UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
800 E. Park Blvd, Plaza IV, Suite 220
Boise, Idaho 83712

Refer to NMFS No.: WCRO-2021-01284

https://doi.org/10.25923/w34p-jy90

August 18, 2021

Chad Hamel
Supervisory Environmental Protection Specialist
Environment, Fish and Wildlife
Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208-3621

Re: Endangered Species Act Section 7 Formal Consultation and Magnuson–Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the East Fork Salmon River 16 Diversion, Screen, and Bridge Replacement Project, Hydrologic Unit Code, HUC 170602011103, Custer County, Idaho

Dear Mr. Hamel:

Thank you for your letter dated May 19, 2021, requesting initiation of consultation with NOAA's National Marine Fisheries Service (NMFS) pursuant to section 7(a)(2) of the Endangered Species Act of 1973 (ESA) (16 U.S.C. 1531 et seq.) for the East Fork Salmon River 16 Diversion, Screen, and Bridge Replacement Project. The enclosed document contains a biological opinion (opinion) prepared by NMFS on the effects of your proposed project. In this opinion, NMFS concludes that the action, as proposed, is not likely to jeopardize the continued existence of Snake River Basin steelhead, Snake River spring/summer Chinook salmon, or result in the destruction or adverse modification of designated critical habitat for both species.

Thank you, also, for your request for consultation pursuant to the essential fish habitat (EFH) provisions in Section 305(b) of the Magnuson–Stevens Fishery Conservation and Management Act [16 U.S.C. 1855(b)] for this action.

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 (RPMs) NMFS considers necessary or appropriate to minimize the impact of incidental take associated with this action. The take statement sets forth terms and conditions, including reporting requirements that the Bonneville Power Administration and/or any person who performs the action must comply with to carry out the RPMs. Incidental take from actions that meet these terms and conditions will be exempt from the ESA take prohibition.

If you have questions regarding this consultation, please contact Chad Fealko, Southern Snake Branch Office, at (208) 768-7707 or chad.fealko@noaa.gov.

Sincerely,

Michael P. Tehan
Assistant Regional Administrator
Interior Columbia Basin Office

Enclosure

cc: W. Schoby – IDFG
J. Richards – IDFG
R. Shull – BPA
C. Colter – Shoshone Bannock Tribes
S. Fisher – USFWS

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

East Fork Salmon River 16 Diversion, Screen, and Bridge Replacement Project,
HUC 170602011103, Custer County, Idaho

NMFS Consultation Number: WCRO-2021-01284

Action Agency: Bonneville Power Administration

Affected Species and Determinations:

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

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

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

Issued By:

Michael P. Tehan
Assistant Regional Administrator

Date: August 18, 2021

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GLOSSARY OF ACRONYMS

ATV	All Terrain Vehicle
BA	Biological Assessment
BMP	Best Management Practices
BPA	Bonneville Power Administration
CFS	cubic feet per second
CWA	Clean Water Act
DPS	Distinct Population Segment
DQA	Data Quality Act
EFH	Essential Fish Habitat
EFSR	East Fork Salmon River
EFSR-16	East Fork Salmon River 16 irrigation diversion ditch
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
HAPC	Habitat Area of Particular Concern
HUC	Hydrologic Unit Code
IDFG	Idaho Department of Fish and Game
IDWR	Idaho Department of Water Resources
ITS	Incidental Take Statement
MPG	Major Population Group
MSA	Magnuson–Stevens Fishery Conservation and Management Act
NMFS	National Marine Fisheries Service
NTU	Nephelometric Turbidity Unit
opinion	Biological Opinion
PBF	Physical and Biological Feature
PFMC	Pacific Fishery Management Council
POD	Point of Diversion
RPM	Reasonable and Prudent Measure
Tribe	Nez Perce Tribe

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 U.S.C. 1531 et seq.), and implementing regulations at 50 CFR 402, as amended.

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

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

1.2. Consultation History

The Bonneville Power Administration (BPA) proposes to fund the replacement of an existing single span bridge, relocate an existing irrigation diversion, and reconstruct a new fish screen on the East Fork Salmon River 16 irrigation diversion ditch (EFSR-16). All actions will occur on private property along the East Fork Salmon River (EFSR), approximately 17 miles upstream from its Salmon River confluence (Latitude 44.12230, and Longitude -114.42505). The BPA will provide this funding to Idaho Department of Fish and Games' (IDFG) Anadromous Screen Shop will implement and oversee the project. The proposed action is a fish passage improvement project, addressing poor fish screen conditions that routinely kill and/or injure fish. The action would typically be covered by an existing programmatic ESA consultation with (BPA 2021) (NMFS No. WCRO-2020-00102). However, the number of stream fords required, and the size of the replacement bridge, both result in this action falling outside the auspices of that consultation.

Starting in February 2020 and extending through June 10, 2021, NMFS discussed the proposed project with IDFG and BPA via phone calls and emails. The BPA and IDFG provided a draft biological assessment (BA) to NMFS for informal review on April 19, 2021, and NMFS sent back comments on May 11, 2021. The BPA addressed our comments, including adoption of a recommendation to remove historic abutment fill associated with the existing bridge. The BPA submitted a final BA for formal consultation on May 19, 2021. This opinion is based on information provided in that final BA. The final BA determined that the proposed action would likely adversely affect Snake River Basin steelhead (*Oncorhynchus mykiss*), Snake River spring/summer Chinook salmon (*O. tshawytscha*), and designated critical habitat for both species. Following our receipt of the final BA and request for consultation NMFS responded on May 25, 2021, acknowledging the initiation of ESA and EFH consultation. Shortly after initiation, the IDFG informed NMFS (by phone) that contractor bids were too high to accept and that the IDFG rejected the bids and then requested modified bids for completion of just the bridge replacement in 2021. The IDFG indicated they would pursue diversion and fish screen reconstruction elements considered in the BA in 2022. For purposes of this consultation, the complete action described in the May 19, 2021, final BA was evaluated, but with a 2-year implementation process.

The U.S. Army Corps of Engineers is not expected to issue a Clean Water Act (CWA) section 404 permit for the project since the proposed activities fall under existing exemptions.

