UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
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Refer to NMFS No: WCRO-2020-00047

https://doi.org/10.25923/s3nk-3s21

June 30, 2020

Lt. Col. Christian N. 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 Deer Creek Dock Placement on the Lower Salmon River, Lewis County, Idaho.

Dear Lt. Col. Dietz:

Thank you for your January 13, 2020, letter and biological assessment (BA) requesting initiation of consultation on the subject action 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.). This consultation was conducted in accordance with the 2019 revised regulations that implement section 7 of the ESA (50 CFR 402, 84 FR 45016).

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

As required by section 7 of the ESA, NMFS provides an incidental take statement (ITS) with the Opinion. The ITS describes reasonable and prudent measures (RPM) NMFS considers necessary or appropriate to minimize the impact of incidental take associated with this action. The take statement sets forth nondiscretionary terms and conditions, including reporting requirements, that the 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.

The enclosed document also includes the results of our analysis of the action's effects on essential fish habitat (EFH) pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), and includes three Conservation Recommendation to avoid, minimize, or otherwise offset potential adverse effects on EFH. These Conservation Recommendations are similar but not identical to the ESA Terms and Conditions. Section

305(b)(4)(B) of the MSA requires federal agencies provide a detailed written response to NMFS within 30 days after receiving these recommendations.

If the 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 if the Conservation Recommendations are accepted.

Please contact Jennifer Gatzke in the Moscow office, at 208-883-0086 (Jennifer.gatzke@noaa.gov) if you have any questions concerning this consultation, or if you require additional information.

Sincerely,

Michael Tehan
Assistant Regional Administrator
Interior Columbia Basin Office

Enclosure

cc:
M. Biljan – COE
M. Lopez – NPT
R. Armstrong – NPT
Z. Swearingen – IDFG
S. Sweeney – USFWS

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

Deer Creek Dock Placement

NMFS Consultation Number: WCRO-2020-00047

Action Agency: US. Army Corps of Engineers

Affected Species and NMFS' Determinations:

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

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

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

Issued By: Michael Tehan
Assistant Regional Administrator

Date: June 30, 2020

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ACRONYMS

ACRONYM	DEFINITION
BA	Biological Assessment
BMP	Best Management Practices
COE	U.S. Army Corps of Engineers
CWA	Clean Water Act
dB	Decibel
DPS	Distinct Population Segment
DQA	Data Quality Act
EFH	Essential Fish Habitat
ESA	Endangered Species Act
ESU	Evolutionarily Significant Units
FR	Federal Register
HAPC	Habitat Areas of Particular Concern
ICTRT	Interior Columbia Basin Technical Recovery Team
IDEQ	Idaho Department of Environmental Quality
ITS	Incidental Take Statement
LAA	Likely to Adversely Affect
MPG	Major Population Group
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NMFS	National Marine Fisheries Service
NLAA	Not Likely to Adveresely Affect
O.	*Oncorhynchus*
OHWM	Ordinary High Water Mark
Opinion	Biological Opinion
PBF	Physical and Biological Features
PCE	Primary Constituent Elements
PFMC	Pacific Fishery Management Council
RHA	Rivers & Harbors Act
RPA	
RPMs	Reasonable and Prudent Measures
SR	Snake River
SRB	Snake River Basin
Tribe	Nez Perce Tribe
VSP	Viable Salmonid Populations

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

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

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

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

1.2 Consultation History

The U.S. Army Corps of Engineers (COE) proposes to issue permit under section 10 of the Rivers and Harbors Act of 1899 (RHA) for the installation of a recreational floating dock on the shoreline of the Salmon River. NMFS was first informed about this project with COE emails on July 8, and August 10, 2019. NMFS received the draft BA dated September 4, 2019, on that same day. The COE initially determined the project was not likely to adversely affect (NLAA) listed species and their critical habitat.

Because juvenile salmonids may occupy the Salmon River shoreline in the location of the proposed dock, the dock has the potential to create an adverse effect to ESA-listed species through increased predation on juvenile salmonids. Docks provide cover for predator fish, such as smallmouth bass. Following discussion regarding the increased potential for predation, a revised request for formal consultation from the COE was received on January 13, 2020. With the revised likely to adversely affect (LAA) determination from COE, NMFS accepted the September 4, 2019 BA as otherwise having sufficient information for NMFS to complete consultation. On January 15, 2020, NMFS sent COE a 30-day letter initiating formal consultation.

On March 25, 2020, NMFS emailed COE requesting confirmation that the time period for the use of Deer Creek seasonal dock is August 1 – December 15 (email record). On May 11, 2020, the COE identified the Idaho Department of Environmental Quality (IDEQ) Clean Water Act

Best Management Practice (BMPs) referenced with the general 401 water quality certification issued for the 2017 Nationwide Permits. Throughout May and June, multiple email and phone communications between COE and NMFS further clarified the BMPs pertinent to the proposed action.

This consultation pertains to potential effects of the proposed project on Snake River Basin steelhead (Oncorhynchus mykiss), Snake River fall Chinook salmon (O. tshawytscha), Snake River spring/summer Chinook salmon (O. tshawytscha), Snake River sockeye salmon (O. nerka), and their designated critical habitats. Based on the timing of the action, NMFS concurs with the initial NLAA determination COE included in the BA for sockeye salmon and their critical habitat. Therefore, sockeye salmon and their critical habitat are not further discussed in this Opinion, but instead are addressed in section 2.12 below.

Because this action has the potential to affect tribal trust resources, NMFS provided a copy of the Action and Conservation Measures to the Nez Perce Tribe (Tribe) for review on June 16, 2020. The Tribe responded on June 19, 2020, that they have no concerns or comments regarding the project.

1.3 Proposed Federal Action

"Action" means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by federal agencies (50 CFR 402.02).

The proposed action is COE's issuance of a 5-year RHA permit for the seasonal use of a floating dock on the lower Salmon River, Lewis County, Idaho. This dock site is 0.1 miles upstream from the Deer Creek confluence, and approximately 13 miles upstream from the Salmon River-Snake River confluence. In 2008, the state of Idaho permitted a floating dock to be placed in this residential location for recreational purposes during times of low flow, August through December. Recently, the property has changed ownership, and a portion of the Salmon River has been designated a navigable waterway, placing it under the jurisdiction of the COE. The RHA now applies in the lower Salmon River, and associated permits are required for in-water infrastructure such as docks that are present in/deployed in the river.

The temporary EZ dock is a polyethylene T-shaped (Appendix A) opaque floating platform covering 380.25 ft^2 with two anchors onshore, and two anchors in the water column. The offshore anchors are below the ordinary high water mark (OHWM) and approximately 30-feet from shoreline. The offshore anchors can be quickly placed by hand using a boat, and will be retrieved with the rest of the dock structure each year. The COE confirmed that the dock will be permitted for installation on or after August 1, and for removal by December 15 of each year (March 25, 2020 email to NMFS). No earth disturbance will take place and no more than two berths are expected.

We considered whether or not the proposed action would enable other activities, and determined that it could potentially provide dock space for several additional vessels. This consultation considers the COE's action of permitting the dock structure and the consequences of the action, including the deployment and presence of the dock in the water and the vessels operating/docking alongside.

For compliance with the Clean Water Act (CWA), the COEs proposed permit relies upon and refers the applicant to the IDEQ BMPs regarding fuel use near water (Household Hazardous Material Use and Disposal BMP 27, Marinas BMP 22, and Equipment Fueling BMP 6)(IDEQ 2005). These BMPs, identified below and comprising a list of practices, will be required in the COE permit issued.

- Check containers of hazardous materials frequently for signs of leakage. If a container is rusty and has the potential of leaking soon, place it in a secondary container before the leak occurs and prevent a clean-up problem (BMP 27 Household Hazardous Material Use and Disposal).
- Use less toxic products whenever possible (BMP 27).
- When hazardous materials are in use, place the container inside a tub or bucket to minimize spills (BMP 27).
- Vessels should be cleaned of external oil and grease prior to entering the Salmon River (BMP 22 Marinas).
- Vessels should be inspected daily for leaks, and any identified problems should be corrected prior to equipment contact with water (BMP 22).
- IDEQ boat operations BMPs include excluding motorized vessels from areas that contain important shallow-water habitat and establishing and enforcing no-wake zones to decrease turbidity (BMP 22).
- Boat cleaning practices to protect water quality include washing the boat hull above the waterline by hand and using detergents and cleaning compounds that are phosphate-free and biodegradable (BMP 22).
- IDEQ fueling operations state that potential pollution from fueling sites can be prevented by locating and designing fueling sites so that spills can be contained in a limited area, having a spill contingency plan, and designing fueling sites with spill containment equipment (BMP 22).
- Fuel and oil are commonly released into surface waters during bilge pumping, during fueling operations through the fuel tank air vent, and during fueling from spills directly into surface waters and into boats. Oil and grease from the operation and maintenance of inboard engines are a source of petroleum in bilges. Petroleum control can be achieved through the use of automatic shutoff nozzles and fuel/air separators on air vents or tank stems of inboard fuel tanks to reduce the amount of fuel spilled into surface waters during boat fueling. The use of oil-absorbing materials in the bilge areas of all boats with inboard engines can also be promoted (BMP 22).
- IDEQ discourages “topping off” of vehicle fuel or storage tanks. Topping off tanks increases the risk of spilling fuel onto the ground. Use secondary containment when transferring fuel from the storage tank to the vessel. Store and maintain appropriate spill cleanup materials in a location known to all near the fueling operation; ensure that applicants are familiar with the spill control plan and proper spill cleanup procedures. Use absorbent materials on small spills and general cleaning rather than hosing down the area. Remove the absorbent materials promptly and dispose as hazardous waste (BMP 6 Equipment Fueling).

