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

Refer to NMFS No: WCRO-2020-03103

February 1, 2021

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Lt. Col. Richard T. Childers
U.S. Army Corps of Engineers
Walla Walla District
201 North Third Avenue. Walla
Walla, Washington 99362

Re: Endangered Species Act Section 7(a)(2) Biological Opinion, and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the rehabilitate of US-12 Clearwater Memorial Bridge between milepost 1.90 and milepost 2.21 of Highway US-12 in Nez Perce County, Idaho.

Dear Ms. Tipuric and Lt. Col Childers:

Thank you for the letter dated October 29, 2020, requesting initiation of consultation with NOAA’s National Marine Fisheries Service (NMFS) pursuant to section 7 of the Endangered Species Act of 1973 (ESA) (16 U.S.C. 1531 et seq.) for the Clearwater Memorial Bridge project. This consultation was conducted in accordance with the 2019 revised regulations that implement section 7 of the ESA (50 CFR 402, 84 FR 45016).

In this biological opinion (Opinion), NMFS concludes that the action, as proposed, is not likely to jeopardize the continued existence of Snake River fall Chinook salmon or Snake River Basin steelhead. NMFS also determined the action will not destroy or adversely modify designated critical habitat for Snake River fall Chinook salmon or Snake River Basin steelhead. Rationale for our conclusions is provided in the attached Opinion.

As required by section 7 of the ESA, NMFS provides an incidental take statement (ITS) with the Opinion. The ITS describes reasonable and prudent measures (RPM) NMFS considers necessary or appropriate to minimize the impact of incidental take associated with this action. The take statement sets forth nondiscretionary terms and conditions, including reporting requirements, that the Federal Highway Administration (FHWA), Idaho Transportation Department (ITD), U.S. Army Corps of Engineers (COE), and any permittee who performs any portion of the action must comply with to carry out the RPM. Incidental take from actions that meet these terms and conditions will be exempt from the ESA take prohibition.

This document also includes the results of our analysis of the action's effects on essential fish habitat (EFH) pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), and includes three Conservation Recommendations to avoid, minimize, or otherwise offset potential adverse effects on EFH. These Conservation Recommendations is similar but not identical to the ESA Terms and Conditions. Section 305(b)(4)(B) of the MSA requires federal agencies provide a detailed written response to NMFS within 30 days after receiving the Conservation Recommendations.

If the response is inconsistent with the EFH Conservation Recommendations, the FHWA, ITD, or COE must explain why the recommendation will not be followed, including the justification for any disagreements over the effects of the action and the recommendations. In response to increased oversight of overall EFH program effectiveness by the Office of Management and Budget, NMFS established a quarterly reporting requirement to determine how many Conservation Recommendations are provided as part of each EFH consultation and how many are adopted by the action agency. Therefore, in your statutory reply to the EFH portion of this consultation, NMFS asks that you identify that this project involves three EFH Conservation Recommendations, and whether or not they are accepted.

Please contact Mr. Dennis Daw, Northern Snake Branch, at 208-378-5698 or dennis.daw@noaa.gov, if you have any questions concerning this consultation, or if you require additional information.

Sincerely,

Michael P. Tehan

Michael P. Tehan
Assistant Regional Administrator
Interior Columbia Basin Office

Enclosure

cc: S. Smith – ITD
A. Hill – ITD
J. Perry—FHWA
B. Inghram—FHWA
W. Schrader--COE
C. Hacker – USFWS
M. Lopez – NPT

Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat

Clearwater Memorial Bridge

NMFS Consultation Number: *WCRO-2020-03103*

Action Agencies: Federal Highway Administration/Idaho Transportation Department,
U.S. Army Corps of Engineers

Affected Species and NMFS' Determinations:

ESA-Listed Species	Status	Is Action Likely to Adversely Affect Species?	Is Action Likely To Jeopardize the Species?	Is Action Likely to Adversely Affect Critical Habitat?	Is Action Likely To Destroy or Adversely Modify Critical Habitat?
Snake River steelhead (*Oncorhynchus mykiss*)	Threatened	Yes	No	Yes	No
Snake River fall Chinook salmon (*Oncorhynchus tshawytscha*)	Threatened	Yes	No	Yes	No

Fishery Management Plan That Identifies EFH in the Project Area	Does Action Have an Adverse Effect on EFH?	Are EFH Conservation Recommendations Provided?
Pacific Coast Salmon	Yes	Yes

Consultation Conducted By: National Marine Fisheries Service, West Coast Region

Issued By: Michael P. Tehan
Assistant Regional Administrator

Date: February 1, 2021

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ACRONYMS

ACRONYM	DEFINITION
AE	Anderson Environmental Consulting
BA	Biological Assessment
BMP	Best Management Practices
CWA	Clean Water Act
COE	US Army Corps of Engineers
dB	Decibel
DQA	Data Quality Act
DPS	Distinct Population Segments
EFH	Essential Fish Habitat
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
F	Fahrenheit
FHWA	Federal Highway Administration
HAPC	Habitat Area(s) of Primary Concern
HUC	Hydrologic Unit Code
ICDC	Idaho Conservation Data Center
ICTRT	Interior Columbia Technical Recovery Team
IDEQ	Idaho Department of Environmental Quality
IDFG	Idaho Fish and Game
ITD	Idaho Transportation District
ITS	Incidental Take Statement
LWD	Large Woody Debris
LSRCP	Lower Snake River Compensation Plan
MSA	Magnuson Steven's Fishery Conservation and Management Act
MPG	Major Population Groupings
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPPC	Northwest Power and Conservation Council
NTU	Nephelometric Turbidity Units
NWFSC	Northwest Fisheries Science Center
OHWM	Ordinary High-Water Mark
OPINION	Biological Opinion
PBF	Physical and Biological Features
PCE	Primary Constituent Element
PFMC	Pacific Fishery Management Council
PORT	Port of Lewis
COE	U.S. Army Corps of Engineers
USFWS	U.S. Fish & Wildlife Service

ACRONYM	DEFINITION
USGS	U.S. Geological Survey
VSP	Viable Salmon Population

1. INTRODUCTION

This Introduction section provides information relevant to the other sections of this document and is incorporated by reference into Sections 2 and 3, below.

1.1. Background

National Marine Fisheries Service (NMFS) prepared the biological opinion (Opinion) and incidental take statement (ITS) portions of this document in accordance with section 7(b) of the Endangered Species Act (ESA) of 1973 (16 USC 1531 et seq.), and implementing regulations at 50 CFR 402, as amended.

We also completed an essential fish habitat (EFH) consultation on the proposed action, in accordance with section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 U.S.C. 1801 et seq.) and implementing regulations at 50 CFR 600.

We completed pre-dissemination review of this document using standards for utility, integrity, and objectivity in compliance with applicable guidelines issued under the Data Quality Act (DQA) (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001, Public Law 106-554). The document will be available within 2 weeks at the NOAA Library Institutional Repository [https://repository.library.noaa.gov/welcome]. A complete record of this consultation is on file at the Snake River Basin Office, Boise Idaho.

1.2. Consultation History

Idaho Transportation Department (ITD) contacted staff members from U.S. Fish and Wildlife Service (USFWS), NMFS, and Idaho Department of Fish and Game (IDFG) during June and July of 2020 to obtain information regarding species utilization in the area and potential concerns about the project activities and timing for in-water work. During September 2020, ITD further discussed the project with NMFS and USFWS and provided a draft biological assessment (BA). NMFS responded with comments on the draft BA on September18 2020. NMFS received a final BA on October 29, 2020. NMFS and ITD discussed a minor clarification on the use and placement of spud barges, and then NMFS concluded that the BA was sufficient to initiate formal consultation. October 29, 2020 is considered the date formal consultation was initiated.

1.3. Proposed Federal Action

"Action" means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by federal agencies (50 CFR 402.02). The ITD District 2, with funding from the Federal Highway Administration (FHWA), is planning to rehabilitate the existing US Highway 12 Clearwater Memorial Bridge to provide a widened structure that meets current standards. This activity requires construction within and over the Clearwater River, which contains federally listed threatened and endangered species and their designated critical habitat. Implementation of the proposed action will require the placement of fill material below the ordinary high water mark (OHWM). As such, the FHWA will be required to obtain a section 404 Clean Water Act permit from the U.S. Army Corps of Engineers (COE). Construction is anticipated to begin in 2023.

We considered whether the proposed action would cause any other activities and determined that it would not.

The existing US Highway12 Clearwater Memorial Bridge is a 12-span, 1,352-foot-long bridge that crosses over the Clearwater River. The bridge was constructed in 1944 and does not meet current standards. It is considered a "Commerce Restricting Bridge" on the Idaho State Highway System and restricts over legal annual permit trucks traveling on the bridge. In addition, it is not wide enough to accommodate the pedestrian and bicyclist needs. Further, multiple bridge piers have scour around their bases that needs to be addressed.

The existing roadway contains four 11-foot-wide lanes separated by a one-foot six-inch-wide median barrier, narrow shoulders, one foot-wide outer barriers, and five foot-wide walkways on either overhang, for a total width of 62 feet (Table 1). Each of the 11 piers supporting the bridge consists of six reinforced concrete columns on a web wall supported by a spread footing. The footings for piers 1 and 11 are on the river embankment, while piers 2 through 10 are embedded in the riverbed. Trees, limbs, and debris are caught on the nose of piers 4, 7, 8 and 9 (Figures 1 and 2). There are signs of scour at several of the piers (Table 1). Currently the stormwater drainage flows through deck drains into the Clearwater River.

Table 1: Table describing current bridge dimensions with proposed dimensions.

Desorption	Existing	Proposed
Bridge Span	1352'	1352'-No change
Lanes	Four 11' lanes	Four 12' lanes
Median Barrier	1'6"	4’
Outer Barrier/Shoulder	1'	Add barrier and shoulders on both sides
Pedestrian Walkway	5' on either side	6' on either side
# Piers	11	11
Total Width	62'	78' (widened by 16')
Scour Repair Around Piers/Footings	Unknown quantity. Scour around woody debris and around piers 4, 7, 8, and 9.	4,550 cubic yards of clean riprap will be placed at Piers 3-9. It will cover 0.74 acres of streambed.
Stormwater	Deck drains discharge to Clearwater River	Collect stormwater in the shoulder and drain to bioswales north of river.

Figure 1: Side view of existing bridge.

Figure 2: View of the underside of the bridge.

The proposed project would widen the superstructure by eight feet on either side of the existing bridge to meet current standards, accommodate bicycle and pedestrian access, and increase the load carrying capacity for trucks. The structure span, alignment, length, piers, and number of lanes will not change. The roadway superstructure would be widened from 62 feet to 78 feet wide to accommodate wider (12 feet vs 11 feet) lanes, a 4 foot-striped median, shoulders on both sides, a traffic separated walkway, bicycle pedestrian features, and stormwater collection. The project would integrate with the US-12 & 21st Street Intersection project at the south end of the bridge. New girders and wider abutments would be needed to support the widened deck, but the existing pier columns are structurally adequate to support this widened configuration; therefore, the existing piers will be used without major repairs or retrofit. The project will add scour protection at the bottom of the bridge piers. The roadway profile, vertical clearance, and three-span continuous configuration of the existing bridge will be maintained.

Stormwater

Currently, any stormwater that collects on the bridge flows to existing curbing and is discharged directly into the river through deck drains. The proposed new drainage system will collect and treat stormwater prior to being discharged into the river. There will be no deck drains and instead will be a 2% cross-drain system to route all stormwater from both the roadway and the sidewalk to the north end of the bridge, where it will drain onto “bioswales” before reaching the COE levee ponds. The bioswales will be constructed during the bridge rehabilitation, while the levee ponds are existing and controlled by the COE. If the bioswales overflow, they will flow to the levee ponds. The levee ponds flow to the river through control structures. Expansion joints will be protected to minimize potential for water to drain onto bearings below the joints.

In-Water Work

This reach of the Clearwater River is bounded on both the North and the South shores by the Lewiston Levee, which was constructed by the COE in 1973. The levee lies between piers 1 and 2 on the south bank, and between pier 10 and 11 on the north bank. Piers 1 and 11 are above OHWM. Piers 3 to 9 are considered “scour critical” and require placing clean riprap below the OHWM for scour protection and foundation strengthening. The placing of riprap in the scour holes at the piers is the only in-water work for this project. The size of each pillar and the quantities of scour protection riprap are shown in Table 2.

Table 2: The amount of riprap required at each pier.

Activity	Description (dimensions ft.)	Area (sq. ft. {acre{)
Pier 3	38'x96'	3,136
Pier 4	38'x96'	3,136
Pier 5	74' x 112'	7,630
Pier 6	46' x 104'	4,240
Pier 7	50' x 108'	4,840
Pier 8	50' x 108'	4,840
Pier 9	48' x 106'	4,536
Total		32,358 (0.74 ac)

Barge Use

Barges with a crane will be equipped with a contractor-designed containment system to collect debris, carry equipment, and personnel, for the bridge construction. Cranes may also be placed on pads on either side of the shore along the levee. Barges will be launched from a contractor-negotiated site, which is expected to be the Port of Lewiston’s (Port) commercial launch.

The barges will be moved along the bridge as needed to accommodate the bridge construction and the barges will be stabilized on the river bottom using spuds. Spuds are a type of anchor system used to stabilize the barge in place during construction activities. The spuds are metal cylinders, or I-beams, that are hydraulically pressed into the substrate to hold the barge in place. Barges will not be stored on the shoreline and will be positioned near bridge pillars 3-8 when the barges are not in direct use, and never longer than four days. Direct use is when the barge is not actively being used for construction purposes. There will be spill prevention and containment on the barges to minimize potential for debris or hazardous materials to enter the river. For the purposes of this Opinion, in keeping with ITD’s definition of the in-water work activities and timing, barges and their anchoring are not categorized as in-water work. Nevertheless, the effects of barges are considered in the Effects sections, below. The barges will be for loading and unloading, transport, and support for construction activities.

