unlikely that this response would be sufficient to alter the fitness of any individual bull trout because any avoidance to the action area is expected to short in duration.

Given the low frequencies, short-term/intermittent nature of the vibratory hammer use (likely up to 2 to 4 hours per day, over the course of an 8 to 10 hour day and proposed conservation measures (i.e., timing of in-water work and daily "soft-start" procedures), it is reasonably certain that impacts to bull trout resulting from vibratory hammer use during piling installation will not result in injury or long-term adverse behavioral effects to either adult or subadult bull trout. The proposed use of a vibratory hammer is anticipated to result in few, if any, sub-lethal and no lethal

effects to bull trout. This is based on the low number of subadults and adults that are expected to be within the action area during the in-water work period. Short-term displacement or disturbance of bull trout (e.g., from foraging, resting, or moving through project area) may also be due to equipment and construction noise and/or human presence.

5.1.6 Predation

Given the lack of complex habitat structure within the action area, expansion of in-water and over-water structures may provide overhead cover and velocity refuge that can attract predators such as northern pikeminnow (*Ptychocheilus oregonensis*), smallmouth bass (*Micropterus dolomieui*), largemouth bass (*M. salmoides*), and piscivorous birds. A proposed mitigation measure to offset the increased overwater cover will include that approximately 207 square feet (28%) of the proposed Project replacement pump deck will be grated to allow for 60 percent light penetration.

The environmental baseline with the project action area has been degraded by development and human activity and provides very little foraging and shoaling habitat for bull trout. Therefore, given the existing baseline conditions within the action area and the proposed mitigation measure, it is anticipated that potential effects of the new in-water/ over-water structures on salmonid predation will be minimal. Juvenile bull trout are not expected to occur within the proposed action area (only subadult and adult bull trout) due to the size and flow of the river; therefore, there would be minimal potential for predation on bull trout, although not discountable.

5.2 Effects of the Action on Bull Trout Critical Habitat

The proposed action is expected to have a short-term, but limited, adverse effect on PBF 2 (i.e., Migration habitats with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and freshwater and marine foraging habitats, including but not limited to permanent, partial, intermittent, or seasonal barriers), but to no other PBFs.

Access to migration habitat may be disrupted during construction of the proposed action. The proposed project would drive sheets pile pipe into the substrate of the Middle Columbia River. Noise from the driving of piles would create a temporary disturbance causing fish to avoid the work area. This disturbance would be temporary in nature, limited to the duration of the work window and the daily timing of construction activities and would be unlikely to pose an impediment to bull trout migration. This temporarily intermittent disruption of migration habitat is expected to impact the bull trout Critical Habitat by temporarily rendering the action area unsuitable for bull trout use.

Water quality will be adversely affected by instream and near stream construction projects. The proposed project would result in short-term, localized increases in turbidity because of sediment removal and the driving of piles. Given the existing substrate conditions (primarily sand), timing of in-water work (December 1 – February 28), proposed excavation techniques and management practices (e.g., ramp up, etc.), and use of a vibratory hammer for piling installation, it is anticipated that any project related increases in background turbidity will be very limited and highly localized. This limited and highly localized increase in background turbidity will impact bull trout Critical Habitat by temporarily rendering the action area unsuitable for bull trout use.

In addition, the presence of equipment instream or near lakeshore adds some degree of risk of contamination from lubricants, antifreeze, and hydraulic fluids. These risks are greatly reduced by conservation measures contained in the proposed action and pollution control plan (such as daily leak inspection of equipment, removal of contaminants from equipment used below OHWM, and diapering of equipment within 150 feet of the Columbia River).

There will be short term disturbance of the substrate from the sediment removal and installation of sheet pilings, but this will be temporary in nature and would not be expected to permanently alter the character of the substrate in the Middle Columbia River. In general, the environmental baseline within the action area has been degraded by development and human activity and provides very little habitat complexity for bull trout (PBF 4). Given the existing, degraded baseline conditions and substrates (primarily coarse sand), proposed timing of in-water work (outside the peak migration stages), relative size of the action area, proposed excavation techniques, and use of a vibratory hammer for piling installation, it is reasonably certain that the proposed alteration of existing substrates will not result in long-term adverse effects to bull trout critical habitat within the action area.

Given the above anticipated effects to bull trout critical habitat, the Service has determined that the proposed action will not adversely modify bull trout critical habitat.

6.0 CUMULATIVE EFFECTS

Cumulative effects are those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation (50 CFR 402.02). Future federal actions that are unrelated to the proposed action are not considered in this section because they will require separate consultation pursuant to section 7 of the Act. The Service assumes that future non-Federal, state, and private activities will continue at similar intensities as in recent years.

Major effects to listed resources in the action area are primarily the result of urban development, the construction of the FCRPS, agriculture, and associated water diversion and water control activities. Additional effects to the Middle Columbia River would result from an increase in recreational and commercial use of the area. Recreation in the area includes fishing, hunting, boating, bird watching, and swimming, while commercial activities are dominated by year-round barge traffic.

Future actions that may contribute to cumulative effects include additional residential development along the Columbia River, although the terrain, land ownership, and zoning may limit the extent of development. Increased impervious surfaces could add to runoff that may contribute additional oils, pesticides, fertilizers, and hazardous wastes to fish-bearing waters, including the action area.

When considered together, these cumulative effects are likely to have a small negative effect on bull trout population abundance, productivity, and some short-term negative effects on spatial structure (short-term blockages of fish passage). Similarly, the condition of critical habitat PBF will be slightly degraded by the cumulative effects.

7.0 SUMMARY AND SYNTHESIS

This section is the final step in assessing the risk posed to bull trout and bull trout critical habitat as a result of implementing the proposed action. In this section, we synthesize the effects of the action, environmental baseline, and the cumulative effects to the status of the species and critical habitat, to formulate our Opinion as to whether the proposed action is likely to: (1) jeopardize the continued existence of the species by reducing appreciably the likelihood of both the survival and recovery of the species in the wild by reducing the reproduction, numbers, or distribution; or (2) destroy or adversely modify critical habitat by appreciably diminishing the value of critical habitat as whole for the conservation of a listed species.

As discussed previously in this document, the jeopardy determination for the bull trout, just like for all listed species, is made at the scale of the listed entity (in this case, the coterminous U.S. distinct population segment (DPS) of the bull trout). However, in recognition of recovery units established for the bull trout and in accordance with the Service's policy, the jeopardy determination for the bull trout relies upon an assessment of how the effects of the proposed action, together with cumulative effects, are likely to affect the survival and recovery role of the Mid-Columbia recovery unit. This approach recognizes that if the effects of a proposed Federal action, taken together with cumulative effects, are compatible with the survival and recovery role assigned to each recovery unit, then that action is not likely to appreciably reduce the likelihood of the survival and recovery of the bull trout at the coterminous (DPS) listing scale (i.e., the action is not likely to jeopardize the bull trout).

In this document, we have used a hierarchical approach to inform the above assessment. The effects of the proposed action on the bull trout were characterized at the core area scale. Maintenance or enhancement of bull trout core areas, which consist of one or more local populations, is fundamental to conserving the bull trout at the recovery unit and rangewide scale.

Conserving core areas provides for persistence of the bull trout from a distribution, genetic, and demographic perspective. To the extent that the effects of the action, together with cumulative effects, are compatible with what is necessary for core area persistence means those effects are compatible with the survival and recovery role assigned to each recovery unit. That compatibility serves as the basis for concluding that the proposed action is not likely to jeopardize the continued existence of the bull trout.

There are six recovery units identified for the coterminous DPS of bull trout (U.S. Fish and Wildlife Service 2015, p. 23) representing 109 core areas and 611 local populations (U.S. Fish and Wildlife Service 2015, p. 3 Appendix F). As noted previously, the action area is within the Mid- Columbia recovery unit. Our analysis above determined there may be adverse effects in the Umatilla River core area from the proposed action. A summary of how the Columbia River and Umatilla River core area are likely to be affected is presented below.

The Mid-Columbia Recovery Unit (MCRU) is located within eastern Washington, eastern Oregon, and portions of central Idaho. The MCRU is recognized as an area where bull trout have co-evolved with salmon, steelhead, lamprey, and other fish populations. Reduced fish numbers due to historic overfishing and land management changes have caused changes in nutrient abundance for resident migratory fish like the bull trout (Service 2015b p.C-1).

The MCRU also includes seven segments of shared foraging, migration and overwintering (FMO) habitat that are outside core area boundaries but may be used by bull trout originating from multiple core areas. These include the Mid-Columbia River, Snake River, John Day River, Clearwater River, Grande Ronde River, Okanagan River, and Lower Chelan River. FMO habitat is defined as relatively large streams and mainstem rivers, including lakes or reservoirs, estuaries, and nearshore environments, where subadult and adult migratory bull trout forage, migrate, mature, or overwinter. This habitat is typically downstream from spawning and rearing habitat and contains all the physical elements to meet critical overwintering, spawning migration, and subadult and adult rearing needs. While year-round occupancy by bull trout in the seven shared FMO segments in the Mid-Columbia Recovery Unit is possible, stream temperatures are often prohibitive during the warmest times of the years; thus, occupancy is more common from late fall through late spring.

The Mid-Columbia RUIP (USFWS 2015b) identifies 5 primary threats to bull trout in the Umatilla River Core Area. Primary threats are those factors known or likely (i.e., non-speculative) to negatively impact bull trout populations at the core area level, and accordingly require actions to assure bull trout persistence to a degree necessary that bull trout will not be at risk of extirpation within that core area in the foreseeable future (4 to 10 bull trout generations, approximately 50 years). The Walla Walla - Umatilla Bull Trout Working Group also identified an additional 4 threats that, while not currently considered primary threats, impact bull trout to some degree and are worth noting and tracking.

Primary and additional threats to bull trout in the Umatilla River Core Area. Include: Upland Riparian/Land Management - 1. Livestock grazing and agricultural practices, and transportation networks have eliminated or reduced riparian cover, resulting in a loss of habitat complexity, sediment loading, and warm water temperatures. Instream Impacts - 2. Transportation networks and agricultural practices have channelized and oversimplified the river channel, eliminating important wetlands and floodplain interaction, increasing sediment loading, decreasing instream flows and increasing water temperatures. Water Quality - 3. High instream water temperatures and sediment loading because of intense land use activities mentioned above significantly limit summer rearing habitat for migratory fish, the predominant life history type. Increased water temperatures and loss of available habitat due to climate change are predicted as a high risk to this core area. Connectivity Impairment - 4. Passage barriers in the lower Umatilla River and warm water temperature barriers impede free movement of bull trout between spawning and rearing areas and FMO habitat. Small Population Size - 5. Critically low abundance and an apparent reduction in the resident life history type put the core area at high risk of genetic and demographic stochasticity.

Overall, the threats to bull trout in the Umatilla River core area range from minor to severe and are considered ineffective or partially effectively managed. Threats due to small population size, potential catastrophic wildfire, and water quality are rated as the most severe in the core area. Habitat related threats, upland/riparian land management and instream impacts, and the demographic threats, connectivity impairment and fisheries management, are all rated as high severity and partially effective management effectiveness. The two threats related to nonnative fish species, brook trout and predatory warm water species, are minor in severity with partially effective management effectiveness.

Although there is not likely to be many bull trout within the action area, the Service anticipates at least a few individuals (adults and/or subadults) will experience some level of adverse effect from project activities related to increased sediment and turbidity and hydroacoustics. Migration and foraging may be temporarily disrupted, and bull trout may be injured or killed. However, the number of bull trout predicted to be injured or killed as result from the proposed action is small and the spatial scope of that injury will not have a meaningful impact on reproduction, numbers or distribution of bull trout. These adverse effects to bull trout and its critical habitat will be minimized, to the extent possible, by implementing conservation measure listed in the BA.

8.0 CONCLUSION

Bull Trout

After reviewing the status of the bull trout, the environmental baseline for the action area, and the effects of the proposed action, including all measures proposed to avoid and minimize adverse effects, and the cumulative effects, it is the Service's Biological Opinion that the St. Hilaire Brothers and East Improvement District: Columbia River Pumping Station and Intake Modification Project is not likely to jeopardize the continued existence of the bull trout.

This no jeopardy finding for the bull trout is supported by the following:

- In-water work windows, timing, and duration of projects are expected to minimize direct and indirect effects to bull trout from project activities such that very few individuals are expected to be injured.
- Conservation measures incorporated into the proposed action are expected to minimize direct and indirect effects to bull trout from project activities.
- Only short-term adverse effects to aquatic and terrestrial habitats are anticipated (e.g., water quality, channel dynamics, and overall watershed conditions and functions).
- The amount of injured or killed bull trout predicted to result from the proposed action is small and the spatial scope of that injury will not have a meaningful impact on reproduction, numbers or distribution of bull trout.

Overall, the proposed St. Hilaire Brothers and East Improvement District: Columbia River Pumping Station and Intake Modification Project will cause short-term adverse direct and indirect effects to bull trout and the proposed action is not likely to reduce appreciably the likelihood of both the survival and recovery of bull trout in the wild by reducing the reproduction, numbers, or distribution of the species.

Bull Trout Critical Habitat

After reviewing the status of the species, the environmental baseline for the action area, and the effects of the proposed action, including all measures proposed to avoid and minimize adverse effects, and the cumulative effects, it is the Service's Biological Opinion that the St. Hilaire Brothers and East Improvement District: Columbia River Pumping Station and Intake Modification Project is not likely to result in the destruction or adverse modification of designated critical habitat for bull trout.

This finding of no destruction or adverse modification of critical habitat is supported by the following:

- The conservation measures described in the proposed action are expected to minimize the extent and duration of habitat effects, such that it is unlikely that the function or conservation role of the critical habitat will be adversely affected in the long-term by the proposed activity.
- Only short-term adverse effects to aquatic and terrestrial habitats are anticipated (e.g., water quality, channel dynamics, and overall watershed conditions and functions) including bull trout critical habitat.

The proposed action is not likely to appreciably diminish the value of critical habitat as a whole for the conservation of the bull trout.

9.0 INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened animal species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. *Harm* is defined by the Service as an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering (50 CFR 17.3). Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary and must be undertaken by the Corps so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, for the exemption in section 7(o)(2) to apply. The Corps has a continuing duty to regulate the activity covered by this incidental take statement. If the Corps: (1) fails to assume and implement the terms and conditions, or (2) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Corps or applicant must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR 402.14(i)(3)].

9.1 Amount or Extent of Take

Although the Service anticipates a low number of bull trout may be incidentally harmed and harassed as a result of the proposed action, the Service anticipates incidental take of bull trout will be difficult to detect for the following reason(s): the presence and number of bull trout is difficult to ascertain within the action area. Detecting an impaired or dead individual is highly unlikely in this area because of the depth of the project and the river's flow. For instance, an injured fish would be extremely difficult to find in order to quantify incidental take. Therefore, even though incidental take is expected to occur, sufficient data are not available to enable the Service to determine an exact number of individuals that may be taken under the proposed action. However, the Service is quantifying incidental take in the form of a conservative estimate based on similar past actions.

The Service anticipates that bull trout may be incidentally taken as a result of the pile installation during project implementation. There is also potential for limited incidental take of bull trout from the implementation of the other project-related construction activities resulting from short-term increases in hydroacoustics, sedimentation, turbidity, and/or chemical contamination that may affect essential behavioral patterns and/or physiologic processes. Given the short duration of the construction activities and the degraded quality of the action area, the Service anticipates few adult and/or subadult bull trout (and no juvenile bull trout) would be in the area during construction. If any individuals are injured, it would be a subset of those that are present. The timing of the project also reduces the likelihood and number of bull trout anticipated in the action area. Therefore, the amount of take for bull trout, regardless of the life stage (i.e., sub-adult or adult) for all project-related activities is limited to five individuals as sub-lethal take through harm and harassment and zero individuals through any manner of lethal take.

9.2 Effect of the Take
In the accompanying Biological Opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat.

9.3 Reasonable and Prudent Measures
The Service believes the following reasonable and prudent measure(s) are necessary and appropriate to minimize the impacts (i.e., the amount or extent) of incidental take of bull trout. The Corps shall:

1. To the extent possible, monitor any detectable adverse effects to bull trout during the proposed action.

9.4 Terms and Conditions
In order to be exempt from the prohibitions of section 9 of Act, the Corps must comply with the following terms and conditions, which implement the Reasonable and Prudent Measures described above and outline required reporting and monitoring requirements. These terms and conditions are non-discretionary.