Because this action has the potential to affect tribal trust resources, NMFS provided copies of the draft proposed action, terms, and conditions for this opinion to the Shoshone–Bannock Tribe on June 30, 2021, requesting comments. The Shoshone–Bannock Tribe did not respond. Draft excerpts were also shared with the BPA and IDFG on June 29, 2021. BPA responded the same day, indicating the measures appeared implementable.

1.3. Proposed Action

Under the ESA, "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). Under MSA, Federal action means any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken by a Federal agency (50 CFR 600.910).

Using funds provided by BPA, the IDFG will replace a 35 year-old fish screen on the East Fork Salmon River 16 (EFSR-16) irrigation ditch with a new fish screen that meets NMFS criteria (2011). To improve the fish bypass outlet location and reduce the need for future instream diversion maintenance, the new point of diversion (POD) will be relocated upstream approximately 1,000 feet. Relocating the POD will also require the need to reconstruct a short section of new irrigation ditch that will tie into the existing ditch. The current POD and delivery abandoned section of delivery ditch will be reclaimed and rehabilitated. The new diversion will include a new irrigation control structure. The existing access bridge[1] (a 45-foot span rail car) will be replaced with a 90-foot span railcar. This project will require fording the river with construction equipment at low water, as there is no other safe access to the site until the bridge is reconstructed.

We considered, under the ESA, whether or not the proposed action would cause any other activities and determined that it would not. Irrigation and ranching practices would likely continue to occur by landowners in absence of screen or bridge replacement. Access across the EFSR would likely continue by using the existing bridge (until it fails) and by using the existing stream ford, albeit with seasonal limitations due to high water. We did not identify any other activities tied to the proposed projects.

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[1] The existing bridge's log abutments are railing and the deck has insufficient weight capacity for the equipment to access work areas on the east side of the EFSR.

1.3.1. Access and Staging

Primary access to the property will occur on the county-maintained EFSR Road. On the ranch, existing gravel-surfaced routes and a native-material surfaced ranch road lead to the bridge approach (about 2,100 feet from the EFSR Road). An existing two-wheel track along the left bank (looking downstream) will be used for about 490 feet, then cross-country travel is required through hay ground for about 430 feet along the left bank to access the existing ford. The approach to the ford on river left will be stabilized by sloping a 15-foot long by 10-foot wide approach above water using an excavator to a grade suitable for concrete trucks. If needed following slope grading, angular rock will be placed on the constructed approach. The approach will access an exposed cobble bed leading into the water. Upon project completion, the added rock will be removed and the approach de-compacted, restored to original grade, and replanted with site-appropriate native vegetation.

Concrete pouring, required for the new fish screen bays, is expected to require 14 to 21 loaded cement truck crossings at the ford site. An excavator and loaded dump trucks will also use the ford up to 30 times. Vehicles will traverse about 100 feet of riverbed, of which approximately 60 feet will likely be wetted. Max depth will be up to 24 inches, with average water depth about 18 inches when the ford is used. Existing unsurfaced roadways and wheel tracks will be used during construction to minimize additional disturbance.

Staging areas are identified in construction drawings. Parking, fueling, and construction supply storage will occur at a site on the west side of the river to avoid fording fuel trucks. Following bridge replacement, excavator refueling may occur at a designated site on the east side of the EFSR. All fueling and staging areas will be more than 150 feet from flowing water during the construction period.

1.3.2. Irrigation Ditch Alignment

A new irrigation ditch will be excavated along the alignment shown in the design drawings, provided in the final BA (BPA 2021). The ditch will be passed beneath an existing road in a corrugated metal pipe arch culvert (20-feet long and 57-inches wide by 38-inches tall). The new ditch will connect to the existing ditch less than 200 feet upstream of the former fish screen site.

Behind the existing headgate, which will be removed, the existing ditch will be plugged for about 30 feet. The ditch has been identified as an historical feature recommended as eligible for listing in the National Register of Historic Places.

1.3.3. Fish Screen Design and Construction

The new screen will be a double bay, rotary drum design in a concrete housing. The screen's cleaning system will be operated by a paddlewheel. The existing fish screen (consisting of a concrete structure and drum paddlewheel) will be removed, with metal parts returned to the IDFG screen shop, and concrete housing disposed of by the contractor according to state and local requirements. Removal will occur following at least one season of using the new diversion, screen, and ditch, affirming that they perform as intended.

The existing buried bypass pipe (used to redirect migrating fish from the fish screen to the river) will also be removed. A new 10-inch diameter bypass pipe will be installed from the new screen north to the EFSR, about 450 feet. The bypass will have cleanouts at 75-foot centers.

1.3.4. Irrigation Diversion Headgate Design and Construction

A new headgate will be constructed and installed. Willow clumps will be planted around it. Construction will require dewatering, using super sacs in a horseshoe-shaped pattern in the river. Fish will be salvaged from the isolated work area according to approved procedures (NMFS 2011) using qualified IDFG personnel. The work area (~800 square feet) will be dewatered using pumps with approved fish screens (NMFS 2011).

At the upstream end of the existing diversion's push up dam (constructed of cobbles and gravel with little fine material), approximately 20 feet of the push-up dam's material will be removed and used to fill a portion of the existing ditch. IDFG estimates about six excavator bucket scoops of material will be removed. The remainder of the dam's material will be removed by subsequent high flows, which currently occurs almost annually and results in the need to construct a push-up dam.

1.3.5. Bridge Design and Construction

The existing 44-foot-long bridge will be lifted away by a crane or excavator. The old bridge abutments (logs embedded into the right bank and a concrete abutment in the left bank) will be removed. No dewatering is proposed for the removal of these old abutments because of the deep pools in the riverbed on the downstream edge of both abutments and because removal is anticipated to produce little sediment and only minor streambank disturbance. Installation and removal of cofferdams that would be required for effective dewatering in this setting is anticipated to create more adverse instream impacts (e.g., sedimentation and fish disturbance) than they would prevent, and would thus provide minimal, if any, protective benefit. The right bank abutment sits on imported material atop a bedrock shelf above the river, allowing removal without disturbing the riverbank. The left bank abutment sits on imported material above large imported boulders and riprap at the water's edge, allowing its removal without disturbing the riverbank. These imported boulders and riprap contain very little fine material.