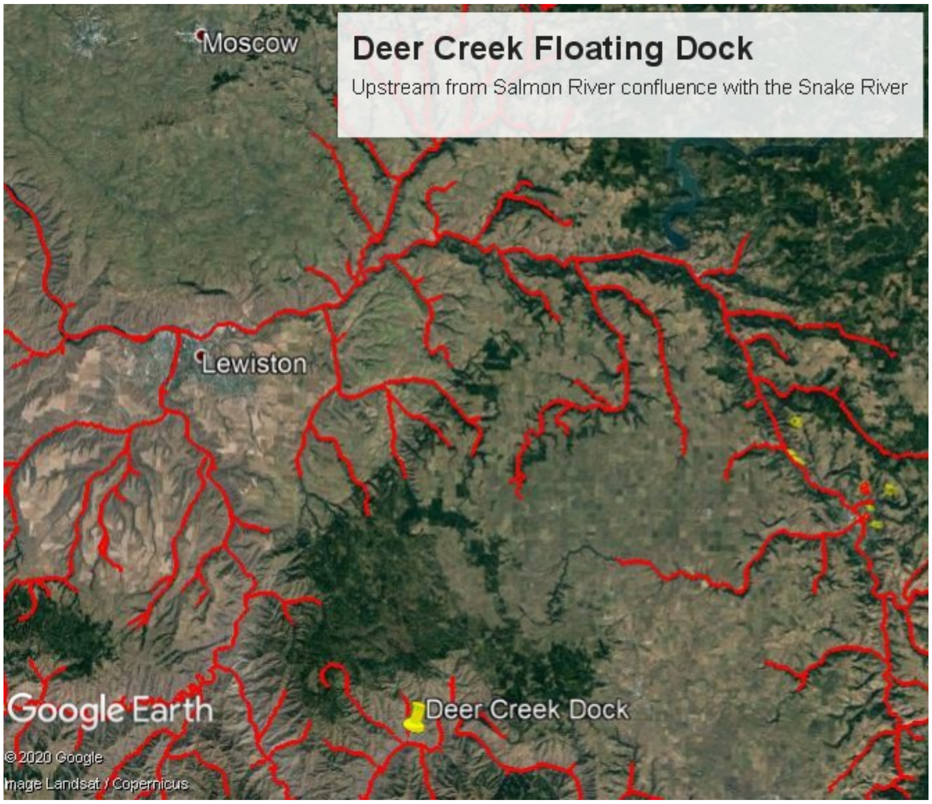


Figure 1. Map of Deer Creek Floating Dock Project Site, ~30 mi SE of Lewiston, ID.

Figure 2. Map of Lower Salmon River Action Area, Deer Creek confluence shown in upper left quadrant. The dock site is located at the left edge of the beach and marked with a red square.

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

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

The COE determined the proposed action is NLAA Snake River sockeye salmon or its critical habitat. Our concurrence is documented in the "Not Likely to Adversely Affect" Determinations section (Section 2.13).

2.1 Analytical Approach

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

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

The designations of critical habitat for Snake River salmon and steelhead species use the terms primary constituent element (PCE) or essential features. The 2016 critical habitat regulations (50 CFR 424.12) replaced 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.

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

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

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

indirectly result in an alteration that appreciably diminishes the value of critical habitat as a whole for the conservation of a listed species.

- If necessary, suggest a Reasonable and Prudent Alternative (RPA) to the proposed action.

2.2 Rangewide Status of the Species and Critical Habitat

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

The Opinion also examines the condition of critical habitat throughout the designated area, evaluates the conservation value of the various watersheds, and coastal and marine environments that make up the designated area, and discusses the function of the essential PBFs that help to form that conservation value. Table 1 describes the Federal Register (FR) notices and most recent notice dates for the species under consideration in this Opinion.

Table 1. Listing status, status of critical habitat designations and protective regulations, and relevant FR 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
Steelhead (*O. mykiss*)			
Snake River Basin (SRB)	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.

For spring/summer Chinook salmon, this section of the Salmon River is a migratory corridor for all Salmon River populations, and is occupied by the Little Salmon River population of the South Fork Salmon River major population group (MPG). The population includes returns from large-scale hatchery releases but some of its side tributary spawning sites likely have low hatchery contributions (NMFS 2017a). This population is currently rated at high risk abundance and productivity, but low risk for spatial structure and diversity (NMFS 2017a). Those factors combined give an overall rating of high risk for the population (NMFS 2017a).

This section of the Salmon River may be occupied by all freshwater life stages of the Lower Snake River population of Snake River fall Chinook salmon - the single extant population for the Evolutionarily Significant Unit (ESU). This population includes fish spawning in the mainstem of the Snake River and lower reaches of several associated tributaries, including the Salmon River (NMFS 2017b). The population is currently rated at low risk for abundance and productivity, moderate risk for spatial structure, moderate risk for diversity, and has an overall rating of "viable" (NMFS 2017b). The Snake River fall Chinook ESU as a whole is not meeting the recovery goal described in the recovery plan for the species, which requires the single population to be "highly viable," (i.e., have a 1 percent or lower risk of extinction within 100 years) (NWFSC 2015).

For steelhead, this section of the Salmon River is a migratory corridor for all Salmon River populations, and is occupied by the Little Salmon River population of the Salmon River MPG. The population has high potential for hatchery contributions in natural spawning areas (NMFS 2017a). The Little Salmon River population is currently rated at moderate risk for abundance and productivity. There is uncertainty associated with the abundance and productivity estimates because they rely on extrapolation from estimates for other populations within the distinct population segment (DPS). The population is currently rated moderate risk for spatial structure and diversity. These combined ratings give an overall rating of moderate risk (with uncertainty), i.e., the population is estimated to have an extinction risk of less than 25 percent within 100 years (NMFS 2017a).

Table 1 lists the dates and FR notices for the designations of critical habitat for Snake River Basin steelhead, Snake River spring/summer Chinook salmon, and Snake River fall Chinook salmon. Detailed information on the status of critical habitat throughout the designation area is provided in the recovery plan for each species (NMFS 2017a; NMFS 2017b, NMFS 2015), which are incorporated by reference here. NMFS describes critical habitat in terms of essential PBFs of that habitat to support one or more life stages (e.g., sites with conditions that support spawning, rearing, migration, and foraging). For Snake River spring/summer Chinook salmon, PBFs include spawning gravel, water quality, water quantity, food, riparian vegetation, water temperature, substrate, water velocity, cover/shelter, space, and safe passage. For Snake River fall Chinook salmon, PBFs are the same as for spring/summer Chinook salmon, but also include the term "access" (similar to safe passage). For Snake River Basin steelhead, PBFs include water quality, water quantity, spawning substrate, floodplain connectivity, forage, natural cover, and passage free of artificial obstructions. Across the designations, the current ability of PBFs to support the species varies from excellent in wilderness areas to poor in areas of intensive human land use.

<u>2.2.1 Status of the Species</u>

This section describes the present condition of the Snake River spring/summer Chinook salmon and Snake River fall Chinook salmon evolutionarily significant units (ESUs), and the Snake River steelhead distinct population segment (DPS). NMFS expresses the status of a salmonid ESU or DPS in terms of likelihood of persistence over 100 years (or risk of extinction over 100 years). NMFS uses McElhaney et al.'s (2000) description of a viable salmonid population (VSP) that defines "viable" as less than a 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 built up from the aggregate risk levels of the individual populations and MPGs that make up the ESU/DPS.

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

2.2.1.1 Snake River Spring/Summer Chinook Salmon

The Snake River spring/summer 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 Snake River spring/summer Chinook were threatened: (1) Abundance of naturally produced Snake River spring and summer 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. Snake River spring/summer Chinook salmon are characterized by their return times. Runs classified as spring Chinook salmon include adult fish counted at Bonneville Dam beginning in early March and ending the first week of June; summer runs are those Chinook adults that pass Bonneville Dam from June 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).

Spring/summer Chinook spawn 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. Snake River spring/summer 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).