1. To implement reasonable and prudent measure #1 (effects to bull trout), the Corps shall ensure that during the project implementation, any observed adverse effects to bull trout that may occur from these activities will be documented and reported to the Service. Contact the Service's La Grande Field Office immediately to report your observations, especially if they are related to bull trout. Any verbal communications with this office must be followed-up with a written communication describing the observations in detail within 3 business days of the observation(s).

The Service believes that no more than 5 (non-lethal), and 0 (lethal) bull trout will be incidentally taken as a result of the proposed action. The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The

Federal agency must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

The Service is to be notified within three working days upon locating a dead, injured or sick endangered or threatened species specimen. Initial notification must be made to the nearest U.S. Fish and Wildlife Service Law Enforcement Office. Notification must include the date, time, precise location of the injured animal or carcass, and any other pertinent information. Care should be taken in handling sick or injured specimens to preserve biological materials in the best possible state for later analysis of cause of death, if that occurs. In conjunction with the care of sick or injured endangered or threatened species or preservation of biological materials from a dead animal, the finder has the responsibility to ensure that evidence associated with the specimen is not unnecessarily disturbed. Contact the U.S. Fish and Wildlife Service Law Enforcement Office at (503) 682-6131, or the Service's Oregon Fish and Wildlife Office at (503) 231-6179.

9.5 Conservation Recommendations

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1. Notify the Service's La Grande Field Office of any bull trout observations during project implementation.

Pacific and Other Native Lamprey Species

The following recommendations are for Pacific lamprey, but may also benefit other species of lamprey (e.g. river lamprey, western brook lamprey), which we know less about. Consideration of Pacific lamprey during permitted in-water work for salmonids is important because their abundance and distribution has significantly declined throughout its range over the past three decades, and efforts to reverse this decline are needed (USFWS 2019). Pacific lamprey are both culturally and ecologically important. Lamprey are a Tribal Trust species, and have a high cultural significance to Native American tribes from California to Alaska.

While Pacific lamprey are anadromous like salmon, their life history has some unique aspects that are typically not considered during implementation of instream activities, even when using design considerations and best management practices for salmonids. Adjustments to minimize adverse effects to Pacific lamprey should be made at the project design phase to accommodate lamprey passage, lamprey spawning periods, existence of nests, upstream and downstream movement, and avoid direct mortality to larval lamprey burrowed in the substrate.

For context, an abbreviated description of Pacific lamprey life history and habitat use in freshwater is provided as follows: As adults, Pacific lamprey return from the ocean to fresh water primarily during spring and summer months, primarily moving at night. They often spend about 1 year in freshwater habitat before spawning, usually holding under large substrate (e.g., large boulders, bedrock crevices) associated with low water velocities until the following spring, when

they move to spawning areas. Adult lampreys spawn generally between March and July in gravel bottom stream, usually at the upstream end of riffle habitat near suitable habitat for larval lamprey (sometimes called ammocoetes) and die after spawning (Beamish 1980).

After hatching, the larval lamprey drift downstream to areas of low stream velocity and burrow into depositional areas with sand or silt substrate, and filter feed on algae, diatoms, and detritus for 3 to 7 years. Larvae can be difficult to detect since they range in size from about .08 to 6 inches long; the smaller ones are easy to overlook. Larvae will move downstream during flow events, mostly at night. Many age classes of larvae will congregate together, often occurring in large clusters in depositional sites with fine sediments where habitats are optimal, making lamprey larvae populations particularly susceptible to activities that involve dredging/excavating, stranding and use of toxic chemicals. Metamorphosis of larval lamprey into the juvenile outmigrant form (sometimes called "macrophthalmia") occurs generally from July through November but is variable depending on distance from salt water. Out-migration to the ocean occurs during or shortly after transformation (Beamish 1980). Out-migration generally peaks with rising stream and river flows in late winter or early spring (Kostow 2002).

Lampreys likely provide substantial benefits to ecosystem health and water quality on which ESA-listed fish rely. Lamprey have been documented as prey by many different animal species, including 20 species of fish (both native and non-native), 11 species of birds, and 9 marine mammals (ODFW, 2020, p.119; Table A3.4). Because the caloric content of Pacific Lamprey is significantly higher than salmon (Close et al. 2002; Clemens et al. 2019 as cited in ODFW 2020), lampreys may serve as important "predation buffers" for ESA-listed salmonids and distract predators away from feeding upon salmon at times. ODFW (2020, p. 116) summarized ecological benefits into three categories:

1) 'ecosystem engineers'.
2) nutrient suppliers to freshwater ecosystems and recyclers of nutrients within these systems; and
3) prey sources for other animals / predation buffers to salmonid species.

ODFW, in its Coastal, Columbia, and Snake Conservation Plan for Lampreys in Oregon (ODFW 2020, p. 116; Available: https://www.dfw.state.or.us/fish/CRP/docs/coastal_columbia_snake_lamprey/CPL%20-%20Final%202-14-20.pdf) further describes these categories follows:

> As 'ecosystem engineers' lampreys benefit the surrounding habitat in freshwater streams in ways that differ by life stage. For example, as adults, lampreys construct redds in which they spawn. Construction of these redds alters the streambed in ways that favor aggregations of aquatic insects that process stream nutrients and feed juvenile fishes (Hogg et al. 2014). In addition, the burrowing behavior of larval lamprey has been associated with increased water exchange between the stream and substrate in the streambed, increased oxygen in the substrate, and an increase in fine particulate matter on the surface of the substrate (Shirakawa et al. 2013; Boeker and Geist 2016).

Anadromous lampreys provide marine-derived nutrients to freshwater ecosystems (Close et al. 2002; Nislow and Kynard 2009). Their spawned-out carcasses decay and release nutrients into the surrounding water (Weaver et al. 2015). These nutrients are assimilated by aquatic insects (Weaver et al. 2016), which may be consumed by juvenile salmonids. As nutrient recyclers, larval lamprey feed on detritus and algae and convert these food sources into energy stored as animal (larval lamprey) tissue (Close et al. 2002) that is then available to larger predators that eat them. Lampreys are a prey source for humans (see below) and many different animals (Table A3.4).

Larval and juvenile lampreys migrating downstream may focus the attention of predatory fishes and birds, thereby potentially offering a predation reprieve for juvenile salmon and steelhead. Similarly, the high caloric content, ease of capture (relative to salmonids), and the tendency to migrate in schools may make Pacific Lamprey desirable prey sources for pinnipeds, thereby buffering adult salmon and steelhead from predation (Close et al. 2002).

Threats to Pacific Lampreys

Threats to lampreys include:

- Lack of awareness.
- Poor passage conditions and entrainment.
- De-watering and streamflow management from water diversions, instream projects and hydropower peaking.
- Dredging from construction, channel maintenance and mining activities.
- Chemical poisoning from accidental spills or chemical treatments.
- Poor water quality.
- Stream and floodplain degradation (channelization, loss of side channels, scouring).

From the above list, it is clear that many of the same threats to anadromous salmon also impact Pacific lamprey. Thus, some best management practices for salmon are also beneficial to lampreys. However, lamprey have some unique life-history aspects that are not often considered during implementation of instream activities, simply due to lack of awareness. An oversight at a single project can greatly impact lampreys in the project area, and over time, multiple projects may cumulatively impact local populations. As an example, larval lamprey remain burrowed for several years in stream substrates, and many individuals (hundreds to thousands) of multiple age classes can concentrate together in the preferred habitats (depositional areas), making larval lamprey populations particularly susceptible to activities that involve dredging/excavating, stranding and toxic chemical spills.

Lamprey Recommendations: Species-specific adjustments to minimize adverse effects to Pacific lamprey can be made at the project design phase and during implementation to accommodate lamprey passage, lamprey spawning periods, existence of nests, upstream and downstream movement, and to avoid direct mortality to larval lamprey burrowed in the substrate.

Biological considerations of lamprey should be incorporated into project design, objectives, salvage and best management practices for the protection and conservation of this species. Such efforts collectively may reduce the need for future ESA listings. Currently there are several guidance documents available to assist in such actions:

1. Best Management Guidelines for Native Lampreys during In-Water Work (Lamprey Technical Workgroup 2020) https://www.fws.gov/pacificlamprey/Documents/2020%20Lamprey%20BMG%20Final.pdf covers a broad spectrum of actions including biology, salvage during dewatering actions, habitat restoration, screening, and passage and includes case studies.
2. Practical Guidelines for Incorporating Adult Pacific Lamprey Passage at Fishways (Lamprey Technical Workgroup 2017) (https://www.fws.gov/pacificlamprey/Documents/2017.06.20%20LampreyPsgFINAL.pdf) includes specific guidance on providing upstream passage within existing fishways and in new fishway designs and includes case studies.
3. Barriers to Adult Pacific Lamprey at Road Crossings: Guidelines for Evaluating and Providing Passage https://www.fws.gov/pacificlamprey/Documents/LTW_2020_LampreyPassage@RdXings_Final_062920.pdf (Lamprey Technical Workgroup 2020) includes culvert passage assessments and recommendations for lamprey passage, and includes case studies. Available: https://www.fws.gov/pacificlamprey/LTWGMainpage.cfm
4. Additional documents, information, materials and updates may be found on the website for the Pacific Lamprey Conservation Initiative's Lamprey Technical Workgroup: https://www.fws.gov/pacificlamprey/LTWGMainpage.cfm

Lamprey Reporting:
In order for the Service to be kept informed of actions that minimize or avoid adverse effects or that benefit Pacific lamprey, other lamprey species, and their habitats, the Service requests notification of the implementation of any of the above conservation recommendations, and copies of any relevant publications for conserving lamprey species and their habitats. Please send documents to:

State Supervisor
U.S. Fish and Wildlife Service
Oregon Fish and Wildlife Office
Attn: Ann Gray
2600 SE 98th Avenue, Suite 100
Portland, Oregon 97266

Freshwater Mussels
While no species of freshwater mussels are federally listed in the Pacific Northwest, they are of high value (culturally, ecologically, and environmentally) to many entities. The Service recommends that the Action Agencies require considerations for the biological needs of all native freshwater mussel species for all permits requiring instream or near-stream projects.

There are six species of western freshwater mussels: the western pearlshell, the western ridged mussel, the winged floater, the Oregon floater, the Yukon floater, and woebegone floater. The Xerces Society for Invertebrate Conservation (Xerces Society) maintains a great resource for western freshwater mussels at https://xerces.org/endangered-species/freshwater-mussels. To paraphrase from the Xerces Society's website:

> Freshwater mussels are experiencing a dramatic decline; 72-percent of North American freshwater mussels are considered extinct or imperiled, representing one of the most at-risk groups of animals in the United States. The decline of freshwater mussels has been well-studied in eastern North America but has received very little attention in states west of the Rocky Mountains.
>
> Native freshwater mussels have immense ecological and cultural significance. As filter-feeders, they can substantially improve water quality by filtering out harmful pollutants, which benefits both humans and aquatic ecosystems. These animals can be highly sensitive to environmental changes and thus have great potential to be used as indicators of water quality. Freshwater mussels have been historically important sources of food, tools, and other implements for many Native American tribes. Native Americans in the interior Columbia Basin have harvested these animals for at least 10,000 years, and they remain an important cultural heritage for tribes today.

Mussel Recommendations: The biological considerations of freshwater mussel species should be incorporated into project design, objectives, salvage and relocation, and best management practices for the protection and conservation of this species. The Xerces Society has developed a publication "Conservation the Gems of Our Waters: Best Management Practices for Protecting Native Western Freshwater Mussels during Aquatic and Riparian Restoration, Construction, and Land Management Projects and Activities (Blevins et al. 2017), and a companion handbook, Mussel Friendly Restoration (Blevins et al. 2019)- both available online at https://xerces.org/publications/guidelines/mussel-friendly-restoration. These documents include information on determining if mussels are present at your site, project development and review, salvage and relocation, monitoring and practices for minimizing project impacts for several different activities (i.e. construction, vegetation management, flow management, restoration). The Xerces Society website also has a field identification guide developed by the Xerces Society and Confederation Tribes of the Umatilla Indian Reservation at https://pnwmussels.org/wp-content/uploads/2016/07/QuickMusselGuide_CTUIR.pdf

Freshwater Mussels Reporting

In order for the Service to be kept informed of actions that minimize or avoid adverse effects or that benefit freshwater mussels, and their habitats, the Service requests notification of the implementation of any of the above conservation recommendations, and copies of any relevant publications for conserving mussel species and their habitats. Please send documents to:

> State Supervisor
> U.S. Fish and Wildlife Service
> Oregon Fish and Wildlife Office
> Attn: Courtney Newlon
> 2600 SE 98th Avenue, Suite 100
> Portland, Oregon 97266

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

10. REINITIATION NOTICE

This concludes formal consultation on the St. Hilaire Brothers and East Improvement District: Columbia River Pumping Station and Intake Modification Project. As provided in 50 CFR 402.16, reinitiation of consultation is required and shall be requested by the Federal agency or by the Service, where discretionary Federal involvement or control over the action has been retained or is authorized by law and: (1) If the amount or extent of taking specified in the incidental take statement is exceeded; (2) If new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (3) If the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the Biological Opinion; or (4) If a new species is listed or critical habitat designated that may be affected by the identified action. If you have any questions about this consultation, please contact Marisa Meyer (541) 962-8597.

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APPENDIX A: STATUS OF THE SPECIES – BULL TROUT

This section provides information about the bull trout's life history, habitat preferences, geographic distribution, population trends, threats, and conservation needs. This includes description of the effects of past human activities and natural events that have led to the current status of the bull trout. This information provides the background for analyses in later sections of the biological opinion. The proposed and final listing rules contain a physical species description (U.S. Fish and Wildlife Service 1998, 63 FR 31647; U.S. Fish and Wildlife Service 1999, 64 FR 58910). Additional information can be found at https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=E065.

Listing Status and Current Range

The coterminous United States population of the bull trout (Salvelinus confluentus) was listed as threatened on November 1, 1999 (U.S. Fish and Wildlife Service 1999, 64 FR 58910). The threatened bull trout occurs in the Klamath River Basin of south-central Oregon; the Jarbidge River in Nevada; the Willamette River Basin in Oregon; Pacific Coast drainages of Washington, including Puget Sound; major rivers in Idaho, Oregon, Washington, and Montana, within the Columbia River Basin; and the St. Mary-Belly River, east of the Continental Divide in northwestern Montana (Bond 1992, p. 2; Brewin and Brewin 1997, p. 215; Cavender 1978, pp. 165-166; Leary and Allendorf 1997, pp. 716-719; U.S. Fish and Wildlife Service 1998, 63 FR 31647; U.S. Fish and Wildlife Service 1999, 64 FR 58910; U.S. Fish and Wildlife Service 2010, 75 FR 2269; U.S. Fish and Wildlife Service 2015, pg. 1).

The final listing rule for the United States coterminous population of the bull trout discusses the consolidation of five DPSs into one listed taxon and the application of the jeopardy standard in accordance with the requirements of section 7 of the Endangered Species Act of 1973, as amended (Endangered Species Act; 16 U.S.C. 1531 et seq.), relative to this species, and established five interim recovery units for each of these DPSs for the purposes of Consultation and Recovery (U.S. Fish and Wildlife Service 1999, 64 FR 58930).

Six draft recovery units were identified based on new information (U.S. Fish and Wildlife Service 2010, 75 FR 63898) that confirmed they were needed to ensure a resilient, redundant, and representative distribution of bull trout populations throughout the range of the listed entity. The final Recovery Plan for the Coterminous Bull Trout Population (bull trout recovery plan) formalized these six recovery units (U.S. Fish and Wildlife Service 2015, pg. 36-43) (see Figure 1). The final recovery units replace the previous five interim recovery units and will be used in the application of the jeopardy standard for Section 7 consultation proceedures.