Following abutment removal, the imported material on the right bank will be removed without altering the bedrock shelf to allow for as much high-flow channel capacity as possible (impacting approximately 350 square feet along the riverbank). The imported material and large boulders and riprap above and along the left bank will also be removed to expand channel capacity (impacting approximately 500 square feet along riverbank).

The new abutments will be constructed 75-feet apart on each side of the river. These will be constructed far enough up each bank that no in-water work, dewatering, or fish salvage will be required. Willow clumps will be planted around them. The new 89-foot long, 10.5-foot wide rail-car bridge will then be placed atop the new abutments.

1.3.6. Construction Sequencing and In-water Work

The bridge will be reconstructed first to provide access and minimize use of the ford during fish screen construction and ditch digging. The existing bridge deck will be removed and abutments for the new bridge will be constructed. Neither of these actions will require in-river work or dewatering. Removal of the old abutments will follow. This removal is planned for the in-water work window of July 7 through August 15 (USBWP 2005). The new bridge deck will be installed using a large crane with no instream operations necessary. The fish screen will be constructed next, followed by the irrigation ditch, and finally the irrigation diversion and control structure. This work will likely occur in 2022. Screen construction and ditch excavation will be accomplished "in the dry," with no contact with the river. Excavated material from the new ditch line will be stockpiled and used to contour the completed screen site and the former diversion site. The entire site will be hydro-seeded with native grass seed following final grading.

Construction of the new diversion headgate and control structure will require dewatering and bank excavations within a horseshoe-shaped cofferdam. It will be accomplished during the instream work window. Upon completion of the headgate, and following at least 2 weeks for cement curing at the new headgate and fish screen, flows may be introduced to evaluate the completed project to ensure it functions as intended.

Dozens of stream crossings at the ford will be needed to complete construction. These will all occur within the identified in-water work window. Though the bridge will be complete before screen and headgate construction, and thereby provide access for most construction traffic, it will not be sufficient to support the weight of the excavator, loaded dump trucks, and loaded cement trucks needed for the headgate and fish screen construction, so those will still need to continue using the ford even after bridge construction.

1.3.7. Conservation Measures

The BPA and IDFG propose conservation measures identified in Table 1 to minimize the impacts of bridge and diversion replacement on ESA-listed fish and their habitat. These measures are critical parts of the proposed action necessary to appropriately minimize impacts.

Table 1. Conservation Measures.

Category	Specific Measures
Site Preparation	• Sediment barriers such as filter fabric fences, weed-free straw matting/bales, or fiber wattles will be used in all work areas sloping toward the EFSR. Sediment barriers will be biodegradable and will be removed when no longer needed. • Accumulated sediment will be removed during the project and prior to removing the filter fence after completion of work. • For standard-strength filter fabric, a wire mesh support fence will be fastened securely to the upslope side of the posts and the fabric stapled or wired to the mesh. If extra-strength fabric is used, the wire mesh fence may be eliminated. • All erosion controls will remain in place and functioning appropriately until site restoration is complete. All barriers will be removed when no longer needed.

Category	Specific Measures
	• Any large wood, native vegetation, weed-free topsoil or native material displaced during construction will be stockpiled for use in site restoration. • Flows and weather conditions will be monitored daily for events that may cause extremely high flows. In such events, all equipment will be removed from the work site until flows have abated.
Water Quality Protection	• Ford approaches will be stabilized prior to use and restored following use. • No treated wood will be used in new bridge construction. • The contractor will develop an adequate, site-specific Spill Prevention and Countermeasure or Pollution Control Plan, which will include: site plan and narrative describing methods of erosion/sediment control; methods for confining/removing/disposing of excess construction materials and measures for equipment washout facilities; a spill containment plan; and, measures to reduce/recycle hazardous and non-hazardous wastes. • The spill containment control plan will include: notification procedures, specific cleanup and disposal instructions for different products, quick response containment and cleanup measures, proposed methods for disposal of spilled materials, and employee training on spill containment. • Uncured concrete and form materials will be treated as a hazardous material with measures taken to avoid contact with the active stream channel. Concrete must be sufficiently cured or dried (48-72 hours depending on temperature) before coming into contact with stream flow. • Concrete trucks will be cleaned of any external concrete and be free of dripping concrete before using the ford in either direction. • Materials for containment and cleanup will be available onsite during pre-construction, construction, and restoration phases of the project. • Turbidity will be monitored every 4 hours during work (using a turbidimeter or by visual observation). If turbidity levels approach 50 nephelometric turbidity units (NTU) over background levels (100 feet above activities), work must cease immediately and actions taken to reduce turbidity before continuing work within the channel. Monitoring of turbidity levels will continue until levels are near to background levels. • Excavators and dump trucks operating with hydraulic fluid will use only those fluids certified as non-toxic to aquatic organisms. • All heavy equipment will be washed prior to entry to the construction area so it is free of external petroleum-based products. Accumulations of soil or debris will be removed from the drive mechanisms (wheels, tires, tracks, etc.) and undercarriage of equipment prior to its use within 150 feet of any water body. • Vehicle staging, cleaning, maintenance, refueling, and fuel storage will only occur at the appropriately designated staging areas with appropriate spill containment systems • All stationary power equipment such as generators, cranes, or stationary drilling equipment operated within 150 feet of any water body will be diapered to prevent leaks unless suitable containment is provided to prevent potential spills from entering the water. • All waste material such as construction debris, silt, excess dirt or overburden resulting from this project will be deposited above the limits of floodwater in an IDFG-approved upland disposal site. • Appropriate containers for proper disposal of construction materials will be maintained in the staging areas before being taken to an approved facility. • Extreme care will be taken during both removal of the existing structures and new construction to ensure that no petroleum products, hydraulic fluid, fresh