Spatial Structure and Diversity. The Snake River ESU includes all naturally spawning populations of spring/summer Chinook salmon 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 15 artificial propagation programs (70 FR 37160). The hatchery programs include the South Fork Salmon River (McCall Hatchery), Johnson Creek, Lemhi River, 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 spring/summer-run 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. Spring/summer 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 spring/summer Chinook salmon in some years (Matthews and Waples 1991), yet in 1994 and 1995, fewer than 2,000 naturally produced adults returned to the Snake River (ODFW and WDFW 2019). From the mid-1990s and the early 2000s, the population increased dramatically and peaked in 2001 at 45,273 naturally produced adult returns. Since 2001, the numbers have fluctuated between 32,324 (2003) and 4,425 (2017), and the trend for the most recent five years (2014-2018) has been generally downward (ODFW and WDFW 2019). Although most populations in this ESU have increased in abundance since listing, 27 of the 28 extant populations remain at high risk of extinction due to low abundance/productivity, with one population (Chamberlin Creek) at moderate risk of extinction (NWFSC 2015). All currently extant populations of Snake River spring/summer Chinook salmon will likely have to increase in abundance and productivity in order for the ESU to recover (Table 2).

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

Pacific salmon and steelhead, NMFS concluded that the species should remain listed as threatened (81 FR 33468).

Life History. Snake River fall Chinook salmon enter the Columbia River in July and August, and migrate past the lower Snake River mainstem dams from August through November. Fish spawning takes place from October through early December in the mainstem of the Snake River, primarily between Asotin Creek and Hells Canyon Dam, and in the lower reaches of several of the associated major tributaries including the Tucannon, Grande Ronde, Clearwater, Salmon, and Imnaha Rivers (Connor and Burge 2003; Ford 2011). Spawning has occasionally been observed in the tailrace areas of the four mainstem dams (Dauble et al. 1999; Dauble et al. 1995; Dauble et al. 1994; Mueller 2009). Juveniles emerge from the gravels in March and April of the following year.

Until relatively recently, all Snake River fall 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 they reach the ocean by winter (Connor and Burge 2003; Coutant and Whitney 2006). However, several studies have shown that another life history pattern exists where a significant number of smaller Snake River fall Chinook juveniles overwinter in Snake River reservoirs prior to outmigration. These fish begin migration later than most, arrest their seaward migration and overwinter in reservoirs on the Snake and Columbia Rivers, then resume migration and enter the ocean in early spring as age-1 smolts (Connor and Burge 2003; Connor et al. 2002; Connor et al. 2005; Hegg et al. 2013). Connor et al. (2005) termed this life history strategy "reservoir-type." Scale samples from natural-origin adult fall Chinook salmon taken at Lower Granite Dam have indicated that approximately half of the returns overwintered in freshwater (Ford 2011). Tiffan and Connor (2012) showed that subyearling fish favor water less than 6 feet deep.

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

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

Abundance and Productivity. Historical abundance of Snake River fall Chinook salmon is estimated to have been 416,000 to 650,000 adults (NMFS 2006), but numbers declined drastically over the 20th century, with only 78 natural-origin fish (Joint Columbia River Management Staff 2014) and 306 hatchery-origin fish (FPC 2019) passing Lower Granite Dam in 1990. Artificial propagation of fall Chinook salmon occurred from 1901 through 1909 and again from 1955 through 1973, but those efforts ultimately failed and by the late 1970s, essentially all Snake River fall Chinook salmon were natural-origin. The large-scale hatchery effort that exists today began in 1976, when Congress authorized the Lower Snake River Compensation Plan (LSRCP) to compensate for fish and wildlife losses caused by the construction and operation of the four lower Snake River dams. The first hatchery fish from this effort returned in 1981 and hatchery returns have comprised a substantial portion of the run every year since. From 2007 to 2016, the proportion of hatchery-origin fish has averaged about 70 percent, based on post-harvest, post-broodstock estimates above Lower Granite Dam (NWFSC 2015).

After 1990, abundance increased dramatically and in 2014 the 10-year geometric mean (2005-2014) was 22,196 total adult returns (FPC 2019) and 6,148 natural-origin adult returns (NWFSC 2015). This is well above the minimum abundance of 4,200 natural-origin spawners needed for highly viable status. However, the productivity estimate for the 1990–2009 brood years is 1.5, which is below the 1.7 minimum needed for highly viable status. From 2015 through 2018, annual returns steadily decreased (Personal Communication, Bill Young, Nez Perce Tribe Hatchery Evaluations Coordinator, October 17, 2019), but in spite of this recent decrease, the geometric mean abundance for 2009-2018 was actually slightly higher than for 2005-2014. However, due to the declining trend, the current productivity estimate is slightly less than 1.5, with substantial uncertainty due to large numbers of hatchery-origin fish reaching spawning habitat. Regardless, an increase in productivity will likely be needed to achieve highly viable status. This could possibly be achieved by reducing mortality during specific life stages, such as a reduction in harvest impacts on adults, currently at 40–50 percent, or improvements in juvenile survivals during downstream migration (NWFSC 2015). Relative abundance has decreased in many Idaho populations since 2014. Felts et al. (2019) found that adult-to-adult productivity for every population except one has declined below replacement since brood year 2012, which has contributed to decreasing spawner abundance.

The ICTRT considered Snake River fall Chinook spawning in the lower Salmon River to be contiguous with and therefore part of the Upper Hells Canyon Major Spawning Area. Data from

2000-2014 redd counts indicate that the lower Salmon River contributes a small percentage (0.8 percent ± 0.1 percent) of the basin-wide Snake River redd counts. During a single aerial survey conducted in 2015, biologists observed 142 fall Chinook salmon redds in the 105-mile reach of the mainstem Salmon River from the mouth to French Creek. From 2011 to 2016, the mean number of redds observed in the Salmon River was 62, ranging from 31 to 142 (Arnsberg et al. 2016). Anecdotal accounts suggest that late spawning Chinook salmon existed historically in this area. For example, Burns found anecdotal evidence for fall Chinook salmon spawning in the lowermost portion of the South Fork Salmon River during 1890–1895, the 1930s, and as recently as 1982 (Connor et al. 2016).

2.2.1.3 Snake River Basin Steelhead

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

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

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

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

The Snake River Basin DPS steelhead exhibit a diversity of life-history strategies, including variations in fresh water and ocean residence times. Traditionally, fisheries managers have classified Snake River Basin steelhead into two groups, A-run and B-run, based on ocean age at return, adult size at return, and migration timing. A-run steelhead predominantly spend 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). The Clearwater River drainage alone may have historically produced 40,000 to 60,000 adults (Ecovista et al. 2003), and historical harvest data suggests that steelhead production in the Salmon River was likely higher than in the Clearwater (Hauck 1953). In contrast, at the time of listing in 1997, the 5-year geomean abundance for natural-origin steelhead passing Lower Granite Dam, which includes all but one population in the DPS, was 11,462 adults (Ford 2011). Abundance began to increase in the early 2000s, with the single year count and the 5-year geomean both peaking in 2015 at 45,789 and 34,179, respectively (ODFW and WDFW 2019). Since 2015, the numbers have declined steadily with only 10,717 natural-origin adult returns counted in 2018 (ODFW and WDFW 2019). Even with the recent decline, the 5-year geomean abundance for natural-origin adult returns was 23,100 in 2018 (ODFW and WDFW 2019) which is more than twice the number at listing and substantially greater than the 5-year geomean of 18,847 tabulated in the most recent status review (i.e., Ford 2011).

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 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. The Deer Creek Dock affects the Salmon River MPG.

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

In evaluating the condition of designated critical habitat, NMFS examines the condition and trends of physical and biological features (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).

Table 4 Types of sites, essential physical and biological features, and the species life stage each PBF supports.

Site	Essential Physical and Biological Features	Species Life Stage
Snake River Basin Steelhead[a]		
Freshwater spawning	Water quality, water quantity, and substrate	Spawning, incubation, and larval development
Freshwater rearing	Water quantity & floodplain connectivity to form and maintain physical habitat conditions	Juvenile growth and mobility
	Water quality and forage[b]	Juvenile development
	Natural cover[c]	Juvenile mobility and survival
Freshwater migration	Free of artificial obstructions, water quality and quantity, and natural cover[c]	Juvenile and adult mobility and survival
Snake River Spring/Summer Chinook Salmon & Fall Chinook		
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 and Middle Columbia steelhead. These PBFs will not be affected by the proposed action and have therefore not been described in this Opinion.
[b] Forage includes aquatic invertebrate and fish species that support growth and maturation.
[c] Natural cover includes shade, large wood, log jams, beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks.
[d] Food applies to juvenile migration only.

The lower Salmon River flows through both private and public lands, draining steep forested mountain slopes and then shrubs and grasses along the Salmon River canyon. Habitat conditions in the lower Salmon River are affected by excess fine sediment and reduced riparian vegetation from land use activities on adjacent lands and in upstream areas. Water temperatures drop in the lower Salmon River during the fall, and the plume created by cold water from the Salmon River where it enters the Snake River can provide thermal refugia for fall Chinook salmon (NMFS 2017b).