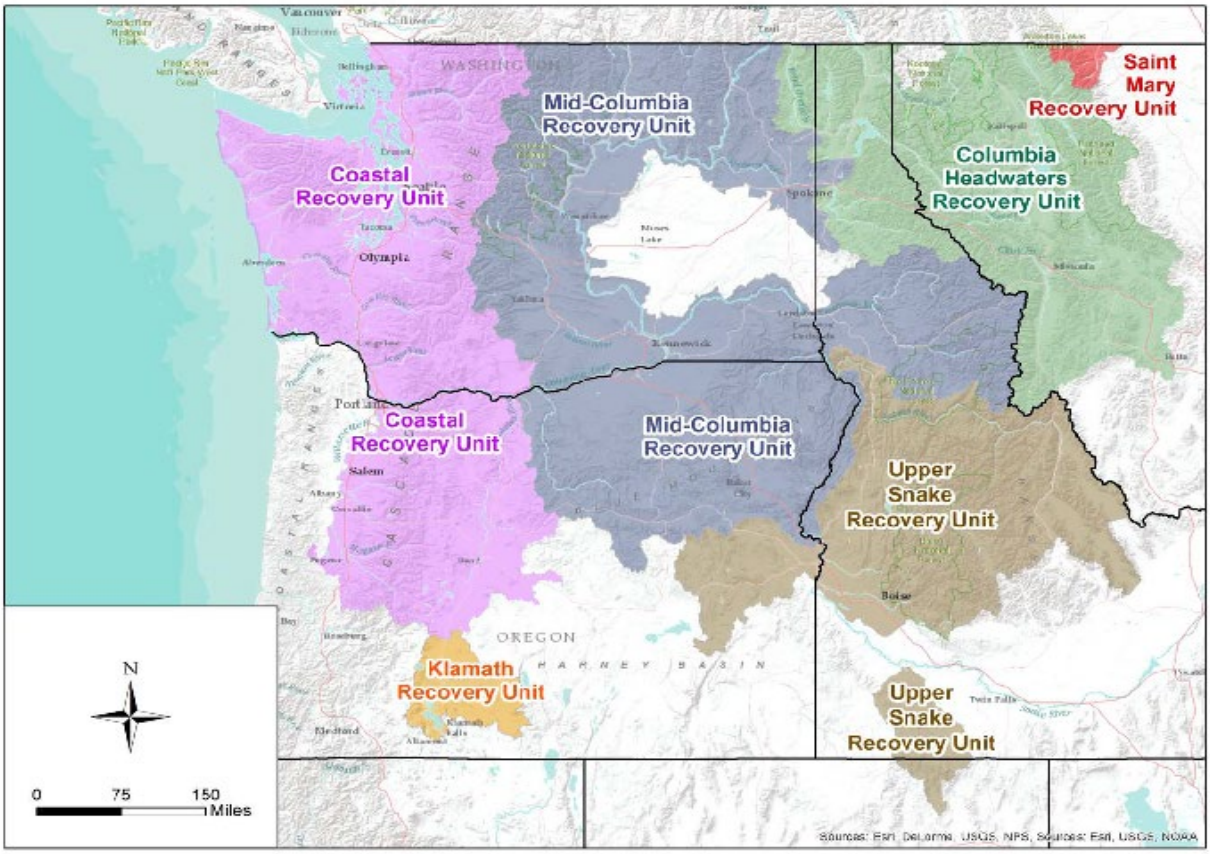

Figure 1. Locations of the six bull trout recovery units in the coterminous United States.

Reasons for Listing, Rangewide Trends and Threats

Throughout its range, the bull trout is threatened by the combined effects of habitat degradation, fragmentation, and alterations associated with dewatering, road construction and maintenance, mining, grazing, the blockage of migratory corridors by dams or other diversion structures, poor water quality; incidental angler harvest; entrainment (a process by which aquatic organisms are pulled through a diversion or other device) into diversion channels; and introduced non-native species (U.S. Fish and Wildlife Service 1998, 63 FR 31647; U.S. Fish and Wildlife Service 1999, 64 FR 58910). Poaching and incidental mortality of bull trout during other targeted fisheries are identified described in the bull trout recovery plan (see Threat Factors B and D) as additional threats (U.S. Fish and Wildlife Service 2015, p. 150). Since the time of coterminous listing the species (U.S. Fish and Wildlife Service 1999, 64 FR 58910) and designation of its critical habitat (U.S. Fish and Wildlife Service 2004a, 69 FR 59996; U.S. Fish and Wildlife Service 2005c, 70 FR 56212; 2010, 75 FR 63898) a great deal of new information has been collected on the status of bull trout. The Service's Science Team Report (Whitesel et al 2004, entire), the bull trout core areas templates (U.S. Fish and Wildlife Service 2005b, entire; U.S. Fish and Wildlife Service 2009, entire), Conservation Status Assessment (U.S. Fish and Wildlife Service 2005a), and 5-year Reviews (U.S. Fish and Wildlife Service 2008, entire; U.S. Fish and Wildlife Service 2015g, entire) have provided additional information about threats and status. The final recovery plan lists other documents and meetings that compiled information about the status of bull trout (U.S. Fish and Wildlife Service 2015, p. 3). As well, 2015 5-year review maintained the listing status as threatened based on the information compiled in the final bull

trout recovery plan (U.S. Fish and Wildlife Service 2015g, p.3) and the recovery unit implementation plans (RUIPs) (U.S. Fish and Wildlife Service 2015a-f).

When first listed, the status of bull trout and its threats were reported by the Service at subpopulation scales. In 2002 and 2004, the draft recovery plans (U.S. Fish and Wildlife Service 2002, entire; U.S. Fish and Wildlife Service 2004a, entire; U.S. Fish and Wildlife Service 2004b, entire) included detailed information on threats at the recovery unit scale (i.e. similar to subbasin or regional watersheds), thus incorporating the metapopulation concept with core areas and local populations. In the 2008, 5-year Review, the Service established threats categories (i.e. dams, forest management, grazing, agricultural practices, transportation networks, mining, development and urbanization, fisheries management, small populations, limited habitat, and wild fire.) (U.S. Fish and Wildlife Service 2008, entire). In the final recovery plan, threats and recovery actions are described for 109 core areas, forage/migration and overwintering areas, historical core areas, and research needs areas in each of the six recovery units (U.S. Fish and Wildlife Service 2015, p 10-11). Primary threats are described in three broad categories: Habitat, Demographic, and Nonnative Fish for all recovery areas described in the listed range of the species. The 2015 5-year status review (U.S. Fish and Wildlife Service 2015g, entire) references the final recovery plan and the recovery unit implementation plans and incorporates by reference the threats described therein. Although significant recovery actions have been implemented since the time of listing, the 5-year review concluded that bull trout still meets the definition of a "threatened" species (U.S. Fish and Wildlife Service 2015g, entire).

New or Emerging Threats

The final Recovery Plan for the Coterminous Bull Trout Population (U.S. Fish and Wildlife Service 2015, pg. 17) describes new or emerging threats, climate change, and other threats. Climate change was not addressed as a known threat when bull trout was listed. The 2015 bull trout recovery plan and RUIPs (U.S. Fish and Wildlife Service 2015a-f) summarize the threat of climate change and acknowledge that some bull trout local populations and core areas may not persist into the future due to small populations, isolation, and effects of climate change (U.S. Fish and Wildlife Service 2015, p. 48). The recovery plan further states that use of best available information will ensure future conservation efforts that offer the greatest long-term benefit to sustain bull trout and their required coldwater habitats (U.S. Fish and Wildlife Service 2015, p. vii, and pp. 17-20). Mote et al. (2014) summarized climate change effects to include rising air temperature, changes in the timing of streamflow related to changing snowmelt, increases in extreme precipitation events, lower summer stream flows, and other changes. A warming trend in the mountains of western North America is expected to decrease snowpack, hasten spring runoff, reduce summer stream flows, and increase summer water temperatures (Poff et al. 2002, entire; Koopman et al. 2009, entire; PRBO Conservation Science 2011, entire). Lower flows as a result of smaller snowpack could reduce habitat, which might adversely affect bull trout reproduction and survival. Warmer water temperatures could lead to physiological stress and could also benefit nonnative fishes that prey on or compete with bull trout. Increases in the number and size of forest fires could also result from climate change (Westerling et al. 2006) and could adversely affect watershed function by resulting in faster runoff, lower base flows during the summer and fall, and increased sedimentation rates. Lower flows also may result in increased groundwater withdrawal for agricultural purposes and resultant reduced water availability in certain stream reaches occupied by bull trout (U.S. Fish and Wildlife Service 2015b, p. B-10). Although all salmonids are likely to be affected by climate change, bull trout

are especially vulnerable given that spawning and rearing are constrained by their location in upper watersheds and the requirement for cold water temperatures (Battin et al. 2007, pp. 6672-6673; Rieman et al. 2007, p. 1552). Climate change is expected to reduce the extent of cold water habitat (Isaak et al. 2015), and increase competition with other fish species (lake trout, brown trout, brook trout, and northern pike) for resources in remaining suitable habitat. Several authors project that brook trout, a fish species that competes for resources with and predates on the bull trout, will continue increasing their range in several areas (an elevation shift in distribution) due to the effects from climate change (Wenger et al. 2011, Isaak et al. 2010, 2014; Peterson et al. 2013; Dunham 2015).

Life History and Population Dynamics

Distribution

The historical range of bull trout includes major river basins in the Pacific Northwest at about 41 to 60 degrees North latitude, from the southern limits in the McCloud River in northern California and the Jarbidge River in Nevada to the headwaters of the Yukon River in the Northwest Territories, Canada (Cavender 1978, pp. 165-166; Bond 1992, p. 2). To the west, the bull trout's range includes Puget Sound, various coastal rivers of British Columbia, Canada, and southeast Alaska (Bond 1992, p. 2). Bull trout occur in portions of the Columbia River and tributaries within the basin, including its headwaters in Montana and Canada. Bull trout also occur in the Klamath River basin of south-central Oregon. East of the Continental Divide, bull trout are found in the headwaters of the Saskatchewan River in Alberta and Montana and in the MacKenzie River system in Alberta and British Columbia, Canada (Cavender 1978, pp. 165-166; Brewin and Brewin 1997, entire).

Reproductive Biology

The iteroparous reproductive strategy (fishes that spawn multiple times, and therefore require safe two-way passage upstream and downstream) of bull trout has important repercussions for the management of this species. Bull trout require passage both upstream and downstream, not only for repeat spawning but also for foraging. Most fish ladders, however, were designed specifically for anadromous semelparous salmonids (fishes that spawn once and then die, and require only one-way passage upstream). Therefore, even dams or other barriers with fish passage facilities may be a factor in isolating bull trout populations if they do not provide a safe downstream passage route. Additionally, in some core areas, bull trout that migrate to marine waters must pass both upstream and downstream through areas with net fisheries at river mouths. This can increase the likelihood of mortality to bull trout during these spawning and foraging migrations.

Growth varies depending upon life-history strategy. Resident adults range from 6 to 12 inches total length, and migratory adults commonly reach 24 inches or more (Goetz 1989, p. 30; Pratt 1985, pp. 28-34). The largest verified bull trout is a 32-pound specimen caught in Lake Pend Oreille, Idaho, in 1949 (Simpson and Wallace 1982, p. 95).

Bull trout typically spawn from August through November during periods of increasing flows and decreasing water temperatures. Preferred spawning habitat consists of low-gradient stream reaches with loose, clean gravel (Fraley and Shepard 1989, p. 141). Redds are often constructed in stream reaches fed by springs or near other sources of cold groundwater (Goetz 1989, pp. 15-16; Pratt 1992, pp. 6-7; Rieman and McIntyre 1996, p. 133). Depending on water temperature,

incubation is normally 100 to 145 days (Pratt 1992, p. 1). After hatching, fry remain in the substrate, and time from egg deposition to emergence may surpass 220 days. Fry normally emerge from early April through May, depending on water temperatures and increasing stream flows (Pratt 1992, p. 1; Ratliff and Howell 1992, p. 10).

Early life stages of fish, specifically the developing embryo, require the highest inter-gravel dissolved oxygen (IGDO) levels, and are the most sensitive life stage to reduced oxygen levels. The oxygen demand of embryos depends on temperature and on stage of development, with the greatest IGDO required just prior to hatching.

A literature review conducted by the Washington Department of Ecology (Washington Department of Ecology 2002, p. 9) indicates that adverse effects of lower oxygen concentrations on embryo survival are magnified as temperatures increase above optimal (for incubation). Normal oxygen levels seen in rivers used by bull trout during spawning ranged from 8 to 12 mg/L (in the gravel), with corresponding instream levels of 10 to 11.5 mg/L (Stewart et al. 2007, p. 10). In addition, IGDO concentrations, water velocities in the water column, and especially the intergravel flow rate, are interrelated variables that affect the survival of incubating embryos (Oregon Department of Environmental Quality 1995, Ch. 2 pp. 23-24). Due to a long incubation period of 220+ days, bull trout are particularly sensitive to adequate IGDO levels. An IGDO level below 8 mg/L is likely to result in mortality of eggs, embryos, and fry.

Population Structure

Bull trout exhibit both resident and migratory life history strategies. Both resident and migratory forms may be found together, and either form may produce offspring exhibiting either resident or migratory behavior (Rieman and McIntyre 1993, p. 2). Resident bull trout complete their entire life cycle in the tributary (or nearby) streams in which they spawn and rear. The resident form tends to be smaller than the migratory form at maturity and also produces fewer eggs (Goetz 1989, p. 15). Migratory bull trout spawn in tributary streams where juvenile fish rear 1 to 4 years before migrating to either a lake (adfluvial form), river (fluvial form) (Fraley and Shepard 1989, p. 138; Goetz 1989, p. 24), or saltwater (anadromous form) to rear as subadults and to live as adults (Brenkman and Corbett 2005, entire; McPhail and Baxter 1996, p. i; Washington Department of Fish and Wildlife et al. 1997, p. 16). Bull trout normally reach sexual maturity in 4 to 7 years and may live longer than 12 years. They are iteroparous (they spawn more than once in a lifetime). Repeat- and alternate-year spawning has been reported, although repeat-spawning frequency and post-spawning mortality are not well documented (Fraley and Shepard 1989, p. 135; Leathe and Graham 1982, p. 95; Pratt 1992, p. 8; Rieman and McIntyre 1996, p. 133).

Bull trout are naturally migratory, which allows them to capitalize on temporally abundant food resources and larger downstream, and resident forms may develop where barriers (either natural or manmade) occur or where foraging, migrating, or overwintering habitats for migratory fish are minimized (Swanberg, 1997, entire; Brenkman and Corbett 2005, pp. 1075-1076; Goetz et al. 2004, p. 105, Starcevich et al 2012, entire; U.S. Fish and Wildlife Service 2016, p. 170). For example, multiple life history forms (e.g., resident and fluvial) and multiple migration patterns have been noted in the Grande Ronde River (Baxter 2002, pp. 96, 98-106). Some river systems have retained habitat conditions that allow free movement between spawning and rearing areas and the mainstem Rivers. In these areas with connectivity bull trout can migrate between large rivers lakes, and spawning tributaries. Other migrations in Central Washington have shown that fluvial and adfluvial life forms travel long distances, migrate between core areas, and mix

together in many locations where there is connectivity (Ringel et al 2014; Nelson and Nelle 2008). Such multiple life history strategies help to maintain the stability and persistence of bull trout populations to environmental changes. Benefits of connected habitat for migratory bull trout include greater growth in the more productive waters of larger streams, lakes, and marine waters; greater fecundity resulting in increased reproductive potential; and dispersing the population across space and time so that spawning streams may be recolonized should local populations suffer a catastrophic loss (Frissell 1999, pp. 861-863; The Montana Bull Trout Scientific Group 1998, p. 13; Rieman and McIntyre 1993, pp. 2-3). In the absence of the migratory bull trout life form, isolated populations cannot be replenished when disturbances make local habitats temporarily unsuitable. Therefore, the range of the species is diminished, and the potential for a greater reproductive contribution from larger size fish with higher fecundity is lost (Rieman and McIntyre 1993, p. 2).