Category	Specific Measures
	cement, sediments, sediment-laden water, chemicals, or any other toxic or deleterious materials are allowed to enter or leach into water bodies.
Operations	• Equipment and materials will only be staged at designated staging areas. • Operate machinery, to the extent feasible, from the top of the streambank along adjacent uplands and previously cleared areas. • Ford use will only occur during the in water work window (July 7–August 15) and in the absence of adult Chinook salmon or their redds. IDFG personnel will monitor for redds and adult Chinook prior to each crossing event, and haze fish out of the area (using an all-terrain vehicle [ATV]) prior to equipment crossing. • All pumps used in areas containing fish habitat will use NMFS approved screen criteria (NMFS 2011). • All equipment will be pressure-washed and inspected prior to entering the work area (including return trips) and after leaving the work area to remove vegetation and soil that may contain noxious weed seeds. Care will be taken to inspect and clean equipment undercarriages. • Machinery will be inspected daily to identify and resolve fuel or lubricant leaks before commencing work activities. • Cover and stockpile excess excavated materials away from the river and flank with sediment fencing to minimize fine sediment release. • Transport surplus excavated materials offsite to an approved receiving location to be determined by the contractor and approved by IDFG. • Protect existing riparian vegetation to the extent possible.
Sediment and Storm Water Control	• The contractor will develop and implement a stormwater pollution prevention plan. • The best management practices (BMPs) will include silt fences or fiber wattles along both sides of the water diversion to prevent stormwater and sediment from entering the stream, and erosion control blankets if necessary. • Ground disturbance will not occur during wet conditions (during or immediately following rain events). • Sediment control BMPs will be maintained and inspected throughout construction, and the contractor will remove captured sediment prior to the removal of BMPs to avoid the potential release of sediments to the river. The contractor will inspect silt fences immediately after each rainfall, and at least daily during prolonged rainfall. • Exposed soils will be seeded and/or planted with native vegetation and covered with appropriate mulch after construction is complete. • Maintain existing stormwater drainage pattern such that stormwater runs off the bridge into riparian vegetation on the streambank before entering the stream.
Instream Work	• Conduct instream work and stream fording only during the instream work window (i.e., July 7–August 15). • An ATV will be driven across the ford prior to each crossing event to scare/displace adult and juvenile fish from the crossing area. • Outside of stream fording, no equipment will operate in active stream flow. • Cofferdam materials (1-yard sacks filled with clean gravel) will be placed using an excavator working from the streambank and cofferdam materials will be stockpiled on top of the bank. • Gravel sacks will be tethered to prevent cofferdam failure in the event that high flows occur during implementation.

Category	Specific Measures
	• Diesel or electric sump pumps will be used if needed to capture seepage flow from cofferdam areas. Pumps must be contained and screened as per NMFS criteria (2011) to avoid entraining juvenile fish. • Pumped water will be discharged to a temporary settling basin; bermed pond; a Baker tank or similar structure; or geotextile bags. Biofiltration materials will be used to return pumped water to the river (e.g., filtration through straw bales). • Route silt-laden seepage water that is not feasibly captured to a settling system prior to discharge back to the river. • Dewatered areas will be pre-washed to settle fine sediment prior to rewatering the work site. • Install and remove cofferdams slowly to allow flow to be reduced and re-watered gradually.
Fish Salvage	• Ensure safe handling of all fish by having an IDFG fish biologist onsite who is experienced with the work area and salvage practices to conduct or supervise any required capture and release operation. • Guide adult fish from the area behind the cofferdams to areas upstream or downstream of the construction area. • Use beach seines (herding) and sanctuary nets (solid-bottomed) as part of any dewatering process to herd fish or capture and release (water-to-water transfer) all fish observed in the area. • Electrofishing equipment will be used for fish salvage, and NMFS electrofishing guidelines (NMFS 2000) will be followed. • A fish biologist will record species and lengths of any ESA-listed fish encountered, noting mortalities, and data will be provided to NMFS.
Restoration	• Upon completion of all construction activities, all temporary structures, devices materials or equipment will be completely removed from the site and all excess spoils and/or waste materials properly disposed of in compliance with Federal, State, and local regulations. • To prevent future erosion, and to stem the invasion of noxious weeds, the disturbed areas will be seeded with a native seed mix that will provide wildlife benefit and erosion control. • Bank stabilization material (i.e., willow clumps, revetment, root wads) will be immediately installed following completion of work at disturbed areas upstream and downstream of the bridge abutments and diversion locations to withstand 100-year peak flows. Stream gravels, round cobbles, and riprap will not be used as exterior armor. • Damaged banks will be restored to a natural slope pattern and profile that is suitable for establishment of permanent woody vegetation.

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

2.1. 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 physical and biological features (PBFs) that help to form that conservation value.

This opinion considers the status of two species: Snake River Basin steelhead and Snake River spring/summer Chinook salmon. Each of these evolutionarily significant units (ESU) or distinct population segments (DPS) is composed of multiple populations, which spawn and rear in different watersheds across the Snake River basin. Having multiple viable populations makes an ESU or DPS less likely to become extinct from a single catastrophic event (ICBTRT 2010). NMFS expresses the status of an ESU or DPS in terms of the status and extinction risk of its individual populations, relying on McElhany et al.'s (2000) description of a viable salmonid population (VSP). The four parameters of a VSP are abundance, productivity, spatial structure, and diversity. The recovery plan for Snake River spring/summer Chinook salmon and Snake River Basin steelhead (NMFS 2017) describe these four parameters in detail and the parameter values needed for persistence of individual populations and for recovery of the ESU or DPS.

Table 2 summarizes the status and available information on the Snake River Basin steelhead DPS and the Snake River spring/summer Chinook salmon ESU, based on the detailed information on the status of individual populations, and the species as a whole provided by the ESA Recovery Plan for Snake River Spring/Summer Chinook Salmon & Snake River Basin Steelhead (NMFS 2017) and Status review update for Pacific salmon and steelhead listed under the Endangered Species Act: Pacific Northwest (NMFS 2016). These two documents are incorporated by reference here. Both species remain threatened with extinction due to many individual populations not meeting recovery plan abundance and/or productivity targets.

