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: WCR-2018-10658

February 14, 2019

Lt. Col. Christian Dietz
U.S. Army Corps of Engineers
Walla Walla District
201 North Third Avenue
Walla Walla, Washington 98362-1836

Re: Endangered Species Act Section 7(a)(2) Biological Opinion, and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the Hell's Gate Marina Dredging Project, Nez Perce County, Idaho (HUC 170601030307)

Dear Lieutenant Colonel Christian Dietz,

Thank you for your letter of October 12, 2018, 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 Hell's Gate Marina Dredging Project. Thank you also for your request for consultation pursuant to the essential fish habitat (EFH) provisions in section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA)(16 U.S.C. 1855(b)) for this action. NMFS reviewed the likely effects of the proposed action on EFH, and concluded that the action would adversely affect the EFH of Pacific coast salmon. Therefore, we have included the results of that review in Section 3 of the enclosed document.

For ESA section 7, the biological opinion (Opinion) portion of the enclosure document concludes that the action, as proposed, is not likely to jeopardize the continued existence of Snake River fall Chinook salmon, Snake River spring/summer Chinook salmon, and Snake River Basin steelhead. NMFS also determined the action will not destroy or adversely modify designated critical habitat for Snake River fall Chinook salmon, Snake River spring/summer Chinook salmon, Snake River Basin steelhead, and Snake River sockeye salmon. Additionally, NMFS concludes that the proposed action is not likely to adversely affect Snake River sockeye salmon. The Opinion provides rationale for our conclusions.

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 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.

As noted above, Section 3 of the document includes the results of our analysis of the action's effects on EFH. NMFS includes two Conservation Recommendations to avoid, minimize, or otherwise offset potential adverse effects on EFH. These Conservation Recommendations are 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 these recommendations.

If the MSA response is inconsistent with the EFH Conservation Recommendations, the COE must explain why the recommendations will not be followed, including the justification for any disagreements over the effects of the action and the recommendation. 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 clearly identify the number of Conservation Recommendations accepted.

Please direct questions regarding this consultation to Jennifer Gatzke of our Northern Snake Office in Moscow, Idaho at 208-883-8240 (jennifer.gatzke@noaa.gov).

Sincerely,

Michael P. Tehan
Assistant Regional Administrator
Interior Columbia Basin Office
NOAA Fisheries, West Coast Region

Enclosure
cc: S. Slate – COE

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

Hell's Gate Marina Dredging Project, Nez Perce County, Idaho
HUC 170601030307

NMFS Consultation Number: **WCR-2018-10658**

Action Agency: U.S. Army Corps of Engineers

Affected Species and 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 spring/summer-run Chinook salmon (*Oncorhynchus tshawytscha*)	Threatened	Yes	No	Yes	No
Snake River fall-run Chinook salmon (*Oncorhynchus tshawytscha*)	Threatened	Yes	No	Yes	No
Snake River sockeye salmon (*Oncorhynchus nerka*)	Threatened	No	No	Yes	No

Affected Essential Fish Habitat:

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 14, 2019

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ACRONYMS

ACRONYMN	DEFINITION
BA	Biological Assessment
BMP	Best Management Practices
COE	U.S. Army Corps of Engineers
CWA	Clean Water Act
dP	Decibel
DPS	Distinct Population Segment
DQA	Data Quality Act
EFH	Essential Fish Habitat
ESA	Endangered Species Act
ESU	Evolutionarily Significant Units
FCRPS	Federal Columbia River Power System
FHWA	Federal Highway Administration
HAPC	Habitat Areas of Particular Concern
ICTRT	Interior Columbia Technical Recovery Team
IDFG	Idaho Department of Fish and Game
IDPR	Idaho Department of Parks and Recreation

ACRONYMN	DEFINITION
ITD	Idaho Transportation Department
ITS	Incidental Take Statement
LOC	Letter of Concurrence
LHTAC	Local Highway Technical Assistance Council
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MPG	Major Population Groups
MOP	Minimum Operating Pool
NLAA	Not Likely to Adversely Affect
NMFS	National Marine Fisheries Service
NTU	Nephelometric Turbidity Units
OHWM	Ordinary High Water Mark
Opinion	Biological Opinion
PBF	Physical and Biological Features
PCE	Primary Constituent Elements
PFMC	Pacific Fishery Management Council
RPM	Reasonable and Prudent Measures
RSET	Regional Sediment Evaluation Team
SEF	Sediment Evaluation Framework
SRB	Snake River Snake River Basin (steelhead)
SRF	Snake River fall-run (Chinook)
SRS	Snake River sockeye salmon
SRSS	Snake River spring/summer-run (Chinook)
SLOPES	Standard Local Operating Procedures for Endangered Species
TMDL	Total Maximum Dailey Load
Tribe	Nez Perce Tribe
USFWS	United State Fish and Wildlife Service
VSP	Viable Salmonid 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 U.S.C. 1531 et seq.), and implementing regulations at 50 CFR 402.

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 through NMFS' Public Consultation Tracking System, at https://pcts.nmfs.noaa.gov. A complete record of this consultation is on file at the Snake River Basin Office in Boise, Idaho.

1.2 Consultation History

The Hell's Gate Marina was created by diking a portion of the Snake River and sourcing material from the site for the construction of the Lewiston Levees. The marina basin, located in Lewiston, Idaho (46.37°E, -117.05°W), requires occasional dredging to maintain a safe operating depth for vessels. The boat basin has been a sediment trap since construction. Sediment deposited in slow-moving waters at the entrance and within the boat basin periodically adversely impacts marina operations. Maintenance dredging at the entrance to the marina has occurred periodically since 1982. A reconfiguration of the marina entrance occurred in 1997 in an effort to reduce sedimentation. In 2007, a clamshell dredge cleared the marina entrance, and in 2016, an excavator dredged the riverward side of the entrance channel.

The Standard Local Operating Procedures for Endangered Species (SLOPES) programmatic consultation with the NMFS was used to address the 2007 dredging. After the SLOPES programmatic for Idaho expired, the dredging action in 2016 was addressed through individual informal consultation. In June 2017, NMFS issued a letter of concurrence (LOC) [WCR-2017-7109] for dredging the marina entrance using similar equipment to that used previously. The LOC covered up to five authorizations of dredging under a COE nationwide permit spanning July 2017 through September 2021, authorizing dredging no more than once per year in a single operating season. In-water work under the issued LOC was restricted to low flows between July 15 and September 30. This window aimed to ensure that in-water work would occur when water temperatures at the site are greater than or equal to 23°C, indicating the likely absence of salmon and steelhead.

On August 15, 2018, the COE requested informal consultation on dredging activity during the winter season using a suction dredge to operate inside the marina basin. Following discussion with NMFS, the COE decided to request a programmatic consultation to cover the range of summer and winter marina dredging activities for the next 10 years. NMFS replied on September 13, 2018, with non-concurrence with the COE's initial assessment of not likely to adversely affect (NLAA) and a request for more information in keeping with developing a programmatic consultation. On October 12, the COE submitted a modified biological assessment (BA) and request for formal consultation. NMFS responded with a 30-day letter on October 26, 2018, indicating consultation initiation. However, phone correspondence between the COE and NMFS in December 2018 indicated urgency for expedited approval, due to the need for dredging activity by December 2018 or early January 2019. Therefore, in coordination with the COE, NMFS opted to complete a consultation solely for the winter 2019 dredge action, and subsequently complete a separate programmatic consultation that covers the next 10 years of marina maintenance dredging. The proposed action addressed here is for the single dredging event in winter 2019.

On November 6, 2018, NMFS conferred with the Nez Perce Tribe (Tribe) fish biologists regarding the details of the Hell's Gate Marina Dredging Project. In response, the Tribe indicated: (1) juvenile fall Chinook are not expected to be in the marina during the winter work window; (2) support for limiting sediment pulses as a Best Management Practice (BMP); (3) concern regarding Pacific lamprey in past consultations; (4) interest in monitoring during operations (J. Hesse, personal communication, 2018). Because this action has the potential to affect tribal trust resources, NMFS provided copies of the draft proposed action and terms and conditions for this Opinion to the Tribe on February 11, 2019. The Tribe responded on February 12, 2019, indicating concerns regarding protection of fish that may be present in the marina during dredging activities. In response, NMFS included two additional terms and conditions to restrict the timing of dredging operations and position of the dredge intake to minimize the risk of incidental take.

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). "Interrelated actions" are those that are part of a larger action and depend on the larger action for their justification. "Interdependent actions" are those that have no independent utility apart from the action under consideration (50 CFR 402.02). Boat traffic and marina activity in the action area are reasonably likely to continue due to the proposed action.

The COE is proposing to issue a Section 10 Permit of the Rivers and Harbors Act to the Idaho Department of Parks and Recreation (IDPR); the IDPR will then oversee dredging activities in the Hell's Gate Marina. The proposed action includes the dredging of sediment from the two entrances and the boat basin of the marina. The buildup of sediments is limiting boat access and use of the marina during normal pool operations, which is at minimum operating pool (MOP) seasonally in accordance with the Federal Columbia River Power System (FCRPS) Biological Opinion (Opinion).

Dredging involves the physical removal of sediments from one location, and the placement of that material in another location. The dredging process typically consists of excavation, transport, and placement of dredged sediments. Excavation of dredge material will utilize a hydraulic (i.e., suction or water-induced vacuum) dredge. Once dredged, sediments are transported to a predetermined disposal or placement area. The proposed dredging will be completed with a hydraulic dredge during some portion of a February 15 – March 31, 2019 work period. During that work period the marina is closed to vessel traffic.