Staging and Stockpile Areas

The project would require staging and stockpiling of materials during construction. Parking lots of commercial areas in the southwest corner of the bridge and parks north of the river could potentially be used for staging, with the specifics to be determined by the contractor. The parking lots used for staging or stockpiling material will be a minimum of 50 feet from the river and there will be Best Management Practices (BMPs) in place for containment and practices to reduce the potential for spill.

Vegetation Removal

A few trees, (primarily black locust) immediately adjacent to the sidewalk (approximately 6-10 trees) would be removed to accommodate the enhanced bicycle and pedestrian access; however, they are all located more than 400 feet from the river.

Contaminants

The proposed action includes multiple conservation measures aimed at minimizing the risk of fuel, oil, or similar contaminant leakage into the stream. For example, equipment will be cleaned of external oil and checked for leaks prior to arrival at the project site. Equipment refueling will also occur away from the river channel in designated areas approved by ITD.

Anticipated Construction Sequence

While the contractor would determine the methods, equipment, sequencing and timing of construction, the anticipated construction sequence is shown in Table 3. The project would require approximately 180-240 working days if constructed during one season but there is a possibility that the bridge would be constructed over two seasons. In-water work would be during the in-water work window from July 1 to August 31 with potential to extend through October 15, regardless of whether it is constructed in one or two seasons. Work is anticipated to begin 2023.

Table 3: Anticipated construction sequence.

Activity	Duration	Timing	
		Phase 1	Phase 2
Set up traffic control	1 Week	May 2023	July 2023
Set up BMPs including barge, containment, and spill control	2 Weeks	May 2023	
Remove utility lines	2 Weeks	May 2023	July 2023
Remove superstructure in saw cut sections	3Weeks	May-June 2023	
Remove and Replace abutments and install bent caps and bearing pads	5 Weeks	May-June 2023	July-August 2023
Install steel girders	2 Weeks	May-July 2023	August 2023

Activity	Duration	Timing	
		Phase 1	Phase 2
Install Bridge deck and parapets	6 Weeks	May-July 2023	August-September 2023
Install railing, striping, switch traffic	2 Weeks	May-July 2023	September-October 2023
Place geotextile and riprap around piers 3 through 9	6-8 Weeks	Within July 1-August 31 fish window with potential to extend through October 15	

Above OHWM

Traffic control will be set up prior to construction activities. It is anticipated that half the bridge will be demolished and constructed at a time and that a single lane of traffic in each direction will be maintained on each half of the bridge during construction.

The bridge will be tested to determine if the bridge contains lead or asbestos. The contractor will submit a Containment Plan, Asbestos Removal Plan, Pollution Prevention Plan with Spill Prevention Plan, and Hazardous Waste Plan for ITD review and approval as needed before work begins. This review will be in accordance with the Standard Specifications for Highway Construction. (ITD 2018). The plans will also consider staging areas, stockpile sites, refueling areas, and handling and disposal of construction waste. Spill kits will be located on-site and will be properly utilized if needed. All waste generated will be collected and properly disposed of off-site according to the Resource Conservation and Recovery Act, Clean Water Act, Idaho Hazardous Waste Management Act, and other relevant regulations.

Best Management Practices, based on Idaho Transportation Department; Best Management Practices (BMP) Manual; Temporary and Construction Site Best Management Practices, will be required by ITD, and containment will be installed prior to the start of construction (ITD 2010). Barges will be used to conduct much of the work. Boat traffic control at and near the bridge will be in place during demolition and construction as needed. Details of the primary construction elements for the bridge repairs are described below.

Wastewater and any bridge debris will be collected by barges, which will be located under the bridge and will have a containment system. Wastewater will be disposed of off-site in an upland area according to the Resource Conservation and Recovery Act, Clean Water Act, Idaho Hazardous Waste Management Act, and other relevant regulations.

Super-Structure Demolition

The bridge superstructure will be demolished in phases, requiring work to be staggered. A crane and one or more barges will be launched from the port, as noted above, and moved to the areas to be demolished or constructed. Work will be required along the full length of the structure and the barge will move to these sections as needed. The barge will be stabilized or anchored using spuds installed in the streambed.

Demolition of the existing bridge surface sections including rail, girder, abutments, and deck will be accomplished through saw cutting, lifting, and removing the debris in sections. Rail, girder, and portions of the deck and abutments will be removed as one piece if possible. Portions to be removed would need to be cut free from the portion to remain, and then the piece would be lifted and removed using a single large construction crane or multiple cranes. These pieces will be set on barges to be moved and disposed of according to the Resource Conservation and Recovery Act, Clean Water Act, Idaho Hazardous Waste Management Act, and other relevant regulations. No wastewater or construction debris will be allowed to enter the river.

Superstructure Construction

Construction of the first half of the new bridge features will include constructing wider abutments, wing walls, placing girders, pouring half at a time of the width of the deck, the parapet, and half at a time of the approach slab width on both ends of the bridge. Steel girders will be placed at pier locations using a crane and barge. Steel girders will be spliced with a section installed directly on the piers and a section requiring attachment to the cantilevered end of the pier section. This will require barge(s) use at the pier and at mid span (between splice locations) of each span. This work will impact the waterway for an extended period along the full length of the bridge (up to 7 months over up to two seasons).

Precast concrete pier caps and girder bearings will be placed using a crane and barge. This work is required at nine pier locations within the waterway. This will be done during the girder placement.

The other half of bridge will then be constructed in the same way described above. Rerouted utility lines will then be attached to the upgraded bridge.

Pier concrete repairs above the waterline will involve cleaning the pier surfaces using hand tools equipped with vacuum systems to collect debris and dust. After the areas are cleaned, grout will be placed into the spalls and smoothed. Concrete piers, pier cap, and other exposed concrete surfaces will be washed and treated with Type C waterproofing (silane) prior to superstructure construction. This will be accomplished by a worker with a bucket on a barge with an effective containment method suitable for the conditions.

Wet concrete will be contained on the deck of the bridge using sand bags or visqueen; there will also be containment on the barges below the deck in the event that any concrete is spilled during pouring. Concrete will not be poured during rainy weather, and concrete will be covered if poured in advance of predicted rain.

Below the OHWM

ITD plans for work below OHWM to be limited to the period of July 1-August 31 in one or two seasons. However, if work cannot be completed within this work window, ITD proposes that it can be extended to October 15. Therefore, this Opinion evaluates the project including potential extension of the in-water work through October 15. Excavation of material below OHWM is not proposed for this action.

An underlayment of either graded filter rock or a geotextile fabric will be placed on the river bottom around Piers 3 through 9. Approximately 4,550 cubic yards of riprap will be placed over the geotextile. This would cover approximately 0.74 acres of streambed. This work will require a barge for materials and construction crews to stage operations. Divers will assist with the installation of the geotextile if used.

In order to minimize impacts on the river and fish, the following BMPs will be implemented.

- The contractor will submit a Containment Plan, Asbestos Removal Plan (if applicable), Pollution Prevention Plan with Spill Prevention Plan, and Hazardous Waste Plan for ITD review and approval before work begins. Measures will be implemented prior to construction. This will also consider staging areas, stockpile sites, refueling areas, and handling and disposal of construction waste. All staging, fueling, and storage areas will be located away from and adequately buffered from aquatic areas.

- Spill kits will be located on-site, on the barge, and will be properly utilized if needed. All waste generated will be collected and properly disposed of off-site according to the Resource Conservation and Recovery Act, Clean Water Act, Idaho Hazardous Waste Management Act, and other relevant regulations.

- Methods to scare fish away during the placement of riprap (such as using a cable or chain dragged along the bottom of the river at the base of the pier prior to placing the riprap) to minimize harm to fish.

- Chemical spray such as silane or siloxane for waterproofing will only be applied when winds are less than 15 miles per hour and when temperatures are between 40° F and 100° F (4° C and 38° C) and will not be applied during wet or inclement weather. Proper storage, handling and application of this and other chemicals will be covered under the pollution prevention and spill plan.

- If a wet-blade concrete saw is used, a catch basin would be constructed at the site and/or on the barge to collect cutting water/slurry. A shop vacuum would be used to collect the slurry for offsite disposal.

- If a dry-blade concrete saw is used, an enclosed containment structure would be constructed around the site and/or on the barge to trap airborne dust particles, and a shop vacuum, or other device, would be used to collect the dust for off-site disposal.

- To minimize the potential for introducing sediment to the aquatic system, sediment fences or other erosion control measures will be placed between ground disturbing activities and live water. Ground disturbance will not occur during wet conditions (i.e., during or immediately following rain events).

- No water will be taken from the river for use in the project.

- Petroleum-based hydraulic fluid for in-water equipment will be replaced with a non-petroleum, lower impact to environment type of fluid.

- Barges will not be stored near shore. If the barge is not in direct use, the barge will be moved offshore to deeper water, near piers 3-8.

2. ENDANGERED SPECIES ACT: BIOLOGICAL OPINION AND INCIDENTAL TAKE STATEMENT

The ESA establishes a national program for conserving threatened and endangered species of fish, wildlife, plants, and the habitat upon which they depend. As required by section 7(a)(2) of the ESA, each federal agency must ensure that its actions are not likely to jeopardize the continued existence of endangered or threatened species, or adversely modify or destroy their designated critical habitat. Per the requirements of the ESA, federal action agencies consult with NMFS and section 7(b)(3) requires that, at the conclusion of consultation, NMFS provide an Opinion stating how the agency's actions would affect listed species and their critical habitats. If incidental take is reasonably certain to occur, section 7(b)(4) requires NMFS to provide an ITS that specifies the impact of any incidental taking and includes non-discretionary reasonable and prudent measures (RPMs) and terms and conditions to minimize such impacts.

2.1. Analytical Approach

This Opinion includes both a jeopardy analysis and an adverse modification analysis. The jeopardy analysis relies upon the regulatory definition of "jeopardize the continued existence of" a listed species, which is "to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species" (50 CFR402.02). Therefore, the jeopardy analysis considers both survival and recovery of the species.

This Opinion relies on the regulatory definition of "destruction or adverse modification," which "means a direct or indirect alteration that appreciably, diminishes the value of critical habitat as a whole for the conservation of a listed species" (50 CFR 402.02).

The designations of critical habitat for Snake River fall Chinook salmon and Snake River Basin steelhead use the terms primary constituent element (PCE) or essential features. The 2016 critical habitat regulations (50 CFR 424.12) replaced that terminology with physical or biological features (PBFs). 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. In this Opinion, we use the term PBF to mean PCE or essential feature, as appropriate for the specific critical habitat.

The 2019 regulations define effects of the action using the term "consequences" (50 CFR 402.02). As explained in the preamble to the regulations (84 FR 44977), that definition does not change the scope of our analysis and in this Opinion we use the terms "effects" and "consequences" interchangeably.

We use the following approach to determine whether a proposed action is likely to jeopardize listed species or destroy or adversely modify critical habitat:

- Evaluate the rangewide status of the species and critical habitat expected to be adversely affected by the proposed action.
- Evaluate the environmental baseline of the species and critical habitat.
- Evaluate the effects of the proposed action on species and their habitat using an exposure-response approach.
- Evaluate cumulative effects.
- In the integration and synthesis, add the effects of the action and cumulative effects to the environmental baseline, and, in light of the status of the species and critical habitat, analyze whether the proposed action is likely to: (1) Directly or indirectly reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species; or (2) directly or indirectly result in an alteration that appreciably diminishes the value of critical habitat as a whole for the conservation of a listed species.
- If necessary, suggest a reasonable and prudent alternative (RPA) to the proposed action.

2.2. Rangewide Status of the Species and Critical Habitat

This Opinion examines the status of each species that would be adversely affected by the proposed action. The status is determined by the level of extinction risk that the listed species face, based on parameters considered in documents such as recovery plans, status reviews, and listing decisions. This informs the description of the species' likelihood of both survival and recovery. The species status section also helps to inform the description of the species' "reproduction, numbers, or distribution" as described in 50 CFR 402.02.

The Opinion also examines the condition of critical habitat throughout the designated area, evaluates the conservation value of the various watersheds and coastal and marine environments that make up the designated area, and discusses the function of the essential PBFs that help to form that conservation value. Table 4 describes the Federal Register notices and notice dates for the species under consideration in this Opinion.

Table 4: Listing status, status of critical habitat designations and protective regulations, and relevant Federal Register decision notices for ESA-listed species considered in this Opinion.

Species	Listing Status	Critical Habitat	Protective Regulations
Chinook salmon *(Oncorhynchus tshawytscha)*			
Snake River fall-run	T 6/28/05; 70 FR 37160	12/28/93; 58 FR 68543	6/28/05; 70 FR 37160
Steelhead (*O. mykiss*)			
Snake River Basin	T 1/05/06; 71 FR 834	9/02/05; 70 FR 52630	6/28/05; 70 FR 37160

Note: Listing status: 'T' means listed as threatened under the ESA; 'E' means listed as endangered.

2.2.1 Status of the Species

This section describes the present condition of the Snake River fall Chinook salmon evolutionarily significant unit (ESU), and the Snake River Basin steelhead distinct population segment (DPS). NMFS expresses the status of a salmonid ESU or DPS in terms of likelihood of persistence over 100 years (or risk of extinction over 100 years). NMFS uses McElhaney et al.'s (2000) description of a viable salmonid population (VSP) that defines "viable" as less than a five percent risk of extinction within 100 years and "highly viable" as less than a one percent risk of extinction within 100 years. A third category, "maintained," represents a less than 25 percent risk within 100 years (moderate risk of extinction). To be considered viable, an ESU or DPS should have multiple viable populations so that a single catastrophic event is less likely to cause the ESU/DPS to become extinct, and so that the ESU/DPS may function as a metapopulation that can withstand population-level extinction and support recolonization processes (ICTRT 2007). The risk level of the ESU/DPS is built up from the aggregate risk levels of the individual populations and major population groups (MPGs) that make up the ESU/DPS.