Table 2. Most recent listing classification and date, status summary (including recovery plan reference and most recent status review), and limiting factors for species considered in this opinion.

Species	Listing Status	Status Summary	Limiting Factors
Snake River Spring/summer Chinook Salmon	Threatened 6/28/05	This ESU comprises 28 extant and four extirpated populations, organized into five major population groups (MPGs), none of which are meeting the viability goals laid out in the recovery plan (NMFS 2017). All except one extant population (Chamberlin Creek) are at high risk of extinction (NWFSC 2015). Most populations will need to see increases in abundance and productivity in order for the ESU to recover. 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 also need to be lowered in multiple populations in order for the ESU to recover (NWFSC 2015). Overall adult returns have remained very low over the past 3 years (Nez Perce Tribe 2018; Nez Perce Tribe 2019), and the trend for the most recent 5 years (2014–2018) has been generally downward (ODFW and WDFW 2019).	• Adverse effects related to the mainstem Columbia and Snake River hydropower system and modifications to the species' migration corridor. • Degraded freshwater habitat, including altered stream flows and degraded water quality. • Harvest-related effects. • Predation in the migration corridor. • Potential effects from high proportion of hatchery fish on natural spawning grounds.
Snake River Basin Steelhead	Threatened 1/5/06	This DPS comprises 24 populations organized into five MPGs. Currently, five populations are tentatively rated at high risk of extinction, 17 populations are rated at moderate risk of extinction, one population is viable, and one population is highly viable. Four out of the five MPGs are not meeting the population viability goals laid out in the recovery plan (NMFS 2017). In order for the species to recover, more populations will need to reach viable status through increases in abundance and productivity. Additionally, the relative proportion of hatchery fish spawning in natural spawning areas near major hatchery release sites remains uncertain and may need to be reduced (NWFSC 2015, most recent species status review). Since 2015, abundance has declined steadily with only 10,717 natural-origin adult returns counted in 2018 (ODFW & WDFW 2019).	• Adverse effects related to the mainstem Columbia and Snake River hydropower system and modifications to the species' migration corridor. • Genetic diversity effects from out-of-population hatchery releases. Potential effects from high proportion of hatchery fish on natural spawning grounds. • Degraded fresh water habitat. • Harvest-related effects, particularly B-run steelhead. • Predation in the migration corridor.

The proposed action will occur in the EFSR sub-basin, a tributary to the Salmon River. Steelhead here are part of the EFSR population within the Snake River Basin steelhead DPS. This population is a large-sized population in the Salmon River MPG, which contains 12 populations. The EFSR population is not currently identified in NMFS' example recovery scenario for this MPG, but the population is located farther upstream than some other populations and could be used to satisfy viability criteria in lieu of other populations. Population specific VSP data remains unavailable. In the most recent status review (NMFS 2016), the abundance of natural-origin steelhead at Lower Granite Dam had increased relative to the prior review. The 2011–2014 geometric mean of natural-origin A-Index steelhead at Lower Granite Dam was over twice the corresponding estimate for the prior review, and the updated B-Index geometric mean was over 50 percent higher than for the prior review (NWFSC 2015). The overall status of the Snake River Basin steelhead DPS remained threatened, with four of the five MPGs in the DPS not meeting their recovery plan objectives. In the Salmon River MPG, all extant populations were considered maintained (NMFS 2016). However, since the last status review, observations of coastal ocean conditions suggested that the 2015–2017 out migrant year classes experienced below average ocean survival during a marine heatwave and its lingering effects. This led researchers to predict a corresponding drop in adult returns through 2019 (Werner et al. 2017). In fact, the best scientific and commercial data available with respect to the adult abundance of steelhead indicate a substantial downward trend in the abundance of natural-origin spawners at the DPS level from 2014 to 2019. The lowest returns since 1999 have occurred in the past 3 years of data (2017 through 2019).

Chinook salmon in the action area are part of the EFSR population. The EFSR population is one of nine populations in the Salmon River MPG and is a large population and in NMFS' most recent status review's (2016) example recovery scenario, it was identified as one of five independent populations needing to be viable in order for the MPG to be viable. In 2015, the population had experienced small improvements in abundance and productivity since 2011, but these metrics were still rated as high risk. The EFSR Chinook population was also at high risk for spatial structure and diversity metrics. Collectively, the population was at high risk of extinction (i.e., >25% extinction risk within 100 years). Since our last status review in 2016, abundance and productivity have declined further, nearing levels reported when the species was first listed. During this time, observations of coastal ocean conditions suggested that the 2015–2017 out migrant year classes experienced below average ocean survival during a marine heatwave and its lingering effects. This led researchers to predict a corresponding drop in adult returns through 2019 (Werner et al. 2017). In fact, the best scientific and commercial data available with respect to the adult abundance of EFSR Chinook salmon indicate a substantial downward trend in abundance and productivity when comparing returns from 2010–2014 to 2015–2019. Specifically, 5-year geometric mean adult abundance declined 77 percent for this population compared to the prior time period. Although NMFS has not yet completed our most recent status determination, declining abundance and productivity will likely preclude any positive change from the high-risk rating.

Table 3 summarizes designated critical habitat for Snake River Basin steelhead, Snake River spring/summer Chinook salmon, based on the detailed information on the status of critical habitat throughout the designation area provided in the recovery plan for each species (NMFS 2017), which is 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 Basin steelhead, PBFs include water quality, water quantity, spawning substrate, floodplain connectivity, forage, natural cover, and passage free of artificial obstructions. 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. 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.

Table 3. Critical habitat, designation date, Federal Register citation, and status summary for critical habitat considered in this opinion.

Species	Designation Date and Federal Register Citation	Critical Habitat Status Summary
Snake River Spring/summer Chinook Salmon	10/25/99 64 FR 57399	Critical habitat consists of river reaches of the Columbia, Snake, and Salmon Rivers, and all tributaries of the Snake and Salmon rivers (except the Clearwater River) presently or historically accessible to this ESU (except reaches above impassable natural falls, and Dworshak and Hells Canyon Dams). Habitat quality in tributary streams varies from excellent in wilderness and roadless areas, to poor in areas subject to heavy agricultural and urban development (NMFS 2017). Reduced summer stream flows, impaired water quality, and reduced habitat complexity are common problems.
Snake River Basin Steelhead	9/02/05 70 FR 52630	Critical habitat encompasses 25 sub-basins in Oregon, Washington, and Idaho. Habitat quality in tributary streams varies from excellent in wilderness and roadless areas, to poor in areas subject to heavy agricultural and urban development (NMFS 2017). Reduced summer stream flows, impaired water quality, and reduced habitat complexity are common problems.