Before dredging, the IDPR will isolate the work area by installing a sediment curtain at both entrances of the marina. Silt curtains will be placed across the riverward side of the entrances to the marina basin to both reduce potential movement of sediments into the Snake River, and restrict fish movement into the project site once dredging activity commences, as pictured below.

Figure 1. Image of Hell's Gate Marina entrance depicting the silt curtain placed to prevent suspended sediments from entering the Snake River Main Channel.

The IDPR will then dredge the marina basin to return it to design capacity. The IDPR will use a rented non-cabled suction dredge to remove approximately 20,000 cubic yards of accumulated silt in the marina, from the handling dock area to the northern channel of the marina basin. The dredge will operate only during daylight hours. The box-shaped cutterhead of the dredge (i.e., dredge intake) is 6 feet wide with a 6-inch diameter hose. The dredge pump will not be turned on until the cutterhead is in contact with or near the bottom of the marina (C. Chase, personal communication, 2019). The suction dredge will operate from a barge, and will work near the existing fuel, handling, and mooring docks to remove the heavy buildup of materials in the area. Dredging will take approximately 30 days to complete. This consultation only pertains to dredging within the marina basin and two entrances, as pictured below.

Figure 2. Satellite image of Hell's Gate Marina depicting the entire area proposed for future dredging, approximately 9 acres. No dredging is proposed beyond the featured polygon.

Unlike previous actions, dredge material, or spoils, will not require dewatering before transportation. The material will be continuously pumped to an old slurry disposal area approximately 500 feet north of the boat basin. This area is hydrologically isolated from the river system by levees with an elevation approximately 40 feet above the ordinary high water mark (OHWM).

Figure 3. Satellite image of Hell's Gate Marina and shoreline disposal site on the Snake River, Lewiston, Idaho.

Substrate sampling conducted prior to dredging in 2007 and 2016 found that sediment fell within the chemical composition limits required under the Sediment Evaluation Framework for the Pacific Northwest (SEF). Additionally, since all dredged materials will be placed in an enclosed basin hydrologically isolated from the river, the COE will not conduct sampling to monitor contaminated sediments during dredging.

All over-water construction vessels will be fueled at commercial fuel docks. Such facilities have spill prevention systems in place, and can immediately respond to any accidental spills that might occur. Equipment will be inspected and cleaned prior to any instream work. The COE and contractors will implement BMP's to prevent spills of fuel, or hydraulic leaks during the dredging and disposal operation.

1.3.1 In-water Work Windows

The winter in-water work window occurs during low flows, between December 15 and March 31. Because few if any listed fish are expected to be present in the marina during this time, and due to the difficult nature of capturing and salvaging fish if any are present inside this large area isolated by the silt curtains, fish salvage operations are not proposed.

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 provides 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 RPMs and terms and conditions to minimize such impacts.

The COE determined the proposed action is: (1) likely to adversely affect Snake River fall (SRF) Chinook salmon, Snake River spring/summer (SRSS) Chinook salmon, Snake River Basin (SRB) steelhead; (2) not likely to adversely affect Snake River sockeye (SRS) salmon; and (3) not likely to adversely affect designated critical habitat for the above mentioned species. Our concurrence for SRS salmon is documented in the "Not Likely to Adversely Affect" Determinations section (Section 2.12). NMFS does not agree with the COE determination for critical habitat and includes an analysis of effects of the action on the four species' designated critical habitat below.

2.1 Analytical Approach

This Opinion includes both a jeopardy analysis and/or an adverse modification analysis. The jeopardy analysis relies upon the regulatory definition of "to jeopardize the continued existence of" a listed species. Jeopardy is "to engage in an action that 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 CFR 402.02). Therefore, the jeopardy analysis considers both survival and recovery of the species.

This Opinion relies on the definition of "destruction or adverse modification," which "means a direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation of a listed species. Such alterations may include, but are not limited to, those that alter the physical or biological features essential to the conservation of a species or that preclude or significantly delay development of such features" (81 FR 7214).

The designations of critical habitat for Snake River salmon and steelhead species use the term primary constituent element (PCE) or essential features. The new critical habitat regulations (81 FR 7414) replace those terms 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.

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

- Identify the rangewide status of the species and critical habitat expected to be adversely affected by the proposed action.

- Describe the environmental baseline in the action area.

- Analyze the effects of the proposed action on both species and their habitat using an "exposure-response-risk" approach.

- Describe any cumulative effects in the action area.

- Integrate and synthesize the above factors by: (1) Reviewing the status of the species and critical habitat; and (2) adding the effects of the action, the environmental baseline, and cumulative effects to assess the risk that the proposed action poses to species and critical habitat.

- Reach a conclusion about whether species are jeopardized or critical habitat is adversely modified.

- If necessary, suggest a reasonable and prudent alternative 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' current "reproduction, numbers, or distribution" as described in 50 CFR 402.02.

This Opinion also examines the condition of critical habitat throughout the designated area, evaluates the conservation value of the various watersheds that make up the designated area, and discusses the current function of the essential physical and biological features (PBF) that help to form that conservation value.

Table 1. 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 spring/summer-run	T 6/28/05; 70 FR 37160	10/25/99; 64 FR 57399	6/28/05; 70 FR 37160
Snake River fall-run	T 6/28/05; 70 FR 37160	12/28/93; 58 FR 68543	6/28/05; 70 FR 37160
Sockeye salmon *(O. nerka)*			
Snake River	E 6/28/05; 70 FR 37160	12/28/93; 58 FR 68543	ESA section 9 applies
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 SRSS Chinook salmon, SRF Chinook salmon, and the SRB steelhead distinct population segment (DPS). NMFS expresses the status of a salmonid Evolutionarily Sigificant Units (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 5 percent risk of extinction within 100 years and "highly viable" as less than a 1 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 sustain population-level extinction and recolonization processes (ICTRT 2007). The risk level of the ESU/DPS is developed from the aggregate risk levels of the individual populations and major population groups (MPGs) that make up the ESU/DPS.

Attributes associated with a viable salmonid population, or 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 Spring/Summer Chinook Salmon

The SRSS 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. Several factors led to NMFS' conclusion that SRSS Chinook were threatened: (1) Abundance of naturally produced SRSS Chinook runs had dropped to a small fraction of historical levels; (2) short-term projections were for a continued downward trend in abundance; (3) hydroelectric development on the Snake and Columbia Rivers continued to disrupt Chinook runs through altered flow regimes and impacts on estuarine habitats; and (4) habitat degradation existed throughout the region, along with risks associated with the use of outside hatchery stocks in particular areas (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. SRSS Chinook salmon are characterized by their return times. Runs classified as spring or summer Chinook salmon are categorized by timing of adult returns. Fish counted at Bonneville Dam beginning in early March and ending the first week of June are deemed spring runs; summer runs pass Bonneville Dam from June 8th through August. Returning adults will hold in deep mainstem and tributary pools until late summer, when they move up into tributary areas and spawn. In general, spring-run type Chinook salmon tend to spawn in higher-elevation reaches of major Snake River tributaries in mid- through late August; and summer-run Chinook salmon tend to spawn lower in Snake River tributaries in late August and September (although the spawning areas of the two runs may overlap). As with most salmon, adults die after spawning providing a large nutrient source for juvenile fish.

SRSS Chinook follow a “stream-type” life history characterized by rearing for a full year in the spawning habitat and migrating in early to mid-spring as age-1 smolts (Healey 1991). Eggs are deposited in late summer and early fall, incubate over the following winter, and hatch in late winter and early spring of the following year. Juveniles rear through the summer, and most overwinter and migrate to sea in the spring of their second year of life. Depending on the tributary and the specific habitat conditions, juveniles may migrate extensively from natal reaches into alternative summer-rearing or overwintering areas. Juvenile SRSS Chinook salmon behave differently than SRF Chinook in that they remain in headwater streams for a year and out–migrate the following spring. Optimal water temperatures range from 59–64°F (14–18°C) with temperatures exceeding 73°F (21°C) being lethal (Wydoski and Whitney 2003). Juvenile Chinook salmon feed on small aquatic invertebrates in both fresh and salt water, primarily arthropods in freshwater and crustaceans in marine environments. As they grow in saltwater, they quickly change to a fish diet (IDFG 2005). SRSS Chinook salmon return from the ocean to spawn primarily as 4- and 5-year-old fish, after 2 to 3 years in the ocean. A small fraction of the fish return as 3-year-old “jacks,” heavily predominated by males (Good et al. 2005).

Juvenile Snake River spring Chinook salmon have been documented as using the backwater areas of McNary Reservoir for rearing. Limited sampling has occurred in the lower Snake River and indicates that individuals of SRSS Chinook salmon may show very limited use of shallow water areas of lower Snake River reservoirs for periods of rearing during the spring outmigration period or overwintering between July and March (Tiffan and Connor 2012; Arntzen et al. 2012). Because this ESU is an upriver stock, no spawning habitat is present in the lower Snake River. Juvenile SRSS Chinook salmon generally migrate through the Snake River during March through July. Most adult SRSS Chinook salmon migrate through the lower Snake River between April and mid-August.