Attributes associated with a VSP are: (1) Abundance (number of adult spawners in natural production areas); (2) productivity (adult progeny per parent); (3) spatial structure; and (4) diversity. A VSP needs sufficient levels of these four population attributes in order to safeguard the genetic diversity of the listed ESU or DPS; enhance its capacity to adapt to various environmental conditions; and allow it to become self-sustaining in the natural environment (ICTRT 2007). These viability attributes are influenced by survival, behavior, and experiences throughout the entire salmonid life cycle, characteristics that are influenced in turn by habitat and other environmental and anthropogenic conditions. The present risk faced by the ESU/DPS informs NMFS' determination of whether additional risk will appreciably reduce the likelihood that the ESU/DPS will survive or recover in the wild.

2.2.1.1 Snake River Fall-run Chinook Salmon

The Snake River fall Chinook salmon ESU was listed as threatened on April 22, 1992 (57 FR 14653). This ESU occupies the Snake River basin, which drains portions of southeastern Washington, northeastern Oregon, and north/central Idaho. Snake River fall Chinook salmon have substantially declined in abundance from historic levels, primarily due to the loss of primary spawning and rearing areas upstream of the Hells Canyon Dam complex (57 FR 14653). Additional concerns for the species have been the high percentage of hatchery fish returning to natural spawning grounds and the relatively high aggregate harvest impacts by ocean and in-river fisheries (Good et al. 2005). On May 26, 2016, in the agency's most recent 5-year review for Pacific salmon and steelhead, NMFS concluded that the species should remain listed as threatened (81 FR 33468).

Life History. Snake River fall Chinook salmon enter the Columbia River in July and August, and migrate past the lower Snake River mainstem dams from August through November. Spawning takes place from October through early December in the mainstem of the Snake River, primarily between Asotin Creek and Hells Canyon Dam, and in the lower reaches of several of the associated major tributaries including the Tucannon, Grande Ronde, Clearwater, Salmon, and Imnaha Rivers (Connor and Burge 2003; Ford 2011). Spawning has occasionally been observed in the tailrace areas of the four-mainstem dams (Dauble et al. 1999; Dauble et al. 1995; Mueller 2009). Juveniles emerge from the gravels in March and April of the following year.

Until relatively recently, Snake River fall Chinook were assumed to follow only an "ocean-type" life history (Dauble and Geist 2000; Good et al. 2005; Healey 1991; NMFS 1992) where they migrate to the Pacific Ocean during their first year of life, normally within 3 months of emergence from spawning substrate as age-0 smolts, to spend their first winter in the ocean. Ocean-type Chinook salmon juveniles tend to display a "rear as they go" rearing strategy in which they continually move downstream through shallow shoreline habitats their first summer and fall until they reach the ocean by winter (Connor and Burge 2003; Coutant and Whitney 2006). However, several studies have shown that another life history pattern exists where a significant number of smaller Snake River fall Chinook juveniles overwinter in Snake River reservoirs prior to outmigration. These fish begin migration later than most, arrest their seaward migration and overwinter in reservoirs on the Snake and Columbia Rivers, then resume migration and enter the ocean in early spring as age-1 smolts (Connor and Burge 2003; Connor et al. 2002; Connor et al. 2005; Hegg et al. 2013). Connor et al. (2005) termed this life history strategy "reservoir-type." Scale samples from natural-origin adult fall Chinook salmon taken at Lower Granite Dam have indicated that approximately half of the returns overwintered in freshwater (Ford 2011). Tiffan and Connor (2012) showed that subyearling fish favor water less than six feet deep.

Spatial Structure and Diversity. The Snake River fall Chinook salmon ESU includes one extant population of fish spawning in the mainstem of the Snake River and the lower reaches of several of the associated major tributaries including the Tucannon, Grande Ronde, Clearwater, Salmon, and Imnaha Rivers. The ESU also includes four artificial propagation programs: the Lyons Ferry Hatchery and the Fall Chinook Acclimation Ponds Program in Washington; the Nez Perce Tribal Hatchery in Idaho; and the Oxbow Hatchery in Oregon and Idaho (70 FR 37160). Historically, this ESU included one large additional population spawning in the mainstem of the Snake River upstream of the Hells Canyon Dam complex, an impassable migration barrier (NWFSC 2015). Four of the five historic major spawning areas in the Lower Snake population currently have natural-origin spawning. Spatial structure risk for the existing ESU is therefore low and is not precluding recovery of the species (NWFSC 2015).

There are several diversity concerns for Snake River fall Chinook salmon, leading to a moderate diversity risk rating for the extant Lower Snake population. One concern is the high proportion of hatchery fish spawning naturally; between 2010 and 2014, only 31percent of spawners in the population were natural-origin, and hatchery-origin returns are widespread across the major spawning areas within the population (NWFSC 2015). The moderate diversity risk is also driven by changes in major life history patterns; shifts in phenotypic traits; high levels of genetic homogeneity in samples from natural-origin returns; selective pressure imposed by current hydropower operations; and cumulative harvest impacts (NWFSC 2015). Diversity risk will need to be reduced to low in order for this population to be considered highly viable, a requirement for recovery of the species. Low diversity risk would require that one or more major spawning areas produce a significant level of natural-origin spawners with low influence by hatchery-origin spawners (NWFSC 2015).

Abundance and Productivity. Historical abundance of Snake River fall Chinook salmon is estimated to have been 416,000 to 650,000 adults (NMFS 2006), but numbers declined drastically over the 20th century, with only 78 natural-origin fish (Joint Columbia River Management Staff 2014) and 306 hatchery-origin fish (FPC 2019) passing Lower Granite Dam in 1990. Artificial propagation of fall Chinook salmon occurred from 1901 through 1909 and again from 1955 through 1973, but those efforts ultimately failed and by the late 1970s, essentially all Snake River fall Chinook salmon were natural-origin. The large-scale hatchery effort that exists today began in 1976, when Congress authorized the Lower Snake River Compensation Plan (LSRCP) to compensate for fish and wildlife losses caused by the construction and operation of the four lower Snake River dams. The first hatchery fish from this effort returned in 1981 and hatchery returns have comprised a substantial portion of the run every year since. From 2007 to 2014 the proportion of hatchery-origin fish has averaged about 70 percent, based on post-harvest, post-broodstock estimates above Lower Granite Dam (NWFSC 2015).

After 1990, abundance increased dramatically and in 2014, the 10-year geometric mean (2005-2014) was 22,196 total adult returns (FPC 2019) and 6,148 natural-origin adult returns (NWFSC 2015). This is well above the minimum abundance of 4,200 natural-origin spawners needed for highly viable status. However, the productivity estimate for the 1990–2009 brood years is 1.5, which is below the 1.7 minimum needed for highly viable status. From 2015 through 2018, annual returns steadily decreased (Personal Communication, Bill Young, Nez Perce Tribe Hatchery Evaluations Coordinator, October 17, 2019), but in spite of this recent decrease, the geometric mean abundance for 2009-2018 was actually slightly higher than for 2005-2014. However, due to the declining trend, the current productivity estimate is slightly less than 1.5, with substantial uncertainty due to large numbers of hatchery-origin fish reaching spawning habitat. Regardless, an increase in productivity will likely be needed to achieve highly viable status. This could possibly be achieved by reducing mortality during specific life stages, such as a reduction in harvest impacts on adults, currently at 40–50 percent, or improvements in juvenile survivals during downstream migration (NWFSC 2015).

Limiting factors for fall Chinook salmon spawning and rearing in the lower Clearwater River include reduced habitat complexity and floodplain connectivity, increased water temperatures, increased sediment, excessive nutrients, and pollutants.

Adult fall Chinook salmon are present in the lower Clearwater River from early September to November holding or migrating to spawning areas upstream. Juvenile fish emerge from redds in upstream areas of the mainstem Clearwater River and its major tributaries and are present in the lower Clearwater starting in June. Approximately half of the fall Chinook salmon juvenile outmigrants pass Lower Granite Dam by June 30; however, it is likely that some juvenile fall Chinook salmon (including "reservoir type," as noted above) are present in the lower Clearwater River during summer and fall. Although relatively warm water temperatures are anticipated during the in-water work window, the lower Clearwater River receives cool water released from Dworshak Reservoir and typically remains sufficiently cool (especially in deeper areas) to support salmonids through the summer. Juvenile fish will be in shallow near-shore areas early in summer, and farther offshore as the fish grow through summer and fall. The small numbers of reservoir type juvenile fish in the lower Clearwater River will become fewer and fewer as summer and fall progress and most fish gradually move down through the reservoir system. If the in-water work extends into October, there will likely also be adult fish in the action area during construction.

2.2.1.2 Snake River Basin Steelhead

The Snake River Basin steelhead was listed as a threatened ESU on August 18, 1997 (62 FR 43937), with a revised listing as a DPS on January 5, 2006 (71 FR 834). This DPS occupies the Snake River basin, which drains portions of southeastern Washington, northeastern Oregon, and north/central Idaho. Reasons for the decline of this species include substantial modification of the seaward migration corridor by hydroelectric power development on the mainstem Snake and Columbia Rivers, and widespread habitat degradation and reduced streamflows throughout the Snake River basin (Good et al. 2005). Another major concern for the species is the threat to genetic integrity from past and present hatchery practices, and the high proportion of hatchery fish in the aggregate run of Snake River Basin steelhead over Lower Granite Dam (Good et al. 2005; Ford 2011). On May 26, 2016, in the agency's most recent 5-year review for Pacific salmon and steelhead, NMFS concluded that the species should remain listed as threatened (81 FR 33468).

Life History. Adult Snake River Basin steelhead enter the Columbia River from late June to October to begin their migration inland. After holding over the winter in larger rivers in the Snake River basin, steelhead disperse into smaller tributaries to spawn from March through May. Earlier dispersal occurs at lower elevations and later dispersal occurs at higher elevations. Juveniles emerge from the gravels in 4 to 8 weeks, and move into shallow, low-velocity areas in side channels and along channel margins to escape high velocities and predators (Everest and Chapman 1972). Juvenile steelhead then progressively move toward deeper water as they grow in size (Bjornn and Rieser 1991). Juveniles typically reside in fresh water for 1 to 3 years, although this species displays a wide diversity of life histories. Smolts migrate downstream during spring runoff, which occurs from March to mid-June depending on elevation, and typically spend 1 to 2 years in the ocean.

Spatial Structure and Diversity. This species includes all naturally-spawning steelhead populations below natural and manmade impassable barriers in streams in the Snake River basin of southeast Washington, northeast Oregon, and Idaho, as well as the progeny of six artificial propagation programs (71FR834). The hatchery programs include Dworshak National Fish Hatchery, Lolo Creek, North Fork Clearwater River, East Fork Salmon River, Tucannon River, and the Little Sheep Creek/Imnaha River steelhead hatchery programs. The Snake River Basin steelhead listing does not include resident forms of *O. mykiss* (rainbow trout) co-occurring with steelhead.

The ICTRT identified 24 extant populations within this DPS, organized into five MPGs (ICTRT 2003). The ICTRT also identified a number of potential historical populations associated with watersheds above the Hells Canyon Dam complex on the mainstem Snake River, a barrier to anadromous migration. The five MPGs with extant populations are the Clearwater River, Salmon River, Grande Ronde River, Imnaha River, and Lower Snake River. In the Clearwater River, the historic North Fork population was blocked from accessing spawning and rearing habitat by Dworshak Dam. Current steelhead distribution extends throughout the DPS, such that spatial structure risk is generally low. For each population in the DPS, Table 3 shows the current risk ratings for the parameters of a VSP (spatial structure, diversity, abundance, and productivity).

The Snake River Basin DPS steelhead exhibit a diversity of life-history strategies, including variations in fresh water and ocean residence times. Traditionally, fisheries managers have classified Snake River Basin steelhead into two groups, A-run and B-run, based on ocean age at return, adult size at return, and migration timing. A-run steelhead predominantly spend one year in the ocean; B-run steelhead are larger with most individuals returning after two years in the ocean. New information shows that most Snake River populations support a mixture of the two run types, with the highest percentage of B-run fish in the upper Clearwater River and the South Fork Salmon River; moderate percentages of B-run fish in the Middle Fork Salmon River; and very low percentages of B-run fish in the Upper Salmon River, Grande Ronde River, and Lower Snake River (NWFSC 2015). Maintaining life history diversity is important for the recovery of the species.

Diversity risk for populations in the DPS is either moderate or low. Large numbers of hatchery steelhead are released in the Snake River, and the relative proportion of hatchery adults in natural spawning areas near major hatchery release sites remains uncertain. Moderate diversity risks for some populations are thus driven by the high proportion of hatchery fish on natural spawning grounds and the uncertainty regarding these estimates (NWFSC 2015). Reductions in hatchery-related diversity risks would increase the likelihood of these populations reaching viable status.

Abundance and Productivity. Historical estimates of steelhead production for the entire Snake River basin are not available, but the basin is believed to have supported more than half the total steelhead production from the Columbia River basin (Mallet 1974, as cited in Good et al. 2005). The Clearwater River drainage alone may have historically produced 40,000 to 60,000 adults (Ecovista et al. 2003), and historical harvest data suggests that steelhead production in the Salmon River was likely higher than in the Clearwater (Hauck 1953). In contrast, at the time of listing in 1997, the 5-year geomean abundance for natural-origin steelhead passing Lower Granite Dam, which includes all but one population in the DPS, was 11,462 adults (Ford 2011). Abundance began to increase in the early 2000s, with the single year count and the 5-year geomean both peaking in 2015 at 45,789 and 34,179, respectively (ODFW and WDFW 2019). Since 2015, the numbers have declined steadily with only 10,717 natural-origin adult returns counted in 2018 (ODFW and WDFW 2019). Even with the recent decline, the 5-year geomean abundance for natural-origin adult returns was 23,100 in 2018 (ODFW and WDFW 2019) which is more than twice the number at listing and substantially greater than the 5-year geomean of 18,847 tabulated in the most recent status review (NWFSC 2015).