Limited information exists on potential factors that could be limiting fall Chinook salmon use of, and production in the lower Salmon River. Snake River fall Chinook salmon use the Salmon River within the action area for spawning, early rearing, and migration. Fall Chinook salmon begin spawning in the lower Salmon River in October.

Table 5 describes the geographical extent within the Snake River of critical habitat for the ESA-listed Chinook salmon species and steelhead. Critical habitat includes the stream channel and water column with the lateral extent defined by the ordinary high-water line, or the bankfull elevation where the ordinary high-water line is not defined. In addition, critical habitat for the 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 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 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). 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 SRB, streamflows are substantially reduced by water diversions (NMFS 2015; NMFS 2017a). 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 SR spring/summer Chinook salmon 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. Removal of riparian vegetation, alteration of natural stream morphology, and withdrawal of water for agricultural or municipal use all contribute to elevated stream temperatures. Water quality in spawning and rearing areas in the Snake River has also been impaired by high levels of sedimentation and by heavy metal contamination from mine waste (e.g., IDEQ and USEPA 2003; IDEQ 2001).

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

- Minimizing winter drafts (for flood risk management and power generation) to increase flows during peak spring passage;
- Releasing water from storage to increase summer flows;
- Releasing water from Dworshak Dam to reduce peak summer temperatures in the lower Snake River;
- Constructing juvenile bypass systems to divert smolts, steelhead kelts, and adults that fall back over the projects away from turbine units;

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

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

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

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 habitat available to salmon. Such changes may restrict our ability to conserve diverse salmon life histories.

Climate change could affect Snake River fall Chinook salmon in the following ways: (a) Higher water temperatures during adult migration may lead to increased mortality or reduced spawning success; (b) if water temperatures accelerate the rate of egg development, it could lead to earlier fry emergence and dispersal, which could be either beneficial or detrimental, depending upon location and prey availability; (c) warmer temperatures will increase metabolism, which may increase or decrease juvenile growth rates and survival, depending upon availability of food; (d) increases in water temperatures in Snake and Columbia River reservoirs could increase consumption rates and growth rates of predators and, hence, predation-related mortality on subyearling fall Chinook salmon; and (e) reduced flow in late spring and summer may lead to delayed migration of juvenile fall Chinook salmon and higher mortality passing dams (NMFS 2015).

It is possible that Snake River fall Chinook salmon may be among those salmonids either least affected by, or most likely to adapt to, climate change effects on the mainstem and tributary habitat. Climate change could pose less impact on the species because: (1) Adults are able to avoid peak summer temperatures and still spawn; (2) juveniles will likely grow faster if winter/spring conditions are warmer and migrate earlier – avoiding elevated summer temperatures; (3) current use of tributary habitat seems to be limited by low winter water temperature and could improve if the temperatures rise; and (4) the fish appear to rely less on estuary habitat than other Chinook salmon ESUs with subyearling migrant life history patterns (NMFS 2015). Nevertheless, the effects that climate change will have on species abundance, productivity, spatial structure, and diversity remain poorly understood; and this uncertainty reinforces the importance of achieving survival improvements throughout the entire life cycle (NMFS 2015).

Climate change could affect Snake River Basin steelhead and Snake River spring/summer Chinook salmon in the following ways: (a) Winter flooding in transient and rainfall-dominated watersheds may reduce overwintering habitat for juveniles; (b) reduced summer and fall flows may reduce the quality and quantity of juvenile rearing habitat, strand fish, or make fish more susceptible to predation and disease; (c) timing of smolt migration may change due to a modified timing of the spring freshet; and (d) lethal water temperatures may occur in the mainstem river migration corridor or in holding tributaries resulting in higher adult mortality rates (NMFS 2017a).

Both freshwater and marine productivity tend to be lower in warmer years for Snake River spring/summer Chinook salmon populations. Thus, all other threats and conditions remaining equal, future deterioration of water quality, water quantity, and/or physical habitat due to climate change is expected to cause a reduction in the number of naturally produced adult spring/summer Chinook salmon returning to populations across the ESU (NMFS 2016a). This possibility reinforces the importance of achieving survival improvements throughout the species' entire life cycle and across different populations, because neighboring populations with different habitat may respond differently to climate change.

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, 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 with high summer 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, to alter critical habitat by generally increasing temperature and peak flows, and decreasing base flows. Although changes will not be spatially homogenous, effects of climate change are expected to decrease the capacity of critical habitat to support successful spawning, rearing, and migration. Habitat action can address the adverse impacts of climate change on salmon. Examples include restoring connections to historical floodplains and freshwater and estuarine habitats to provide refugia for fish and 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). The area affected by the proposed action consists of the habitat in the lower Salmon River under and adjacent to the proposed dock (extending 50 feet from the dock in all directions) and the riparian area adjacent to the dock. The bounds of the action area approximate the distance where smallmouth bass predation on Chinook salmon and steelhead may be enhanced by overhead cover created by the dock and associated vessels tied alongside; and the area where fish may be disturbed by the more concentrated boat movements to and from shore due to the dock.

The action area is used by all freshwater life history stages of Snake River spring/summer Chinook salmon, and migratory and juvenile rearing life stages for Snake River spring/summer Chinook salmon and Snake River spring/summer steelhead. The action area is within designated critical habitat for each of the three species.

2.4 Environmental Baseline

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

The action area for this project is within the main lower Salmon River, and the dock will be placed alongside the downstream end of a wide sand beach. This section of river is almost 300 feet wide and relatively deep, with a rocky bank directly across the river from the dock location (Figure 2). There is a shallow riffle at the eastern upstream edge of the property and another riffle just downstream from the project area, near the downstream edge of the landowner's property.

Effects to the action area have come from land use practices both onsite and adjacent to the action area, as well as upstream - activities such as agricultural and timber practices, residential and commercial development, historic mining practices in and around the river, and recreational activities such as floating, boating, and fishing. The State of Idaho issued the prior landowner a permit to install a seasonal, private, floating dock in 2008. That dock was used each year, between August and December, within the action area, and the new landowner was recently issued a new permit by the state. In 2016, the COE designated the lower Salmon River a navigable waterway under Section 10 of the RHA of 1899. The installation of the dock now requires an RHA permit from the COE, and the permit is the federal nexus for this consultation.

The following detail baseline conditions:

- The Salmon River is almost 300 feet wide at the project site during normal summer flows.

- The physical characteristics of the Salmon River from the action area downstream to the mouth, about 13 miles, are largely unaltered by development due to the steepness of the canyon and paucity of roads. The nearest river neighbor is approximately 3 miles upstream.

- Human uses of and impacts to the action area from activities nearby or farther upstream include: agriculture and ranching, transportation, seasonal rafting, boating, fishing, camping and other recreational activities that have occurred for many years and continue to occur each year. The action area is valuable to all species of ESA listed fish that migrate, spawn, develop, and rear in and around the project site. The complex habitat features a variety of depth, velocity, and substrate useful for different life stages of anadromous fish.

2.5 Effects of the Action

Under the ESA, "effects of the action" are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (see 50 CFR 402.17). In our analysis, which describes the effects of the proposed action, we considered 50 CFR 402.17(a) and (b). Physical disturbance, turbidity, sedimentation, chemical contamination, and predator habitat enhancement are potential effects.

2.5.1 Effects to species

Snake River Basin steelhead use the Salmon River within the action area for migration, rearing, and overwintering. Spawning occurs in tributary streams, outside the action area. Snake River spring/summer Chinook salmon use the Salmon River within the action area for rearing and migration. Spawning occurs farther upstream, in various tributary streams and the upper mainstem Salmon River. Snake River fall Chinook salmon use the Salmon River within the action area for spawning, early rearing, and migration. Fall Chinook spawning in this section of the Lower Salmon River usually begins in the third week of October (B. Arnsberg, Fisheries Biologist NPT, personal communication, 2019).

2.5.1.1 Disturbance, turbidity, sedimentation, and chemical contamination

Most, if not all Snake River fall Chinook juveniles will be farther downstream (in the Snake and Columbia Rivers) by August, when the dock is installed (Arnsberg et al. 1992; Connor et al. 2002). Some Snake River spring/summer Chinook and steelhead pre-smolt juveniles will likely be present, along with adults of all three species, during the period of time when the dock will be in use.

We evaluated the effects of project-caused disturbance, turbidity, and sedimentation on juvenile salmon and steelhead. During the installation and removal of the floating dock, individual juvenile salmon and steelhead that might be in the area would likely relocate from the temporary disturbance. We expect direct impacts to rearing and/or overwintering juveniles related to the installation and removal of the dock to be minimal. The installation and removal of the dock involves one or two days of activity. The only substrate disturbance below the OHWM will be the placement and removal of the river anchor, which will cause a very brief disturbance of river bottom sediments and very little turbidity. Lowering the anchor to the sandy substrate (by hand via jet boat) could temporarily cause fish present in the immediate area to move short distances away. However, we anticipate that any short-term movements of individual fish away from the anchors and associated turbidity would be brief, would not displace the fish to different habitats, nor interfere with their usual behavior. Earth disturbance for the land anchor will be above the OHWM and small, such that very little sediment is likely to be delivered to the river.