Spatial Structure and Diversity. The Snake River ESU includes all naturally spawning populations of SRSS Chinook in the mainstem Snake River (below Hells Canyon Dam) and in the Tucannon River, Grande Ronde River, Imnaha River, and Salmon River subbasins (57 FR 23458), as well as the progeny of 13 artificial propagation programs (70 FR 37160). The hatchery programs include the South Fork Salmon River (McCall Hatchery), Johnson Creek, Pahsimeroi River, East Fork Salmon River, West Fork Yankee Fork Salmon River, Upper Salmon River (Sawtooth Hatchery), Tucannon River (conventional and captive broodstock programs), Lostine River, Catherine Creek, Lookingglass Creek, Upper Grande Ronde River, Imnaha River, and Big Sheep Creek programs. The historical Snake River ESU likely also included populations in the Clearwater River drainage and extended above the Hells Canyon Dam complex.

Within the Snake River ESU, the Interior Columbia Technical Recovery Team (ICTRT) identified 28 extant and 4 extirpated or functionally extirpated populations of SRSS Chinook salmon, listed in Table 2 (ICTRT 2003; McClure et al. 2005). The ICTRT aggregated these populations into five MPGs: Lower Snake River, Grande Ronde/Imnaha Rivers, South Fork Salmon River, Middle Fork Salmon River, and Upper Salmon River. For each population, Table 2 shows the current risk ratings that the ICTRT assigned to the four parameters of a VSP (spatial structure, diversity, abundance, and productivity).

Spatial structure risk is low to moderate for most populations in this ESU (NWFSC 2015) and is generally not preventing the recovery of the species. Snake River spring/summer-run Chinook salmon spawners are distributed throughout the ESU albeit at very low numbers. Diversity risk, on the other hand, is somewhat higher, driving the moderate and high combined spatial structure/diversity risks shown in Table 2 for some populations. Several populations have a high proportion of hatchery-origin spawners—particularly in the Grande Ronde, Lower Snake, and South Fork Salmon MPGs—and diversity risk will need to be lowered in multiple populations in order for the ESU to recover (ICTRT 2007, ICTRT 2010, NWFSC 2015).

Abundance and Productivity. Historically, the Snake River drainage is thought to have produced more than 1.5 million adult SRSS Chinook salmon in some years (Matthews and Waples 1991), yet by the mid-1990s counts of wild fish passing Lower Granite Dam dropped to less than 10,000 (IDFG 2007). Wild returns have since increased somewhat but remain a fraction of historic estimates. Between 2005 and 2015, the number of wild adult fish passing Lower Granite Dam annually ranged from 8,808 to 30,338 (IDFG 2016). Natural origin abundance has increased over the last five years for most populations in this ESU, but the increases have not been large enough to change population viability ratings for abundance and productivity; all but one population (Chamberlain Creek) remain at high risk of extinction over the next 100 years (NWFSC 2015). Near all SRSS Chinook salmon populations will need to see substantial increases in abundance and productivity in order for the ESU to recover.

Table 2. Summary of viable salmonid population parameter risks and overall current status for each population in the Snake River spring/summer Chinook salmon ESU (NWFSC 2015).

MPG	Population	VSP Risk Parameter		Overall Viability Rating
		Abundance/ Productivity	Spatial Structure/ Diversity	
South Fork Salmon River (Idaho)	Little Salmon River	*Insf. data*	Low	High Risk
	South Fork Salmon River mainstem	High	Moderate	High Risk
	Secesh River	High	Low	High Risk
	East Fork South Fork Salmon River	High	Low	High Risk
Middle Fork Salmon River (Idaho)	Chamberlain Creek	Moderate	Low	Maintained
	Middle Fork Salmon River below Indian Creek	*Insf. data*	Moderate	High Risk
	Big Creek	High	Moderate	High Risk
	Camas Creek	High	Moderate	High Risk
	Loon Creek	High	Moderate	High Risk
	Middle Fork Salmon River above Indian Creek	High	Moderate	High Risk
	Sulphur Creek	High	Moderate	High Risk
	Bear Valley Creek	High	Low	High Risk

MPG	Population	VSP Risk Parameter		Overall Viability Rating
		Abundance/ Productivity	Spatial Structure/ Diversity	
	Marsh Creek	High	Low	High Risk
Upper Salmon River (Idaho)	North Fork Salmon River	*Insf. data*	Low	High Risk
	Lemhi River	High	High	High Risk
	Salmon River Lower Mainstem	High	Low	High Risk
	Pahsimeroi River	High	High	High Risk
	East Fork Salmon River	High	High	High Risk
	Yankee Fork Salmon River	High	High	High Risk
	Valley Creek	High	Moderate	High Risk
	Salmon River Upper Mainstem	High	Low	High Risk
	Panther Creek			***Extirpated***
Lower Snake (Washington)	Tucannon River	High	Moderate	High Risk
	Asotin Creek			***Extirpated***
Grande Ronde and Imnaha Rivers (Oregon/ Washington)	Wenaha River	High	Moderate	High Risk
	Lostine/Wallowa River	High	Moderate	High Risk
	Minam River	High	Moderate	High Risk
	Catherine Creek	High	Moderate	High Risk
	Upper Grande Ronde River	High	High	High Risk
	Imnaha River	High	Moderate	High Risk
	Lookingglass Creek			***Extirpated***
	Big Sheep Creek			***Extirpated***

2.2.1.2 Snake River fall-run Chinook Salmon

The SRF 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. The SRF 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. Adult SRF 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. 1995; Dauble et al. 1994; Mueller 2009). Juveniles emerge from the gravels in March and April of the following year, moving downstream from natal spawning and early rearing areas from May through early fall. Juvenile SRF Chinook salmon move seaward slowly as subyearlings, typically within several weeks of emergence (Waples et al. 1991). Tiffan and Connor (2012) showed that subyearling fish favor water less than 6 feet deep.

Until relatively recently, SRF Chinook were assumed to follow 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 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 SRF 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 SRF Chinook salmon taken at Lower Granite Dam have indicated that approximately half of the returns overwintered in freshwater (Ford 2011).

Having lost access to historic spawning and rearing sites in the upper Snake River, SRF Chinook salmon now reside in waters that are generally cooler and of lower velocity than the majority of historic spawning areas. These alterations to the lower Snake River habitat by hydroelectric dams have created obstacles to SRF Chinook survival. Prior to alteration of the Snake River Basin by dams, SRF Chinook salmon exhibited a largely ocean-type life history, where they migrated downstream and reared in the mainstem Snake River during their first year. Today, SRF Chinook salmon exhibit one of two life histories, either ocean-type or reservoir-type (Connor, et al. 2005). In the reservoir-type life history, juveniles overwinter in the pools created by the dams prior to migrating out to sea. This life history is likely a response to early development in cooler temperatures, which prevents juveniles from reaching the necessary size to migrate out of the Snake River.

Historically, the primary SRF Chinook salmon spawning areas were located on the upper mainstem Snake River (Connor et al. 2005). A series of Snake River mainstem dams block access to the upper Snake River, which has significantly reduced spawning and rearing habitat for SRF Chinook salmon. The vast majority of spawning today occurs upstream from Lower Granite Dam, with the largest concentration of spawning sites in the Clearwater River, downstream from Lolo Creek. Currently, natural spawning is limited to the Snake River from the upper end of Lower Granite reservoir to Hells Canyon Dam, the lower reaches of the Imnaha, Grande Ronde, Clearwater, Salmon, and Tucannon Rivers, and small areas in the tailraces of the lower Snake River hydroelectric dams (Good et al. 2005; Mueller and Coleman 2007).

Wild juvenile SRF Chinook salmon typically pass through the Lower Snake River from mid-June through September, with double peaks in mid-July and some lingering portion of the annual migration lasting until December. Many of the juvenile SRF Chinook salmon outmigrating from the Clearwater and Snake Rivers spend time in shoreline areas (less than 3 meters [9.8 feet] in depth) in the Lower Granite reservoir and less time in downriver reservoirs, where they prefer sand-substrate areas (Bennett et al. 1997). Tiffan and Connor (2012) similarly reported low gradient shoreline areas less than 2 meters deep were highly used by naturally produced juvenile SRF Chinook salmon. When water temperatures reach about 21.1°C (70°F), these fish appear to have achieved adequate growth and fitness due to the warming conditions of these shallow-water habitat areas. They leave the shoreline areas to either continue rearing or begin their migration in the cooler pelagic zone of the reservoirs (Bennett et al. 1997). Some of the subyearlings discontinue active migration before or after entering the reservoirs in mid-summer (Arnsberg and Statler 1995). These “reservoir-type” juveniles are primarily natural origin SRF Chinook salmon (Connor et al. 2005) and they feed and grow as they move downstream offshore in reservoirs during fall and winter and into spring when they become yearlings (Tiffan et al. 2012).

Winter is a critical season that can greatly influence the survival and behavior of juvenile anadromous salmonids. Fish in small streams limit their winter movement and energy expenditure by seeking nearshore cover and holding (review by Brown et al. 2011). However, Tiffan et al. (2012) hypothesized that the need for cover, protection from predators, and energy conservation are met in reservoirs in ways that allow fish more unrestricted movement at lower energetic costs than observed in small streams. Further, the same authors deduced from angling catch data that reservoir-type juveniles are largely pelagic. Furthermore, sampling data, including radio-telemetry efforts, suggests that use of shallow water habitat during the fall and winter by juvenile SRF Chinook is limited and that while juveniles passed shallow water habitat sites, relatively few entered them. Radio-tagged fish located during mobile tracking in the winter of 2010 were pelagically oriented, and generally not found over shallow water or close to shore (Tiffan and Connor 2012).