Population-specific abundance estimates exist for some but not all populations. Of the populations for which we have data, three (Joseph Creek, Upper Grande Ronde, and Lower Clearwater) are meeting minimum abundance/productivity thresholds and several more have likely increased in abundance enough to reach moderate risk. Despite these recent increases in abundance, the status of many of the individual populations remains uncertain, and four out of the five MPGs are not meeting viability objectives (NWFSC 2015). In order for the species to recover, more populations will need to reach viable status through increases in abundance and productivity.

Table 5: Summary of viable salmonid population parameter risks and overall current status for each population in the Snake River Basin steelhead DPS (NMFSC 2015). Risk rating with "?" are based on limited or provisional data series.

MPG	Population	VSP Risk Parameter		Overall Viability Rating
		Abundance/ Productivity	Spatial Structure/ Diversity	
Lower Snake River	Tucannon River	High?	Moderate	High Risk?
	Asotin Creek	Moderate?	Moderate	Maintained?
Grande Ronde River	Lower Grande Ronde	N/A	Moderate	Maintained?
	Joseph Creek	Very Low	Low	**Highly Viable**
	Wallowa River	N/A	Low	Maintained?
	Upper Grande Ronde	Low	Moderate	**Viable**
Imnaha River	Imnaha River	Moderate?	Moderate	Maintained?
Clearwater River (Idaho)	Lower Mainstem Clearwater River*	Moderate?	Low	Maintained?
	South Fork Clearwater River	High?	Moderate	High Risk?
	Lolo Creek	High?	Moderate	High Risk?
	Selway River	Moderate?	Low	Maintained?
	Lochsa River	Moderate?	Low	Maintained?
	North Fork Clearwater River			*Extirpated*
Salmon River (Idaho)	Little Salmon River	Moderate?	Moderate	Maintained?
	South Fork Salmon River	Moderate?	Low	Maintained?
	Secesh River	Moderate?	Low	Maintained?
	Chamberlain Creek	Moderate?	Low	Maintained?
	Lower Middle Fork Salmon R.	Moderate?	Low	Maintained?
	Upper Middle Fork Salmon R.	Moderate?	Low	Maintained?
	Panther Creek	Moderate?	High	High Risk?
	North Fork Salmon River	Moderate?	Moderate	Maintained?
	Lemhi River	Moderate?	Moderate	Maintained?
	Pahsimeroi River	Moderate?	Moderate	Maintained?
	East Fork Salmon River	Moderate?	Moderate	Maintained?
	Upper Mainstem Salmon R.	Moderate?	Moderate	Maintained?
Hells Canyon	Hells Canyon Tributaries			*Extirpated*

*Current abundance/productivity estimates for the Lower Clearwater Mainstem population exceed minimum thresholds for viability, but the population is assigned moderate risk for abundance/productivity due to the high uncertainty associated with the estimate.

The steelhead populations of the Clearwater MPG migrate through and to some extent rear in the lower Clearwater River where the bridge project is. Adult steelhead are present beginning in August and through fall and winter, before moving upstream to spawn in late winter/early spring. Out-migrating juvenile steelhead (ages 1-3) are present in the lower Clearwater River in the spring and early summer. Some rearing juvenile steelhead (ages 0-2) are present in the lower Clearwater River in almost all seasons, although in the late summer, when water is not being released from Dworshak Reservoir, the lower Clearwater River temperatures can become marginally suitable for steelhead, and during that period likely holds very few juvenile fish. During the July and August portion of the in-water work period, the small numbers of rearing juvenile steelhead are likely to be in the deep pools and cooler areas in the vicinity of the bridge (ICDC 2017) (Personal communication Ries 2020).

Summary

Both steelhead and fall Chinook salmon may be present in the action area during the construction of the bridge. All life stages may be present especially if the in-water work window is extended to October 15. Many of the abundance estimates are based on limited data; both populations have low diversity, and are heavily influenced by hatchery origin fish. Both steelhead and fall Chinook are not meeting viability criteria for recovery.

2.2.2 Status of Critical Habitat

In evaluating the condition of designated critical habitat, NMFS examines the condition and trends of PBFs, which are essential to the conservation of the ESA-listed species because they support one or more life stages of the species. Proper function of these PBFs is necessary to support successful adult and juvenile migration, adult holding, spawning, incubation, rearing, and the growth and development of juvenile fish. Modification of PBFs may affect freshwater spawning, rearing or migration in the action area. Generally speaking, sites required to support one or more life stages of the ESA-listed species (i.e., sites for spawning, rearing, migration, and foraging) contain PBF essential to the conservation of the listed species (e.g., spawning gravels, water quality and quantity, side channels, or food) (Table 6).

Table 6: Types of sites, essential physical and biological features, and the species life stage each PBF supports.

Site	Essential Physical and Biological Features	Species Life Stage
Snake River Basin Steelhead[a]		
Freshwater spawning	Water quality, water quantity, and substrate	Spawning, incubation, and larval development
Freshwater rearing	Water quantity & floodplain connectivity to form and maintain physical habitat conditions	Juvenile growth and mobility
	Water quality and forage[b]	Juvenile development
	Natural cover[c]	Juvenile mobility and survival
Freshwater migration	Free of artificial obstructions, water quality and quantity, and natural cover[c]	Juvenile and adult mobility and survival

Site	Essential Physical and Biological Features	Species Life Stage
Snake River Fall Chinook Salmon		
Spawning & Juvenile Rearing	Spawning gravel, water quality and quantity, cover/shelter (Chinook only), food, riparian vegetation, space (Chinook only)	Juvenile and adult
Migration	Substrate, water quality and quantity, water temperature, water velocity, cover/shelter, food[d], riparian vegetation, space, safe passage	Juvenile and adult

[a] Additional PBFs pertaining to estuarine, nearshore, and offshore marine areas have also been described for Snake River steelhead and Middle Columbia steelhead. These PBFs will not be affected by the proposed action and have therefore not been described in this Opinion.

[b] Forage includes aquatic invertebrate and fish species that support growth and maturation.

[c] Natural cover includes shade, large wood, log jams, beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks.

[d] Food applies to juvenile migration only.

Table 7 describes the geographical extent within the Snake River of critical habitat for fall Chinook salmon and steelhead. Critical habitat includes the stream channel and water column with the lateral extent defined by the ordinary high-water line, or the bankfull elevation where the ordinary high-water line is not defined. In addition, critical habitat for fall Chinook salmon includes the adjacent riparian zone, which is defined as the area within 300 feet of the line of high water of a stream channel or from the shoreline of standing body of water (58 FR 68543). The riparian zone is critical because it provides shade, streambank stability, organic matter input, and regulation of sediment, nutrients, and chemicals.

Table 7: Geographical extent of designated critical habitat within the Snake River for ESA-listed salmon and steelhead.

ESU/DPS	Designation	Geographical Extent of Critical Habitat
Snake River fall Chinook salmon	58 FR 68543; December 28, 1993	Snake River to Hells Canyon Dam; Palouse River from its confluence with the Snake River upstream to Palouse Falls; Clearwater River from its confluence with the Snake River upstream to Lolo Creek; North Fork Clearwater River from its confluence with the Clearwater River upstream to Dworshak Dam; and all other river reaches presently or historically accessible within the Lower Clearwater, Hells Canyon, Imnaha, Lower Grande Ronde, Lower Salmon, Lower Snake, Lower Snake–Asotin, Lower North Fork Clearwater, Palouse, and Lower Snake–Tucannon subbasins.
Snake River Basin steelhead	70 FR 52630; September 2, 2005	Specific stream reaches are designated within the Lower Snake, Salmon, and Clearwater River basins. Table 21 in the Federal Register details habitat areas within the DPS's geographical range that are excluded from critical habitat designation.

Spawning and rearing habitat quality in tributary streams in the Snake River varies from excellent in wilderness and roadless areas to poor in areas subject to intensive human land uses (NMFS 2015; NMFS 2017). Critical habitat throughout much of the Interior Columbia (which includes the Snake River and the Middle Columbia River) has been degraded by intensive agriculture, alteration of stream morphology (i.e., channel modifications and diking), riparian vegetation disturbance, wetland draining and conversion, livestock grazing, dredging, road construction and maintenance, logging, mining, and urbanization. Reduced summer streamflows, impaired water quality, and reduction of habitat complexity are common problems for critical habitat in non-wilderness areas. Human land use practices throughout the basin have caused streams to become straighter, wider, and shallower, thereby reducing rearing habitat and increasing water temperature fluctuations.

In many stream reaches designated as critical habitat in the Snake River basin, streamflows are substantially reduced by water diversions (NMFS 2015; NMFS 2017). Withdrawal of water, particularly during low-flow periods that commonly overlap with agricultural withdrawals, often increases summer stream temperatures, blocks fish migration, strands fish, and alters sediment transport (Spence et al. 1996). Reduced tributary streamflow has been identified as a major limiting factor for Snake River Basin steelhead in particular (NMFS 2017).

Many stream reaches designated as critical habitat for these species are listed on the Clean Water Act 303(d) list for impaired water quality, such as elevated water temperature (IDEQ 2011). Many areas that were historically suitable rearing and spawning habitat are now unsuitable due to high summer stream temperatures, such as some stream reaches in the Upper Grande Ronde. Removal of riparian vegetation, alteration of natural stream morphology, and withdrawal of water for agricultural or municipal use all contribute to elevated stream temperatures. Water quality in spawning and rearing areas in the Snake River has also been impaired by high levels of sedimentation and by heavy metal contamination from mine waste (e.g., IDEQ and USEPA 2003; IDEQ 2001).

The construction and operation of water storage and hydropower projects in the Columbia River basin, including the run-of-river dams on the mainstem lower Snake and lower Columbia Rivers, have altered biological and physical attributes of the mainstem migration corridor. These alterations have affected juvenile migrants to a much larger extent than adult migrants. However, changing temperature patterns have created passage challenges for summer migrating adults in recent years, requiring new structural and operational solutions (i.e., cold-water pumps and exit "showers" for ladders at Lower Granite and Lower Monumental dams). Actions taken since 1995 that have reduced negative effects of the hydrosystem on juvenile and adult migrants include:

- Minimizing winter drafts (for flood risk management and power generation) to increase flows during peak spring passage;

- Releasing water from storage to increase summer flows;

- Releasing water from Dworshak Dam to reduce peak summer temperatures in the lower Snake River;

- Constructing juvenile bypass systems to divert smolts, steelhead kelts, and adults that fall back over the projects away from turbine units;

- Providing spill at each of the mainstem dams for smolts, steelhead kelts, and adults that fall back over the projects;

- Constructing "surface passage" structures to improve passage for smolts, steelhead kelts, and adults falling back over the projects; and,

- Maintaining and improving adult fishway facilities to improve migration passage for adult salmon and steelhead.

Designated critical habitat in the lower Clearwater River near the project is substantially altered by roads, riprap, levees, and urban stormwater/industrial effluent. As noted above, it can also warm by late summer to temperatures marginally suitable for salmon and steelhead. The banks of the lowermost reaches of the Clearwater River are primarily composed of large riprap associated with the levee bank stabilization. The action area is within the upstream reach of Lower Granite Pool, due to being in the pool and being highly channelized, the action area has times of reservoir habitat and flowing river habitat. During the spring when the action area is functioning as a river, the fine sediment is suspended and moved downstream. Because of these river/reservoir dynamics there is little deposited fine sediment in the action area.

2.2.3 Climate Change Implications for ESA-listed Species and their Critical Habitat

Climate change is affecting aquatic habitat and the rangewide status of Snake River fall Chinook salmon and Snake River Basin steelhead. The U. S. Global Change Research Program reports average warming of about 1.3°F from 1895 to 2011, and projects an increase in average annual temperature of 3.3°F to 9.7°F by 2070 to 2099 (Climate Change Science Program 2014). Climate change has negative implications for ESA listed anadromous fishes and their habitats in the Pacific Northwest (CIG 2004; Scheuerell and Williams 2005; Zabel et al. 2006; ISAB 2007). According to the Independent Science Advisory Board (ISAB), these effects will cause the following:

- Warmer air temperatures will result in diminished snowpack and a shift to more winter/spring rain and runoff, rather than snow that is stored until the spring/summer melt season;

- With a smaller snowpack, watersheds will see their runoff diminished earlier in the season, resulting in lower flows in the June through September period, while more precipitation falling as rain rather than snow will cause higher flows in winter, and possibly higher peak flows; and,

- Water temperatures are expected to rise, especially during the summer months when lower flows co-occur with warmer air temperatures.

These changes will not be spatially homogeneous across the entire Pacific Northwest. Low-lying areas are likely to be more affected. Climate change may have long-term effects that include, but are not limited to, depletion of important cold-water habitat, variation in quality and quantity of

tributary rearing habitat, alterations to migration patterns, accelerated embryo development, premature emergence of fry, and increased competition among species.
Climate change is predicted to cause a variety of impacts to Pacific salmon (including steelhead) and their ecosystems (Mote et al. 2003; Crozier et al. 2008a; Martins et al. 2012; Wainwright and Weitkamp 2013). The complex life cycles of anadromous fishes, including salmon, rely on productive freshwater, estuarine, and marine habitats for growth and survival, making them particularly vulnerable to environmental variation. Ultimately, the effects of climate change on salmon and steelhead across the Pacific Northwest will be determined by the specific nature, level, and rate of change and the synergy between interconnected terrestrial/freshwater, estuarine, nearshore, and ocean environments.