Subsequent use of the dock by up to two motorized vessels is likely to create disturbance during departure and arrival, but this will be intermittent use and fish may move at will to other areas of the channel. It is possible that boat motors, particularly jets, could disturb sandy sediments below the dock and potentially result in water turbidity, as well as suspended sediment. However, since the vessels will likely dock bow toward shore, motors would be angled toward the deepest part of the channel, reducing the likelihood of substrate disturbance and disturbance of juvenile salmon and steelhead.

We also evaluated project-caused disturbance, turbidity, and sedimentation effects on adult salmon and steelhead. Potential for the proposed action to affect migrating adult salmon and steelhead is less than for the juvenile fish; however, a few adult fall Chinook salmon do spawn near the action area. Redd count aerial surveys for Snake River spring/summer Chinook salmon and for Snake River fall Chinook salmon are conducted annually. Fall Chinook salmon spawn in bigger rivers, generally deeper water, and within a smaller set of river miles than spring/summer Chinook salmon.

Migrating and spawning adult Snake River fall Chinook salmon may be present in or nearby the action area during the period of dock installation and presence – August through mid-December. In recent years, fall Chinook salmon have spawned throughout the lower Salmon River. The nearest known redd to the action area was recorded in 2007, located approximately 800-feet upstream from the dock location. The nearest known redds recorded downstream were in 2005 and 2007, located 2 miles downstream of the dock location.

By August, adult Snake River spring/summer Chinook salmon should already be well upstream of the action area, in Salmon River tributary streams either spawning or staging to spawn in August or September.

Migrating adult Snake River steelhead may also be present in the action area when the dock is installed and in place. Were adult salmon and steelhead to encounter the dock or associated mooring/launching activities, they would likely readily move away from the activities, to the center or other side of the river. These brief movements of adult fish to avoid the activities are not expected to harm the fish nor affect their reproductive success.

We also considered that fueling and boat use associated with the dock could leak fuel and oil into the river and cause toxicity effects on juvenile and adult salmon and steelhead. Fueling vessels or transferring fuels to a storage tank can be significant sources of pollution. Fuels carry contaminants that are harmful to fish, including heavy metals, and toxic hydrocarbons and other compounds. Delivery of chemicals - such as fuel, oil, and bilge products - to the river is expected to be insignificant because the applicant will use mitigation measures, as identified by the Idaho State standards (IDEQ, 2005), when storing fuel, fueling boats, using boats to install the land anchor, and subsequently during normal boat use. These BMPs are identified in Section 1.3, above. With those BMPs in place, temporary and seasonal use of the dock for two vessels is expected to contribute no more than small amounts of chemical contaminants to the river, and any addition of chemicals will likely be quickly diluted in the mainstem river volume.

2.5.1.2 Predation

The ESA Recovery Plan for Snake River Spring/Summer Chinook Salmon & Snake River Basin Steelhead (NMFS 2017a) identifies the importance of reducing juvenile mortality during outmigration from rearing habitats through the mainstem Salmon River, Little Salmon River, and key tributary production areas.

Shading from an opaque platform, such as the floating dock described, potentially introduces a longer term effect on habitat conditions that could negatively affect the survival of juvenile salmon and steelhead rearing in or migrating through the action area. Such shading could provide habitat for piscivorous fish that include smallmouth bass *(Micropterus dolomieu)* and northern pikeminnow (*Ptychocheilus oregonensis*). Favored pikeminnow habitat includes slow river reaches, back eddies, and manmade overwater or underwater cover. In the Columbia River basin, studies have found predation from smallmouth bass and other piscivorous fish to be most intense upon subyearling Chinook salmon (Chapman 2007; Connor et al. 2015). Smallmouth bass have a strong affinity for in-water structures such as docks (Carrasquero 2001), where they can hide in the shadows to prey upon juvenile salmonids. In Lake Washington, Washington, 68 percent of all adult smallmouth bass were seen within two meters of a dock (Fresh et al. 2003). As light levels decrease (e.g., underneath docks), predation on juvenile salmonids by piscivorous fishes may increase due to a diminished ability for the juvenile salmonids to detect predators (Rondorf et al. 2010).

Smallmouth bass and northern pikeminnow are found in the lower Salmon River, are likely to occur in the action area, and are known to prey on young salmonids. The lower Salmon River is a migratory corridor and rearing area for steelhead and the two Chinook salmon species. This section of river also provides spawning habitat for Snake River fall Chinook salmon. The relatively small footprint of the dock (380.25 ft^2) would limit the number of bass that could utilize it as cover. However, NMFS is assuming that up to 2 boats will be berthed alongside the dock most of the time the dock is in the water. This will extend the shaded area for predator habitat. The dock appears to be the only dock located along several miles of the river, which may increase the potential for predators to utilize the habitat.

The dock is likely to cause some increased use of, and predation success by bass and pikeminnow in the action area. However, most fall Chinook juveniles should already have moved downstream by August. A small number of pre-smolt steelhead and spring/summer Chinook juveniles may be present during August to December, rearing and slowly moving downriver to overwinter in the Snake and Columbia Rivers.

Quantifying the increase in predation from the proposed dock is not possible due to the range of responses that individual predator and prey fish will have due to the changed habitat. Because the footprint of the proposed dock is small, the potential increase in predator habitat would be relatively small. The increase in predation of salmon and steelhead will be small both because the area of added habitat for predator fish will be small, and because the dock will be deployed and present after the vast majority of juvenile steelhead and salmon have moved through this section of river. We anticipate that the proposed dock would be installed every year for the next five years, so the increase in predation associated with the dock would also occur every year.

2.5.2 Effects to Critical Habitat

Within designated critical habitat, the physical and biological features (PBF) that may be effected by this action are water quality, substrate, cover and safe passage. As noted in the Effects to Species section above, the project effects on water quality (turbidity and chemical contamination) and substrate are all expected to be minor given the small scale of disturbance, and the ability of the mainstem Lower Salmon River to dilute momentary pulses of turbidity and small inputs of toxic chemicals. As also noted above, the proposed action will add overwater cover for both juvenile salmonids and predator fish, and will thus somewhat diminish safe passage conditions for salmonids in the action area, but only with small effects in this case.

2.5.2.1 Water Quality and Substrate

Decreases in water quality from chemical contamination are not likely. The COE 2017 Nationwide Permit issued a general 401 water quality certification. This certification informs the applicant that in order to comply with Section 402 of the Clean Water Act, Idaho state code should be followed (per personal communication COE, May 2020). Regarding fuel and liquid hazardous waste, the COE identifies the Idaho Stormwater Household Hazardous Material Use and Disposal BMP 27 (IDEQ, 2005). We expect that these proposed BMPs described in Section 1.3 will reduce the risk of leaks or spills from vessels entering the Salmon River. Project effects on the water quality PBF will be very small, if even detectable, for chemical contamination and small and temporary for turbidity, as described above under the effects to species. None of the effects are expected to change the function of the water quality PBF. Similarly, none of the effects are expected to change the function of substrate PBF, because these effects are small and of short duration. Minor, temporary, disturbances to a sandy sediment are only likely during the placement and removal of the offshore anchors, twice per season.

2.5.2.2 Cover and Safe Passage

Cover and safe passage are the PBF of primary concern regarding this action. The dock will seasonally provide cover for both salmonids and predators, and that will diminish safe passage for juvenile salmonids somewhat in this location. The small area of critical habitat for which these PBF are affected and the timing of the effect, which diminishes the consequence of this seasonal change in the PBF (most juvenile salmon and steelhead not exposed to the change in the PBF), result in only small, albeit adverse effects on the cover and safe passage PBF.

2.6 Cumulative Effects

"Cumulative effects" are those effects of future state or private activities, not involving federal activities, that are reasonably certain to occur within the action area of the federal action subject to consultation (50 CFR 402.02 and 402.17(a)). Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

Effects to the action area have come from land use practices onsite, adjacent to the action area, and upstream - activities such as agricultural and timber practices, residential and commercial development (i.e. Riggins and White Bird), historic mining practices in and around the river, and recreational activities such as floating, boating, and fishing. For the five-year duration of the proposed action, on-site and nearby land use practices relating to agriculture and primitive roads and the associated effects are likely to continue at the present rate.

Climate change is expected to make recovery targets for salmon and steelhead populations more difficult to achieve due to critical habitat alterations, such as increasing temperature and peak flows, and decreasing base flows. Although changes will not be spatially homogenous, effects of climate change are expected to decrease the capacity of critical habitat to support successful spawning, rearing, and migration.

Some continuing non-federal activities are reasonably certain to contribute to climate effects within the action area. 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).