Redd surveys conducted in the Snake River in 2017 by the Nez Perce Tribe and U.S. Fish and Wildlife Service (USFWS) recorded four SRF Chinook redds five miles upstream from the Hell’s Gate Marina (Arnsberg et al. 2018). The low velocity and relatively fine substrate along a high percentage of the reservoir shorelines of the Lower Snake River reservoirs preclude spawning in these areas. The limited spawning that does occur apparently is in the tailrace areas below all of the lower Snake River dams, where water velocity is high and substrate size is relatively large (Mueller and Coleman 2007, 2008). No redds have been located in other regions of the Snake River reservoirs.

Spatial Structure and Diversity. The SRF 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 three 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 Hatcheries 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 SRF 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).

The USFWS sampled and Passive Integrated Transponder Tag (PIT tagged) subyearling SRF Chinook salmon rearing and migrating in the Snake River from 1992-2000. Beach seine sampling data from the swim beach approximately 0.5 miles upstream from the Hell's Gate Marina documents juvenile SRF Chinook salmon presence from April through early-July (J. Hesse, personal communication, 2018). Tiffan and Connor (2012) found that reservoir-type juvenile SRF Chinook numbers in Lower Granite reservoir was highest in October and decreased over the fall and winter with the lowest abundance in February. Tiffan and Connor (2012) also found that only 3 percent of the juveniles they found in the winter (November through March) in Lower Granite reservoir were in water less than 20 feet deep and only 7 percent were within 80 feet of shore for short times (less than an hour).

Abundance and Productivity. Historical abundance of SRF Chinook salmon is estimated to have been 416,000 to 650,000 fish (NMFS 2006), but numbers declined drastically over the 20th century, with only 78 wild fish passing Lower Granite Dam in 1990 (Joint Columbia River Management Staff 2014). The first hatchery-reared SRF Chinook salmon returned to the Snake River in 1981, and since then the number of hatchery returns has increased steadily, such that hatchery fish dominate the SRF Chinook run. Natural returns have also increased. A recent 10-year (2005-2014) mean abundance of natural-origin SRF Chinook was 6,148 adult spawners, above the minimum viability goal of 4,200 spawners and largely driven by relatively high numbers in the more recent years (NWFSC 2015). Productivity estimated from 1990–2009 brood years is 1.5, meeting the ICTRT's abundance/productivity criteria for a viable population, but falling short of the productivity of 1.7 needed for highly viable status. An increase in productivity could be generated by reductions in mortalities across 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).

Overall, the status of SRF Chinook salmon has substantially improved compared to the time of ESA listing. The single extant population in the ESU is currently meeting the criteria for a rating of "viable" developed by the ICTRT, but the ESU as a whole is not meeting the recovery goals described in the recovery plan for the species, which require the single population to be "highly viable with high certainty" or will require reintroduction/restoration of a viable population above the Hells Canyon Dam complex (NWFSC 2015). For recovery of the species, the Lower Snake population will need an increase in estimated productivity combined with a reduction in diversity risk.

2.2.1.3 Snake River Basin Steelhead

The SRB 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 (Good et al. 2005). The SRB steelhead no longer occur above Dworshak Dam in the Clearwater River basin. The ICBTRT noted that SRB steelhead remain spatially well distributed in each of the six major geographic areas in the Snake River basin (Good et al. 2005). Environmental conditions are generally drier and warmer in these areas than in areas occupied by other steelhead species in the Pacific Northwest. SRB steelhead were blocked from portions of the upper Snake River beginning in the late 1800s and culminating with the construction of Hells Canyon Dam complex in the 1960s.

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 SRB 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 SRB 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 (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 SRB 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 viable salmonid population (spatial structure, diversity, abundance, and productivity).

The SRB DPS steelhead exhibit a diversity of life-history strategies, including variations in fresh water and ocean residence times. Traditionally, fisheries managers have classified SRB 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 1-year in the ocean; B-run steelhead are larger with most individuals returning after 2 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). Historical estimates of steelhead passing Lewiston Dam (removed in 1973) on the lower Clearwater River were 40,000 to 60,000 adults (Ecovista et al. 2003), and the Salmon River basin likely supported substantial production as well (Good et al. 2005). In contrast, at the time of listing in 1997, the 5-year mean abundance for natural-origin steelhead passing Lower Granite Dam, which includes all but one population in the DPS, was 11,462 adults (Ford 2011). Counts have increased since then, with between roughly 23,000 and 44,000 adult wild steelhead passing Lower Granite Dam in the most recent 5-year period (2011–2015) (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 3. Summary of viable salmonid population parameter risks and overall current status for each population in the Snake River Basin steelhead DPS (NWFSC 2015). Risk ratings 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.

2.2.2 Status of Critical Habitat

The action area is located within designated critical habitat for SRSS and SRF Chinook salmon, SR sockeye salmon, and SRB steelhead. 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 4. Types of sites, essential PBFs, 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
Snake River Spring/Summer Chinook, Fall Chinook, and Sockeye Salmon		
Spawning & Juvenile Rearing	Spawning gravel, water quality and quantity, cover/shelter (Chinook only), food, riparian vegetation, space (Chinook only), water temperature and access (sockeye 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. 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 5 describes the geographical extent within the Snake River of critical habitat for each of the four ESA-listed salmon and steelhead species. Critical habitat includes the stream channel and water column with the lateral extent defined by the OHWM, or the bankfull elevation where the OHWM is not defined. In addition, critical habitat for the three salmon species 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 5. 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 sockeye salmon	58 FR 68543; December 28, 1993	Snake and Salmon Rivers; Alturas Lake Creek; Valley Creek, Stanley Lake, Redfish Lake, Yellowbelly Lake, Pettit Lake, Alturas Lake; all inlet/outlet creeks to those lakes
Snake River spring/summer Chinook salmon	58 FR 68543; December 28, 1993. 64 FR 57399; October 25, 1999.	All Snake River reaches upstream to Hells Canyon Dam; all river reaches presently or historically accessible to Snake River spring/summer Chinook salmon within the Salmon River basin; and all river reaches presently or historically accessible to Snake River spring/summer Chinook salmon

ESU/DPS	Designation	Geographical Extent of Critical Habitat
		within the Hells Canyon, Imnaha, Lower Grande Ronde, Upper Grande Ronde, Lower Snake-Asotin, Lower Snake-Tucannon, and Wallowa subbasins.
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 2017a; NMFS 2017b). 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 2017a; NMFS 2017b). 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 SRSS Chinook and SRB steelhead in particular (NMFS 2017a).

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 River. 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 (IDEQ and USEPA 2003; IDEQ 2001).

Migration habitat quality for Snake River salmon and steelhead has also been greatly reduced, primarily by the development and operation of dams and reservoirs on the mainstem Columbia and Snake Rivers (NMFS 2008). Hydroelectric development has modified natural flow regimes in the migration corridor causing higher water temperatures in late summer and fall. Other effects include changes in fish community structure that have led to increased rates of piscivorous and avian predation on juvenile salmon and steelhead, and delayed migration for both adult and juveniles. Physical features of dams such as turbines also kill migrating fish.

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

One factor affecting the rangewide status of Snake River salmon and steelhead, and aquatic habitat at large is climate change. Several studies have revealed that climate change has the potential to affect ecosystems in nearly all tributaries throughout the Snake River (Battin et al. 2007; ISAB 2007). While the intensity of effects will vary by region (ISAB 2007), climate change is generally expected to alter aquatic habitat (water yield, peak flows, and stream temperature). As climate change alters the structure and distribution of rainfall, snowpack, and glaciations, each factor will in turn alter riverine hydrographs. Given the increasing certainty that climate change is occurring and is accelerating (Battin et al. 2007), NMFS anticipates salmonid habitats will be affected. Climate and hydrology models project significant reductions in both total snow pack and low-elevation snow pack in the Pacific Northwest over the next 50 years (Mote and Salathé 2009), changes that will shrink the extent of the snowmelt-dominated watershed habitat available to salmon. Such changes may restrict our ability to conserve diverse salmon life histories.

In the Pacific Northwest, most models project warmer air temperatures, increases in winter precipitation, and decreases in summer precipitation. Average temperatures in the Pacific Northwest are predicted to increase by 0.1 to 0.6°C (0.2°F to 1.0°F) per decade (Mote and Salathé 2009). Warmer air temperatures will lead to more precipitation falling as rain rather than snow. As the snow pack diminishes, seasonal hydrology will shift to more frequent and severe early large storms, changing stream flow timing which may limit salmon survival (Mantua et al. 2009). The largest driver of climate-induced decline in salmon populations is projected to be the impact of increased winter peak flows, which scour the streambed and destroy salmon eggs (Battin et al. 2007).

Higher water temperatures and lower spawning flows in spring and summer, together with increased magnitude of winter peak flows are all likely to increase salmon mortality. The Independent Scientific Advisory Board (ISAB 2007) found that higher ambient air temperatures will likely cause water temperatures to rise. Salmon and steelhead require cold water for spawning and incubation. As climate change progresses and stream temperatures warm, thermal refugia will be essential to persistence of many salmonid populations. Thermal refugia are important for providing salmon and steelhead with patches of suitable habitat while allowing them to undertake migrations through or to make foraging forays into areas with greater than optimal temperatures. To avoid waters above summer maximum temperatures, juvenile rearing may be increasingly found only in the confluence of colder tributaries or other areas of cold-water refugia (Mantua et al. 2009).