- The primary effects of climate change on Pacific Northwest salmon and steelhead include:
- Direct effects of increased water temperatures on fish physiology;
- Temperature-induced changes to streamflow patterns;
- Alterations to freshwater, estuarine, and marine food webs; and,
- Changes in estuarine and ocean productivity.

While all habitats used by Pacific salmon will be affected, the impacts and certainty of the change vary by habitat type. Some effects (e.g., increasing temperature) affect salmon at all life stages in all habitats, while others are habitat-specific, such as streamflow variation in freshwater, sea-level rise in estuaries, and upwelling in the ocean. How climate change will affect each stock or population of salmon also varies widely depending on the level or extent of change, the rate of change, and the unique life-history characteristics of different natural populations (Crozier et al. 2008b). For example, a few weeks' difference in migration timing can have large differences in the thermal regime experienced by migrating fish (Martins et al. 2011).

Temperature Effects. Like most fishes, salmon are poikilotherms (cold-blooded animals); therefore, increasing temperatures in all habitats can have pronounced effects on their physiology, growth, and development rates (see review by Whitney et al. 2016). Increases in water temperatures beyond their thermal optima will likely be detrimental through a variety of processes, including increased metabolic rates (and therefore food demand), decreased disease resistance, increased physiological stress, and reduced reproductive success. All of these processes are likely to reduce survival (Beechie et al. 2013; Wainwright and Weitkamp 2013; Whitney et al. 2016).

By contrast, increased temperatures at ranges well below thermal optima (i.e., when the water is cold) can increase growth and development rates. Examples of this include accelerated emergence timing during egg incubation stages, or increased growth rates during fry stages (Crozier et al. 2008a; Martins et al. 2011). Temperature is also an important behavioral cue for migration (Sykes et al. 2009), and elevated temperatures may result in earlier-than-normal migration timing. While there are situations or stocks where this acceleration in processes or behaviors is beneficial, there are also others where it is detrimental (Martins et al. 2012; Whitney et al. 2016).

Freshwater Effects. Climate change is predicted to increase the intensity of storms, reduce winter snow pack at low and middle elevations, and increase snowpack at high elevations in northern areas. Middle and lower-elevation streams will have larger fall/winter flood events and lower late-summer flows, while higher elevations may have higher-minimum flows. How these changes will affect freshwater ecosystems largely depends on their specific characteristics and location, which vary at fine spatial scales (Crozier et al. 2008b; Martins et al. 2012). For example, within a relatively small geographic area (the Salmon River basin in Idaho), survival of some Chinook salmon populations was shown to be determined largely by temperature, while in others it was determined by flow (Crozier and Zabel 2006). Certain salmon populations inhabiting regions that are already near or exceeding thermal maxima will be most affected by further increases in temperature and, perhaps, the rate of the increases. The effects of altered flow are less clear and likely to be basin-specific (Crozier et al. 2008b; Beechie et al. 2013). However, flow is already becoming more variable in many rivers, and this increased variability is believed to negatively affect anadromous fish survival more than other environmental parameters (Ward et al. 2015). It is likely this increasingly variable flow is detrimental to multiple salmon and steelhead populations, and to other freshwater fish species in the Columbia River basin.

Stream ecosystems will likely change in response to climate change in ways that are difficult to predict (Lynch et al. 2016). Changes in stream temperature and flow regimes will likely lead to shifts in the distributions of native species and provide “invasion opportunities” for exotic species. This will result in novel species interactions, including predator-prey dynamics, where juvenile native species may either be predators or prey (Lynch et al. 2016; Rehage and Blanchard 2016). How juvenile native species will fare as part of “hybrid food webs,” which are constructed from natives, native invaders, and exotic species, is difficult to predict (Naiman et al. 2012).

Estuarine Effects. In estuarine environments, the two big concerns associated with climate change are rates of sea level rise and water temperature warming (Wainwright and Weitkamp 2013; Limburg et al. 2016). Estuaries will be affected directly by sea-level rise: as sea level rises, terrestrial habitats will be flooded and tidal wetlands will be submerged (Kirwan et al. 2010; Wainwright and Weitkamp 2013; Limburg et al. 2016). The net effect on wetland habitats depends on whether rates of sea-level rise are sufficiently slow that the rates of marsh plant growth and sedimentation can compensate (Kirwan et al. 2010).

Due to subsidence, sea-level rise will affect some areas more than others, with the largest effects expected for the lowlands, like southern Vancouver Island and central Washington coastal areas (Verdonck 2006; Lemmen et al. 2016). The widespread presence of dikes in Pacific Northwest estuaries will restrict upward estuary expansion as sea levels rise, likely resulting in a near-term loss of wetland habitats (Wainwright and Weitkamp 2013). Sea-level rise will also result in greater intrusion of marine water into estuaries, resulting in an overall increase in salinity, which will also contribute to changes in estuarine floral and faunal communities (Kennedy 1990). While not all anadromous fish species are highly reliant on estuaries for rearing, extended estuarine use may be important in some populations (Jones et al. 2014), especially if stream habitats are degraded and become less productive. Preliminary data indicate that some Snake River Basin steelhead smolts actively feed and grow as they migrate between Bonneville Dam and the ocean (Beckman 2018), suggesting that estuarine habitat is important for this DPS.

Marine Effects. In marine waters, increasing temperatures are associated with observed and predicted poleward range expansions of fish and invertebrates in both the Atlantic and Pacific Oceans (Lucey and Nye 2010; Asch 2015; Cheung et al. 2015). Rapid poleward species shifts in distribution in response to anomalously warm ocean temperatures have been well documented in recent years, confirming this expectation at short time scales. Range extensions were documented in many species from southern California to Alaska during unusually warm water associated with “the blob” in 2014 and 2015 (Bond et al. 2015; Di Lorenzo and Mantua 2016) and past strong El Niño events (Pearcy 2002; Fisher et al. 2015). For example, recruitment of the introduced European green crab (*Carcinus maenas*) increased in Washington and Oregon waters during winters with warm surface waters, including 2014 (Yamada et al. 2015). Similarly, the Humboldt squid (*Dosidicus gigas*) dramatically expanded its range northward during warm years of 2004–09 (Litz et al. 2011). The frequency of extreme conditions, such as those associated with El Niño events or “blobs” is predicted to increase in the future (Di Lorenzo and Mantua 2016), further altering food webs and ecosystems.

Expected changes to marine ecosystems due to increased temperature, altered productivity, or acidification will have large ecological implications through mismatches of co-evolved species and unpredictable trophic effects (Cheung et al. 2015; Rehage and Blanchard 2016). These effects will certainly occur, but predicting the composition or outcomes of future trophic interactions is not possible with current models.

Wind-driven upwelling is responsible for the extremely high productivity in the California Current ecosystem (Bograd et al. 2009; Peterson et al. 2014). Minor changes to the timing, intensity, or duration of upwelling, or the depth of water-column stratification, can have dramatic effects on the productivity of the ecosystem (Black et al. 2015; Peterson et al. 2014). Current projections for changes to upwelling are mixed: some climate models show upwelling unchanged, but others predict that upwelling will be delayed in spring and more intense during summer (Rykaczewski et al. 2015). Should the timing and intensity of upwelling change in the future, it may result in a mismatch between the onset of spring ecosystem productivity and the timing of salmon entering the ocean, and a shift toward food webs with a strong sub-tropical component (Bakun et al. 2015).

Columbia River anadromous fishes also use coastal areas of British Columbia, Alaska, and midocean marine habitats in the Gulf of Alaska, although their fine-scale distribution and marine ecology during this period are poorly understood (Morris et al. 2007; Pearcy and McKinnell 2007). Increases in temperature in Alaskan marine waters have generally been associated with increases in productivity and salmon survival (Mantua et al. 1997; Martins et al. 2012), thought to result from temperatures that are normally below thermal optima (Gargett 1997). Warm ocean temperatures in the Gulf of Alaska are also associated with intensified downwelling and increased coastal stratification, which may result in increased food availability to juvenile salmon along the coast (Hollowed et al. 2009; Martins et al. 2012). Predicted increases in

freshwater discharge in British Columbia and Alaska may influence coastal current patterns (Foreman et al. 2014), but the effects on coastal ecosystems are poorly understood.
In addition to becoming warmer, the world's oceans are becoming more acidic as increased atmospheric carbon dioxide is absorbed by water. The North Pacific is already acidic compared to other oceans, making it particularly susceptible to further increases in acidification (Lemmen et al. 2016). Laboratory and field studies of ocean acidification show that it has the greatest effects on invertebrates with calcium-carbonate shells, and has relatively little direct influence on finfish; see reviews by Haigh et al. (2015) and Mathis et al. (2015). Consequently, the largest impact of ocean acidification on salmon will likely be the influence on marine food webs, especially the effects on lower trophic levels (Haigh et al. 2015; Mathis et al. 2015). Marine invertebrates fill a critical gap between freshwater prey and larval and juvenile marine fishes, supporting juvenile salmon growth during the important early-ocean residence period (Daly et al. 2009, 2014).

Uncertainty in Climate Predictions. There is considerable uncertainty in the predicted effects of climate change on the globe as a whole, and on the Pacific Northwest in particular. Many of the effects of climate change (e.g., increased temperature, altered flow, coastal productivity, etc.) will have direct impacts on the food webs that species rely on in freshwater, estuarine, and marine habitats to grow and survive. Such ecological effects are extremely difficult to predict even in simple systems, and minor differences in life-history characteristics among stocks of salmon may lead to large differences in their response (e.g. Crozier et al. 2008b; Martins et al. 2011, 2012). This means it is likely that there will be "winners and losers," meaning some salmon populations may enjoy different degrees or levels of benefit from climate change while others will suffer varying levels of harm. Climate change is expected to impact anadromous fishes during all stages of their complex life cycle. In addition to the direct effects of rising temperatures, indirect effects include alterations in flow patterns in freshwater and changes to food webs in freshwater, estuarine, and marine habitats. There is high certainty that predicted physical and chemical changes will occur; however, the ability to predict bio-ecological changes to fish or food webs in response to these physical/chemical changes is extremely limited, leading to considerable uncertainty. In additional to physical and biological effects, there is also the question of indirect effects of climate change and whether human "climate refugees" will move into the range of salmon and steelhead, increasing stresses on their respective habitats (Dalton et al. 2013; Poesch et al. 2016).

Summary. Climate change is expected to impact Pacific Northwest anadromous fishes during all stages of their complex life cycle. In addition to the direct effects of rising temperatures, indirect effects include alterations in stream-flow patterns in freshwater and changes to food webs in freshwater, estuarine, and marine habitats. There is high certainty that predicted physical and chemical changes will occur; however, the ability to predict bio-ecological changes to fish or food webs in response to these physical/chemical changes is extremely limited, leading to considerable uncertainty. As we continue to deal with a changing climate, management actions may help alleviate some of the potential adverse effects (e.g., hatcheries serving as a genetic reserve and source of abundance for natural populations, increased riparian vegetation and floodplain reconnection to control water temperatures, etc.).

Climate change is expected to make recovery targets for Chinook salmon and steelhead populations more difficult to achieve. Climate change is expected to alter critical habitat by generally increasing temperature and peak flows and decreasing base flows. Although changes will not be spatially homogenous, effects of climate change are expected to decrease the capacity of critical habitat to support successful spawning, rearing, and migration. Habitat action can address the adverse impacts of climate change on Chinook salmon and steelhead. Examples include restoring connections to historical floodplains and freshwater and estuarine habitats to provide fish refugia and areas to store excess floodwaters, protecting and restoring riparian vegetation to ameliorate stream temperature increases, and purchasing or applying easements to lands that provide important cold water habitat and cold water refugia (Battin et al. 2007; ISAB 2007).

The proposed action will increase the life of the bridge piers and bridge. The effects of the bridge and the modified river substrate at the base of the piers will continue for several decades as climate change progresses.

2.3. Action Area

"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).

The Project extends between milepost 1.90 and milepost 2.21 of US-12 in Nez Perce County, Idaho. It is in Section 32, Township 36N, and range 5W. The US-12 Memorial Bridge spans the Clearwater River, connecting the City of Lewiston, Idaho on the south to North Lewiston (Figure 3).

Figure 3: Map of where the Us Highway 12 Clearwater Memorial Bridge is located.

The action area includes the terrestrial and aquatic areas that could be directly impacted by the project construction, noise, vibration, or indirectly impacted. The action area for the project is shown in Figure 4 and includes:

- The existing Clearwater Memorial Bridge including in-water areas around the base of the piers, where riprap material would be placed. The aquatic action area also includes 1,200 feet downstream and 400 feet upstream to account for potential sediment movement downstream and barge operation and noise disturbance above and below the bridge.

- The riverbanks, roadway, and upland areas adjacent to US-12 that will be used for roadway approaches, fill slopes, abutments, stormwater treatment, utility relocation and other roadway improvements.