2.7 Integration and Synthesis

The Integration and Synthesis section is the final step in our assessment of the risk posed to species and critical habitat as a result of implementing the proposed action. In this section, we add the effects of the action (Section 2.5) to the environmental baseline (Section 2.4) and the cumulative effects (Section 2.6), taking into account the status of the species and critical habitat (Section 2.2), to formulate the agency's Opinion as to whether the proposed action is likely to: (1) Reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing its numbers, reproduction, or distribution; or (2) appreciably diminish the value of designated or proposed critical habitat as a whole for the conservation of the species.

Snake River spring/summer and fall Chinook salmon, which are present in the action area, are threatened with extinction. For spring/summer Chinook salmon, 22 populations from three MPGs migrate past the action area on their way to the ocean; and all except one of the populations in these MPGs are currently at high risk of extinction. For fall Chinook salmon, the one remaining population in the ESU is currently viable, per the ICTRT's criteria, but must reach a status of "highly viable with high certainty" for the ESU as a whole to meet recovery goals (NWFSC 2015). For the Snake River steelhead DPS, all populations from the Salmon River MPG pass through, and some individuals may linger in, the action area section of the Salmon River. The status of many of individual steelhead 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 need to reach viable status through increases in abundance and productivity.

The proposed action would enhance predator fish habitat in a small area of the lower Salmon River, likely leading to a small amount of increased predation upon juvenile salmon and steelhead as they rear in and migrate through the nearshore area of the Salmon River. High rates of predation mortality upon rearing and migrating juveniles in the Salmon River is a limiting factor to the recovery of ESA listed species; and climate change has the potential to magnify this limiting factor in future decades (NMFS 2015; NMFS 2016).

While effects on fish from potential disturbance, turbidity/sedimentation, and chemicals are expected to be very small and not cause harm, there may be adverse effects associated with increased predation risk caused by the dock. Quantifying the increase in predation mortality from the proposed dock is not possible due to the range of responses that individual predator and prey fish will have to the changed habitat. However, because the footprint of the proposed dock is small (381 ft^2) plus area of vessels docked alongside), and because the vast majority of migrating juvenile fish will have passed the site before the dock is present, the potential annual increase in the number of juveniles consumed by predator fish will also be small.

Effects of climate change are expected to decrease the capacity of critical habitat to support successful spawning, rearing, and migration. On site land use practices relating to private residence, agriculture and primitive roads are likely to continue at the present rate.

Because we expect very few, if any, fall Chinook salmon juveniles to be present in the action area during the time of the action, we expect the (at most) very small increase in subyearling mortality not to decrease the overall abundance and productivity status of the one remaining population. Adult fall Chinook salmon may encounter the dock and associated activities during their upstream migration; however, they would likely just move away from the activities and not be harmed in any way. All known spawning sites for fall Chinook salmon are well outside of the action area.

For spring/summer Chinook salmon, most smolts for all the Salmon River populations will have left the river in the spring and should not be present when the dock is installed. Any small increase in predation mortality to pre-smolt juveniles would be spread across many populations and would be limited to a small subset of those pre-smolts, fish that rear their way down through the action area during late summer/fall. Thus, although some populations may be at high risk for abundance and productivity, we do not expect the small increase in predation mortality to greatly impact abundance and productivity values for any of the individual populations. Adult spring/summer Chinook salmon will not be in the action area during the action.

For steelhead, by late summer most of the smolts will have migrated downstream, and a small number of individual pre-smolts from among the various populations may be exposed to the presence of the dock and the associated increased predation risk. Adult steelhead could encounter the dock in the course of migration and seeking overwintering pools upstream of this site. Adult steelhead would likely simply move away from the dock and associated activities, and would not be harmed by the proposed action in any way.

For those three species, the proposed dock's effects to any population are expected to be very small. Therefore, the proposed action is not likely to reduce the abundance and productivity, and therefore, the viability of the Snake River fall Chinook salmon ESU, the Snake River spring/summer ESU, or the Snake River Basin steelhead DPS. Because the abundance and productivity will not be reduced, the action will not reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing its numbers, reproduction, or distribution

Potential effects to critical habitat PBFs of water quality and substrate are likely to be small. The proposed action would reduce the safe passage PBF under and immediately surrounding the proposed dock. Because the dock occupies a very small part of the overall rearing habitat along the Salmon River temporarily, this reduction in safe passage in a very small area will not appreciably diminish the value of designated or proposed critical habitat as a whole for the conservation of any of the three species.

2.8 Conclusion

After reviewing and analyzing the current status of the listed species and critical habitat, the environmental baseline within the action area, the effects of the proposed action, the effects of other activities caused by the proposed action, and cumulative effects, it is NMFS' Opinion that the proposed action is not likely to jeopardize the continued existence of Snake River spring/summer Chinook salmon, Snake River fall Chinook salmon, or Snake River steelhead; and it is not likely to destroy or adversely modify designated critical habitat for those species.

2.9 Incidental Take Statement

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

2.9.1 Amount or Extent of Take

In the Opinion, NMFS determined that incidental take of ESA-listed species is reasonably certain to occur because small numbers of rearing juvenile steelhead and Chinook salmon may be in the action area and some of those fish may be killed because of the hiding areas for predatory fish that the dock will provide. The proposed dock will modify habitat under and immediately adjacent to the dock site on the Salmon River shoreline, increasing area use and predation rate by bass and northern pikeminnow. Some take is likely to occur if the juvenile salmon and steelhead encounter predator fish attracted by the enhanced habitat provided by the proposed dock. Estimating the specific number of fish injured or killed by these habitat modifying activities is difficult if not impossible, despite the use of the best available scientific and commercial data. That is because of the range of responses individual bass, pikeminnow, and juvenile salmon and steelhead will have to the changed habitat. Available data and techniques are insufficient to quantify the increase in predation of juvenile fish that can be ascribed to the additional hiding cover the dock will provide for predators.

While this uncertainty makes it impossible to quantify take in terms of numbers of fish injured or killed, the extent of habitat change to which fish will be exposed is readily discernible, is proportionate to the amount of harm, and presents a reliable measure of the extent of take that can be monitored and tracked. Therefore, we will use a habitat surrogate for take associated with habitat modification. Specifically, the surrogate for incidental take associated with modified habitat is a maximum square footage of 381 ft^2 of dock overwater dock structure in the action area. Although this surrogate is coextensive with the proposed action, it nevertheless functions as an effective reinitiation trigger for the reasons outlined above.

2.9.2 Effect of the Take

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

2.9.3 Reasonable and Prudent Measures

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

The COE shall:

- Monitor the proposed action to ensure that the incidental take surrogate is not exceeded.

2.9.4 Terms and Conditions

The terms and conditions described below are non-discretionary, 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 entity to whom a term and condition is directed does not comply with the following terms and conditions, protective coverage for the proposed action would likely lapse.

To implement RPM 1 the COE shall:

- Confirm that the installed floating dock structure does not exceed 381 ft^2. The COE shall contact the NMFS Snake Basin Office immediately if the completed structure exceeds this square footage.

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).

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

- The COE should require future grating on dock floats in order to increase the transmission of light through the structure and thus create less desirable habitat for predator fish.

- The COE should direct applicants to use mooring buoys instead of docks, thus creating less predator habitat in nearshore habitat.

- The COE should encourage seasonal installation of dock structures in the nearshore environment, avoiding dock installation from March through May when rearing juvenile salmon are most likely to occupy shallow nearshore habitat.

- The COE should encourage the applicants to harvest predator fish in this area, while complying with the applicable state sport fishing regulations.

- The COE should require that fuel storage be contained at least 150 feet away from flowing water, and that a spill and containment plan be adhered to.

Please notify NMFS if the COE, or another entity, carries out these recommendations so that we will be kept 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 Deer Creek Floating Dock Placement Project.

As 50 CFR 402.16 states, reinitiation of consultation is required and shall be requested by the federal agency or by the NMFS where discretionary federal agency involvement or control over the action has been retained or is authorized by law and if: (1) The amount or extent of incidental taking specified in the ITS is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action.

2.12 "Not Likely to Adversely Affect" Determinations

Although the captive brood program has been highly successful in producing hatchery Snake River sockeye salmon, substantial increases in survival rates across all life history stages must occur in order to reestablish sustainable natural production (NWFSC 2015). In particular, juvenile and adult losses during travel through the Salmon, Snake, and Columbia River migration corridor continue to present a significant threat to species recovery (NMFS 2015). NMFS does not anticipate the proposed action will have adverse effects on Snake River sockeye salmon. Juvenile sockeye salmon are not expected to be present within the action area during the proposed period of dock installation, presence, and removal. Because Snake River sockeye will not be migrating downstream through this area between August 1 and December 15, NMFS does not anticipate that the dock will impact any individual juvenile fish of this species. Adult sockeye salmon may potentially be present in the action area during the August portion of the action, but any adult fish would readily avoid project activities in their migration through or by the action area.