Climate change is expected to make recovery targets for 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 generally 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 salmon. 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 or refuge habitat (Battin et al. 2007; ISAB 2007).

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). For this project, the action area will consist of the entrances to the marina basin, the marina basin itself, the adjacent and upland hydrologically isolated disposal site, equipment staging areas, and 100 feet downstream from each marina entrance in the main channel of the Snake River (the likely extent of potential downstream turbidity effects).

The Snake River in the reach containing the action area is designated critical habitat for SRSS Chinook, SRF Chinook, SRS salmon, and SRB steelhead. Both adult and juvenile life stages of ESA-listed SRSS Chinook, SRF Chinook, SRB steelhead, and SRS salmon use the main channel as a migration corridor. The action area provides potential shallow water rearing habitat for SRF Chinook salmon, but disturbance from operating vessels and lack of vegetation reduce its value as refugia. During the winter months, juvenile SRF Chinook, SRSS Chinook, and SRB steelhead may exhibit very limited use of shallow water areas of the lower Snake River, such as that found near and within the marina basin.

2.4 Environmental Baseline

The "environmental baseline" includes the past and present impacts of all federal, state, or private actions and other human activities in the action area, the anticipated impacts of all proposed federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of state or private actions which are contemporaneous with the consultation in process (50 CFR 402.02).

Snake River habitat alterations

Human activities have degraded aquatic habitats and affected native fish populations in the Snake River Basin. These include stream channelization, elimination of wetlands, construction of flood control dams and levees, construction of roads, water withdrawals, unscreened water diversions, agriculture, livestock grazing, urbanization, outdoor recreation, artificial fish propagation, fish harvest, and the introduction of non-native species (Henjum et al. 1994; Rhodes et al. 1994; Spence et al. 1996). Although fragmented by the presence of dams, the mainstem Snake River provides habitat that may help to maintain interactions between fish populations in the tributaries. It currently provides for the foraging and overwintering of all ESA-listed Snake River salmonids except SRS salmon, and could provide some spawning habitat for SRF Chinook salmon.

Lower Granite Reservoir extends upstream from the dam to Lewiston, Idaho. Hell's Gate Marina is located near Snake RM 143.2 and is within the area influenced by the Lower Granite Dam. The Hell's Gate Marina action area is on the right bank of the Snake River in Lewiston, upstream of the mouth of the Clearwater River. When the Lower Granite Reservoir was created, 40 to 60 percent of the shallow-water sand bar habitat used by juvenile SRF Chinook salmon became either mid-depth bench habitat or deep-water habitat. Deeper water is more suited to sturgeon and predator species. Today less than 10 percent of Lower Granite reservoir consists of shallow water habitat (Seybold and Bennett 2010). Increasing the amount of shallow water habitat could potentially enhance the aquatic productivity of the reservoirs. An analysis of limiting conditions for reservoir-wide habitat indicates that low gradient, open sand, shallow-water habitat (with no additional cover structure) will be moderately to highly suitable for SRF Chinook salmon rearing habitat (Curet 1994, and Connor et al. 2002, 2005; Tiffan and Connor 2012; Tiffan and Hatten 2012).

Salmon and steelhead habitat baseline conditions in the Hell's Gate Marina and in the Snake River adjacent to the marina include: (1) a "Not Supporting" status for the beneficial use of Cold Water Aquatic Life in the Lower Snake River, according to the IDEQ 2014 Integrated Report (IDEQ 2016); (2) lack of aquatic vegetation due to high sedimentation in the marina basin, marina entrances, and near-shore area of Snake River channel adjacent to the marina; (3) high summer water temperatures within the marina basin and marina entrances, creating annually unsuitable habitat conditions. However, adequate cold water refugia exists within the marina and adjacent water in the winter months; (4) lack of water current in the marina basin except near the marina entrances; (5) pre-dredging marina water depths between 1.5 feet and 2.0 feet at MOP; (6) limited egress from the marina basin due to the 50-foot wide marina entrances. The marina basin lies adjacent to the main channel of the Snake River for approximately 1,900 feet.

Snake River sediment transport

Many of the Snake River Plateau soils are light and highly erodible with low rainfall limiting the ability of vegetative cover to reestablish if it is removed. Wind erosion is prevalent, especially during the spring and fall, when high winds and dry soil conditions create dust storms. Dryland agricultural practices that expose the soil during spring cultivation and fall harvesting exacerbate these dust storms. Forest fires and agricultural plowing contribute sediment to the rivers. Landslides in burned areas contribute large amounts of sediment.

As the Snake and Clearwater Rivers meet the slackwater of the Lower Granite Reservoir, bedload and suspended particles soon settle to the river bottom, resulting in a substantial accumulation of sediment near the head of the reservoir, including in the Hell's Gate Marina area. Prior to dam construction, finer-grained materials deposited on the river floodplain or high along the channel margins, and the riverbed presented a complex mosaic of substrate conditions along the length of the lower Snake River. Now there are few shallow-water sandy shoals below the confluence area. Consequently, smolts must travel substantial distances between foraging areas.

Each of the Lower Snake River Project reservoirs has a 3 to 5 foot operating range and the COE maintains a 14-foot-deep, 250-foot-wide navigation channel, as measured at the minimum operating pool (MOP). The FCRPS Biological Opinion also contains a requirement to operate the pools at MOP during certain times of the year (NMFS 2014). As such, Lower Granite pool depth fluctuates, depending on the season and determined annually by the FCRPS Biological Opinion. Normal pool operations generally mean that the pool is run at MOP from approximately April to the end of August. Compounding the effects of sedimentation within the boat basins and approaches, the Hell's Gate Marina must operate during lower water levels, thereby reducing the draft of the basins.

Trophic relationships

In the Lower Snake River and the lower reach of the Clearwater River, dams have changed food web interaction both directly and indirectly. Impoundments have directly increased predation risk for anadromous salmon and steelhead smolts by delaying downstream migration, thereby prolonging their exposure to piscivorous birds and fishes. Impoundments have also changed trophic interaction indirectly by creating extensive new habitat (e.g., riprap banks) that favors some native piscivorous fishes like northern pikeminnow, and provides new opportunities for non-native piscivores like walleye and smallmouth bass (Beamesderfer and Rieman 1988; Kareiva et al. 2000; Petersen et al. 1999). Arntzen et al. (2012) found that smallmouth bass diets consisted of less than six percent juvenile Chinook salmon by weight, indicating that salmonids were not a significant portion of their diet at shallow water habitat sites. Both the Sport Reward Program (Northern Pikeminnow Management Program) (Radtke et al 2004), and scientific sampling funded by the BPA (USACE 2002), removed significant numbers of northern pikeminnows from the Columbia River Basin and reduced predation by that species on juvenile salmonids. The initial construction of Hell's Gate Marina provided additional habitat for native and non-native piscivorous fish, increasing predation risk for salmonids in this area.

2.5 Effects of the Action

Under the ESA, "effects of the action" means the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline (50 CFR 402.02). Indirect effects are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur. The Hell Gate Marina Dredging Project (and future boat traffic enabled by the project) could potentially cause effects through multiple pathways: turbidity and suspended sediment, chemical contamination, entrainment/disturbance/displacement, noise, effects from predation, and changes in prey base.

2.5.1 Effects on Species

Effects from turbidity and suspended sediment

The Idaho standard states that turbidity shall not exceed the background by more than 50 NTU instantaneously or by more than 25 NTU for more than 10 consecutive days. Background turbidity data collected from the lower Snake River indicate that turbidity was lowest at the confluence of the Snake and Clearwater Rivers and increased farther downstream in the Snake River. Median turbidity values ranged from 2 to 4 nephelometric turbidity unit (NTUs) in the Snake River, well below Idaho's 25 NTU limit. These measurements did not include sampling during periods of heavy runoff or heavy storm non-point source water discharge. The average background turbidity level in the Snake and Clearwater Rivers during the winter dredging period in 2006 was less than 5 NTU. Given that proposed marina dredging will utilize silt curtains (to discourage suspended sediments from entering the main channel), which will be left in place until the water column appears clear, turbidity is not expected to increase measurably in the main river channel.

SRF Chinook salmon, SRSS Chinook salmon, and SRB steelhead may be nearby the project site in the main channel of the Snake River. Additionally, fish could potentially be present in the marina basin, thus becoming trapped by the silt curtains and exposed to the effects of suspended sediment. In the Snake River adjacent to the marina entrances, where there could be a sediment plume if the silt curtains leak or fail, salmon and steelhead are likely to move if they encounter a sediment plume, with the most severe effect being the energetic cost of moving away from the area. Moving to a different location might increase exposure of smolts and subyearling fish to predators or less favorable conditions for growth, but this effect is likely to be minor.

Because the proposed action will utilize silt curtains at the marina entrances, any turbidity effects outside of the marina are expected to be low concentration and to dissipate quickly as water with high turbidity is diluted by water in the main channel of the river with low turbidity. Temporary suspended sediment may also occur during final removal of the silt curtains. Fish are expected to relocate to avoid highly turbid water. Although fish presence within the marina area is unlikely, it is possible, and any fish that are trapped behind the turbidity curtains may be exposed to higher levels of turbidity at a longer duration. Turbidity levels within the marina could be more severe depending on proximity to dredging activities, potentially resulting in harm, harassment, or death to fish. The turbidity created can have a detrimental effect on fish and other aquatic life by reducing oxygen uptake through their gills, reducing visibility for feeding and navigating, and causing physiological stress. More severe turbidity conditions within the marina near the dredge sites are likely to dissipate in a matter of several hours after the daily dredging activities conclude and suspended sediment settles. After the last day of dredging, the silt curtains will be left in place until the water column appears clear. Available data are insufficient to estimate an exact number of individual salmon and steelhead that could be confined within the marina. Listed fish confined within the marina during the up to 30-day work period may be harmed as a result of sustained exposure to, and/or repeated displacement by project-generated suspended sediment.