Whitesel et al. (2004, p. 2) noted that although there are multiple resources that contribute to the subject, Spruell et al. (2003, entire) best summarized genetic information on bull trout population structure. Spruell et al. (2003, entire) analyzed 1,847 bull trout from 65 sampling locations, four located in three coastal drainages (Klamath, Queets, and Skagit Rivers), one in the Saskatchewan River drainage (Belly River), and 60 scattered throughout the Columbia River Basin. They concluded that there is a consistent pattern among genetic studies of bull trout, regardless of whether examining allozymes, mitochondrial DNA, or most recently microsatellite loci. Typically, the genetic pattern shows relatively little genetic variation within populations, but substantial divergence among populations. Microsatellite loci analysis supports the existence of at least three major genetically differentiated groups (or evolutionary lineages) of bull trout (Spruell et al. 2003, p. 17). They were characterized as:

i. "Coastal", including the Deschutes River and all of the Columbia River drainage downstream, as well as most coastal streams in Washington, Oregon, and British Columbia. A compelling case also exists that the Klamath Basin represents a unique evolutionary lineage within the coastal group.

ii. "Snake River", which also included the John Day, Umatilla, and Walla Walla rivers. Despite close proximity of the John Day and Deschutes Rivers, a striking level of divergence between bull trout in these two systems was observed.

iii. "Upper Columbia River" which includes the entire basin in Montana and northern Idaho. A tentative assignment was made by Spruell et al. (2003, p. 25) of the Saskatchewan River drainage populations (east of the continental divide), grouping them with the upper Columbia River group.

Spruell et al. (2003, p. 17) noted that within the major assemblages, populations were further subdivided, primarily at the level of major river basins. Taylor et al. (1999, entire) surveyed bull trout populations, primarily from Canada, and found a major divergence between inland and coastal populations. Costello et al. (2003, p. 328) suggested the patterns reflected the existence of two glacial refugia, consistent with the conclusions of Taylor and Costello (2006, pg. 1165-1170), Spruell et al. (2003, p. 26) and the biogeographic analysis of Haas and McPhail (2001, entire). Both Taylor et al. (1999, p. 1166) and Spruell et al. (2003, p. 21) concluded that the Deschutes River represented the most upstream limit of the coastal lineage in the Columbia River Basin.

More recently, the Service identified additional genetic units within the coastal and interior lineages (Ardren et al. 2011, p. 18). Based on a recommendation in the Service's 5-year review of the species' status (U.S. Fish and Wildlife Service 2008, p. 45), the Service reanalyzed the 27 recovery units identified in the 2002 draft bull trout recovery plan (U.S. Fish and Wildlife Service 2002, p. 48) by utilizing, in part, information from previous genetic studies and new information from additional analysis (Ardren et al. 2011, entire). In this examination, the Service applied relevant factors from the joint Service and NMFS Distinct Population Segment (DPS) policy (U.S. Fish and Wildlife Service 1996, entire) and subsequently identified six draft recovery units that contain assemblages of core areas that retain genetic and ecological integrity across the range of bull trout in the coterminous United States. These six draft recovery units were used to inform designation of critical habitat for bull trout by providing a context for deciding what habitats are essential for recovery (U.S. Fish and Wildlife Service 2010, p. 63898). These six recovery units, adopted in the final bull trout recovery plan (U.S. Fish and Wildlife Service 2015) and described further in the RUIPs (U.S. Fish and Wildlife Service 2015a-f) include: Coastal, Klamath, Mid-Columbia, Columbia Headwaters, Saint Mary, and Upper Snake. A number of additional genetic analyses within core areas have been completed to understand uniqueness of local populations (Hawkins and Van Barren 2006, 2007; Small et al. 2009; DeHann and Neibauer 2012).

Population Dynamics

Although bull trout are widely distributed over a large geographic area, they exhibit a patchy distribution, even in pristine habitats (Rieman and McIntyre 1993, p. 4). Increased habitat fragmentation reduces the amount of available habitat and increases isolation from other populations of the same species (Saunders et al. 1991, entire). Burkey (1989, entire) concluded that when species are isolated by fragmented habitats, low rates of population growth are typical in local populations and their probability of extinction is directly related to the degree of isolation and fragmentation. Without sufficient immigration, growth for local populations may be low and probability of extinction high (Burkey 1989, entire; Burkey 1995, entire).

Metapopulation concepts of conservation biology theory have been suggested relative to the distribution and characteristics of bull trout, although empirical evidence is relatively scant (Rieman and McIntyre 1993, p. 15; Dunham and Rieman 1999, entire; Rieman and Dunham 2000, entire). A metapopulation is an interacting network of local populations with varying frequencies of migration and gene flow among them (Meffe and Carroll 1994, pp. 189-190). For inland bull trout, metapopulation theory is likely most applicable at the watershed scale where habitat consists of discrete patches or collections of habitat capable of supporting local populations; local populations are for the most part independent and represent discrete reproductive units; and long-term, low-rate dispersal patterns among component populations influences the persistence of at least some of the local populations (Rieman and Dunham 2000, entire). Ideally, multiple local populations distributed throughout a watershed provide a mechanism for spreading risk because the simultaneous loss of all local populations is unlikely. However, habitat alteration, primarily through the construction of impoundments, dams, and water diversions has fragmented habitats, eliminated migratory corridors, and in many cases isolated bull trout in the headwaters of tributaries (Rieman and Clayton 1997, pp. 10-12; Dunham and Rieman 1999, p. 645; Spruell et al. 1999, pp. 118-120; Rieman and Dunham 2000, p. 55).

Human-induced factors as well as natural factors affecting bull trout distribution have likely limited the expression of the metapopulation concept for bull trout to patches of habitat within the overall distribution of the species (Dunham and Rieman 1999, entire). However, despite the theoretical fit, the relatively recent and brief time period during which bull trout investigations have taken place does not provide certainty as to whether a metapopulation dynamic is occurring (e.g., a balance between local extirpations and recolonizations) across the range of the bull trout or whether the persistence of bull trout in large or closely interconnected habitat patches (Dunham and Rieman 1999, entire) is simply reflective of a general deterministic trend towards extinction of the species where the larger or interconnected patches are relics of historically wider distribution (Rieman and Dunham 2000, pp. 56-57). Research does, however, provide genetic evidence for the presence of a metapopulation process for bull trout, at least in the Boise River Basin of Idaho (Whiteley et al. 2003, entire), while Whitesel et al. identifies that bull trout fit the metapopulation theory in several ways (Whitesel et al, 2004, p. 18-21).

Habitat Characteristics

The habitat requirements of bull trout are often generally expressed as the four "Cs": cold, clean, complex, and connected habitat. Cold stream temperatures, clean water quality that is relatively free of sediment and contaminants, complex channel characteristics (including abundant large wood and undercut banks), and large patches of such habitat that are well connected by unobstructed migratory pathways are all needed to promote conservation of bull trout throughout all hierarchical levels.

Bull trout have more specific habitat requirements than most other salmonids (Rieman and McIntyre 1993, p. 4). Habitat components that influence bull trout distribution and abundance include water temperature, cover, channel form and stability, valley form, spawning and rearing substrate, and migratory corridors (Fraley and Shepard 1989, entire; Goetz 1989, pp. 23, 25; Hoelscher and Bjornn 1989, pp. 19, 25; Howell and Buchanan 1992, pp. 30, 32; Pratt 1992, entire; Rich 1996, p. 17; Rieman and McIntyre 1993, pp. 4-6; Rieman and McIntyre 1995, entire; Sedell and Everest 1991, entire; Watson and Hillman 1997, entire). Watson and Hillman (1997, pp. 247-250) concluded that watersheds must have specific physical characteristics to provide the habitat requirements necessary for bull trout to successfully spawn and rear and that these specific characteristics are not necessarily present throughout these watersheds. Because bull trout exhibit a patchy distribution, even in pristine habitats (Rieman and McIntyre 1993, pp. 4-6), bull trout should not be expected to simultaneously occupy all available habitats.

Migratory corridors link seasonal habitats for all bull trout life histories. The ability to migrate is important to the persistence of bull trout (Rieman and McIntyre 1993, p. 2). Migrations facilitate gene flow among local populations when individuals from different local populations interbreed or stray to nonnatal streams. Local populations that are extirpated by catastrophic events may also become reestablished by bull trout migrants. However, it is important to note that the genetic structuring of bull trout indicates there is limited gene flow among bull trout populations, which may encourage local adaptation within individual populations, and that reestablishment of extirpated populations may take a long time (Rieman and McIntyre 1993, p. 2; Spruell et al. 1999, entire). Migration also allows bull trout to access more abundant or larger prey, which facilitates growth and reproduction. Additional benefits of migration and its relationship to foraging are discussed below under "Diet."

Cold water temperatures play an important role in determining bull trout habitat quality, as these fish are primarily found in colder streams, and spawning habitats are generally characterized by temperatures that drop below 9 °C in the fall (Fraley and Shepard 1989, p. 137; Pratt 1992, p. 5; Rieman and McIntyre 1993, p. 2).

Thermal requirements for bull trout appear to differ at different life stages. Spawning areas are often associated with cold-water springs, groundwater infiltration, and the coldest streams in a given watershed (Pratt 1992, pp 7-8; Rieman and McIntyre 1993, p. 7). Optimum incubation temperatures for bull trout eggs range from 2 °C to 6 °C whereas optimum water temperatures for rearing range from about 6 °C to 10 °C (Buchanan and Gregory 1997, p. 4; Goetz 1989, p. 22). In Granite Creek, Idaho, Bonneau and Scarnecchia (1996, entire) observed that juvenile bull trout selected the coldest water available in a plunge pool, 8 °C to 9 °C, within a temperature gradient of 8 °C to 15 °C. In a landscape study relating bull trout distribution to maximum water temperatures, Dunham et al. (2003, p. 900) found that the probability of juvenile bull trout occurrence does not become high (i.e., greater than 0.75) until maximum temperatures decline to 11 °C to 12 °C.

Although bull trout are found primarily in cold streams, occasionally these fish are found in larger, warmer river systems throughout the Columbia River basin (Buchanan and Gregory 1997, p. 2; Fraley and Shepard 1989, pp. 133, 135; Rieman and McIntyre 1993, pp. 3-4; Rieman and McIntyre 1995, p. 287). Availability and proximity of cold water patches and food productivity can influence bull trout ability to survive in warmer rivers (Myrick 2002, pp. 6 and 13).

All life history stages of bull trout are associated with complex forms of cover, including large woody debris, undercut banks, boulders, and pools (Fraley and Shepard 1989, p. 137; Goetz 1989, p. 19; Hoelscher and Bjornn 1989, p. 38; Pratt 1992, entire; Rich 1996, pp. 4-5; Sedell and Everest 1991, entire; Sexauer and James 1997, entire; Thomas 1992, pp. 4-6; Watson and Hillman 1997, p. 238). Maintaining bull trout habitat requires stable and complex stream channels and stable stream flows (Rieman and McIntyre 1993, pp. 5-6). Juvenile and adult bull trout frequently inhabit side channels, stream margins, and pools with suitable cover (Sexauer and James 1997, p. 364). These areas are sensitive to activities that directly or indirectly affect stream channel stability and alter natural flow patterns. For example, altered stream flow in the fall may disrupt bull trout during the spawning period, and channel instability may decrease survival of eggs and young juveniles in the gravel from winter through spring (Fraley and Shepard 1989, p. 141; Pratt 1992, p. 6; Pratt and Huston 1993, p. 70). Pratt (1992, p. 6) indicated that increases in fine sediment reduce egg survival and emergence.

Diet

Bull trout are opportunistic feeders, with food habits primarily a function of size and life-history strategy. Fish growth depends on the quantity and quality of food that is eaten, and as fish grow their foraging strategy changes as their food changes, in quantity, size, or other characteristics (Quinn 2005, pp. 195-200). Resident and juvenile migratory bull trout prey on terrestrial and aquatic insects, macrozooplankton, and small fish (Boag 1987, p. 58; Donald and Alger 1993, pp. 242-243; Goetz 1989, pp. 33-34). Subadult and adult migratory bull trout generally feed on various fish species (Donald and Alger 1993, pp. 241-243; Fraley and Shepard 1989, pp. 135, 138; Leathe and Graham 1982, pp. 13, 50-56). Bull trout of all sizes other than fry have been found to eat fish half their length (Beauchamp and VanTassell 2001, p. 204). In nearshore marine areas of western Washington, bull trout feed on Pacific herring (Clupea pallasi), Pacific

sand lance (Ammodytes hexapterus), and surf smelt (Hypomesus pretiosus) (Goetz et al. 2004, p. 105; Washington Department of Fish and Wildlife et al. 1997, p. 23).

Bull trout migration and life history strategies are closely related to their feeding and foraging strategies and their environment. Migration allows bull trout to access optimal foraging areas and exploit a wider variety of prey resources both within and between core areas. Connectivity between the spawning, rearing, overwintering, and forage areas maintains this diversity. There have been recent studies documenting movement patterns in the Columbia River basin that document long distance migrations (Borrows et al 2016, entire; Schaller et al 2014, entire; U.S. Fish and Wildlife Service 2016, entire). For example, a data report documented a juvenile bull trout from the Entiat made over a 200-mile migration between spawning grounds in the Entiat River to foraging and overwintering areas in Columbia and Yakima River near Prosser Dam (PIT Tag Information System 2015, Tag Code 3D9.1C2CCD42DD). As well, in the Skagit River system, anadromous bull trout make migrations as long as 121 miles between marine foraging areas in Puget Sound and headwater spawning grounds, foraging on salmon eggs and juvenile salmon along their migration route (Washington Department of Fish and Wildlife et al. 1997, p. 25). Anadromous bull trout also use marine waters as migration corridors to reach seasonal habitats in non-natal watersheds to forage and possibly overwinter (Brenkman and Corbett 2005, pp. 1078-1079; Goetz et al. 2004, entire).

Conservation Needs

The 2015 recovery plan for bull trout established the primary strategy for recovery of bull trout in the coterminous United States: (1) conserve bull trout so that they are geographically widespread across representative habitats and demographically stable in six recovery units; (2) effectively manage and ameliorate the primary threats in each of six recovery units at the core area scale such that bull trout are not likely to become endangered in the foreseeable future; (3) build upon the numerous and ongoing conservation actions implemented on behalf of bull trout since their listing in 1999, and improve our understanding of how various threat factors potentially affect the species; (4) use that information to work cooperatively with our partners to design, fund, prioritize, and implement effective conservation actions in those areas that offer the greatest long-term benefit to sustain bull trout and where recovery can be achieved; and (5) apply adaptive management principles to implementing the bull trout recovery program to account for new information (U.S. Fish and Wildlife Service 2015, p. 24.).

Information presented in prior draft recovery plans published in 2002 and 2004 (U.S. Fish and Wildlife Service 2002, 2004a, 2004b) provided information that identified the original list of threats and recovery actions across the range of the species and provided a framework for implementing numerous recovery actions by our partner agencies, local working groups, and others with an interest in bull trout conservation. Many recovery actions were completed prior to finalizing the recovery plan in 2015.

The 2015 recovery plan (U.S. Fish and Wildlife Service 2015, entire) integrates new information collected since the 1999 listing regarding bull trout life history, distribution, demographics, conservation successes, etc., and integrates and updates previous bull trout recovery planning efforts across the range of the coterminous bull trout listing

The Service has developed a recovery approach that: (1) focuses on the identification of and effective management of known and remaining threat factors to bull trout in each core area; (2)

acknowledges that some extant bull trout core area habitats will likely change (and may be lost) over time; and (3) identifies and focuses recovery actions in those areas where success is likely to meet our goal of ensuring the certainty of conservation of genetic diversity, life history features, and broad geographical representation of remaining bull trout populations so that the protections of the Act are no longer necessary (U.S. Fish and Wildlife Service 2015, p. 45-46).

To implement the recovery strategy, the 2015 recovery plan establishes the recovery of bull trout will entail effectively managing threats to ensure the long-term persistence of populations and their habitats, ensuring the security of multiple interacting groups of bull trout, and providing habitat conditions and access to them that allow for the expression of various life history forms within each of six recovery units (U.S. Fish and Wildlife Service 2015, p. 50-51)." The recovery plan defines four categories of recovery actions that, when implemented and effective, should:

> 1. Protect, restore, and maintain suitable habitat conditions for bull trout;
>
> 2. Minimize demographic threats to bull trout by restoring connectivity or populations where appropriate to promote diverse life history strategies and conserve genetic diversity;
>
> 3. Prevent and reduce negative effects of nonnative fishes and other nonnative taxa on bull trout; and
>
> 4. result in actively working with partners to conduct research and monitoring to implement and evaluate bull trout recovery activities, consistent with an adaptive management approach using feedback from implemented, site-specific recovery tasks, and considering the effects of climate change (U.S. Fish and Wildlife Service 2015, p. 50-51).