The action area is a migration corridor only for sockeye salmon. The potential impact to PBF for sockeye critical habitat is safe passage for adults and juveniles. While some adults may be migrating through the project area during the time of the action, safe passage should not be affected due to their large size and seasoned ability to avoid predation. The dock will not be in place to shelter predatory fish at the time when juveniles move through on their downstream migration, therefore we consider the effect to both adult and juvenile sockeye critical habitat to be discountable. Because all effects to sockeye salmon and their habitat will be insignificant or discountable, NMFS concurs that the proposed action is NLAA Snake River sockeye salmon or their critical habitat.

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) 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

The PFMC designated EFH for Chinook salmon, coho salmon, and Puget Sound pink salmon (PFMC 1999). The proposed action and action area for this consultation are described in the Introduction to this document. The action area is within designated EFH for Chinook salmon. The proposed action will affect EFH for rearing and migration life-history stages of Chinook salmon. The PFMC has identified five habitat areas of particular concern (HAPC), which warrant additional focus for conservation efforts due to their high ecological importance. Three of the five HAPC are applicable to freshwater and include: (1) Complex channels and floodplain habitats; (2) thermal refugia; and (3) spawning habitat. The proposed action will not adversely affect any of these HAPC.

3.2 Adverse Effects on Essential Fish Habitat

Adverse effects to EFH in the action area are the same as those identified in the critical habitat section of the Opinion. The proposed action will seasonally diminish safe passage conditions for salmon EFH beneath and immediately adjacent to the dock structure and accompanying vessels.

3.3 Essential Fish Habitat Conservation Recommendations

To ensure minimal effects to Chinook salmon EFH, the COE should apply the following permitting conditions:

1. Ensure that proper construction plans, designs, and techniques are followed, and make sure that all precautionary measures are followed.

2. Ensure that an emergency spill containment kit is kept on site during construction activities and on-site personnel are knowledgeable and trained in the use of the spill containment equipment.

3. Notify NMFS as soon as possible of any fuel spill of 1 gallon or more.

3.4 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 user of this Opinion is the COE. Other interested users could include applicants. Individual copies of this Opinion were provided to the COE. The document will be available within 2 weeks at the NOAA Library Institutional Repository [https://repository.library.noaa.gov/welcome]. The format and naming adheres to conventional standards for style.

4.2 Integrity

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

4.3 Objectivity

Information Product Category: Natural Resource Plan.

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

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

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

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

5. References

Arnsberg, B. D., W. P. Connor, E. Connor, M. J. Pishl and M. A. Whitman. 1992. Mainstem Clearwater River study: assessment for salmonid spawning, incubating, and rearing. Final report. Portland, OR. Prepared for Bonneville Power Administration. Project no. 88-15, Contract no. DE-BI79-87BP37474.

Arnsberg, B., P. Groves, F. Mullins, and D. Milks. 2016. 2015 Snake River fall Chinook salmon spawning summary. Nez Perce Tribe, Idaho Power Company, U.S. Fish and Wildlife Service, and Washington Department of Fish and Wildlife. January 2016, 6 pp.

Arnsberg, B. 2019. Personal communication by email from Nez Perce Tribe, June 25, 2019.

Battin, J., and coauthors. 2007. Projected impacts of climate change on salmon habitat America 104(16):6720-6725.

Biljan, M. 2020. Personal communication by email from COE, May 4, 2020.

Bjornn, T. C. and D. W. Reiser. 1991. Habitat requirements of salmonids in streams. Pages 83–138 *in* W.R. Meehan, editor. Influences of forest and rangeland management on salmonid fishes and their habitats. American Fisheries Society, Special Publication 19. Bethesda, Maryland.

Carrasquero, J. 2001. Over-Water Structures: Freshwater Issues. Washington State Department of Fish and Wildlife.

Chapman, D. W. 2007. Effects of Docks in Wells Dam Pool on Subyearling Summer/Fall Chinook Salmon. Douglas County Public Utility District. 19 p.

Connor, W. P., H. L. Burge, R. Waitt, and T. C. Bjornn. 2002. Juvenile life history of wild fall Chinook salmon in the Snake and Clearwater Rivers. North American Journal of Fisheries Management 22:703-712.

Connor, W. P., and H. L. Burge. 2003. Growth of wild subyearling fall Chinook salmon in the Snake River. North American Journal of Fisheries Management 23:594-599.

Connor, W. P., J. G. Sneva, K. F. Tiffan, R. K. Steinhorst, and D. Ross. 2005. Two alternative juvenile life history types for fall Chinook salmon in the Snake River Basin. Transactions of the American Fisheries Society 134:291-304.

Connor, W. P., B. D. Arnsberg, J. A. Chandler, T. D. Cooney, P. A. Groves, J. A. Hesse, G. W. Mendel, D. J. Milks, D. W. Rondorf, S. J. Rosenberger, M. L. Schuck, K. F. Tiffan, R. S. Waples, and W. Young. 2016. A Retrospective (circa 1800–2015) on abundance, spatial distribution, and management of Snake River Basin fall Chinook salmon. Draft 2 Parts I, II, and III. 1. http://www.streamnetlibrary.org/?page_id=1357. http://www.streamnetlibrary.org/?page_id=1181 (Available May 13, 2016.September 30, 2015).

Coutant, C. C., and R. R. Whitney. 2006. Hydroelectric system development: effects on juvenile and adult migration. Pages 249-324 *in* R. N. Williams, editor. Return to the River- Restoring Salmon to the Columbia River. Elsevier Academic Press, Amsterdam.

Dauble DD, RL Johnson, RP Mueller, CS Abernethy, BJ Evans, and DR Geist. 1994. Identification of Fall Chinook Salmon Spawning Sites near Lower Snake River Hydroelectric Projects. U.S. Army Corps of Engineers, Walla Walla District, Walla Walla, Washington.

Dauble DD, RL Johnson, RP Mueller, and CS Abernethy. 1995. Spawning of Fall Chinook Salmon Downstream of Lower Snake River Hydroelectric Projects, 1994. U.S. Army Corps of Engineers, Walla Walla District, Walla Walla, Washington.

Dauble, D. D., R. L. Johnson, and A. Garcia. 1999. Fall chinook spawning in tailraces of lower Snake River hydroelectric projects. Transactions of the American Fisheries Society 128:672-697.

Dauble, D. D. and D. R. Geist. 2000. Comparisons of mainstem spawning and habitats for two populations of fall Chinook salmon in the Columbia River Basin. Regulated Rivers: Research and Management 16:345-361.

Ecovista, Nez Perce Tribe Wildlife Division, and Washington State University Center for Environmental Education. 2003. Draft Clearwater Subbasin Assessment, Prepared for Nez Perce Tribe Watersheds Division and Idaho Soil Conservation Commission. 463 p. http://www.nwcouncil.org/fw/subbasinplanning/clearwater/plan/Default.htm

Everest, F. H. and D. W. Chapman. 1972. Habitat selection and spatial interaction by juvenile Chinook salmon and steelhead trout in two Idaho streams. Journal of the Fisheries Research Board of Canada 29(1):91-100.

Felts, E. A., B. Barnett, M. Davison, C. J. Roth, J. R. Poole, R. Hand, M. Peterson, and E. Brown. 2019. Idaho adult Chinook Salmon monitoring. Annual report 2018. Idaho Department of Fish and Game Report 19-10.

Fish Passage Center (FPC). 2019. Chinook salmon adult return data downloaded from the Fish Passage Center website (www.fpc.org) in October, 2019.

Ford, M.J. (ed.). 2011. Status review update for Pacific salmon and steelhead listed under the Endangered Species Act: Pacific Northwest. U.S. Dept. Commer., NOAA Tech. Memo. NMFS-NWFSC-113, 281 p. http://www.westcoast.fisheries.noaa.gov/publications/status_reviews/salmon_steelhead/multiple_species/5-yr-Snake River.pdf

Fresh, K.L., D. Rothaus, K.W. Mueller, and C. Waldbillig. 2003. Habitat utilization by smallmouth bass in the littoral zones of Lake Washington and Lake Union/Ship Canal. 2003 Lake Washington Chinook salmon workshop. King County Department of Natural Resources, January 24, 2003. Shoreline, WA.

Good, T.P., R.S. Waples, and P. Adams (editors). 2005. Updated status of federally listed ESUs of West Coast salmon and steelhead. U.S. Dept. Commerce, NOAA Tech. Memo. NMFS-NWFSC-66, 598 p.

Hauck, F. R. 1953. The Size and Timing of Runs of Anadromous Species of Fish in the Idaho Tributaries of the Columbia River. Prepared for the U.S. Army, Corps of Engineers by the Idaho Fish and Game Department, April 1953. 16 pp.

Healey, M. C. 1991. Life history of chinook salmon (*Oncorhynchus tshawytscha*). Pages 80 *in* C. Groot, and L. Margolis, editors. Pacific salmon life histories. University of British Columbia Press, Vancouver, Canada.