Chemical contamination

Activities that produce suspended sediment also have the potential to cause harm, harassment, or death by suspending toxic chemicals in the water column when sediments are disturbed. In the mainstem Snake River below the mouth of the Clearwater River, the COE has identified numerous chemical contaminants in sediments: polycyclic aromatic hydrocarbons, organophosphates, chlorinated herbicides, ammonia, oil, grease, glyphosate, AMPA, dioxin, heavy metals, and others. In 2015, the COE conducted sampling of sediments in the marina for contaminants and found that none of the sample parameters exceeded the Northwest Regional Sediment Evaluation Team (RSET) thresholds. Therefore, sediment contaminants present were at levels below thresholds toxic to benthic invertebrates.

Contaminants that separate from sediment particles will remain in the water column for varying amounts of time based on chemical properties, temperature, discharge, and the amount of suspended organic material in the water column. Some risk of toxicity exists from chemicals that might be either undetected, not well understood, and/or impractical for removal.

Contaminants are most likely to be suspended in the marina water column both during and after dredging activities. Due to the use of silt curtains during project activities, as well as retaining the silt curtains installation until the water column has settled, the risk of exposing fish outside the marina to suspended contaminants is expected to be low. The chance of contained water exiting the marina is low. Any contaminants that escape the contained area and enter the river channel are expected to be rapidly diluted due to high flow volume of the Snake River. Any listed fish entrapped within the marina could be exposed to high levels of contaminants, and thus be more susceptible to risk of injury or death.

In addition to contaminants suspended in the water column by disturbing substrate, chemicals may enter the water via construction equipment used in and around the water. All over-water construction vessels will be fueled at commercial fuel docks. Such facilities have spill prevention systems in place, and can immediately respond to any accidental spills that might occur. Equipment will be inspected and cleaned prior to any instream work. The COE and contractors will implement BMPs to prevent spills of fuel, or hydraulic leaks during the dredging and disposal operation. Based on the past success of these types of conservation measures in other projects, negative impacts to ESA-listed fish and fish habitat from fuel spills or leaks are unlikely.

Entrainment, Disturbance, Displacement

A non-cabled hydraulic suction dredge operating within the boat basin will pump sediments directly from the dredge to the upland disposal site. During the proposed winter work window, juvenile SRF Chinook salmon, SRSS Chinook salmon, and SRB steelhead are generally not likely to reside in the boat basin due to lack of suitable/preferred wintering habitat. However, juvenile fish of those species are in the adjacent Snake River at that time (typically offshore and in small numbers), and it is possible individual fish may be confined in the boat basin when it is closed off for work by installation of the silt curtains. Any fish present within the marina area after the installment of the silt curtains may be negatively impacted by entrainment, disturbance, and/or displacement due to hydraulic suction dredging activity. Any fish present within the Snake River outside the silt curtains will not be affected by these components of the section dredging activity, except for potential minor noise disturbance.

Excavation of dredge material will utilize a hydraulic (i.e., suction or water-induced vacuum) dredge. The dredge includes a 6-foot wide cutterhead connected to a 6-inch diameter hose (C. Chase, personal communication, 2019). Although entrainment rates for mobile fish species are low, early life stages are more susceptible to harm (Wenger et al. 2017). Entrainment rates are also higher when fish occupy an entire water column in narrow channels, or if fish are migrating downstream when water velocity exceeds swimming speed (Reine and Clarke 1998). Vulnerability to entrainment also increases if a dredge intake is placed more than three feet above a river or lake bottom, as salmonids occupy the mid to upper water column when active, but may occupy the lower water column when resting (AMS 2009).

Any juvenile salmon or steelhead in the immediate water column near the cutterhead could potentially be entrained by the dredge, resulting in injury or death. However, the dredge will occupy a very small area of the marina basin, allowing fish to relocate. Additionally, due to the work window and slackwater environment in the marina, migrating juveniles are not expected to be present. The dredge pump will only operate during daylight hours, when salmonids are expected to be in the mid to upper water column, away from the cutterhead of the dredge. The dredge pump will be turned off when the cutterhead is not in contact with the marina bottom. The pump will not be operated while the cutterhead is two feet or more above the marina bottom. Water velocities produced by the dredge pump are expected to be low. Due to the work window, project location, and associated project design features, NMFS expects a low potential for entrainment of individual fish that may be confined in the marina basin due to silt curtain placement.

Instream operation of machinery for dredging creates noise that may potentially disturb fish, displace them from the area, and prevent them from returning until activities are completed. Vibrations and pressure variations from noise that are above background levels cause a startle response in fish (Eaton et al. 1977). The burst of movement when a fish startles has little direct effect other than a brief minor energetic cost from the movement (Barton and Schreck 1987), but there may also be indirect effects.

Noise generated from dredging activity and machinery may alter behavior in nearby fish. Any fish within the marina basin is likely to exhibit modified behavior during dredging activity. Fish in the main river system could also exhibit modified behavior, but noise effects are expected to be at a lower level. Fish are expected to move only short distances or seek cover. If fish in the main river system are impacted, similar habitat types exist up and downstream of the affected area and are expected to provide cover similar to the area fish are displaced from. Any fish within the marina basin may be unable to move away from noise generated from the dredging activity, resulting in harm or harassment. Effects will occur intermittently, for no more than 30 days.

When a juvenile fish moves from a preferred location, it can become more vulnerable to predation, or can encounter conditions in the new environment that might be more or less favorable for growth and survival (Railsback et al. 1999). In a large river such as the lower Snake and Clearwater Rivers, juvenile salmon displaced from dredging or filling sites can easily move laterally to avoid disturbance from instream work activities. Carlson *et al.* (2001) found that fish displaced by dredging in the Columbia River resumed normal positions and normal behavior within a short time after moving. A brief disruption in feeding and energy expenditures in moving from one spot to another is unlikely to have any lasting effect since fish are not stationary in the absence of a disturbance, and feeding rates and energetic demands are relatively low to begin with. Displacement will not increase predation risks for adults. However, predation risks for juvenile fish might increase, though the risk will be small.

Physiological Effects of Sound

Dickerson *et al*. (2001) examined sound levels from bucket dredging in Cook Inlet, Alaska, and found the peak sound level to be 124 decibel (dB) at a distance of 150 meters from a dredge. Sound levels attenuated to background levels at a distance of more than 1,000 meters. Dredging within the marina is unlikely to generate sound levels capable of causing physiological harm to ESA-listed fish (206 dB peak and greater). These disturbance effects on critical habitat are temporary, and are not expected to interfere with fish passage or any other PCEs.

Changes in the Prey Base

Streambed disturbance from dredging will alter the invertebrate populations that live in and on the surface of the stream bottom. Dredging will cause temporary reductions in benthic invertebrates by crushing, covering, or dislodging them (Harvey 1986; Harvey and Lisle 1998). The reductions are likely to be short-lived as disturbed areas are likely to be recolonized within several months after project completion (Fowler 2004; Griffith and Andrews 1981; Harvey 1986; Harvey and Lisle 1998). Even though availability of benthic invertebrate species will be reduced in dredge areas, the alteration may have little effect on feeding by juvenile salmonids. Benthic invertebrates are not a significant part of the diet of salmon and steelhead smolts, and Chinook subyearlings. In Columbia River reservoirs, Rondorf *et al*. (1990) found that subyearling Chinook salmon fed mostly on planktonic *Daphnia spp.* and terrestrial insects. The availability of planktonic invertebrates will not be greatly affected by disturbance of the substrate; therefore, the temporary reduction in benthic invertebrates at dredge sites is likely to cause no more than minor changes in feeding and food consumption by listed fish.

2.5.2 Effects on Critical Habitat

Implementation of the proposed project is likely to affect freshwater rearing and migration habitat for Snake River salmon and steelhead. The PBFs that could possibly be adversely affected by the proposed action are water quality, forage, and fish passage. Each of these effects are described in more detail below:

Water Quality

As described above, project activities will greatly disturb the stream substrate within the action area. Fine sediment will be suspended which has the potential to lessen the conservation value of the designated critical habitat. However, project application of state water quality standards requires that turbidity shall not exceed the background by more than 50 NTU instantaneously or by more than 25 NTU for more than 10 consecutive days. At these levels, the overall effects on the water quality PBF will be small and temporary. Due to project design features which include the use of silt curtains, the area that will be affected will also be small.

Likewise, it is possible that the suspension of fine sediments will also suspend chemical contaminants. However, for the same reasons described above for sediment, it is likely that these effects will be temporary and very minimal. Continued boat traffic as a result of marina maintenance could result in minor chemical contamination of water within the marina. However, most boat traffic occurs in the summer months when the marina water temperatures are unsuitable for salmonids. Any contamination in the main channel of the Snake River as a result of boat traffic to and from the marina is expected to be rapidly diluted.

Forage

Disturbance of the stream substrate will have the effect of diminishing macroinvertebrate populations in the action area. However, as described above in the species effects section, it is likely that these effects will be short-lived and small.