Bull trout recovery is based on a geographical hierarchical approach. Bull trout are listed as a single DPS within the five-state area of the coterminous United States. The single DPS is subdivided into six biological-based recovery units: (1) Coastal Recovery Unit; (2) Klamath Recovery Unit; (3) Mid-Columbia Recovery Unit; (4) Upper Snake Recovery Unit; (5) Columbia Headwaters Recovery Unit; and (6) Saint Mary Recovery Unit (U.S. Fish and Wildlife Service 2015, p. 23). A viable recovery unit should demonstrate that the three primary principles of biodiversity have been met: representation (conserving the genetic makeup of the species); resiliency (ensuring that each population is sufficiently large to withstand stochastic events); and redundancy (ensuring a sufficient number of populations to withstand catastrophic events) (U.S. Fish and Wildlife Service 2015, p. 33).

Each of the six recovery units contain multiple bull trout recovery areas which are non-overlapping watershed-based polygons, and each core area includes one or more local population. Currently there are 109 occupied core areas, which comprise 611 local populations (U.S. Fish and Wildlife Service 2015, p. 3, Appendix F). There are also six core areas where bull trout historically occurred but are now extirpated, and one research needs area where bull trout were known to occur historically, but their current presence and use of the area are uncertain (U.S. Fish and Wildlife Service 2015, p. 3, Appendix F). Core areas can be further described as complex or simple (U.S. Fish and Wildlife Service 2015, p. 3-4). Complex core areas contain multiple local bull trout populations, are found in large watersheds, have multiple

life history forms, and have migratory connectivity between spawning and rearing habitat and foraging, migration, and overwintering habitats (FMO). Simple core areas are those that contain one bull trout local population. Simple core areas are small in scope, isolated from other core areas by natural barriers, and may contain unique genetic or life history adaptations.

A core area is a combination of core habitat (i.e., habitat that could supply all elements for the long-term security of bull trout) and a core population (a group of one or more local bull trout populations that exist within core habitat) and constitutes the basic unit on which to gauge recovery within a recovery unit. Core areas require both habitat and bull trout to function, and the number (replication) and characteristics of local populations inhabiting a core area provide a relative indication of the core area's likelihood to persist. A core area represents the closest approximation of a biologically functioning unit for bull trout. Core areas are presumed to reflect the metapopulation structure of bull trout.

A local population is a group of bull trout that spawn within a particular stream or portion of a stream system (U.S. Fish and Wildlife Service 2015, p. 73). A local population is considered to be the smallest group of fish that is known to represent an interacting reproductive unit. For most waters where specific information is lacking, a local population may be represented by a single headwater tributary or complex of headwater tributaries. Gene flow may occur between local populations (e.g., those within a core population), but is assumed to be infrequent compared with that among individuals within a local population.

Population Units

The final recovery plan (U.S. Fish and Wildlife Service 2015) designates six bull trout recovery units as described above. These units replace the 5 interim recovery units previously identified (U.S. Fish and Wildlife Service 1999). The Service will address the conservation of these final recovery units in our section 7(a)(2) analysis for proposed Federal actions. The recovery plan (U.S. Fish and Wildlife Service 2015), identified threats and factors affecting the bull trout within these units. A detailed description of recovery implementation for each recovery unit is provided in separate recovery unit implementation plans (RUIPs) (U.S. Fish and Wildlife Service 2015a-f), which identify recovery actions and conservation recommendations needed for each core area, forage/ migration/ overwinter (FMO) areas, historical core areas, and research needs areas. Each of the following recovery units (below) is necessary to maintain the bull trout's numbers and distribution, as well as its genetic and phenotypic diversity, all of which are important to ensure the species' resilience to changing environmental conditions. For more details on Federal, State, and tribal conservation actions in this unit see the actions since listing, contemporaneous actions, and environmental baseline discussions below.

Coastal Recovery Unit

The Coastal RUIP describes the threats to bull trout and the site-specific management actions necessary for recovery of the species within the unit (U.S. Fish and Wildlife Service 2015a, entire). The Coastal Recovery Unit is divided into three Geographic Regions: Puget Sound, Olympic Peninsula, and the Lower Columbia River regions. This recovery unit contains 20 core areas comprising 84 local populations and a single potential local population in the historic Clackamas River core area where bull trout had been extirpated and were reintroduced in 2011. This recovery unit also has four historically occupied core areas that could be re-established (U.S. Fish and Wildlife Service 2015, p. 47; U.S. Fish and Wildlife Service 2015a, p. A-2).

Although population strongholds do exist across the three regions, populations in the Puget Sound region generally have better demographic status while the Lower Columbia River region exhibits the least robust demography (U.S. Fish and Wildlife Service 2015a, p. A-6). Puget Sound and the Olympic Peninsula currently support the only anadromous local populations of bull trout. This recovery unit also contains ten shared FMO habitats which allow for the continued natural population dynamics in which the core areas have evolved (U.S. Fish and Wildlife Service 2015a, p. A-5). There are four core areas within the Coastal Recovery Unit that have been identified as current population strongholds: Lower Skagit, Upper Skagit, Quinault River, and Lower Deschutes River (U.S. Fish and Wildlife Service 2015, p.79; U.S. Fish and Wildlife Service 2015a, p. A-3). These are the most stable and abundant bull trout populations in the recovery unit. The Puget Sound region supports at least two core areas containing a natural adfluvial life history.

The demographic status of the Puget Sound populations is better in northern areas. Barriers to migration in the Puget Sound region are few, and significant amounts of headwater habitat occur in protected areas (U.S. Fish and Wildlife Service 2015a, p. A-7). The current condition of the bull trout in this recovery unit is attributed to the adverse effects of climate change, loss of functioning estuarine and nearshore marine habitats, development and related impacts (e.g., flood control, floodplain disconnection, bank armoring, channel straightening, loss of instream habitat complexity), agriculture (e.g., diking, water control structures, draining of wetlands, channelization, and the removal of riparian vegetation, livestock grazing), fish passage (e.g., dams, culverts, instream flows) residential development, urbanization, forest management practices (e.g., timber harvest and associated road building activities), connectivity impairment, mining, and the introduction of non-native species (U.S. Fish and Wildlife Service 2015a, p. A-1 – A-25). Conservation measures or recovery actions implemented or ongoing include relicensing of major hydropower facilities that have provided upstream and downstream fish passage or complete removal of dams, land acquisition to conserve bull trout habitat, floodplain restoration, culvert removal, riparian revegetation, levee setbacks, road removal, and projects to protect and restore important nearshore marine habitats (U.S. Fish and Wildlife Service 2015a, p. A-33 – A-34).

Klamath Recovery Unit

The Klamath recovery unit implementation plan describes the threats to bull trout and the site-specific management actions necessary for recovery of the species within the unit (U.S. Fish and Wildlife Service 2015b, entire). The Klamath Recovery Unit is located in southern Oregon and northwestern California. The Klamath Recovery Unit is the most significantly imperiled recovery unit, having experienced considerable extirpation and geographic contraction of local populations and declining demographic condition, and natural re-colonization is constrained by dispersal barriers and presence of nonnative brook trout (U.S. Fish and Wildlife Service 2015, p. 39). This recovery unit currently contains three core areas and eight local populations (U.S. Fish and Wildlife Service 2015, p. 47; U.S. Fish and Wildlife Service 2015b, p. B-1). Nine historic local populations of bull trout have become extirpated (U.S. Fish and Wildlife Service 2015b, p. B-1). All three core areas have been isolated from other bull trout populations for the past 10,000 years (U.S. Fish and Wildlife Service 2015b, p. B-3). The current condition of the bull trout in this recovery unit is attributed to the adverse effects of climate change, habitat degradation and fragmentation, past and present land use practices, agricultural water diversions, nonnative species, and past fisheries management practices (U.S. Fish and Wildlife Service

2015b, p. B-13 – B-14). Conservation measures or recovery actions implemented or ongoing include removal of nonnative fish (e.g., brook trout, brown trout, and hybrids), acquiring water rights for instream flows, replacing diversion structures, installing fish screens, constructing bypass channels, installing riparian fencing, culver replacement, and habitat restoration (U.S. Fish and Wildlife Service 2015b, p. B-10 – B-11).

Mid-Columbia Recovery Unit

The Mid-Columbia RUIP describes the threats to bull trout and the site-specific management actions necessary for recovery of the species within the unit (U.S. Fish and Wildlife Service 2015c, entire). The Mid-Columbia Recovery Unit is located within eastern Washington, eastern Oregon, and portions of central Idaho. The Mid-Columbia Recovery Unit is divided into four geographic regions: Lower Mid-Columbia, Upper Mid-Columbia, Lower Snake, and Mid-Snake Geographic regions. This recovery unit contains 24 occupied core areas comprising 142 local populations, two historically occupied core areas, one research needs area, and seven FMO habitats (U.S. Fish and Wildlife Service 2015, p. 47; U.S. Fish and Wildlife Service 2015c, p. C-1 – C-4). The current condition of the bull trout in this recovery unit is attributed to the adverse effects of climate change, agricultural practices (e.g. irrigation, water withdrawals, livestock grazing), fish passage (e.g. dams, culverts), nonnative species, forest management practices, and mining (U.S. Fish and Wildlife Service 2015c, p. C-9 – C-34). Conservation measures or recovery actions implemented or ongoing include road removal, channel restoration, mine reclamation, improved grazing management, removal of fish barriers, and instream flow requirements (U.S. Fish and Wildlife Service 2015c, C-37 – C-40).

Columbia Headwaters Recovery Unit

The Columbia headwaters RUIP describes the threats to bull trout and the site-specific management actions necessary for recovery of the species within the unit (U.S. Fish and Wildlife Service 2015d). The Columbia Headwaters Recovery Unit is located in western Montana, northern Idaho, and the northeastern corner of Washington. The Columbia Headwaters Recovery Unit is divided into five geographic regions: Upper Clark Fork, Lower Clark Fork, Flathead, Kootenai, and Coeur d'Alene geographic regions (U.S. Fish and Wildlife Service 2015d, p. D-2 – D-4). This recovery unit contains 35 bull trout core areas; 15 of which are complex core areas as they represent larger interconnected habitats and 20 simple core areas as they are isolated headwater lakes with single local populations. The 20 simple core areas are each represented by a single local population, many of which may have persisted for thousands of years despite small populations and isolated existence (U.S. Fish and Wildlife Service 2015d, p. D-1). Fish passage improvements within the recovery unit have reconnected some previously fragmented habitats (U.S. Fish and Wildlife Service 2015d, p. D-42), while others remain fragmented. Unlike other recovery units in Washington, Idaho and Oregon, the Columbia Headwaters Recovery Unit does not have any anadromous fish overlap (U.S. Fish and Wildlife Service 2015d, p. D-42). Therefore, bull trout within the Columbia Headwaters Recovery Unit do not benefit from the recovery actions for salmon (U.S. Fish and Wildlife Service 2015d, p. D-42). The current condition of the bull trout in this recovery unit is attributed to the adverse effects of climate change, mostly historical mining and contamination by heavy metals, expanding populations of nonnative fish predators and competitors, modified instream flows, migratory barriers (e.g., dams), habitat fragmentation, forest practices (e.g., logging, roads), agriculture practices (e.g. irrigation, livestock grazing), and residential development (U.S. Fish and Wildlife Service 2015d, p. D-10 – D-25). Conservation measures or recovery actions

implemented or ongoing include habitat improvement, fish passage, and removal of nonnative species (U.S. Fish and Wildlife Service 2015d, p. D-42 – D-43).

Upper Snake Recovery Unit
The Upper Snake RUIP describes the threats to bull trout and the site-specific management actions necessary for recovery of the species within the unit (U.S. Fish and Wildlife Service 2015e, entire). The Upper Snake Recovery Unit is located in central Idaho, northern Nevada, and eastern Oregon. The Upper Snake Recovery Unit is divided into seven geographic regions: Salmon River, Boise River, Payette River, Little Lost River, Malheur River, Jarbidge River, and Weiser River. This recovery unit contains 22 core areas and 207 local populations, with over 70 percent being present in the Salmon River Region (U.S. Fish and Wildlife Service 2015, p. 47; U.S. Fish and Wildlife Service 2015e, p. E-1 – E-2). The current condition of the bull trout in this recovery unit is attributed to the adverse effects of climate change, dams, mining, forest management practices, nonnative species, and agriculture (e.g., water diversions, grazing) (U.S. Fish and Wildlife Service 2015e, p. E-15 – E-18). Conservation measures or recovery actions implemented or ongoing include instream habitat restoration, instream flow requirements, screening of irrigation diversions, and riparian restoration (U.S. Fish and Wildlife Service 2015e, p. E-19 – E-20).

St. Mary Recovery Unit
The St. Mary RUIP describes the threats to bull trout and the site-specific management actions necessary for recovery of the species within the unit (U.S. Fish and Wildlife Service 2015f). The Saint Mary Recovery Unit is located in Montana but is heavily linked to downstream resources in southern Alberta, Canada. Most of the Saskatchewan River watershed which the St. Mary flows into is located in Canada. The United States portion includes headwater spawning and rearing habitat and the upper reaches of FMO habitat. This recovery unit contains four core areas, and seven local populations (U.S. Fish and Wildlife Service 2015f, p. F-1) in the U.S. Headwaters. The current condition of the bull trout in this recovery unit is attributed primarily to the outdated design and operations of the Saint Mary Diversion operated by the Bureau of Reclamation (e.g., entrainment, fish passage, instream flows), and, to a lesser extent habitat impacts from development and nonnative species (U.S. Fish and Wildlife Service 2015f, p. F-7 – F-8). The primary issue precluding bull trout recovery in this recovery unit relates to impacts of water diversions, specifically at the Bureau of Reclamations Milk River Project (U.S. Fish and Wildlife Service 2015f, p. F-5). Conservation measures or recovery actions implemented or ongoing are not identified in the St. Mary RUIP; however, the Service is conducting interagency and tribal coordination to accomplish conservation goals for the bull trout (U.S. Fish and Wildlife Service 2015f, p. F-9)

Federal, State and Tribal Actions Since Listing
Since our listing of bull trout in 1999, numerous conservation measures that contribute to the conservation and recovery of bull trout have been and continue to be implemented across its range in the coterminous United States. These measures are being undertaken by a wide variety of local and regional partnerships, including State fish and game agencies, State and Federal land management and water resource agencies, Tribal governments, power companies, watershed working groups, water users, ranchers, and landowners.

In many cases, these bull trout conservation measures incorporate or are closely interrelated with work being done for recovery of salmon and steelhead, which are limited by many of the same

threats. These include removal of migration barriers (culvert removal or redesign at stream crossings, fish ladder construction, dam removal, etc.) to allow access to spawning or FMO habitat; screening of water diversions to prevent entrainment into unsuitable habitat in irrigation systems; habitat improvement (riparian revegetation or fencing, placement of coarse woody debris in streams) to improve spawning suitability, habitat complexity, and water temperature; instream flow enhancement to allow effective passage at appropriate seasonal times and prevent channel dewatering; and water quality improvement (decommissioning roads, implementing best management practices for grazing or logging, setting pesticide use guidelines) to minimize impacts from sedimentation, agricultural chemicals, or warm temperatures.

At sites that are vulnerable to development, protection of land through fee title acquisition or conservation easements is important to prevent adverse impacts or allow conservation actions to be implemented. In several bull trout core areas, it is necessary to continue ongoing fisheries management efforts to suppress the effects of non-native fish competition, predation, or hybridization; particularly brown trout, brook trout, lake trout, and northern pike (Fredenberg et al. 2007; DeHaan et al. 2010, entire; DeHaan and Godfrey 2009, entire; Fredericks and Dux 2014; Rosenthal and Fredenberg 2017). A more comprehensive overview of conservation successes from 1999-2013, described for each recovery unit, is found in the Summary of Bull Trout Conservation Successes and Actions since 1999 (Available at: (http://www.fws.gov/pacific/ecoservices/endangered/recovery/documents/Service_2013_summary_of_conservation_successes.pdf).