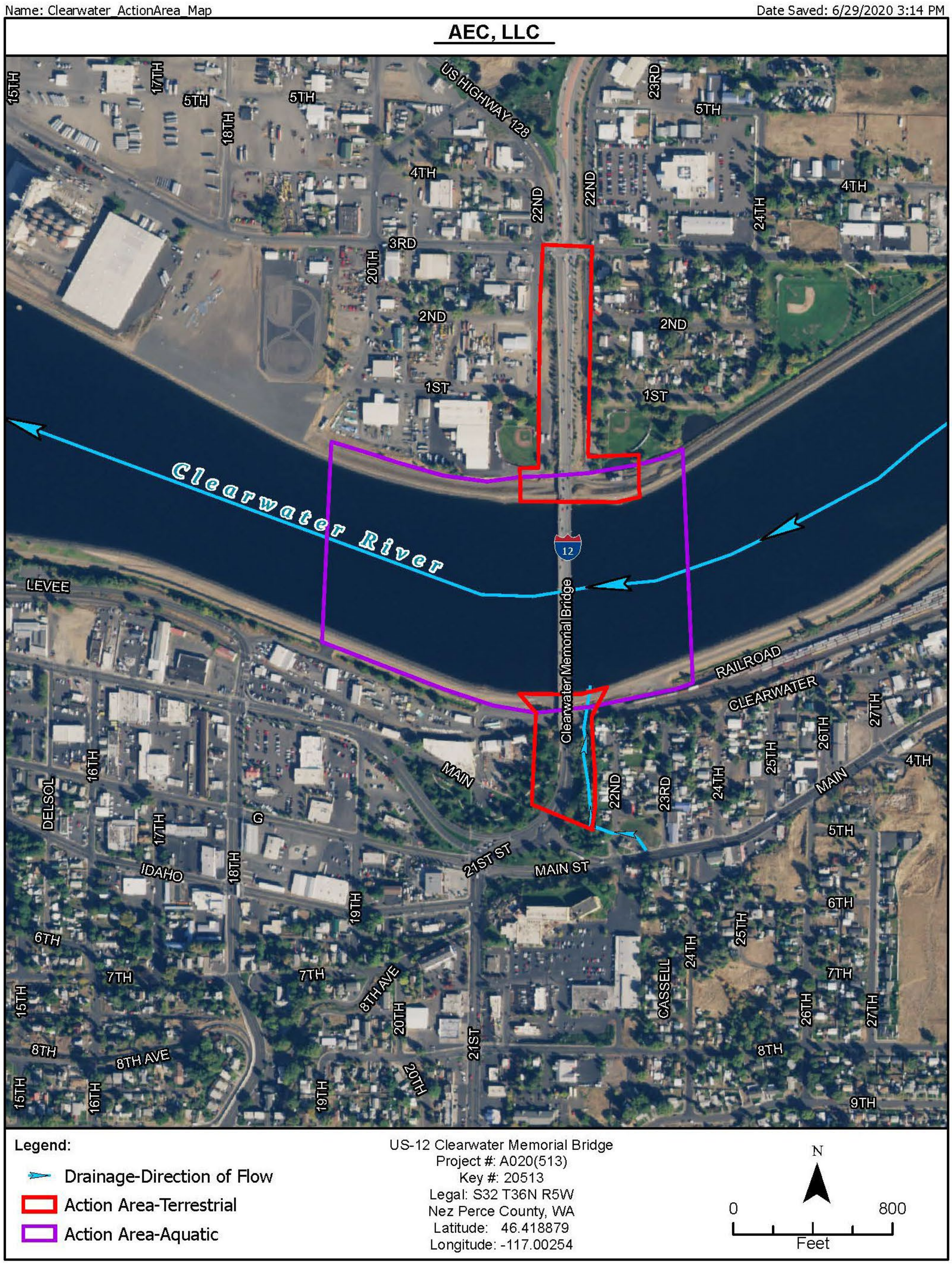

Figure 4: Map depicting the action area.

The action area is used by all freshwater life history stages of threatened Snake River fall Chinook salmon and Snake River Basin steelhead. The river within the action area is designated critical habitat for both species.

2.4. Environmental Baseline

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 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 (50 CFR 402.02).

The action area is at the bottom of the Clearwater Subbasin drainage, HUC 17060306 in north central Idaho. The Clearwater River originates in the Bitterroot Mountains at elevations ranging from 8,400-9,000 feet and derives its flow from a network of tributaries. Four major tributaries drain into the mainstem Clearwater River: the Lochsa, Selway, South Fork Clearwater, and North Fork Clearwater rivers. Dworshak Dam, located approximately two miles above the mouth of the North Fork Clearwater River, was constructed in 1972 and eliminated access to the North Fork Clearwater River, one of the most productive systems for anadromous fish in the subbasin.

Limiting factors within the Clearwater basin include high water temperatures, increased sediment, excessive nutrients, and pollutants. (NMFS 2017). Relatively high surface erosion and landslide hazards contribute to sedimentation in the Clearwater basin, primarily in logged or agricultural areas. In the Clearwater River Subbasin, there are reaches and tributaries that are 303(d) listed; including Lindsay Creek, located immediately upstream of the action area the Lower Granite Dam pool (the action area), and a segment of the North Fork Clearwater River at the Dworshak Dam. The three reaches listed above are classified as non-functioning for cold-water aquatic life (IDEQ 2014).

The construction of Lower Granite dam has altered the action area from a free flowing river to a reservoir habitat. The COE considers the action area to be the within the Lower Granite pool, which is 303d listed for temperature, though the action area has flowing water at certain times of the year, specifically during spring runoff. In the lower Clearwater River, the alteration from river habitat to reservoir habitat combines with alterations in temperature and flow regimes caused by operations of Dworshak Reservoir many miles upstream. These alterations have caused changes in timing of migration of adult and juvenile anadromous fish. (Ecovista, 2003).

During the summer, the Lower Granite pool temperatures may exceed lethal limits for anadromous fish in some areas; however, releases of cool water from Dworshak Reservoir provide some refuge to ESA-listed anadromous fish within the action area. The cool water releases from Dworshak are required to keep the temperature of the Snake River below 20ºC during fall Chinook upstream migration. The timing of releases from Dworshak vary yearly but generally start in July and continue through September (Cook et al. 2006). The temperatures in the action area are generally below 15ºC during the cool water releases. Given the temperature in the Snake River at this time are generally over 20ºC, there is substantial thermal stratification, with the cold water from the Clearwater River being pushed under the warmer water of the Snake River. This stratification becomes pronounced at the confluence of the Snake and Clearwater Rivers (Cook et al. 2006). There may be a small amount of thermal stratification in the action area, due to effects of the Lower granite pool, but it is expected to be minor given that the confluence is approximately three kilometers downriver of the action area (Cook et al. 2006).

The Clearwater Memorial Bridge is on the mainstem of the Clearwater River approximately three kilometers upstream of its confluence with the Snake River. The Clearwater River transitions to the Lower Granite Dam Reservoir/Pool near the action area with abutting industrial and commercial facilities including the Port of Lewiston complex, levees, levee ponds, Clearwater Paper, railroad facilities, and commercial businesses. The entire action area is within the Lower Granite pool and is channelized by levees that were constructed to protect the city of Lewiston from rising water levels due to the construction of Lower Granite Dam. The action area does not have any side channel habitat, or flood plain connectivity. As mentioned above the action area has elevated water temperature and other anthropomorphic habitat degradation. The levees are made up of steep, rocky slopes, and are mostly unvegetated except for a cluster of trees on the northwest corner of the bridge, and small clusters of willow and reed canary grass along the rocky levee. As mentioned above, the reservoir/river interactions in the action area cause times of flowing water and times of reservoir type habitat. This creates a system where deposited fine sediment is flushed out each spring, which does not allow for accumulation of large amounts of deposited fine sediment within the action area.

2.5. Effects of the Action

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 (see 50 CFR 402.17). In our analysis, which describes the effects of the proposed action, we considered 50 CFR 402.17(a) and (b).

2.5.1 Effects to the Species

The in-water portion of the proposed action may take place from July 15 through October 15. The FHWA and ITD estimates that the in-water work will be completed over two seasons. Salmonids present in the action area during the project implementation period could experience the following effects from the proposed action:

- Increased risk of predation by piscivorous fish species;

- Risk of injury or death of juvenile and adult salmonids due crushing by the rock fill;

- Exposure to short-term turbidity plumes and associated sediment deposition immediately downstream of the project site;

- Exposure to construction noise and disturbance; and,

- Exposure to chemical contamination.

2.5.1.1 Increased predation risk

ICDC data (ICDC 2017) and local experts (Personal communication Ries 2020) indicate that fall Chinook salmon and steelhead utilize this section of the Clearwater River for migration or rearing. The in-water work will be conducted during the periods of low flow from July through August, with the provision for an extension through October 15. If in-water work goes into September and October, adult Chinook salmon and steelhead will be present, either migrating through or holding in the action area. Some juvenile salmon and steelhead will be moving down through, or rearing in the action area in each month of the in-water work period (July – October)

The project may cause some increased predation of juvenile salmon and steelhead by temporarily displacing them out of cover/shelter into areas where they are more exposed to predators, and by adding low-light areas that help predator fish ambush the juvenile fish. The existing bridge provides permanent overhead cover and will be widened, slightly increasing the overwater cover and shade for fish species. Overwater structure/low light areas introduced by barges used during construction may benefit fish that prey on salmonids. Piscivorous fish in the area include smallmouth bass, and northern pikeminnow; these species have been documented as predators on juvenile salmonids (Vigg et al. 1991; Tabor et al. 1993; Zimmerman 1999; Fritts and Pearsons 2004). Smallmouth bass and northern pikeminnow (Pribyl et al. 2004; Celedonia et al. 2008) are well known to prey upon juvenile salmonids in the Snake and Columbia Rivers (NMFS 2019). The need to evade predators could slightly alter foraging and movement patterns, requiring more energy expenditure, and/or further increasing predation susceptibility (Nightingale and Simenstad 2001; Rondorf et al. 2010).

The increased overhead structure caused by barges will be intermittent and short-lived. Juvenile fall Chinook salmon and steelhead in the action area will tend to be either right along the shallowest margins of the river (for early summer newly emerged fall Chinook salmon) or not offshore in 6 – 10 feet of water (summer/early fall rearing fall Chinook salmon and steelhead). Barges will only be in the near shore areas during use for some of the construction activities, which will be short lived. Further, the noise during construction activities will likely cause some fish to move away from the barges. When the barges are not in use (moored offshore) or when stationed for work on the offshore portions of the bridge, the chances of juvenile salmonids being under/near the barges is small. Therefore, the barges (and the associated cover for predators) will only temporarily be in the area where juvenile Chinook and steelhead are likely to be.

The widening of the bridge will create additional permanent overhead shade. However, the shade from the bridge will not be present at all times in any spot under the bridge. With the height of the bridge, it is expected that the shade will move throughout the day and not create constant shade in any given area. Also, the shade created by the bridge will not create the same darkness and cover as docks or barges. Therefore, it is assumed the predation risk effects from the increment of increased shade caused by the bridge widening (widened 16 feet; total width of 78 feet) will be extremely small.

Given the complexity of predator prey dynamics it is not possible to determine the number of juvenile salmonids injured or killed from increased predation. However, NMFS expects that very few juvenile salmon and steelhead will be killed by predator fish as a result of the proposed action. As mentioned above, the barges will be near shore for a very short time and only when in direct use. This should minimize the impact from barges creating overhead cover and shade for predator fish species. However, it is expected that an unknown number of juvenile fish may be injured or killed due to the action. Therefore, we will use the project's proposed limits on nearshore placement of barges as a surrogate for an actual number of fish harmed. If, for instance, the barges are near shore when not in direct use for construction purposes for more than four days then take allowances will be exceeded (refer to Incidental Take section, below).

2.5.1.2 Riprap Placement

The placement of riprap is known to cause adverse effects to stream morphology, fish habitat, and fish populations (Schmetterling et al. 2001; Garland et al. 2002). For this project, placement of the riprap rock fill on the river bottom at the base of the piers has the potential to injure or kill fish located in the immediate areas through physical trauma during rock placement or soon thereafter if the rocks shift or move after initial placement. Approximately 4,550 cubic yards of rock will be used to stabilize and fill the scour holes along piers 3-9. Although unlikely during low-flow conditions, some of this large rock could shift or move downstream at higher flows.

NMFS expects that few, if any fish, would be crushed by the rock fill, because any fish present would likely be effectively hazed out of the area by ITD's BMP of dragging chains or cables though the area immediately before rock will be placed. Further, these piers 3-9 are somewhat or far offshore and in deeper faster moving water that is not high quality/preferred habitat for the juvenile fall Chinook salmon and steelhead in the action area. Possibly a few juvenile fish will be injured or killed by the placement of rock or its subsequent shifting in high flows. If this occurs, it would likely be at the base of piers three and nine, the nearest to shore that are receiving riprap at their base. It is not possible to determine the actual number of salmonids injured or killed, but the amount of riprap placed should be proportionate to the number of juvenile salmonids injured or killed. Therefore, we will use the proposed amount of riprap, 4,550 cubic yards as a surrogate for the number of juvenile salmonids killed or injured.

If the in-water work period extends into September and October, which ITD proposes as a contingency, then it is likely that adult Chinook salmon and steelhead will be present. If adult fish are present, the construction/barge activity and the hazing techniques mentioned above will likely move them out of the area prior to rock placement. Adult fish would likely move out of the immediate area unharmed and continue their upriver migration or hold in another, similar river habitat farther away from the construction activity.

The existing scour holes near the piers may act somewhat as resting habitat for migrating adults, because the action area is highly uniform and lacks complex habitat. Because the action will fill these scour holes and eliminate these minor features of the river that might provide resting for adults, after the project is completed adults may tend to move through and not hold near the piers quite as much and move nearer shore or upstream if seeking slower water in which to rest/hold. Those effects on adult fish movement and habitat use will likely be minor and are unlikely to appreciably affect the fish or their reproductive success.

2.5.1.3 Suspended Sediment

Project activities including the use of chains and cables to haze fish away from the scour holes, placement of rock in the scour holes, and setting of barge spuds/anchors within the wetted channel will create brief pulses of suspended sediment, mobilizing fine materials previously deposited in the riverbed. In other respects, sediment effects are not likely, with all machinery operating from a barge or from a dry riverbank. Pulses of suspended sediment are likely to be small and brief and will quickly dissipate as materials are dispersed downstream.