Hegg, J., B. Kennedy, P. Chittaro, and R. Zabel. 2013. Spatial structuring of an evolving life-history strategy under altered environmental conditions. Oecologia: 1-13.

Interior Columbia Technical Recovery Team (ICTRT). 2003. Working draft. Independent populations of Chinook, steelhead, and sockeye for listed evolutionarily significant units within the Interior Columbia River domain. NOAA Fisheries. July.

ICTRT. 2007. Viability Criteria for Application to Interior Columbia Basin Salmonid ESUs, Review Draft March 2007. Interior Columbia Basin Technical Recovery Team: Portland, Oregon. 261 pp. https://www.nwfsc.noaa.gov/research/divisions/cb/genetics/trt/trt_documents/ictrt_viability_criteria_reviewdraft_2007_complete.pdf

ICTRT. 2010. Status Summary – Snake River Spring/Summer Chinook Salmon ESU. Interior Columbia Technical Recovery Team: Portland, Oregon.

Idaho Department of Environmental Quality (IDEQ). 2001. Middle Salmon River-Panther Creek Subbasin Assessment and TMDL. IDEQ: Boise, Idaho. 114 p.

IDEQ. 2005. Catalog of Stormwater Best Management Practices for Idaho Cities and Counties. IDEQ: Water Quality Division Boise, ID. 663 p.

IDEQ. 2011. Idaho's 2010 Integrated Report, Final. IDEQ: Boise, Idaho. 776 p.

IDEQ and U.S. Environmental Protection Agency (EPA). 2003. South Fork Clearwater River Subbasin Assessment and Total Maximum Daily Loads. IDEQ: Boise, Idaho. 680 p.

Idaho Department of Fish and Game. 2004 and 2005. Salmon River: Spring, Summer, Fall Chinook Salmon; Sockeye Salmon; Steelhead and Bull Trout Fish Distribution [map online]. Portland (OR); StreamNet.

Independent Scientific Advisory Board (ISAB). 2007. Climate change impacts on Columbia River Basin fish and wildlife. ISAB Climate Change Report, ISAB 2007-2, Northwest Power and Conservation Council, Portland, Oregon.

Joint Columbia River Management Staff. 2014. 2014 Joint Staff Report: Stock Status and Fisheries for Fall Chinook, Coho Salmon, Chum Salmon, Summer Steelhead, and White Sturgeon, January 14, 2014. Oregon Department of Fish & Wildlife, Washington Department of Fish and Wildlife. 88 p.

Mantua, N., I. Tohver, and A. Hamlet. 2009. Impacts of climate change on key aspects of freshwater salmon habitat in Washington State. Climate Impacts Group, University of Washington, Seattle, Washington.

Matthews, G. M., R. S. Waples. 1991. Status Review for Snake River Spring and Summer Chinook Salmon. U.S. Dept. of Commerce, NOAA Tech. Memo., NMFS-F/NWC-200. https://www.nwfsc.noaa.gov/publications/scipubs/techmemos/tm201/

McClure, M., T. Cooney, and ICTRT. 2005. Updated population delineation in the interior Columbia Basin. May 11, 2005 Memorandum to NMFS NW Regional Office, Co-managers, and other interested parties. NMFS: Seattle, Washington. 14 p.

McElhany, P., M.H. Ruckelshaus, M.J. Ford, T.C. Wainwright, and E.P. Bjorkstedt. 2000. Viable salmonid populations and the recovery of evolutionarily significant units. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-NWFSC-42, Seattle, Washington, 156 p.

Mote, P. W. and E. P. Salathé. 2009. Future climate in the Pacific Northwest. Climate Impacts Group, University of Washington, Seattle, Washington.

Mueller, R.P. 2009. Survey of Fall Chinook Salmon Spawning Areas Downstream of Lower Snake River Hydroelectric Projects, 2008. COE, WA.

National Marine Fisheries Service (NMFS). 1992. Federal Register Notice: Threatened status for Snake River spring–summer Chinook salmon, threatened status for Snake River fall Chinook salmon. Federal Register 57:78(22 April 1992):14653–14663.

NMFS. 2006. National Marine Fisheries Service's comments and preliminary recommended terms and conditions for an application for a major new license for the Hells Canyon hydroelectric project (FERC No. 1971). National Marine Fisheries Service, Seattle, Washington. January 24, 2006.

NMFS. 2015. ESA Recovery Plan for Snake River Sockeye Salmon (*Oncorhynchus nerka*), June 8, 2015. NOAA Fisheries, West Coast Region. 431 p. http://www.westcoast.fisheries.noaa.gov/publications/recovery_planning/salmon_steelhead/domains/interior_columbia/snake/snake_river_sockeye_recovery_plan_june_2015.pdf

NMFS (National Marine Fisheries Service). 2016a. 2016 5-Year Review: Summary & Evaluation of Snake River Sockeye, Snake River Spring-Summer Chinook, Snake River Fall-Run Chinook, and Snake River Basin Steelhead.

NMFS. 2017a. ESA Recovery Plan for Snake River Spring/Summer Chinook & Steelhead. NMFS. http://www.westcoast.fisheries.noaa.gov/publications/recovery_planning/salmon_steelhead/domains/interior_columbia/snake/Final%20Snake%20Recovery%20Plan%20Docs/final_snake_river_spring-summer_chinook_salmon_and_snake_river_basin_steelhead_recovery_plan.pdf

NMFS. 2017b. ESA Recovery Plan for Snake River Fall Chinook Salmon (*Oncorhynchus tshawytscha*). http://www.westcoast.fisheries.noaa.gov/publications/recovery_planning/salmon_steelhead/domains/interior_columbia/snake/Final%20Snake%20Recovery%20Plan%20Docs/final_snake_river_fall_chinook_salmon_recovery_plan.pdf

Northwest Fisheries Science Center (NWFSC). 2015. Status review update for Pacific salmon and steelhead listed under the Endangered Species Act: Pacific Northwest. 356 p.

Oregon Department of Fish and Wildlife and Washington Department of Fish and Wildlife (ODFW and WDFW). 2019. 2019 Joint Staff Report: Stock Status and Fisheries for Spring Chinook, Summer Chinook, Sockeye, Steelhead, and other Species. Joint Columbia River Management Staff. 97 pp.

Pacific Fishery Management Council (PFMC). 1999. Amendment 14 to the Pacific Coast Salmon Plan. Appendix A: Description and Identification of Essential Fish Habitat, Adverse Impacts and Recommended Conservation Measures for Salmon. Pacific Fishery Management Council, Portland, Oregon (March 1999). http://www.pcouncil.org/salmon/salfmp/a14.html

PFMC. 2014. Appendix A to the Pacific Coast Salmon Fishery Management Plan, as modified by Amendment 18. Identification and description of essential fish habitat, adverse impacts, and recommended conservation measures for salmon.

Rondorf, D.W., G.L. Rutz, and J.C. Charrier. 2010. Minimizing Effects of Over-Water Docks on Federally Listed Fish Stocks in McNary Reservoir: A Literature Review for Criteria, Anadromous Fish Evaluation Program Report 2010-W68SBV91602084, U. S. Geological Survey Western Fisheries Research Center, Columbia River Research Laboratory, WA.

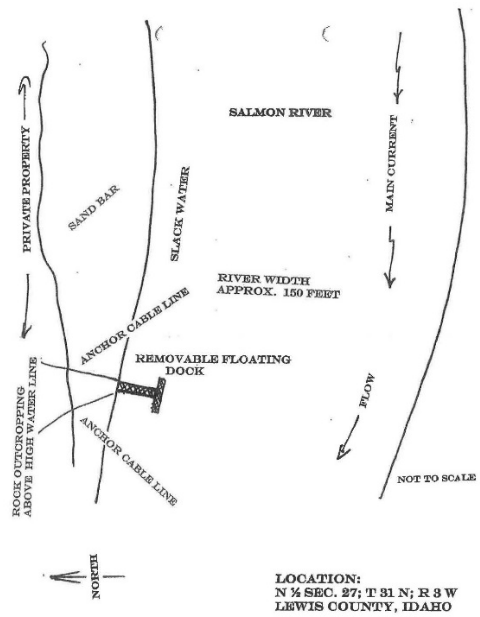
Spence, B., G. Lomnicky, R. Hughes, and R.P. Novitski. 1996. An ecosystem approach to salmonid conservation. TR-4501-96-6057. ManTech Environmental Research Services Corp.: Corvallis, Oregon.

Tiffan, K. F., and W. P. Connor. 2012. Seasonal Use of Shallow Water Habitat in the Lower Snake River Reservoirs by Juvenile Fall Chinook Salmon. 2010–2011 Final Report of Research to U.S. Army Corps of Engineers Walla Walla District.

Young, B. 2019. Personal communication by email from Nez Perce Tribe Hatchery Evaluations Coordinator, October 17, 2019

6. APPENDICES

6.1 Appendix A. Deer Creek floating dock placement in action area



6.2 Appendix B. Deer Creek floating dock design