Projects that have undergone Act section 7 consultation have occurred throughout the range of bull trout. Singly or in aggregate, these projects could affect the species' status. The Service has conducted periodic reviews of prior Federal "consulted-on" actions. A detailed discussion of consulted-on effects in the proposed action area is provided in the environmental baseline section below.

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APPENDIX B: STATUS OF CRITICAL HABITAT – BULL TROUT

Legal Status

Current Designation

The Service published a final critical habitat designation for the coterminous United States population of the bull trout on October 18, 2010 (70 FR 63898); the rule became effective on November 17, 2010. Critical habitat is defined as the specific geographic area(s) that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection. Critical habitat may include an area that is not currently occupied by the species but that will be needed for its recovery. Designated critical CHUs for the bull trout are described in Appendix A, Figure 1. A justification document describes occupancy and the rationale for why these habitat areas are essential for the conservation of bull trout was developed to support the rule and is available on our website (https://www.fws.gov/pacific/bulltrout/crithab/Jusitfication%20Docs.html).

The scope of the designation involved the species' coterminous range. Rangewide, the Service designated reservoirs/lakes and stream/shoreline miles as bull trout critical habitat (Table B-1). Designated bull trout critical habitat is of two primary use types: 1) spawning and rearing, and 2) foraging, migration, and overwintering (FMO).

Table B-1. Stream/shoreline distance and reservoir/lake area designated as bull trout critical habitat by state.

State	Stream/Shoreline Miles	Stream/Shoreline Kilometers	Reservoir /Lake Acres	Reservoir/ Lake Hectares
Idaho	8,771.6	14,116.5	170,217.5	68,884.9
Montana	3,056.5	4,918.9	221,470.7	89,626.4
Nevada	71.8	115.6	-	-
Oregon	2,835.9	4,563.9	30,255.5	12,244.0
Oregon/Idaho	107.7	173.3	-	-
Washington	3,793.3	6,104.8	66,308.1	26,834.0
Washington (marine)	753.8	1,213.2	-	-
Washington/Idaho	37.2	59.9	-	-
Washington/Oregon	301.3	484.8	-	-
Total	19,729.0	31,750.8	488,251.7	197,589.2

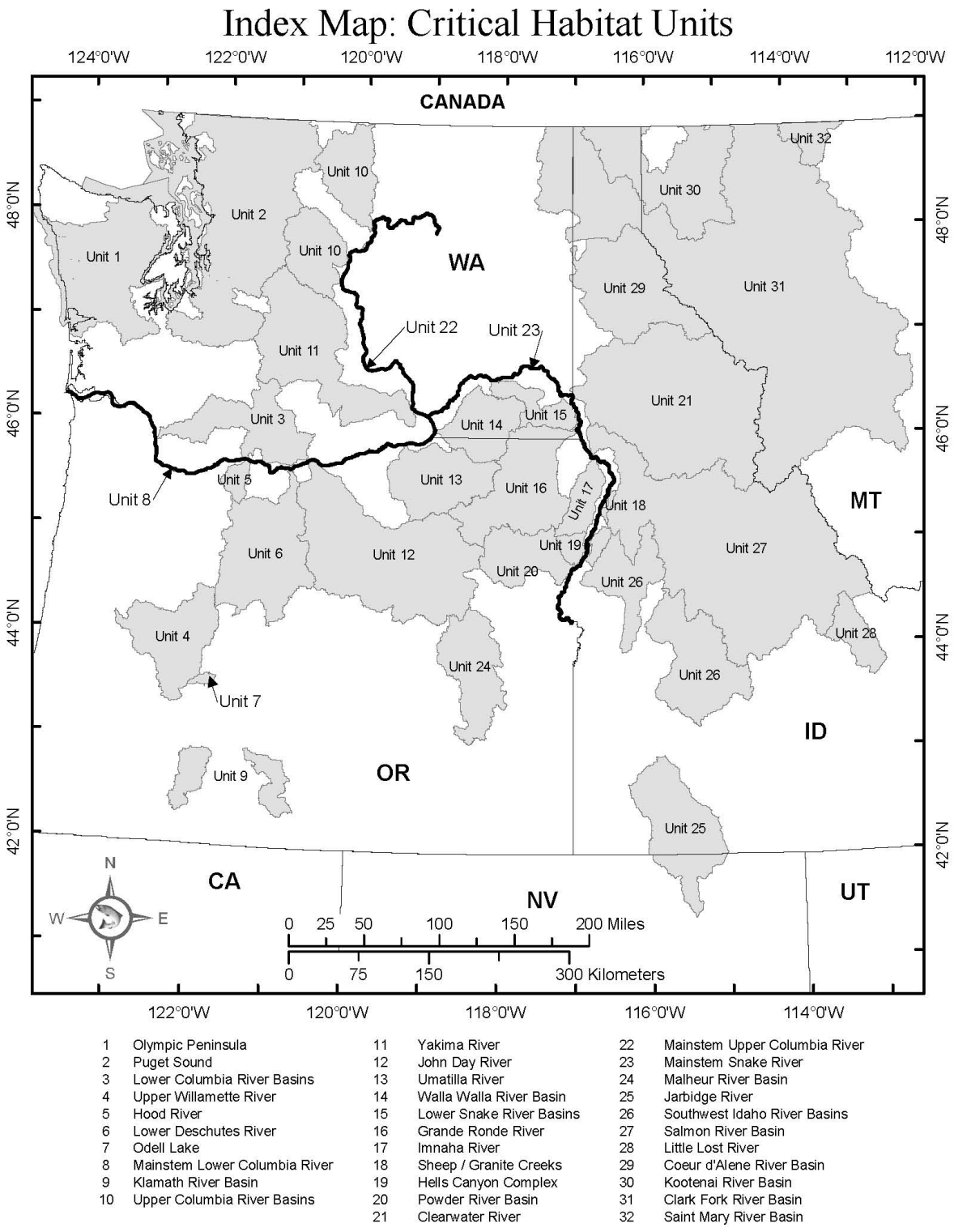

Figure 1. Index map of bull trout designated critical habitat units.

This rule also identifies and designates as critical habitat approximately 1,323.7 km (822.5 miles) of streams/shorelines and 6,758.8 ha (16,701.3 acres) of lakes/reservoirs of unoccupied habitat to address bull trout conservation needs in specific geographic areas in several areas not occupied at the time of listing. These unoccupied areas were determined by the Service to be essential for restoring functioning migratory bull trout populations based on currently available scientific information. These unoccupied areas often include lower main stem river environments that can provide seasonally important migration habitat for bull trout. This type of habitat is essential in areas where bull trout habitat and population loss over time necessitates reestablishing bull trout in currently unoccupied habitat areas to achieve recovery.

The final rule continues to exclude some critical habitat segments based on a careful balancing of the benefits of inclusion versus the benefits of exclusion. Critical habitat does not include: 1) waters adjacent to non-Federal lands covered by legally operative incidental take permits for habitat conservation plans (HCPs) issued under section 10(a)(1)(B) of the Endangered Species Act of 1973, as amended (Act), in which bull trout is a covered species on or before the publication of this final rule; 2) waters within or adjacent to Tribal lands subject to certain commitments to conserve bull trout or a conservation program that provides aquatic resource protection and restoration through collaborative efforts, and where the Tribes indicated that inclusion would impair their relationship with the Service; or 3) waters where impacts to national security have been identified (75 FR 63898). Excluded areas are approximately 10 percent of the stream/shoreline miles and 4 percent of the lakes and reservoir acreage of designated critical habitat. Each excluded area is identified in the relevant CHU text, as identified in paragraphs (e)(8) through (e)(41) of the final rule. Fewer than 2,000 stream miles and 20,000 acres of lake and reservoir surface area were excluded from the designation of critical habitat. It is important to note that the exclusion of waterbodies from designated critical habitat does not negate or diminish their importance for bull trout conservation, nor reduce authorities that protect the species under the Act. Because exclusions reflect the often-complex pattern of land ownership, designated critical habitat is often fragmented and interspersed with excluded stream segments.

Conservation Role and Description of Critical Habitat

The conservation role of bull trout critical habitat is to support viable core area populations (75 FR 63898:63943 [October 18, 2010]). The core areas reflect the metapopulation structure of bull trout and are the closest approximation of a biologically functioning unit for the purposes of recovery planning and risk analyses. CHUs generally encompass one or more core areas and may include FMO areas, outside of core areas, that are important to the survival and recovery of bull trout.

As shown in Figure 1, thirty-two CHUs within the geographical area occupied by the species at the time of listing are designated under the final critical habitat rule. Twenty-nine of the CHUs contain all of the physical or biological features identified in this final rule and support multiple life-history requirements. Three of the mainstem river units in the Columbia and Snake River basins contain most of the physical or biological features necessary to support the bull trout's particular use of that habitat, other than those physical biological features associated with Primary Constituent Elements (PCEs) 5 and 6, which relate to breeding habitat.

The primary function of individual CHUs is to maintain and support core areas, which 1) contain bull trout populations with the demographic characteristics needed to ensure their persistence and contain the habitat needed to sustain those characteristics (Rieman and McIntyre 1993, p. 19); 2) provide for persistence of strong local populations, in part, by providing habitat conditions that encourage movement of migratory fish (The Montana Bull Trout Scientific Group 1998, pp. 48-49; Rieman and McIntyre 1993, pp. 22-23); 3) are large enough to incorporate genetic and phenotypic diversity, but small enough to ensure connectivity between populations (Hard 1995, pp. 314-315; Healey and Prince 1995, p. 182; The Montana Bull Trout Scientific Group 1998, pp. 48-49; Rieman and McIntyre 1993, pp. 22-23); and 4) are distributed throughout the historic range of the species to preserve both genetic and phenotypic adaptations (Hard 1995, pp. 321-322; The Montana Bull Trout Scientific Group 1998, pp. 13-16; Rieman and Allendorf 2001, p. 763; Rieman and McIntyre 1993, p. 23).

The Olympic Peninsula and Puget Sound CHUs are essential to the conservation of amphidromous bull trout, which are unique to the Coastal-Puget Sound population segment. These CHUs contain marine nearshore and freshwater habitats, outside of core areas, that are used by bull trout from one or more core areas. These habitats, outside of core areas, contain PCEs that are critical to adult and subadult foraging, overwintering, and migration.

Primary Constituent Elements for Bull Trout Critical Habitat

Within the designated critical habitat areas, the PCEs for bull trout are those habitat components that are essential for the primary biological needs of foraging, reproducing, rearing of young, dispersal, genetic exchange, or sheltering. Based on our current knowledge of the life history, biology, and ecology of the bull trout and the characteristics of the habitat necessary to sustain its essential life-history functions, we determined in our final designation that the following PCEs are essential for the conservation of bull trout.

1. Springs, seeps, groundwater sources, and subsurface water connectivity (hyporheic flows) to contribute to water quality and quantity and provide thermal refugia.
2. Migration habitats with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and freshwater and marine foraging habitats, including but not limited to permanent, partial, intermittent, or seasonal barriers.
3. An abundant food base, including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.
4. Complex river, stream, lake, reservoir, and marine shoreline aquatic environments, and processes that establish and maintain these aquatic environments, with features such as large wood, side channels, pools, undercut banks and unembedded substrates, to provide a variety of depths, gradients, velocities, and structure.
5. Water temperatures ranging from 2 °C to 15 °C (36 °F to 59 °F), with adequate thermal refugia available for temperatures that exceed the upper end of this range. Specific temperatures within this range will depend on bull trout life-history stage and form; geography; elevation; diurnal and seasonal variation; shading, such as that provided by riparian habitat; streamflow; and local groundwater influence.
6. In spawning and rearing areas, substrate of sufficient amount, size, and composition to ensure success of egg and embryo overwinter survival, fry emergence, and young-of-the-year and juvenile survival. A minimal amount of fine sediment, generally ranging in size

from silt to coarse sand, embedded in larger substrates, is characteristic of these conditions. The size and amounts of fine sediment suitable to bull trout will likely vary from system to system.

7. A natural hydrograph, including peak, high, low, and base flows within historic and seasonal ranges or, if flows are controlled, minimal flow departure from a natural hydrograph.
8. Sufficient water quality and quantity such that normal reproduction, growth, and survival are not inhibited.
9. Sufficiently low levels of occurrence of non-native predatory (e.g., lake trout, walleye, northern pike, smallmouth bass); interbreeding (e.g., brook trout); or competing (e.g., brown trout) species that, if present, are adequately temporally and spatially isolated from bull trout.

PCE 9 addresses the presence of nonnative predatory or competitive fish species. Although this PCE applies to both the freshwater and marine environments, currently no non-native fish species are of concern in the marine environment, though this could change in the future.

Note that only PCEs 2, 3, 4, 5, and 8 apply to marine nearshore waters identified as critical habitat. Also, lakes and reservoirs within the CHUs also contain most of the physical or biological features necessary to support bull trout, with the exception of those associated with PCEs 1 and 6. Additionally, all except PCE 6 apply to FMO habitat designated as critical habitat.

Critical habitat designated within each CHU includes the stream channels within the designated stream reaches and has a lateral extent as defined by the bankfull elevation on one bank to the bankfull elevation on the opposite bank. Bankfull elevation is the level at which water begins to leave the channel and move into the floodplain and is reached at a discharge that generally has a recurrence interval of 1 to 2 years on the annual flood series. If bankfull elevation is not evident on either bank, the ordinary high-water line must be used to determine the lateral extent of critical habitat. The lateral extent of designated lakes is defined by the perimeter of the waterbody as mapped on standard 1:24,000 scale topographic maps. The Service assumes in many cases this is the full-pool level of the waterbody. In areas where only one side of the waterbody is designated (where only one side is excluded), the mid-line of the waterbody represents the lateral extent of critical habitat.

In marine nearshore areas, the inshore extent of critical habitat is the mean higher high-water (MHHW) line, including the uppermost reach of the saltwater wedge within tidally influenced freshwater heads of estuaries. The MHHW line refers to the average of all the higher high-water heights of the two daily tidal levels. Marine critical habitat extends offshore to the depth of 10 meters (m) (33 ft) relative to the mean low low-water (MLLW) line (zero tidal level or average of all the lower low-water heights of the two daily tidal levels). This area between the MHHW line and minus 10 m MLLW line (the average extent of the photic zone) is considered the habitat most consistently used by bull trout in marine waters based on known use, forage fish availability, and ongoing migration studies and captures geological and ecological processes important to maintaining these habitats. This area contains essential foraging habitat and migration corridors such as estuaries, bays, inlets, shallow subtidal areas, and intertidal flats.

Adjacent shoreline riparian areas, bluffs, and uplands within CHUs are not designated as critical habitat. However, it should be recognized that the quality of marine and freshwater habitat along streams, lakes, and shorelines is intrinsically related to the character of these adjacent features, and that human activities that occur outside of the designated critical habitat within the CHUs can have significant effects on physical and biological features of the aquatic environment.

Activities that are likely to cause adverse effects to critical habitat are evaluated to determine if they are likely to "destroy or adversely modify" critical habitat such that the critical habitat will no longer serve the intended conservation role for the species or retain those PCEs that relate to the ability of the area to at least periodically support the species. Activities that may destroy or adversely modify designated critical habitat are those that alter the PCEs to such an extent that the conservation value of critical habitat is appreciably reduced (75 FR 63898:63943). The Service's evaluation must be conducted at the scale of the entire critical habitat area designated, unless otherwise stated in the final critical habitat rule (U.S. Fish and Wildlife Service and National Marine Fisheries Service 1998, pp. 4-39). Thus, adverse modification of bull trout critical habitat is evaluated at the scale of the final designation, which includes the critical habitat designated for the Klamath River, Jarbidge River, Columbia River, Coastal-Puget Sound, and Saint Mary-Belly River population segments. However, we consider all 32 CHUs to contain features or areas essential to the conservation of the bull trout (75 FR 63898:63901, 63944). Therefore, if a proposed action would alter the physical or biological features of critical habitat to an extent that appreciably reduces the conservation function of one or more critical habitat units for bull trout, a finding of adverse modification of the entire designated critical habitat area may be warranted (75 FR 63898:63943).