The effects of suspended sediment on salmonids vary based on exposure time and concentration. These effects were reviewed by Newcombe and Jensen (1996) and range from avoidance response, to minor physiological stress from increased rate of coughing, to injury from abrasion of gill tissue, to death. Salmonids are relatively tolerant of low to moderate levels of suspended sediment (Gregory and Northcote 1993). Salmon and steelhead tend to avoid suspended sediment above certain concentrations (Servizi and Martens 1992; McLeay et al. 1987). Avoidance behavior can mitigate adverse effects when fish are capable of moving to an area with lower concentrations of suspended sediment. Researchers have reported thresholds for salmonid avoidance behavior at turbidities ranging from 30 to 70 nephelometric turbidity units (NTU) (Lloyd 1987; Servizi and Martens 1992; Berg and Northcote 1985), which indicates that fish move away from suspended sediment in an effort to avoid harmful effects. The small amount of turbidity from the proposed action is likely to cause no more than avoidance behavior and/or brief exposures to low concentrations of turbidity.

The proposed action does not involve excavation, and the riverbed materials in the scour holes are composed almost entirely of large rocks and gravels that are too large to become suspended in the river at base flows when the work will occur. Sediments small enough to remain suspended in the water column for a great distance are unlikely to accumulate in the scour holes where hydraulic conditions are capable of washing away everything but large rocks. Consequently, very little sediment is likely to become suspended from rock placement, and pulses of suspended sediment are unlikely to reach concentrations or durations that are harmful to fish.

The setting of spud barges have the potential of creating sediment pulses each time the barge is moved. The barge will move across the length of the bridge as needed for construction purposes. The spuds will be set as anchors to hold the barge in place. This will create a small sediment pulse that will dissipate quickly downstream of the area. When the barge is moved there will be a small sediment pulse as the spuds are retracted and replaced after the barge has moved. The sediment inputs will occur multiple times over the course of the project, however the barge will remain in the same place for multiple days at a time. As mentioned above, the action area is a highly channelized system. The action area lacks complex habitat and slower moving water where deposited sediment would accumulate. There is likely very little accumulated fine sediment within the action area due to the multiple piers and channelized river that would keep most fine sediment suspended until further downstream. Therefore, the very small intermittent suspended sediment will be spread out over the course of two years and will have very little impact to ESA-listed fish.

With the limited amount of fine sediment in the substrate in the work areas, brief duration of disturbance by rock placement and barge anchoring upon the native substrate and high discharge rate of the Clearwater River, the amount of sediment suspension and re-deposition is expected to be very small in each instance of rock placement and spud anchor setting/retracting. Juvenile and adult fish in the action area are unlikely to be exposed to more than small brief increases in turbidity and are unlikely to experience harmful effects from project-associated suspended sediment.

2.5.1.4 Fine Sediment Deposition

Fine sediments are composed of sands, silts, and clays that are readily mobilized as suspended sediment in flowing water when riverbed materials are moved. Suspended sediments mobilized by rock placement (described above) will be re-deposited downstream from the project site. Incubating eggs and newly hatched fry can be killed by deposition of fine sediment in redds when the sediment reaches a threshold of approximately 30 percent fines by volume (Everest et al. 1987; Spence et al. 1996). Fine sediment deposition in spawning gravel reduces interstitial water flow, leading to depressed dissolved oxygen concentrations, and it can physically trap emerging fry in the gravel (Koski 1966; Everest et al. 1987; Meehan and Swanston 1977). Fine sediment may also affect fish by reducing the availability of spaces between rocks that may be used as cover or winter rearing if the volume is sufficient to fill the voids between rocks.

The proposed action will mobilize riverbed sediments but not add new sediment to the river. Streambed sediment will be mobilized in a brief series of pulses when rocks are placed directly on the riverbed and when spud anchors are placed. As mentioned above, the substrate at these bridge pier sites is not likely to have much fine sediment. With the small volume of fine sediment dispersed and redeposited in the river from the rock placement and anchor setting/retracting activities associated with this project, changes in the amount and distribution of substrate fine sediment in the action area are likely to be extremely small.

Given the limited set of project activities that will mobilize/redistribute fine sediment, and the relatively coarse material composition of the river substrate in the work areas, the proposed action is unlikely to cause a sufficient amount of sediment deposition to cause adverse effects to fish.

2.5.1.5 Noise and Disturbance

Construction noise or visual stimulus may disturb nearby salmonids, causing them to move away from the project activities, and possibly dispersing them into areas with less forage and less cover/safety from predators. If fish move, they are expected to move only short distances to an area where they feel more secure (Grant and Noakes 1987; Ries 1995; Olson 1996). Because the river habitat at the project site is relatively uniform, we expect that if fish are displaced into nearby areas they are unlikely to be adversely affected by those changes in location. Noise from the construction heavy equipment operated from shore, bridge, or barge will not likely rise to the decibel level known to physically harm fish (FHWA 2008; Wysocki et al. 2007).

2.5.1.6 Chemical Contamination

NMFS bases our statements about chemical and debris containment effects on the standard features of these types of plans ITD approves. Use of construction equipment and heavy machinery adjacent to and over the river poses the risk of an accidental spill or leakage of fuel, lubricants, hydraulic fluid, antifreeze, or similar contaminants into the riparian zone, or directly into the water. If these contaminants enter the water, the substances could adversely affect habitat, injure or kill aquatic food organisms, or directly impact ESA-listed species (e.g., Neff 1985; Staples et al. 2001).

The proposed action includes multiple conservation measures aimed at minimizing the risk of fuel, oil, or similar contaminant leakage into the stream. For example, to prevent small leaks equipment will be cleaned of external oil and checked for leaks prior to arrival at the project site. For large spills, fuel storage and equipment refueling will occur away from the river channel in an area that has containment and is highly unlikely to reach the river. Based on the past success of these types of conservation measures in other projects, introduction of fuels, etc. into the water either will not occur or will occur in extremely small amounts that are rapidly diluted. NMFS therefore anticipates the project contaminants will not have discernible effects on water quality nor associated negative impacts to ESA-listed fish.

Any overwater work including silane, concrete dust, wet saw slurry, and wet concrete will have containment and protective measures to minimize potential for releases to the water and spill prevention measures will be in place prior to construction. Any potential releases, should they occur, would be very small quantities (ounces) and rapid dilution of these small quantities would be very low, if even detectable, concentrations where the juvenile and adult fish occur. Therefore, effects to the fish that are present are expected to be negligible.

If wet concrete comes in contact with water it can have a detrimental effect on the surrounding environment by causing the pH to rise. This rise in pH can harm and kill animal and plant life. Uncured cement may cause burning of gills and suffocation of fish as a result of increases in pH. In a Maryland project (Hunter et al. 2014), repairs to steel culverts using concrete grout were shown to spike water pH above the state regulatory limit of 8.5. However, laboratory and field testing suggested that spikes in pH are most significant within the first few hours, and highly localized. The BMPs to ensure wet concrete does not come in contact with the river have been shown to be highly successful. This should equate to little or no wet concrete entering the river. If a small amount of wet concrete does enter the river, it is assumed that given the size of the Clearwater River that the increase in pH will be extremely small and dissipate quickly.

There will also be a small beneficial effect from the project to water quality and fish. Currently the stormwater from the bridge pavement surfaces, which have traces or more of fuels and oils, discharges into the Clearwater through deck drains. The proposed action will create a collection system for this water and route it to nearshore “bioswales” that filter the water. As mentioned above the bioswales drain into the levee ponds, and the levee ponds eventually drain to the river though control structures. Compared to the baseline, this will improve water quality in the action area, albeit by a very small and difficult to detect amount.

Summary

The main sources of effects are the placement of riprap in the scour holes, and the potential increased predation due to increased overhead structure. Riprap placement has the potential of directly harming fish by falling rock hitting the fish. This should be minimized by scaring the fish out of the area. The increased predation would most likely be associated with the barges. As long as the barges are relocated when not in use, predation should be minimized. The increase width of the bridge to 78 feet could create more shade for predatory fish to hide. However, given the height of the bridge, this cover will be consistently moving throughout the day and will likely not create consistent cover for predatory fish.

2.5.2 Effects to Critical Habitat

The action area includes designated critical habitat for Snake River fall Chinook salmon, and Snake River Basin steelhead. The proposed action has the potential to affect the following PBFs: water quality, substrate, natural cover, and safe passage. Any modification of these PBFs may affect freshwater migration or rearing in the action area. Proper function of these PBFs is necessary to support successful adult and juvenile migration, adult holding, spawning, rearing, and the growth and development of juvenile fish.

The following discussion on PBFs applies to freshwater rearing and migration sites for fall Chinook salmon and steelhead within the action area.

2.5.2.1 Water Quality

The proposed action could potentially negatively affect water quality through chemical contamination or short-term increases in turbidity. However, decreases in water quality from chemical contamination are not likely. As described in Section 2.5.1.6, we expect that proposed BMPs will effectively reduce, to very low, the risk of leaks or spills from machinery, and wet concrete from entering the Clearwater River. As described in Section 2.5.1.3, the instances of turbid water will be of low magnitude and will quickly dissipate due the lack of fine sediment and large amount of discharge in the Clearwater River relative to the volume of suspended sediment. Project effects on the water quality PBF from chemical contamination will be very small from machinery operation, if even detectable, and large spills are unlikely. Project effects on the water quality PBF from turbidity are expected to be very small and temporary. None of the effects are expected to change the function of the water quality PBF.

2.5.2.2 Substrate

As described above, fine sediment deposition is unlikely to cause measurable changes to substrate characteristics. The substrate PBF will be virtually unchanged beyond the area where rocks will be placed on the river bottom along the piers. These small changes to the substrate in the action area will eliminate the scour holes, minor features that may have provided some resting areas for adult fish, but will not substantially change the function of the substrate PBF.

2.5.2.3 Natural Cover

At present, the scour holes at the bridge piers likely provides cover during base flows. Filling the scour holes with rocks eliminates the cover provided by the holes; however, a hole created by a bridge pier and river hydraulics is not a natural cover element. The larger diameter rocks to be placed in the hole will be much larger than would occur naturally, thus creating voids that fish could also use for cover. However, the voids between the rocks are likely to eventually fill with finer material, thus any changes in cover provided by the large rocks will be temporary. The natural cover PBF would not be affected, but the small areas of artificial cover provided by the scour holes at base flows would be lost.

2.5.2.4 Safe Passage

The proposed use of barges for the construction of the bridge will increase the amount of over-water structure at the already existing bridge location. As discussed in the Effects on the Species section, above, there is likely to be a small increase in predation on migrating and rearing juveniles when the barges are operating in near shore areas, where the juvenile fish tend to be. The increased width of the bridge will create permanent shade. However as described above in the Effects of the Species section this is expected to have an extremely minor effect on predation. The function of the safe passage PBF at the site will likely be somewhat reduced during the periods of barge usage nearshore; however, the effects on the function of the PBF for the river reach as a whole will be very small as well as short duration.

Summary

The two PBFs that will most likely be effected are natural cover and safe passage. The scour holes most likely create resting areas for migrating adults and potentially, slack water for juveniles. Though this is not natural habitat, it may be beneficial to the fish due to the high-channelized river within the action area. Filling the scour holes will eliminate these resting areas. The barges and increased width of the bridge may give predatory fish places to hide and may increase predation on juvenile fish in the action area. Locating the barges off shore when not in use will minimize predation. The increased width of the bridge could create more shade for predatory fish to hide. However, given the height of the bridge, this cover will be consistently moving throughout the day and will likely not create consistent cover for predatory fish.

2.6. 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 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.

Some continuing non-federal activities are reasonably certain to contribute to climate effects within the action area. However, it is difficult if not impossible to distinguish between the action area’s future environmental conditions caused by global climate change that are properly part of the environmental baseline *vs.* cumulative effects. Therefore, all relevant future climate-related environmental conditions in the action area are described in the environmental baseline (Section 2.4).

The COE, Clearwater Paper, and the Port of Lewiston own most of the shoreline surrounding the action area. Any projects involving work below the OHWM or on the COE owned levee would require coordination and permitting through the COE, which is a federal action requiring evaluation under the ESA. The City of Lewiston Planning Department (Hollingshead 2020) was contacted and was not aware of any non-federal projects planned for the reasonably foreseeable future in or near the action area.

Other non-federal activities that are expected to continue within the action area and in upstream areas that may affect the action area include sport fishing, use of barges for industries, continued maintenance of roads, boat launches, levees, railroads, parks, public and industrial facilities, stormwater treatment upgrades, wastewater treatment and utility upgrades, farming, logging, road construction and maintenance, and streambank armoring. It is expected that the non-federal activities will continue to impact the fish species and baseline conditions similarly as they do today; therefore, there will be no new cumulative effects to the species and critical habitat that have not already been considered under the environmental baseline.

2.7. Integration and Synthesis

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 (Section 2.5) to the environmental baseline (Section 2.4) and the cumulative effects (Section 2.6), taking into account the status of the species and critical habitat (Section 2.2), to formulate the agency’s 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 main sources of effects are the placement of riprap in the scour holes, and the potential increased predation due to increased overhead structure. Riprap placement has the potential of directly harming fish by falling rock hitting the fish. This should be minimized by scaring the fish out of the area. The increased predation would most likely be associated with the barges.

Barges will be relocated when not in use to minimize predation. The increased width of the bridge could create more shade for predatory fish to hide. However, given the height of the bridge, this cover will be consistently moving throughout the day and will likely not create consistent cover for predatory fish.

The action is expected to harm small numbers of juvenile salmon and steelhead by causing a small amount of increased predation by piscivorous fishes, and through displacement and impingement from placing of rock in the scour holes near the piers. There will be a temporary increase in predation risk caused by project barges providing additional cover from which predators can ambush juvenile salmon and steelhead. To reduce this predation effect, if a barge is not in direct use for more than four days, the barge will be moored farther offshore where the juvenile fish do not tend to occur. There will also be a very small permanent increase in overhead structure (bridge) width of 16 feet (total width of 78 feet) and thus an increase in shade on the river, which may make predators successful in killing a few more juvenile fish in this area. There is potential for crushing fish while placing 4,550 cubic yards of riprap below the OHWM. This potential is small because the scour hole work areas are not highly suitable for juvenile fish, and fish will be herded/scared out of the area prior to rock placement.