Fish Passage

The Snake River in the action area is migratory habitat for the adult and juvenile salmon and steelhead. The silt curtains that will be suspended will temporarily block some holding/rearing habitat that may be used in the course of migration. However, the habitat that will be blocked is not mainstem migratory habitat but rather habitat that might be used by fish that go off-course or are resting. Also, the period of marina blockage in February and March does not coincide with migration of salmon species in this reach. Adult steelhead overwintering in the Snake River below Lewiston may begin migrating upstream toward spawning tributaries in late February or March. However, it is unlikely those concerted movements would involve any use of the marina or its entrances for holding/resting, given the already slack water of the reservoir. For those reasons, the overall value of migratory habitat in the action area will not be appreciably affected by the proposed action. Continued boat traffic as a result of marina maintenance is not expected to have an appreciable impact on fish passage in the main channel of the Snake River.

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). 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). Considering potential for additional development and for habitat restoration along the Snake River, NMFS assumes that effects of future state and private activities on the action area will remain similar to what they are presently.

Typical activities in this area of urban development along the river include boating, fishing, and other forms of water-related recreation, as well as industrial development. Increasing environmental regulations, and diversification in local economies, has reduced some impacts that have been previously associated with water and land use by agriculture and extractive industries. For instance, Washington and Idaho have developed total maximum daily load (TMDL) restrictions for various water quality components, including turbidity, temperature, pesticides, heavy metals and others in the Snake River and some of its tributaries. Water quality may improve as these plans are implemented. NMFS anticipates that sedimentation and water quality in the marina area will remain the same or will improve slightly as a result of future state and private activities in the immediate area and areas upstream.

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 diminishes the value of designated or proposed critical habitat for the conservation of the species.

Baseline conditions in the action area have been greatly affected by human activities. The primary effect has been the creation of slow-water habitat in what used to be a free-flowing river. Water quality has been negatively impacted by industrial activity in and upstream of the action area. However, baseline conditions in the action area will likely remain relatively consistent into the near future. Likewise, it is anticipated that cumulative effects will result in a relatively static condition in this area.

The SRF Chinook salmon, SRSS Chinook salmon, and SRB steelhead are all listed as threatened under the ESA. The status of SRF Chinook salmon has improved over the last decade. The numbers of SRB steelhead returning has increased recently, as have number of SRSS Chinook salmon, albeit to a lesser extent. The most recent status review indicates that all three species should remain listed as threatened (81 FR 33468).

Both adult and juvenile life stages of SRF Chinook salmon, SRSS Chinook salmon, SRS salmon, and SRB steelhead use the action area in the Snake River as a migration corridor. Many of the Snake River water quality and habitat parameters are not properly functioning. During the winter months, juvenile SRF Chinook, SRSS Chinook, and SRB steelhead may exhibit very limited use of shallow water areas of the lower Snake River, such as that found near and within the marina basin. Overwintering SRF Chinook juveniles are the species/life history stage most likely to be present in or at least near the action area during the proposed work window.

As noted above, successful implementation of the proposed action, including the described design criteria and BMPs, is expected to have the following adverse effects on salmon and steelhead and their designated critical habitats:

1. The installment of silt curtains at the marina entrances are expected to minimize any turbidity effects outside of the marina. Fish are expected to relocate to avoid highly turbid water. Although fish presence within the marina area during the work window is not highly likely, it is possible, and any fish that are trapped behind the silt curtains may experience repeated exposure to high levels of turbidity, potentially resulting in harm, harassment, or death to fish.

2. Fish present within the marina area after the installment of the silt curtains may be negatively impacted by entrainment, disturbance, and/or displacement due to hydraulic suction dredging activity, potentially resulting in capture or injury.

3. Noise and movement generated from dredging activity and machinery may alter behavior in nearby fish. Any fish within proximity to the dredging activity is likely to experience modified behavior. Fish are expected to move only short distances or seek cover. Although unlikely, if fish in the main river system are impacted, similar habitat types exist up and downstream of the affected area and are expected to provide cover similar to the area fish are displaced from. Any fish within the marina basin may be unable to move away from noise and movement associated with the dredging activity, resulting in repeated displacement and harm or harassment. Effects will occur intermittently, for no more than 30 days.

4. Displacement due to the action and the future boat traffic it enables will not increase predation risks for adult fish. However, predation risks for juvenile fish might increase, although the risk will be small. In winter, the majority of juvenile fish near the action area will be SRF Chinook salmon, which prefer deep-water areas where predatory fish cannot approach without being detected. Overall action-caused increase in predation risk outside the marina is expected to be negligible. If there are juvenile fish trapped within the marina during the work period, with predator fish also present, predation may increase. Increased risk of predation within the marina is one of the potential mechanisms of harm associated with the activity-caused displacement of juvenile fish described in item 3, above.

Streambed disturbance from dredging will alter the invertebrate populations that live in and on the surface of the stream bottom. Dredging will cause temporary reductions in benthic invertebrates by crushing, covering, or dislodging. The reductions are likely to be short-lived as disturbed areas are likely to recolonize within several months after project completion. Therefore, the temporary reduction in benthic invertebrates at dredge sites is likely to cause no more than minor changes in feeding and food consumption by listed fish.

Due to the use of silt curtains during project activities, as well as retaining the silt curtains installation until the water column has settled, the risk of fish exposure to suspended contaminants is expected to be low. Sampling of sediment in the marina basin in 2015 indicated that contaminant levels were below toxic thresholds for benthic invertebrates. Temporary suspension of low level contaminants due to dredging activity is not expected to cause harm to ESA-listed fish that may be present in the marina during the work period. The chance of contained water exiting the marina is low. Any contaminants that escape the contained area and enter the river channel are expected to be rapidly diluted due to high flow volume of the Snake River.

Listed fish could be present in the marina basin during the project work window. If fish are exposed to the adverse effects of dredging operations, it is not likely to be a large number of individuals due to lack of suitable habitat in the marina and winter timing of the project. Due to the low probability of fish presence during the operating window, we expect there to be minimal incidental take. Similarly, very low densities of ESA-listed salmonids are likely to be present in the main channel, in the small portion of action area adjacent to/outside of the marina. Fish are likely to be transitory in the main channel next to the marina, and project effects on those fish and that portion of critical habitat are expected to be extremely small.

The number of fish affected is expected to be too small and the type of effects too minor to produce any observable effect on the VSP parameters of any of the listed species. The action will not modify the VSP parameters for the affected populations of any species to more than an extremely small extent. The action will also not appreciably reduce abundance and productivity or spatial structure/diversity of the associated ESUs or DPS. In addition, the probability of recovery and survival for each species will not likely be affected.

The action area is designated critical habitat for all four listed Snake River species. The proposed action will cause short-term adverse effects to PBFs. As described above, these effects will be small and temporary. As such, the proposed action is not expected to diminish the conservation value of critical habitat in the action area for any of the four affected species. Because the conservation value of critical habitat in the action area will not be greatly affected, the conservation value of critical habitat at the designation scale for any of these species will also not be greatly affected.

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, any effects of interrelated and interdependent activities, and cumulative effects, it is NMFS' Opinion that the proposed action is not likely to jeopardize the continued existence of SRF Chinook salmon, SRB steelhead, or SRSS Chinook salmon. The action is also not likely to destroy or adversely modify designated critical habitat for SRF Chinook salmon, SRB steelhead, SRSS Chinook salmon, or SR sockeye salmon.

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). "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

The proposed action is reasonably certain to result in incidental take of ESA-listed species. NMFS is reasonably certain the incidental take described here will occur because the Snake River is used as migratory, spawning, and rearing habitat for ESA species. In this Opinion, NMFS determined that incidental take is reasonably certain to occur because of physical disturbance/displacement/injury, and/or physiological effects of suspended sediment and turbidity.

NMFS anticipates that such incidental take will be difficult to detect and measure. There is no practical way to determine when fish might be harmed by suspended sediment, because there may be no outwardly visible signs of harm or injury. Finding a dead fish is unlikely because the immediate effects of take are likely to be sublethal, and subsequent deaths may occur later in time, after fish have moved out of the action area. Therefore, even though NMFS expects that incidental take of SRF Chinook salmon, SRSS Chinook salmon, and SRB steelhead is reasonably certain to occur during the implementation of action, available data are insufficient to estimate an exact number of individuals that may be harmed.

While NMFS expect that very few listed fish will be present in the action area at the time of the project and its effects, a small number of juvenile salmon and steelhead may be in the boat basin and become trapped when the silt curtains are placed at the marina entrances. Once the basin is isolated, listed fish within the isolated area will be exposed to the action effects (Section 2.5), and susceptible to incidental take. Because it will be difficult to detect such a presence without prior fish survey and salvage operations, and/or species monitoring during dredge activity, NMFS uses a surrogate to calculate incidental take.

When the expected number of individuals that may be taken is not quantifiable, NMFS uses an environmental surrogate for monitoring and reporting. NMFS has developed ecological surrogates to create a clear trigger for determining when the anticipated amount of take that may occur from dredging activities would be exceeded and, if discretionary involvement or control is retained or authorized by law, when reinitiation of consultation would be required. Approximately 9 acres of the marina basin will be dredged.

The concentration and duration of suspended sediment from dredging activities will likely reach thresholds where fish may be harmed by physiological effects of stress or reduced growth. Persistent turbidity levels of 25 NTU or more are reasonably certain to harm listed salmon and steelhead. These conditions are expected to occur within the marina basin and entrances during in-water dredging activities (i.e., conditions pertain only to project area on marina side of the silt curtains). In the same area within the marina, involving the same listed fish, juvenile fish may be entrained by the hydraulic dredge or displaced repeatedly such that their risk of being killed by predators and experiencing other harmful effects of displacement increases.