Current Critical Habitat Condition Range-wide

The condition of bull trout critical habitat varies across its range from poor to good. Although still relatively widely distributed across its historic range, the bull trout occurs in low numbers in many areas, and populations are considered depressed or declining across much of its range (67 FR 71240). This condition reflects the condition of bull trout habitat. The decline of bull trout is primarily due to habitat degradation and fragmentation, blockage of migratory corridors, poor water quality, past fisheries management practices, impoundments, dams, water diversions, and the introduction of nonnative species (63 FR 31647, June 10, 1998; 64 FR 17112, April 8, 1999).

There is widespread agreement in the scientific literature that many factors related to human activities have impacted bull trout habitat function and continue to do so. Among the many factors that contribute to degraded PCEs, those which appear to be particularly significant and have resulted in a legacy of degraded habitat conditions are as follows: 1) fragmentation and isolation of local populations due to the proliferation of dams and water diversions that have eliminated habitat, altered water flow and temperature regimes, and impeded migratory movements (Dunham and Rieman 1999, p. 652; Rieman and McIntyre 1993, p. 7); 2) degradation of spawning and rearing habitat and upper watershed areas, particularly alterations in sedimentation rates and water temperature, resulting from forest and rangeland practices and intensive development of roads (Fraley and Shepard 1989, p. 141; The Montana Bull Trout Scientific Group 1998, pp. ii - v, 20-45); 3) the introduction and spread of nonnative fish species, particularly brook trout and lake trout, as a result of fish stocking and degraded habitat conditions, which compete with bull trout for limited resources and, in the case of brook trout,

hybridize with bull trout (Leary et al. 1993, p. 857; Rieman et al. 2006, pp. 73-76); 4) in the Coastal-Puget Sound region where amphidromous bull trout occur, degradation of mainstem river FMO habitat, and the degradation and loss of marine nearshore foraging and migration habitat due to urban and residential development; and 5) degradation of FMO habitat resulting from reduced prey base, roads, agriculture, development, and dams.

Effects of Climate Change on Bull Trout Critical Habitat

One objective of the final rule was to identify and protect those habitats that provide resiliency for bull trout use in the face of climate change. Over a period of decades, climate change may directly threaten the integrity of the essential physical or biological features described in PCEs 1, 2, 3, 5, 7, 8, and 9. Protecting bull trout strongholds and cold water refugia from disturbance and ensuring connectivity among populations were important considerations in addressing this potential impact. Additionally, climate change may exacerbate habitat degradation impacts both physically (e.g., decreased base flows, increased water temperatures) and biologically (e.g., increased competition with non-native fishes). For more discussion regarding impacts of climate change, see the status of the species and environmental baseline sections.

Consulted on Effects to Critical Habitat

The Service has formally consulted on the effects to bull trout critical habitat throughout its range. Section 7 consultations include actions that continue to degrade the environmental baseline in many cases. However, long-term restoration efforts are also proposed and have been implemented, which provides some stability or improvement in the existing functions within some of the critical habitat units. For about a detailed analysis of prior consulted-on effects in the action area, see the environmental baseline section.

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ATTACHMENT 2:
National Marine Fisheries Service Biological Opinion dated October 9, 2024

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
1201 NE Lloyd Boulevard, Suite 1100
PORTLAND, OR 97232-1274

October 9, 2024

https://doi.org/10.25923/h9vx-ba77

Refer to NMFS No: WCRO-2023-01663

William D. Abadie
Chief, Regulatory Branch
Portland District, US Army Corps of Engineers
P.O. Box 2946
Portland, Oregon 97208-2946

Re: Reinitiation of Endangered Species Act Section 7(a)(2) Biological Opinion and Magnuson–Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the St. Hilaire Brothers Irrigation Pump Station Permit Modification (Corps No. NWP-2017-414, Modification #1), Umatilla County, Oregon (Lat/Long: 45°55'46"N 119°05'57"W).

Dear Mr. Abadie:

This letter responds to your July 24, 2023 request for reinitiation of consultation with the National Marine Fisheries Service (NMFS) pursuant to Section 7 of the Endangered Species Act (ESA) for the subject action. Your request qualified for our expedited review and analysis because it met our screening criteria and contained all required information on, and analysis of, your proposed action and its potential effects to ESA-listed species and designated critical habitat.

NMFS also reviewed the likely effects of the proposed action on essential fish habitat (EFH), pursuant to section 305(b) of the Magnuson–Stevens Fishery Conservation and Management Act (16 U.S.C. 1855(b)) and concluded that the action would adversely affect the EFH of Pacific coast salmon. Therefore, we have included the results of that review in this document.

We have reviewed the US Army Corps of Engineers (Corps') original February 1, 2018 consultation request and biological assessment (BA) for the St. Hilaire Brothers pump station expansion; our March 6, 2018, biological opinion (NMFS 2018, Tracking No. WCR-2018-8908) on the original action; and the Corps' July 24, 2023, reinitiation request and updated BA (Campbell 2023) for the St. Hilaire Brothers proposed modifications to the original pump station expansion project. Where relevant, we have adopted the information and analyses you and the applicant have provided and/or referenced but only after our independent, science-based evaluation confirmed they meet our regulatory and scientific standards. From the January 2018 BA, we adopt by reference the following sections: (1) Chapter 1, portions of sections 1.4 (description of the proposed action), 1.5 (scope of the proposed action), and 1.7 (proposed conservation measures) that pertain specifically to the St. Hilaire Brothers' pump station

expansion[1]; and Chapter 4 (effects of the action). From the July 20, 2023, updated BA for the proposed modifications, we adopt by reference the modified proposed action (pages 1 and 2), and (2) the effects of the modified action (pages 2 through 5).

Updates to the regulations governing interagency consultation (50 CFR part 402) were effective on May 6, 2024 (89 FR 24268). We are applying the updated regulations to this consultation. The 2024 regulatory changes, like those from 2019, were intended to improve and clarify the consultation process, and, with one exception from 2024 (offsetting reasonable and prudent measures), were not intended to result in changes to the Services' existing practice in implementing section 7(a)(2) of the ESA (89 FR 24268; 84 FR 45015). We have considered the prior rules and affirm that the substantive analysis and conclusions articulated in this biological opinion and incidental take statement would not have been any different under the 2019 regulations or pre-2019 regulations.

In 2018, the Corps issued a 5-year permit (NWP-2017-414) for the St. Hilaire Brothers and East Improvement District (EID) Columbia River Pump Station and Intake Project on the Columbia River at about river mile (RM) 301.7, in Umatilla County near Hermiston, Oregon. This included the expansion of the existing St. Hilaire Brothers pump station; construction of an adjacent, new irrigation pump station for EID to consolidate the transfer of existing and new mitigated irrigation water rights to a centralized point of diversion; and removal of approximately 6,450 square feet (0.15 acre) of asphalt and concrete debris from below the ordinary high-water (OHW) line of the Columbia River. NMFS completed a biological opinion with the Corps for this action on March 6, 2018 (NMFS 2018). Construction of the new, adjacent EID pump station and the removal of asphalt and concrete has been completed, but the proposed expansion of the St Hilaire Brothers existing pump station was delayed, and the Corps permit expired before it could be completed. The St Hilaire Brothers have requested a 5-year extension and modification to Corps permit NWP-2017-414.

As described in the Corps' July 24, 2023 letter and associated BA, the Corps proposes to reauthorize permit NWP-2017-414 to allow St. Hilaire Brothers to complete the pump station expansion as originally proposed with the modifications described in the updated BA. As previously noted, the original proposed action (pump station expansion) and proposed modifications are incorporated by reference. For purposes of reinitiation of ESA section 7 consultation, both proposed actions are combined into one action and summarized below.

Proposed Action Summary

- Expand the St. Hilaire Brothers' existing pump station deck roughly 15 feet to the east to accommodate three new pumps and a new 42-inch diameter discharge pipe which allow for an additional 38.6 cubic feet per second (cfs) withdrawal capacity.
- Install, with a vibratory hammer, 26 steel H-piles to support the decking, three 60-inch diameter by 7.75-foot-long sleeve pipe to protect the new pumps, and two 12.75-inch diameter steel piles to support the new 42-inch diameter discharge pipe.

[1] Construction of the adjacent East Improvement District pump station and removal of the asphalt and concrete debris were completed under the Corps' original 5-year permit and addressed in NMFS' March 6, 2018, biological opinion. Therefore, reinitiation on that portion of the original action is not required.

- Remove roughly 360 cubic yards of accumulated sediment from under the existing St. Hilaire pump station, below the OHW line, with a suction dredge and a floating pipeline for discharging into the actively flowing river channel about 275 feet north of the existing pump station.

- Fill approximately 365 cubic yards of material placed below the OHW line and consisting of the excavated sediment and steel H-piles.

The pump station deck would cover approximately 751 square feet over the ordinary high-water line and consist of 544 square feet of concrete and 207 square feet of grating. All the in-water work, including pile driving, in-water pump and pipe connections, and dredging would be accomplished during the in-water work period of December 1 through February 28.

BIOLOGICAL OPINION

We examined the status of each species that could be adversely affected by the proposed action, to inform the description of the species' "reproduction, numbers, or distribution" as described in 50 CFR 402.02. These species are the same as in NMFS 2018 and include: Upper Columbia River (UCR) spring-run Chinook salmon, UCR steelhead, Middle Columbia River (MCR) steelhead, Snake River (SR) spring/summer-run Chinook salmon, SR fall-run Chinook salmon, and Snake River Basin (SRB) steelhead. We also examined the condition of critical habitat throughout the designated area and discuss the function of the physical or biological features essential to the conservation of the species that create the conservation value of that habitat. The most updated status of the species and critical habitat summary information as well as the relevant Recovery Plans for these species can be found at: https://www.fisheries.noaa.gov/west-coast/consultations/esa-section-7-consultations-west-coast#columbia-river-middle-and-upper. In summary, the status of the listed species addressed in this opinion were upheld in our most recent status review updates. Our conclusions regarding the effects of the action on SR sockeye salmon is presented below under the heading: NLAA determinations.

"Action area" means all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action (50 CFR 402.02). For the St. Hilaire Brothers pump station, the action area is the in-water construction footprint including a radius of 500 feet into the Columbia River to account for the minor, temporary turbidity effects.

The "environmental baseline" refers to the condition of the listed species or its designated critical habitat in the action area, without the consequences to the listed species or designated critical habitat caused by the proposed action. The environmental baseline includes the past and present impacts of all federal, state, or private actions and other human activities in the action area, the anticipated impacts of all proposed federal projects in the action area that have already undergone formal or early section 7 consultations, and the impact of State or private actions which are contemporaneous with the consultation in process. The environmental baseline is highly degraded, primarily as a result of operation of the Columbia River hydropower system that has transformed the action area from a free-flowing river into a reservoir with warm, slow-moving water and an abundance of native and non-native predators of juvenile salmonids. Water management activities have reduced flows in the Columbia River, measured at Bonneville Dam,

from April through July. On average, this reduction ranges from 7,000 cubic feet per second (cfs) in March to 171,000 cfs in June (NMFS 2020). Additionally, the Columbia River dams and hydrosystem operations have decreased the delivery of sediment to the lower river and estuary by more than 50 percent (as measured at Vancouver, Washington). The overall reduction in sediment, combined with bank armoring and in-water structures that focus flow in the navigation channel, has reduced the availability of shallow water habitat along the margins of the Columbia River (NMFS 2020).

Over the course of the year, the action area supports both adult and juvenile migration of all populations of UCR spring-run Chinook salmon, UCR steelhead, MCR steelhead, SR spring/summer-run Chinook salmon, SR fall-run Chinook salmon, SRB steelhead and SR sockeye salmon. The action area also supports juvenile rearing for these same populations except SR sockeye salmon smolts, which migrate quickly through the action area. However, only a small number of adult UCR, MCR, and SRB steelhead may overwinter in the action area during the winter in-water work period (Dec. 1 – Feb. 28) and a few individual, late migrating, adult SR fall-run Chinook salmon may be in the action area during the early part of the in-water work period. A few individuals of juvenile UCR, MCR, and SRB steelhead may rear in the action area during the in-water work period. Also, a small number of juvenile SR fall-run Chinook salmon that do not fully outmigrate could overwinter in the action area.

The action area provides physical and biological features (PBFs) of critical habitat for rearing and migration, though these persist in a largely degraded condition. The ability of critical habitat in the action area to support recovery of these listed species is primarily limited by the existence and operations of McNary Dam and dams upstream of the action area that have dramatically altered hydrology of the Columbia River and changed the basic nature of the action area from a river to a series of reservoirs. Predation on juveniles and poor water quality, particularly high temperature, also impede the ability of the critical habitat in the action area to support recovery.

Under the ESA, "effects of the action" are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action.

An assessment of the effects of the proposed action to species are included in the original Biological Assessment (BA) (Corps 2018), pages 56 through 61, and the updated BA (Campbell 2023), pages 2 through 5, and these sections are adopted here (50 CFR 402.14(h)(3)). NMFS has evaluated these sections and, after our independent, science-based evaluation, determined it meets our regulatory and scientific standards.

The Corps found that effects to species and critical habitat from the proposed action may include:

- Entrainment of rearing juveniles in the suction dredge, resulting in injury or death. Increased, localized turbidity from pile installation and dredging, resulting in minor,

temporary and intermittent behavioral changes to adults and juveniles. Increased turbidity will also have a minor, temporary and intermittent negative effect to water quality.

- Accidental release of a very small amount of toxic materials in the water, which will have a minor, temporary negative effect on water quality but will not result in injurious effects to adults or juveniles due to the proposed containment measures and spill response.
- New pile placement will alter substrates, resulting in a minor, permanent loss of rearing habitat for juveniles. This loss of habitat may also permanently displace juveniles, resulting in their increased risk of predation.
- Dredging will alter substrates, resulting in a minor, temporary loss of rearing habitat. This loss of habitat may also temporarily displace juveniles, resulting in their increased risk of predation.
- Increased noise during pile driving, resulting in a minor, temporary, and intermittent behavioral effect to juveniles and adults. The installation of steel piles and sleeve pipe with a vibratory hammer is not expected to cause injury or mortality.
- Increased in-water and overwater structures, resulting in an increased risk of predation to juveniles. These structures can attract fishes that prey on juvenile salmonids.
- The additional 38.6 cfs of pumping capability is a transfer of existing surface withdrawal water rights and is not a new withdrawal.

We supplement the BAs (Corps 2018 and Campbell 2023) with the following effects to the physical and biological features (PBFs) of critical habitat:

- The use of a suction dredge will have a minor, temporary negative effect on the safe passage PBF of critical habitat due to the risk of entrainment of juveniles.
- The addition of in-water and overwater structures will have a minor, but permanent, negative effect on safe passage PBFs of critical habitat due to the potential for increased predation on juveniles.

"Cumulative effects" are those effects of future state or private activities, not involving federal activities, that are reasonably certain to occur within the action area of the federal action subject to consultation (50 CFR 402.02 and 402.17(a)). Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA. We were not able to identify any additional cumulative effects not already discussed in NMFS (2018) and we assume that future State and private actions and land uses will continue within the action area at roughly their current rate.

The Integration and Synthesis section is the final step in our assessment of the risk posed to species and critical habitat as a result of implementing the proposed action. In this section, we add the effects of the action to the environmental baseline and the cumulative effects, taking into account the status of the species and critical habitat, to formulate the agency's biological opinion as to whether the proposed action is likely to: (1) reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing its numbers, reproduction, or distribution; or (2) appreciably diminish the value of designated or proposed critical habitat as a whole for the conservation of the species.

The environmental baseline is highly degraded, primarily as a result of operation of the Columbia River hydropower system that has transformed the action area from a free-flowing river into a reservoir with warm, slow-moving water and an abundance of native and non-native predators of juvenile salmonids. Water management activities have reduced flows in the Columbia River, measured at Bonneville Dam, from April through July. On average, this reduction ranges from 7,000 cubic feet per second (cfs) in March to 171,000 cfs in June (NMFS 2020). Additionally, the Columbia River dams and hydrosystem operations have decreased the delivery of sediment to the lower river and estuary by more than 50 percent (as measured at Vancouver, Washington). The overall reduction in sediment, combined with bank armoring and in-water structures that focus flow in the navigation channel, has reduced the availability of shallow water habitat along the margins of the Columbia River (NMFS 2020).