For both species, 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 for juveniles and adults. However, several actions taken since 1995 have reduced the negative effects of the hydro-system on juvenile and adult migrants. Examples include providing spill at each of the mainstem dams for smolts, steelhead kelts, and adults that fall back over the projects; and maintaining and improving adult fish way facilities to improve migration passage for adult salmon and steelhead.

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

One factor affecting the status of the species and its critical habitat considered in this opinion is climate change. Likely changes in temperature, precipitation, wind patterns, and sea-level height have implications for survival of Snake River Basin steelhead and Snake River spring/summer Chinook salmon in both their freshwater and marine habitats. During the next century, average temperatures in the Pacific Northwest are projected to increase 3 to 10°F, with the largest increases predicted to occur in the summer (Mote et al. 2014). Decreases in summer precipitation of as much as 30 percent by the end of the century are consistently predicted across climate models (Mote et al. 2014). Precipitation is more likely to occur during October through March, less during summer months, and more winter precipitation will be rain than snow (ISAB 2007; Mote et al. 2014). Earlier snowmelt will cause lower stream flows in late spring, summer, and fall, and water temperatures will be warmer (ISAB 2007; Mote et al. 2014). Models consistently predict increases in the frequency of severe winter precipitation events (i.e., 20-year and 50-year events) in the western United States (Dominguez et al. 2012). The largest increases in winter flood frequency and magnitude are predicted in mixed rain-snow watersheds (Mote et al. 2014). In general, these changes in air temperatures, river temperatures, and river flows are expected to cause changes in salmon and steelhead distribution, behavior, growth, and survival, although the magnitude of these changes remains unclear.

Climate change could affect salmon and steelhead in the following ways (NMFS 2017):

- Winter flooding in transient and rainfall-dominated watersheds may scour redds, reducing egg survival.

- Warmer water temperatures during incubation may accelerate the rate of egg development and result in earlier fry emergence and dispersal, which could be either beneficial or detrimental, depending on location and prey availability.

- 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.

- Reduced flows and higher temperatures in late summer and fall may decrease parr-to-smolt survival.

- Warmer temperatures will increase metabolism, which may increase or decrease juvenile growth rates and survival, depending on availability of food.

- Overwintering survival may be reduced if increased flooding reduces suitable habitat.

- Timing of smolt migration may be altered due to a modified timing of the spring freshet, such that there is a mismatch with ocean conditions and predators.

- Higher temperatures while adults are holding in tributaries and migrating to spawning grounds may lead to increased pre-spawning mortality or reduced spawning success as a result of delay or increased susceptibility to disease and pathogens.

- 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 juvenile spring/summer Chinook salmon and steelhead.

- Lethal water temperatures (temperatures that kill fish) may occur in the mainstem migration corridor or in holding tributaries, resulting in higher mortality rates.

- If water temperatures in the lower Snake River (especially Lower Granite Dam and reservoir) warm during late summer and fall sufficiently that they cannot be maintained at a suitable level by cold-water releases from Dworshak Reservoir, then migrating adult Snake River summer Chinook salmon and steelhead could have higher rates of mortality and disease.

Both freshwater and marine productivity tend to be lower in warmer years for Snake River salmon and steelhead populations. Climate factors will likely make it more challenging to increase abundance and recover the species by reducing the suitable rearing areas and leading to a more limited run-timing under the warmer future conditions. This possibility reinforces the importance of achieving survival improvements throughout the species' entire life cycle and across different populations since neighboring populations with different habitat may respond differently to climate change.

2.2. 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 action area (Figure 1) includes the EFSR, from about 1,200 ft. upstream from the existing bridge and extends downstream approximately 1,500 feet downstream of the existing diversion, which is the furthest downstream project activity, and likely beyond any instream sediment effects from project actions. This extent was delineated based on expectations of the project's potential influence on noise (upstream disturbance) and turbidity and includes a total of approximately 0.40 miles of the EFSR. Also included in the action area are all access routes, and the footprint of all shore-based project elements (e.g., staging, new/old ditch and POD, old/new fish screen, etc.)