Based on the above information, NMFS has developed the environmental surrogates described in the paragraph below for incidental take that is reasonably certain to occur should any listed fish be trapped within the marina.

Take will be exceeded if more than 9 acres of the marina basin are dredged. Dredging activity and the associated conditions may occur for as long as 30 days between February 15 and March 31. With the silt curtains in place, instances where turbidity would exceed 25 NTU beyond the confines of the marina would be infrequent and unlikely to persist long enough to cause more than minor behavioral changes in fish in the Snake River adjacent to the marina. If the silt curtain is improperly set up or breached during the project, persistent turbidity exceeding 25 NTU could occur outside the marina, and NMFS' assumption (that any take would be limited to the area inside the curtain) would be violated. Therefore, take will also be exceeded if silt curtains fail during dredging activities or before turbidity levels return to background (pre-dredging) levels.

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.

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).

The COE shall:

1. Minimize incidental take from project activities and implement all of the proposed conservation measures.

2. Ensure completion of a monitoring and reporting program to confirm that the terms and conditions in this ITS were effective in avoiding and minimizing incidental take from permitted activities and that the amount and extent of take was not exceeded.

2.9.4 Terms and Conditions

The terms and conditions described below are nondiscretionary, and the COE or any applicant must comply with them in order to implement the RPMs (50 CFR 402.14). The 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 COE to whom a term and condition is directed does not comply with the following terms and conditions, protective coverage for the proposed action would likely lapse.

1. To implement RPM 1 (minimize take from project activities), the COE shall ensure the following:

    a. In-water dredging operations will only occur during daylight hours.

    b. Whenever practicable, the dredge pump will be turned off when the cutterhead is not in contact with the marina bottom. At no time shall the pump be turned on when the cutterhead is two feet or more above the marina bottom.

    c. Suspended sediment in the marina fully settles prior to removal of the silt curtains; upon completion of dredging activity, turbidity readings within the marina must return to background levels before the curtains are removed.

    d. Silt curtains are checked on a daily basis for proper functionality. Fix any areas where turbid water is visibly exiting the marina basin.

2. To implement RPM 2 (monitoring and reporting), the COE shall:

    a. Monitor turbidity prior to, during, and following dredging activities.

    b. Cease activities and report to NMFS immediately if the extent of take/take surrogate is exceeded. Take exempted through this Opinion would be exceeded if:

        i. The area requiring dredging extends beyond the boundaries of the 9 acres analyzed and identified in Figure 2.

        ii. Silt curtains placed at the entrances of the marina fail, or are removed prematurely, effectively reconnecting the marina basin to the main channel of the Snake River before turbidity levels return to background (pre-dredging) measures.

    c. Submit a monitoring report (with information on dredging area and turbidity monitoring, and suspended sediment containment) by April 15 of the year following project completion to the Snake Basin Office email: nmfswcr.srbo@noaa.gov.

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).

NMFS recommends that the COE look for opportunities to partner with other land management agencies to reduce the input of sediments to the Snake or Clearwater Rivers or their tributaries, therefore reducing the frequency dredging events. In addition, because only 2.2% of Lower Granite reservoir at 143,000 cfs (less at lower flows) is juvenile rearing habitat, but 44% of the reservoir is predator habitat (riprapped banks), NMFS recommends that the COE investigate and adopt techniques to create additional shallow-water habitat (e.g., cover large areas of riprap with organic material that can support riparian vegetation and provide juvenile shallow water rearing habitat).

Please notify NMFS if the COE, or another entity, carries out these recommendations so that we are informed of actions that minimize or avoid adverse effects and those that benefit listed species or their designated critical habitats.

2.11 Reinitiation of Consultation

This concludes formal consultation for the Hell’s Gate Marina Dredging Project.

As 50 CFR 402.16 states, reinitiation of formal consultation is required 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 agency action is subsequently modified in a manner that causes an effect on the listed species or critical habitat that was not considered in this Opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action.

2.12 "Not Likely to Adversely Affect" Determinations

NMFS does not anticipate the proposed action will have adverse effects on SR sockeye salmon. Adult and juvenile wild SR sockeye salmon are not expected to be present in the mainstem Snake River between December 15 and March 31. Wild juvenile SR sockeye salmon generally begin migrating downriver during April and May (starting well upstream of the action area), and wild adult sockeye salmon are not typically counted at Ice Harbor Dam before June or after October. During sampling in May and June 2002, Bennett et al. (2003) found 21 and 14 juvenile sockeye salmon rearing along shallow-water shorelines in the Lower Granite and Little Goose reservoirs, respectively. Similarly, Arntzen et al. (2012) found up to 22 juvenile sockeye at shallow water sample sites in Little Goose and Lower Granite reservoirs from April to July 2011.

Migrating sockeye juveniles pass by the action area but generally use deeper water. In a literature review for the Columbia River, Rondorf et al. (2010) concluded that sockeye and steelhead smolts are much less likely to be found near overwater structures along the shoreline because they are bigger smolts and use deeper water than subyearling Chinook salmon. In another literature review, Chapman (2007) came to a similar conclusion that sockeye salmon and steelhead smolts have a low likelihood of encountering predators associated with docks along the Columbia River. During a 2014 study in the Snake River, Connor et al. (2015) found that only one percent of salmonids consumed by smallmouth bass were steelhead and none were sockeye salmon. Therefore, we expect that the maintenance dredging activity for the marina will have a discountable risk of having an adverse effect on SR sockeye salmon.

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. The MSA (Section 3) defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." 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) also requires NMFS to recommend measures that can be taken by the action agency to conserve EFH.

This analysis is based, in part, on the EFH assessment provided by the COE and descriptions of EFH for Pacific Coast salmon (PFMC 2014) and highly migratory species (HMS) (PFMC (2007)**,** contained in the fishery management plans developed by the Pacific Fishery Management Council (PFMC) and approved by the Secretary of Commerce.

3.1 Essential Fish Habitat Affected by the Project

Based on information provided in the BA and the analysis of effects presented in the ESA portion of this document, NMFS concludes that the proposed action will adversely affect EFH designated for Chinook salmon and coho salmon because it will temporarily have negative effects on water quality and benthic communities.

3.2 Adverse Effects to Essential Fish Habitat

The proposed project will affect a total of 9 acres of river bottom altering benthic habitat and macroinvertebrate production in the short term. The action will also temporarily impair water quality in the marina basin.

Specifically, NMFS has determined that the action will adversely affect EFH as follows:

1. Temporary degradation of water quality (turbidity, contaminants) from construction activities.

2. The alteration of current substrate and benthic forage by dredging activity.

Based on information and the analysis of potential adverse effects presented in the ESA portion of this document, NMFS concludes that the effects of the action on critical habitat for the species described above are similar to the effects that would occur for EFH for Chinook and coho salmon. The proposed action may decrease safe passage conditions for salmon EFH within and nearby entrances to the marina for a short period. The proposed action may result in short-term adverse effects on a variety of habitat parameters, such as substrate, macroinvertebrate/prey species, and water quality. Based on the description of the proposed action and the inclusion of conservation measures as an integral part of the proposed action, there will be small adverse effects to EFH, but any short-term adverse effects will be minimized by the proposed conservation measures.

3.3 Essential Fish Habitat Conservation Recommendations

The PFMC designated EFH for Chinook salmon, Coho salmon, and Puget Sound pink salmon (PFMC 1999). The action area is within the following area designated as EFH under the MSA for various life-history stages of Chinook and/or Coho salmon.

- 17060103 – Lower Snake – Asotin Creek is identified as currently accessible, but unutilized historic EFH for Chinook salmon and coho salmon.

The Habitat Areas of Particular Concern (HAPCs) for salmon are complex channel and floodplain habitat, spawning habitat, thermal refugia, estuaries, and submerged aquatic vegetation (PFMC 2014). NMFS believes that the following conservation measures are necessary to avoid, mitigate, or offset the impact of the proposed action on EFH.

1. Silt curtains placed at the entrances to the marina will contain turbidity within the basin and minimize the release of sediments and/or suspended contaminants into the main Snake River corridor. Curtains should only be removed after allowing suspended

sediment to settle and turbidity to return to background level, in order to avoid a pulse of turbidity entering the main Snake River channel where listed fish are more likely to be present.

2. The COE should initiate or continue studies on the availability and fish use of shallow water habitat in Lower Granite reservoir and in downstream reservoirs. Information of the distribution, connectivity and patch size of existing shallow water areas relative to seasonal flows and fish use will help determine if there are additional areas where shallow water habitat can be created and have the greatest benefit to salmonids.

NMFS expects that full implementation of these EFH Conservation Recommendations would protect approximately 9 acres of designated EFH for Pacific Coast salmon, a highly migratory species, by avoiding or minimizing the adverse effects described in Section 3.2.

3.4 Statutory Response Requirement

As required by section 305(b)(4)(B) of the MSA, the 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 time frames 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 agency must explain its reasons for not following the recommendations, including the scientific justification for any disagreements with NMFS over the anticipated effects of the action and the measures needed to avoid, minimize, mitigate, or offset such effects (50 CFR 600.920(k)(1)).

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, 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 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 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 are the COE and the Idaho Department of Parks and Recreation. Individual copies of this Opinion were provided to the COE. This Opinion will be posted on the Public Consultation Tracking System website. 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 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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