As stated above, the existing status of each evolutionarily significant unit (ESU) and distinct population segment (DPS) were upheld in the most recent status review updates. UCR spring-run Chinook salmon and SR sockeye salmon remain endangered and SR spring/summer and fall Chinook salmon and UCR and MCR steelhead remain threatened under the ESA. This is largely due to a combination of effects in their natal systems (water diversions, riparian habitat loss, high stream temperatures, embedded gravels, etc.) outside the action area and of the existence and operation of several Columbia River dams impairing habitat in the action area.

During the winter in-water work period, we expect a few overwintering adult UCR, MCR, and SRB steelhead, a few late-migrating adult SR fall-run Chinook salmon, a few rearing juvenile UCR, MCR, and SRB steelhead, and a few juvenile SR fall-run Chinook salmon that do not fully outmigrate to be in the action area. Over the course of the year, the action area supports both adult migration and juvenile rearing and migration of UCR spring-run Chinook salmon, UCR steelhead, MCR steelhead, SR spring/summer-run Chinook salmon, SR fall-run Chinook salmon, and SRB steelhead. These individuals could be from any population of these ESUs/DPSs.

The proposed action may kill or injure a small number of juveniles, if present, via entrainment during suction dredging operations. Increased turbidity during pile installation and dredging may cause temporary and intermittent behavioral changes to adults and juveniles; these minor behavioral changes are not expected to interrupt normal migration or rearing activities. Due to the proposed containment and spill response measures, any accidental chemical spills will be minor and are not expected to result in injurious effects to adults or juveniles. Dredging activities may displace and temporarily increase juvenile susceptibility to predation, resulting in the death of a small number of individuals during construction. The placement of new piles may permanently displace and increase juvenile susceptibility to predation, resulting in the death of a small number of individuals over the life of the structure. Noise from pile driving will be minor, temporary and intermittent and may cause temporary and intermittent behavioral changes to adults and juveniles; these minor behavioral changes are not expected to interrupt normal migration or rearing activities. The permanent placement of in-water and overwater structures will permanently increase juvenile susceptibility to predation, resulting in the death of a small number of individuals over the life of the structure. The one-time loss of a very small number of juveniles during construction coupled with the annual loss of a very small number of juveniles over the life of the structure will not appreciably reduce the survival and recovery of the listed species addressed in this opinion.

While degraded, critical habitat is important in the action area. The proposed action will temporarily reduce the function of critical habitat with respect to the freshwater rearing habitat and water quality PBFs during construction via increased turbidity and a temporary (i.e., a few months) loss of forage habitat due to dredging. In the long term, the function of critical habitat with respect to the freshwater rearing and safe passage PBFs will be reduced very slightly from the increase of permanent fill (i.e., new permanent piles) and overwater structures. These minor, negative effects will only occur within the relatively small action area, but will not degrade the ability of critical habitat to support recovery of the listed species. Therefore, the proposed action will not affect the conservation value of critical habitat at the scale of the designation.

Cumulative effects are largely a result of ongoing climate change and are expected to cause a slight degradation of habitat conditions in the action area over the coming decades.

After reviewing and analyzing the current status of the listed species and critical habitat, the environmental baseline within the action area, the effects of the proposed action, and cumulative effects, it is NMFS' biological opinion that the proposed action is not likely to jeopardize the continued existence of UCR spring-run Chinook salmon, UCR steelhead, MCR steelhead, SR spring/summer-run Chinook salmon, SR fall-run Chinook salmon, and SRB steelhead, or destroy or adversely modify their designated critical habitat.

Incidental Take Statement

Section 9 of the ESA and Federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without a special exemption. "Take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. "Harm" is further defined by regulation to include significant habitat modification or degradation that kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering (50 CFR 222.102). "Harass" is further defined by interim guidance as to "create the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering." "Incidental take" is defined by regulation as takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant (50 CFR 402.02). Section 7(b)(4) and section 7(o)(2) provide that taking that is incidental to an otherwise lawful agency action is not considered to be prohibited taking under the ESA if that action is performed in compliance with the terms and conditions of this ITS.

Amount or Extent of Take

In this opinion, NMFS determined that incidental take of a few juveniles from all populations of UCR spring-run Chinook salmon, UCR steelhead, MCR steelhead, SR spring/summer-run Chinook salmon, SR fall-run Chinook salmon, and SRB steelhead is reasonably certain to occur as follows:

1. Injury or death from entrainment during suction dredge operations.
2. An increased risk of predation due to displacement during pile placement and dredge operations.
3. An increased risk of predation due to the permanent placement of in-water and overwater structures.

Estimating the specific number of juveniles injured, killed, or harmed by habitat-modifying activities is not possible because of the wide range of responses that individual juveniles may have and the numbers of predators in the action area. Therefore, as a surrogate, NMFS quantifies take based on the extent of habitat modified. Specifically, the extent of the modified habitat with the added fill of 365 cubic yards (0.041 acre) and removal of 360 cubic yards (0.041 acre). Additionally, 751 square feet of overwater shadow will be cast on aquatic habitat covered by the proposed added decking, and finally the addition of 10 steel piles. Although these surrogates could be considered coextensive with the proposed action, monitoring and reporting requirements will provide opportunities to check throughout the course of the proposed action whether the surrogates are exceeded. For this reason, these surrogates' function as effective reinitiation triggers.

Effect of Take

In the biological opinion, NMFS determined that the amount or extent of anticipated take, coupled with other effects of the proposed action, is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat.

Reasonable and Prudent Measures

"Reasonable and prudent measures" refer to those actions the Director considers necessary or appropriate to minimize the impact of the incidental take on the species (50 CFR 402.02). The following RPMs are modified from NMFS (2018) to address the updated proposed action.

The Corps shall:

1. Minimize take from construction activities.
2. Minimize take from reduction in benthic habitat.
3. Minimize take from new in-water and overwater structures.
4. Track and monitor the project to ensure the applicant meets the requirements of this incidental take statement and that the extent of take is not exceeded.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, the Federal action agency must comply (or must ensure that any applicant complies) with the following terms and conditions. The Corps or any applicant has a continuing duty to monitor the impacts of incidental take and must report the progress of the action and its impact on the species as specified in this ITS (50 CFR 402.14). If the entity to whom a term and condition is directed does not comply

with the following terms and conditions, protective coverage for the proposed action would likely lapse.

1. To implement RPM number 1 (construction activities), the Corps shall ensure that:
    a. The applicant conducts all work below OHW within the winter in-water work window of December 1 through February 28.
    b. Installation of all piles, including the additional 10 steel piles, will be accomplished using a vibratory hammer.
    c. All state and federal permits are followed during the project implementation and after the project is completed.

2. To implement RPM number 2 (benthic habitat), the Corps shall ensure that:
    a. The amount of additional fill material occurring below OHW shall not exceed an area of 0.041 acre.
    b. The amount of additional material removed below OHW shall not exceed 0.041 acre.

3. To implement RPM number 3 (in-water and over-water structures), the Corps shall ensure that the permit requires that the overwater structures provide at least 60 percent light penetration.

4. To implement RPM number 4 (monitoring activities), the Corps shall ensure that:
    a. The applicant tracks and monitors construction activities to ensure that the conservation measures are meeting the objective of minimizing take.
    b. Monitoring shall be conducted by the permittee and include daily visual survey for fish in the nearshore area inside the in-water work area.
    c. The applicant submits a completion of project report to NMFS 2 months after project completion. The applicant shall report all monitoring items to include, at a minimum, the following:
        i. Size and maximum surface area that is covered by structures.
        ii. Piling: number, size and type of piles installed.
        iii. Piling installation: provide a log of the dates, start and stop time, and total duration of all vibratory pile installations.
    d. All reports should include the NMFS tracking number WCRO-2023-01663 and be sent to: crbo.consultationrequest.wcr@noaa.gov

Conservation Recommendations

Section 7(a)(1) of the ESA directs federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. Specifically, conservation recommendations are suggestions regarding discretionary measures to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information (50 CFR 402.02).

The following recommendations are discretionary measures that NMFS believes are consistent with this obligation and therefore should be carried out by the Corps:

- Follow recommendations by the Independent Scientific Advisory Board (2007) to plan now for future climate conditions by implementing protective tributary habitat measures. Implement measures to protect or restore riparian buffers, wetlands, and floodplains; remove stream barriers; and ensure late summer and fall tributary stream flows.

- Support ongoing regional discussions with sovereigns and stakeholders to develop and implement future collaborative conservation approaches to rebuild listed fish populations in the Columbia River Basin.

- Support the various ongoing research, monitoring, and evaluation programs occurring in the Columbia and Snake River Basins. The information derived from these programs facilitates effective adaptive management through establishing a better understanding of the effects of the ongoing operation, maintenance, and management of the 14 federal dam and reservoir projects on the Columbia and Snake Rivers.

Reinitiation of Consultation

Under 50 CFR 402.16(a): "Reinitiation of consultation is required and shall be requested by the Federal agency or by the Service where discretionary Federal agency involvement or control over the action has been retained or is authorized by law and: (1) If the amount or extent of taking specified in the incidental take statement is exceeded; (2) If new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (3) If the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion or written concurrence; or (4) If a new species is listed or critical habitat designated that may be affected by the identified action."

NLAA DETERMINATION

We reviewed the Corps' original February 1, 2018, consultation request and BA for the St. Hilaire Brothers pump station expansion; our March 6, 2018, biological opinion (NMFS 2018, Tracking No. WCR-2018-8908) on the original action; and the Corps' July 24, 2023, reinitiation request and updated BA (Campbell 2023) for the St. Hilaire Brothers proposed modifications to the original pump station expansion project. Based on our knowledge, expertise, and your action agency's materials, we concur with the action agency's conclusions that the proposed action is not likely to adversely affect the following NMFS ESA-listed species and/or designated critical habitat: SR sockeye salmon and its designated critical habitat.

<u>Snake River Sockeye Salmon</u>

This ESU includes all anadromous and residual sockeye salmon from the Snake River Basin, Idaho, and artificially propagated sockeye salmon from the Redfish Lake captive propagation program. This species continues to be at extremely high risk across all four basic risk measures (abundance, productivity, spatial structure and diversity) and remains at high risk for extinction (NMFS 2022). The most updated status of the species and critical habitat summary information

can be found at: https://www.fisheries.noaa.gov/west-coast/consultations/esa-section-7-consultations-west-coast#columbia-river-middle-and-upper.

The primary risks to Snake River sockeye salmon from the proposed action include project construction, pile driving, and increased turbidity. However, NMFS does not expect SR sockeye salmon to be present in this off-channel area during project construction or use this area for rearing during their outmigration. Because sockeye salmon will not likely be present in the action area during project implementation, effects to sockeye or their critical habitat from the proposed action is extremely unlikely, or discountable.

Essential Fish Habitat Response

Thank you also for your request for essential fish habitat (EFH) consultation. NMFS reviewed the proposed action for potential effects on EFH pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), implementing regulations at 50 CFR 600.920, and agency guidance for use of the ESA consultation process to complete EFH consultation. We have concluded that the action would adversely affect EFH designated under the Pacific Salmon Fisheries Management Plan and six conservation recommendations are provided below.

MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

Section 305(b) of the MSA directs federal agencies to consult with NMFS on all actions or proposed actions that may adversely affect EFH. Under the MSA, this consultation is intended to promote the conservation of EFH as necessary to support sustainable fisheries and the managed species' contribution to a healthy ecosystem. For the purposes of the MSA, EFH means "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity", and includes the associated physical, chemical, and biological properties that are used by fish (50 CFR 600.10). Adverse effect means any impact that reduces quality or quantity of EFH, and may include direct or indirect physical, chemical, or biological alteration of the waters or substrate and loss of (or injury to) benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality or quantity of EFH. Adverse effects may result from actions occurring within EFH or outside of it and may include direct, indirect, site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810). Section 305(b) of the MSA also requires NMFS to recommend measures that can be taken by the action agency to conserve EFH. Such recommendations may include measures to avoid, minimize, mitigate, or otherwise offset the adverse effects of the action on EFH (50 CFR 600.905(b)).

The proposed project occurs within EFH for various life history stages of two federally managed fish species within the Pacific Salmon Fishery Management Plan (PFMC 2014): Chinook salmon and coho salmon. Freshwater EFH for Pacific Coast Chinook and coho salmon consists of four major components: 1) spawning and incubation, 2) juvenile rearing, 3) juvenile migration corridors, and 4) adult migration corridors and holding habitat, and overall, can include any habitat currently or historically occupied within Washington, Oregon, and Idaho. Detailed

descriptions and identifications of EFH for salmon are found in Appendix A of Amendment 18 of the Pacific Coast Salmon Plan (PFMC 2014).

Adverse Effects on EFH

NMFS determined the proposed action would adversely affect EFH of Pacific Coast Chinook and coho salmon as follows:

1. The permanent alteration of the near-shore environment by placement of in-water and overwater structures may adversely affect juvenile rearing and migration habitat.

2. Temporary reduction in prey availability from removal and disturbance of benthic habitat during dredging may adversely affect juvenile rearing habitat.

3. Permanent shading of in-water habitat from new overwater structures will adversely affect juvenile rearing migration habitat and adult migration and holding habitat.

4. Temporary reduction in established substrate composition from removal and disturbance of native substrates during dredging and pile placement will adversely affect juvenile rearing habitat.

5. Temporary degradation of water quality (i.e., turbidity, sedimentation, chemical spills) from construction activities will adversely affect juvenile rearing and migration habitat and adult migration and holding habitat.

EFH Conservation Recommendations

NMFS determined that the following conservation recommendations are necessary to avoid, minimize, mitigate, or otherwise offset the adverse effects of the proposed action on EFH:

1. All state and federal permits should be followed during the project implementation and after the project is completed. This will avoid and minimize all adverse effects listed above.
2. The area of additional fill from pile placement should not exceed 0.041 acre. This will minimize adverse effects #1 and #4.

3. The area of additional substrate removal should not exceed 0.041 acre. This will minimize adverse effects #2 and #4.

4. The overwater structures should provide at least 60 percent light penetration and waterproof lightening equipment under portions of the new decking. This will minimize adverse effects #1 and #3.

5. A sediment turbidity curtain should be installed to minimize downstream suspension of sediments and should remain in place until turbidity inside the isolated work area is visually the same as outside the isolated work area. This will minimize adverse effect #5.

Statutory Response Requirement

As required by section 305(b)(4)(B) of the MSA, the Corps must provide a detailed response in writing to NMFS within 30 days after receiving an EFH conservation recommendation. Such a response must be provided at least 10 days prior to final approval of the action if the response is inconsistent with any of NMFS' EFH conservation recommendations unless NMFS and the federal agency have agreed to use alternative time frames for the federal agency response. The response must include a description of the measures proposed by the agency for avoiding, minimizing, mitigating, or otherwise offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with the conservation recommendations, the federal agency must explain its reasons for not following the recommendations, including the scientific justification for any disagreements with NMFS over the anticipated effects of the action and the measures needed to avoid, minimize, mitigate, or offset such effects (50 CFR 600.920(k)(1)).

Supplemental Consultation

The Corps must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH Conservation Recommendations (50 CFR 600. 920(l)).

This letter underwent pre-dissemination review using standards for utility, integrity, and objectivity in compliance with applicable guidelines issued under the Data Quality Act (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001, Public Law 106-554). The biological opinion will be available through NOAA Institutional Repository: https://repository.library.noaa.gov/welcome. A complete record of this consultation is on file at NMFS' Columbia Basin Branch.

Please direct questions regarding this letter to Scott Carlon at 971-322-7436 or email scott.carlon@noaa.gov.

Sincerely,

Nancy L. Munn, Ph.D.
Acting Assistant Regional Administrator
Interior Columbia Basin Office

cc: Danielle Erb, Corps – Portland, Oregon
Eric Campbell, Campbell Environmental, LLC – Wilsonville, Oregon

References

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