Other effects from the project that will be small and will not likely harm fish include turbidity and sediment deposition from barge anchoring and rock placement at the piers, effects from project chemicals (petroleum products for machinery, etc.), and in-water noise/disturbance. Leakage or spilling of chemicals into the Clearwater River will be effectively minimized or avoided through a comprehensive set of project design and BMPs. The sediment and noise effects of the project will be very small both because of the fundamental characteristics of this project and additional project BMPs.

The two PBFs that will most likely be effected are natural cover and safe passage. The scour holes most likely create resting areas for migrating adults and potentially slack water for juveniles. Though this is not natural habitat, it may be beneficial to the fish due to the high velocity channelized river within the action area. Filling the scour holes will eliminate these resting areas. The barges and increased width of the bridge may give predatory fish places to hide and may increase predation on juvenile fish in the action area. As mentioned above, if the barges are relocated off shore when not in use, this should minimize predation. Also as mentioned above, the width of the bridge should not provide more than temporary shade in any one location. Given that these effects to PBFs are minor and or temporary, the proposed action will not appreciably diminish the conservation value of critical habitat as a whole.

The baseline condition of the salmon and steelhead habitat includes substantial alterations within and upstream of the action area. The Clearwater Memorial Bridge is on the mainstem of the Clearwater River approximately 10,000 feet upstream of its confluence with the Snake River. The Clearwater River transitions to the Lower Granite Dam Reservoir/Pool near the action area with abutting industrial and commercial facilities including the Port of Lewiston complex, levees, levee ponds, Clearwater Paper, railroad facilities, and commercial businesses. As mentioned above, the action area is highly channelized which creates fairly strong currents when the action area experiences flowing water. The complex dynamics of the action area, which includes both reservoir and river habitats depending on the time of year, creates a system where most fine sediment is flushed from substrates in the action area during spring runoff.

Cumulative effects from other non-federal activities that could occur in the future include continuation of present activities within and upstream of the action area, including sport fishing, use of barges for industries, maintenance of roads, boat launches, levees, railroads, parks, public and industrial facilities, stormwater treatment upgrades, wastewater treatment and utility upgrades, farming, logging, road construction and maintenance, and streambank armoring. It is expected that the continuance of those and other existing activities will continue to impact the fish species and baseline conditions similarly as they do today.

The project, baseline, and cumulative effects occur within the context of Snake River fall Chinook salmon and steelhead having many factors that limit their survival and viability for recovery, and climate change exacerbating those limiting factors into the future. Nevertheless, the small effects of the project, within this small portion of the species range and critical habitat, likely do not add appreciable risk to the species and do not appreciably change the function of critical habitat as a whole.

2.8. Conclusion

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, the effects of other activities caused by the proposed action, and cumulative effects, it is NMFS' opinion that the proposed action is not likely to jeopardize the continued existence of Snake River fall Chinook salmon or Snake River Basin steelhead or destroy or adversely modify their designated critical habitat.

2.9. 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 actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering (50 CFR 222.102). On an interim basis, NMFS interprets "harass" to mean "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.

2.9.1 Amount or Extent of Take

In the Opinion, NMFS determined that incidental take is reasonably certain to occur as follows:

The placement of rock in the scour holes at piers 3-9 will require the use of 4,550 cubic yards or rock. The placement of rock is expected to injure or kill a small but unknown number of juvenile salmon and steelhead. The number of fish will likely be very small, in part due to the BMPs of scaring fish out of the area prior to rock being placed. Also, the habitat around the piers was previously riprapped, is not preferred/high quality habitat for the juvenile fish, and the in-water work window helps diminish the interaction with fish by avoiding the main outmigration period for these species. It would be very difficult if not impossible to determine the number of fish that are injured or killed during the process of setting rock in the scour holes at the piers. The number of fish injured or killed should be proportionate to the amount of riprap placed; therefore, we will use the amount of rock being placed as a surrogate. If the amount of rock placed below the OHWM exceeds 4,550 cubic yards then the extent of take will be exceeded.

Barges used during construction may benefit fish that prey on salmonids including smallmouth bass and northern pikeminnow, which have been documented as predators on juvenile salmonids (Vigg et al. 1991; Tabor et al. 1993; Zimmerman 1999; Fritts and Pearsons 2004). Smallmouth bass and northern pikeminnow (Pribyl et al. 2004; Celedonia et al. 2008) are well known to prey upon juvenile salmonids in the Snake and Columbia Rivers (NMFS 2019). The need to evade predators could slightly alter foraging and movement patterns, requiring more energy expenditure, or increase predation susceptibility (Nightingale and Simenstad 2001; Rondorf et al. 2010). Predation may cause direct mortality of a few juvenile salmon and steelhead. In addition, juveniles are expected to be closer to shore, so barges anchored near shore for longer than four days would potentially increase predation beyond what is analyzed in this Opinion. We cannot quantify the specific predation effect of the action, or the additional number of juveniles preyed upon due to the complex predator prey dynamics. Therefore, we will use the barges being anchored near shore as a surrogate for increased predation. Juvenile fish generally prefer shoreline type habit. If the barges are moved into deeper swifter water to be stored, then the overwater cover that predatory fish prefer will not be in close proximity to the habitat that juvenile salmonids prefer. Whether the predatory fish disperse and stay in the near shore habitat, or move offshore with the barges, the predation of juvenile salmonids will diminish, as they will have greater chance of escaping predation without the overhead cover. If the barges are anchored and stored near shore when they are not in direct use during construction activities for more than four days, the incidental take will be exceeded.

Similarly, the permanent widening of the bridge widens the band of shade on the river, and over time this small amount of reduced light in the river will likely result in a small amount of additional predation on juvenile salmon and steelhead. The numbers of fish cannot be quantified; however, the implementation of the bridge widening as proposed will serve as a surrogate for that aspect of take. If the bridge is built out to a width greater than 78 feet, incidental take will be exceeded

Although these surrogates are 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, the surrogates function as effective reinitiation triggers.

2.9.2 Effect of the Take

In the 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.

2.9.3 Reasonable and Prudent Measures

"Reasonable and prudent measures" are nondiscretionary measures that are necessary or appropriate to minimize the impact of the amount or extent of incidental take (50 CFR 402.02).

1. All BMPs to reduce predation risks for juvenile salmonids will be followed:
2. All BMPs related to fish removal and rock fill in the scour holes will be followed;
3. Provide a project report verifying that take surrogates were not exceeded.

2.9.4 Terms and Conditions

The terms and conditions described below are non-discretionary, and the FHWA, ITD, and COE or any applicant must comply with them in order to implement the RPMs (50 CFR 402.14). The FHWA, ITD, and COE 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. The following terms and conditions implement RPM 1:
    a) Barges will be moved off shore towards deeper water unless in direct use for construction activities. Barges will be moved offshore if not used for more than four days.
    b) The bridge width will be increased as specified in the proposed action.
2. The following terms and conditions implement RPM 2:
    a) Fish will be passively moved from the scour holes by dragging chains or cables through the scour holes prior to rock being placed.
    b) Riprap placement will not exceed 4,550 cubic yards.

3. The following terms and conditions implement RPM 3:

    a) Within the year after the project is completed, provide a report to NMFS summarizing project implementation and including application of the design and BMPs and take metrics noted in items 1 and 2 above.

    b) NOTICE: If a steelhead or salmon becomes sick, injured, or killed as a result of project-related activities, and if the fish would not benefit from rescue, the finder should leave the fish alone, make note of any circumstances likely causing the death or injury, location and number of fish involved, and take photographs, if possible. If the fish in question appears capable of recovering if rescued, photograph the fish (if possible), transport the fish to a suitable location, and record the information described above. Adult fish should generally not be disturbed unless circumstances arise where an adult fish is obviously injured or killed by proposed activities, or some unnatural cause. The finder must contact NMFS Law Enforcement at (206) 526-6133 as soon as possible. The finder may be asked to carry out instructions provided by Law Enforcement to collect specimens or take other measures to ensure that evidence intrinsic to the specimen is preserved.

2.10. 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).

1. The FHWA, ITD, COE, or any contractor should consider moving the barges even farther offshore than presently planned for each night when work has ceased for the day, and for other periods of temporary cessation in construction. This would minimize the amount of time that barges are anchored near shore.

2. The FHWA, ITD, COE, or any contractor should consider moving the barges to the boat ramp and removing them from the action area for at least portions of the project period when not in use. This would diminish the amount of time the barges are anchored in the action area and therefore minimize the predation risk.

2.11. Reinitiation of Consultation

This concludes formal consultation for FHWA, ITD, and COE.

As 50 CFR 402.16 states, reinitiation of consultation is required and shall be requested by the federal agency or by the NMFS where discretionary federal agency involvement or control over the action has been retained or is authorized by law and if: (1) The amount or extent of incidental taking specified in the ITS is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this Opinion; (3) 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) a new species is listed or critical habitat designated that may be affected by the action.

3. MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT ESSENTIAL FISH HABITAT RESPONSE

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 physical, biological, and chemical 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 on EFH may result from actions occurring within EFH or outside of it and may include site-specific or EFH-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 [CFR 600.905(b)]

This analysis is based, in part, on the EFH assessment provided by the FHWA, ITD, and COE and descriptions of EFH for Pacific Coast salmon (PFMC 2014) contained in the Fishery Management Plan developed by the Pacific Fishery Management Council (PFMC) and approved by the Secretary of Commerce.

3.1. Essential Fish Habitat Affected by the Project

The action area, except for areas above natural barriers to fish passage, is also EFH for Chinook salmon (PFMC 1998), and is in an area where environmental effects of the proposed project may adversely affect EFH for this species.

- The HAPCs for salmon are: complex channel and floodplain habitat, spawning habitat, thermal refugia, estuaries, and submerged aquatic vegetation (see descriptions of salmon HAPCs in Appendix A to the Pacific Coast Salmon FMP.

3.2. Adverse Effects on Essential Fish Habitat

As described in section 2.5.2.3, the scour holes at the bridge piers likely provide cover during base flows. Filling the scour holes with rocks eliminates the cover provided by the holes. Overall, no natural cover would be affected but on the whole, the small area of artificial cover provided by the scour holes at base flows would be lost. This represents a loss of cover for both species considered in this Opinion. Also, as described in section 2.5.2.4, the project involves a small reduction in safe passage features of EFH by increasing cover for predator fish. Those effects will be temporary and small for the barge aspect, and very small but permanent for the increase in shade on the river caused by the incremental increase in overhead profile of the bridge.

3.3. Essential Fish Habitat Conservation Recommendations

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

a) The construction contractor's equipment should be cleaned of external oil and grease prior to arrival at the project site. The construction contractor's equipment should be inspected daily for leaks and accumulation of grease, and any identified problems should be corrected prior to equipment contact with water.

b) In-water work should be confined to the work window of July 15 through October 15.

c) That any terms applied to the CWA 404 permit are consistent with the project description, conservation measures, and terms and conditions in the BA and this Opinion.

Fully implementing these EFH conservation recommendations would protect, by avoiding or minimizing the adverse effects described in Section 3.2, above, approximately 10 acres of designated EFH for Pacific Coast salmon.

3.4. Statutory Response Requirement

As required by section 305(b)(4)(B) of the MSA, FWHA, ITD and COE 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 timeframes for the federal agency response. The response must include a description of 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 agencies must explain their 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)).

In response to increased oversight of overall EFH program effectiveness by the Office of Management and Budget, NMFS established a quarterly reporting requirement to determine how many conservation recommendations are provided as part of each EFH consultation and how many are adopted by the action agencies. Therefore, we ask that in your statutory reply to the

EFH portion of this consultation, you clearly identify the number of conservation recommendations accepted.

3.5. Supplemental Consultation

The FHWA, ITD, or COE 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)).

4. DATA QUALITY ACT DOCUMENTATION AND PRE-DISSEMINATION REVIEW

The Data Quality Act (DQA) specifies three components contributing to the quality of a document. They are utility, integrity, and objectivity. This section of the Opinion addresses these DQA components, documents compliance with the DQA, and certifies that this Opinion has undergone pre-dissemination review.

4.1. Utility

Utility principally refers to ensuring that the information contained in this consultation is helpful, serviceable, and beneficial to the intended users. The intended users of this Opinion FHWA, ITD, and COE. Other interested users could include permit or license applicants, and the Nez Perce Tribes. Individual copies of this Opinion were provided to the FHWA, ITD, and COE. The document will be available within 2 weeks at the NOAA Library Institutional Repository [https://repository.library.noaa.gov/welcome]. The format and naming adheres to conventional standards for style.

4.2. Integrity

This consultation was completed on a computer system managed by NMFS in accordance with relevant information technology security policies and standards set out in Appendix III, 'Security of Automated Information Resources,' Office of Management and Budget Circular A-130; the Computer Security Act; and the Government Information Security Reform Act.

4.3. Objectivity

Information Product Category: Natural Resource Plan.

Standards: This consultation and supporting documents are clear, concise, complete, and unbiased; and were developed using commonly accepted scientific research methods. They adhere to published standards including the NMFS ESA Consultation Handbook, ESA regulations, 50 CFR 402.01 et seq., and the MSA implementing regulations regarding EFH, 50 CFR 600.

Best Available Information: This consultation and supporting documents use the best available information, as referenced in the References section. The analyses in this Opinion and EFH consultation contain more background on information sources and quality.

Referencing: All supporting materials, information, data and analyses are properly referenced, consistent with standard scientific referencing style.

Review Process: This consultation was drafted by NMFS staff with training in ESA and MSA implementation, and reviewed in accordance with West Coast Region ESA quality control and assurance processes.

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