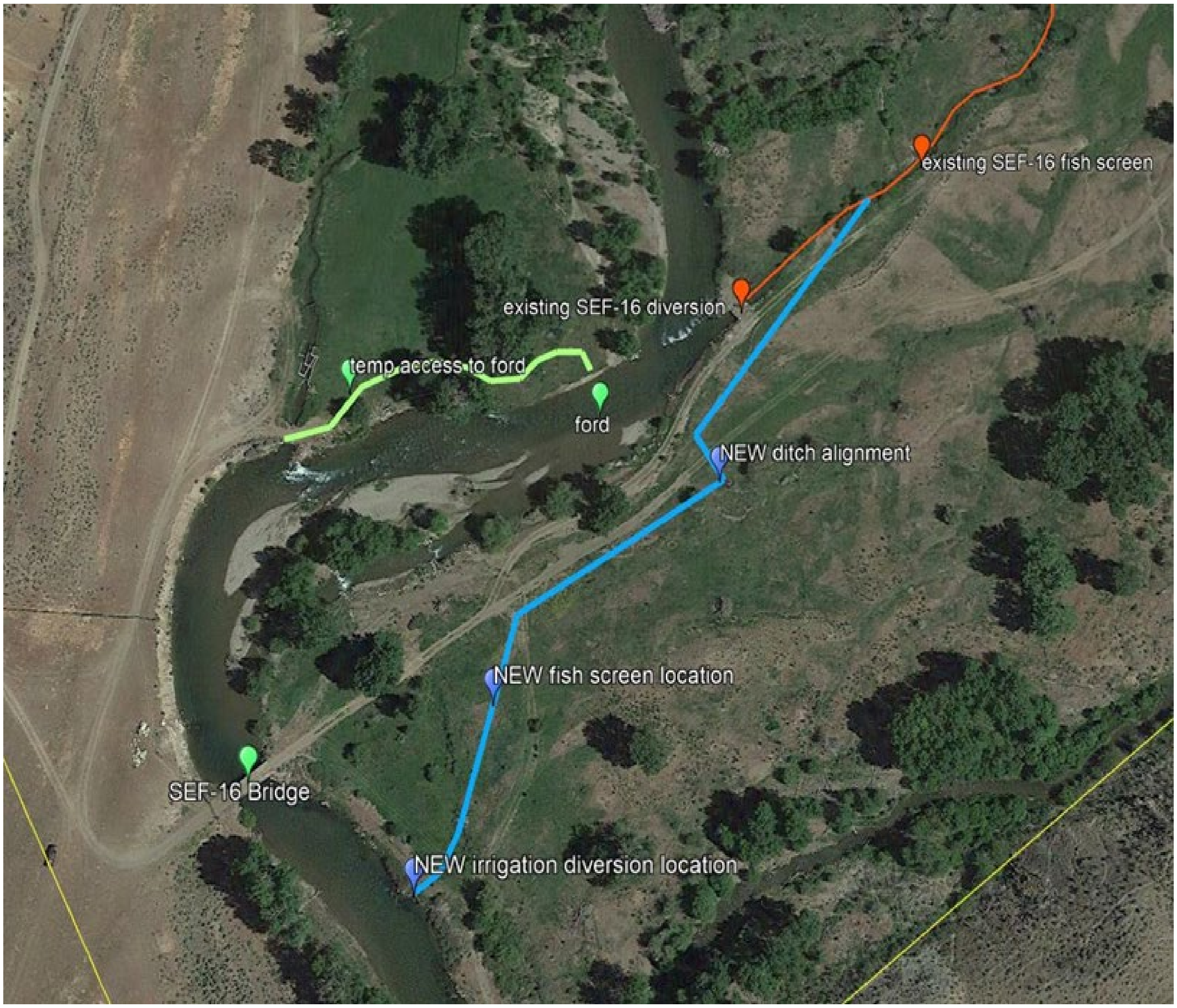

Figure 1. Principle project area and work elements.

2.3. 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 listed species or designated critical habitat caused by the 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 lies entirely on private land managed for hay and livestock production. The EFSR is the upper-most major fork of the Salmon River, and runs north to the Salmon River for about 34 miles. The EFSR occupies a narrow valley, surrounded by steep sagebrush hills. The river valley consists of large meadows vegetated with thick grasses and riparian brush including willows, rush, wild rose and groves of cottonwoods. Sagebrush covers the terraces. The bottomlands of the EFSR in the action area are privately ranched, high-density, wintertime cattle operations, and the project area is located within a historically ranched property, in which the riparian habitat has been degraded by construction of at least three irrigation ditches, grazing, agricultural cultivation, and gravel borrows. Irrigation diversion reduces the quantity of water in the action area, likely reducing the growth and survival of fish through lost habitat quantity and quality. The project site has been heavily grazed for many decades, with significant reductions of riparian shrubs and trees from historical densities (Figure 2). The riverbanks and floodplains are largely denuded of vegetative cover and streambanks are actively eroding and stabilized with large rock where infrastructure is present. As a result, riparian habitats are not functioning effectively for fish habitat needs. There has been extensive land disturbance in the action area associated with the existing bridge and its abutments and development on either side of the stream (roads, buildings, and parking lots). Upstream land uses such as agriculture, water withdrawals, and development have also contributed to degraded habitat in the action area. These activities, both within the action area and upstream from it, have caused the following impacts to stream habitat in the action area.

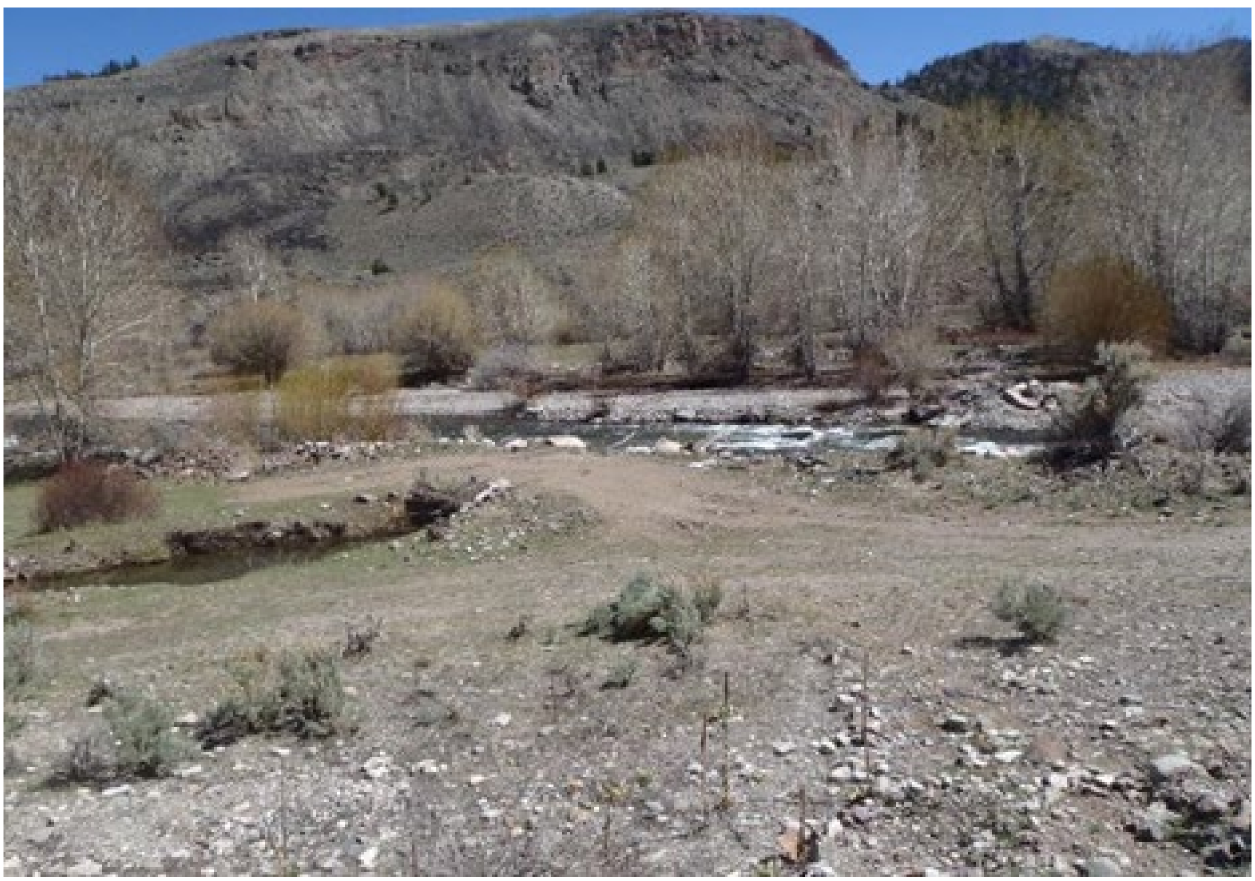

Figure 2. Poor riparian conditions along the EFSR immediately downstream of the proposed bridge replacement site. Also shown is the EFSR-17 irrigation ditch and ranch roads, which influence vegetative conditions.

In the action area, fish habitat in the EFSR is functioning below its potential (see Appendix A, "Population and Environmental Baseline Conditions" for a copy of the matrix of environmental pathways conditions provided by the BPA). In many places, riverbanks are bare and actively eroding. Fill and riprap have been used at the existing bridge site, and along riverbanks downstream, to narrow the river and harden the bank to address erosion. River movement across the floodplain and floodplain connectivity is lacking, as the stream is confined to its channel by the extensive riprap. Where riprap is absent (east bank downstream of bridge), side channels are present and floodplain access is functioning, although influenced by west side bank hardening and private land grazing practices.

Sedimentation (i.e., delivery of fine material) is high along this river, given the free access to it in many places by cattle, and the lack of filtering vegetation along its banks. High flow periods, however, provide sufficient flows to regularly move gravels and substrate embeddedness appears low. The riverbed at the construction sites are primarily clean cobble and gravel as a result. Instream structure is lacking through much of the reach, though some alcoves and two side channel complexes (one above and one below the project site) are available and functional with instream log and logjam habitat features and ample shrub and tree overhanging vegetative cover. Continued grazing along the EFSR prevents establishment of riparian vegetation and introduces sediment from trampling in the stream and on streambanks.

Despite degraded habitat conditions, IDFG has observed Chinook salmon migrating, rearing, and spawning in the action area (BPA 2021). Water temperatures remain appropriate, likely due to the basin's exposure and high elevation. Adults migrate into the river between early June and late August; survey records show them spawning in the mainstem river (including the action area) from August 23 to September 30; with juveniles rearing in the river at all times. Rearing juveniles are typically present at high densities (visual observations only, no survey or density records are available; W. Schoby, IDFG Fish Biologist, personal communication).

Steelhead migrate into the action area between February 1 and May 30 and spawn there from March 15 through June 15. Juveniles are present year-round.

2.4. Effects of the Action

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

2.4.1. Effects to Species

The actions are proposed to benefit ESA-listed species in the action area. Specifically, replacing the derelict EF-16 fish screen is anticipated to improve the screen's effectiveness by bringing the structure into compliance with NMFS criteria (2011). Also, the new screen bypass location will discharge directly to the EFSR, avoiding the current discharge into an intermittent side channel where fish may have been historically injured and/or killed. Installation, and future operation of, a properly constructed irrigation diversion and control gates will improve the management of water delivery to help maintain instream flows, prevent POD washouts during high flows and thus reduce the almost annual turbidity and sedimentation that results. Elimination of the current push-up diversion dam will also eliminate routine instream work necessary to reconstruct the POD following the regular washouts. Past maintenance of the POD likely occurred outside preferred work windows and without adequate conservation measures. As such, that work likely harmed and/or killed juvenile fish when it occurred. Properly sized and constructed bridges maintain better instream aquatic habitat conditions than bridges that artificially constrict flows. The new bridge will be nearly twice as wide as the current, highly constricting, crossing. This is expected to reduce the ongoing downstream bank erosion and riprap cycle occurring for the past several decades. This can reasonably be expected to improve spawning and rearing conditions and thus growth and survival of fish in the action area. The actions proposed, therefore, are expected to have long-term (up to 50 years or more) beneficial effects for Snake River Basin steelhead and Snake River spring/summer Chinook salmon that migrate through, spawn, or rear in the action area.

Implementation of these actions requires initial ground disturbance and instream work and those activities will have temporary adverse effects on fish. The in-water portion of the proposed action will take place sometime between July 7 and August 15. Bridge replacement may occur in 2021, followed by POD and screen replacement in 2022, or all activities could occur in 2022. Adult Chinook salmon and juvenile Chinook salmon and steelhead will likely be present during these times. The work window avoids spawning and/or incubation periods for both species (USBWP 2005) and spawning effects or effects to embryos are not expected. Adult Chinook salmon hold in security cover until spawning begins in late August. In the action area, security cover for adults is mostly limited to deep-water areas in pools, particularly the pool beneath the bridge replacement site.

Adult Chinook salmon in the action area could experience the following incidental adverse effects from the proposed action:

- Displacement from security cover caused by construction activities (i.e., noise and operation in/above water and hazing during fish salvage and ford use).

- Exposure to temporary turbidity plumes downstream from in-water work sites and the ford crossing.

- Long-term minor reduction of water quantity in habitat between the new and old POD.

- Potential exposure to chemical contamination.

- Exposure to increased sediment deposition.

Juvenile steelhead in the action area could experience the same adverse effects as described above for adults and:

- Death or injury from dewatering and fish salvage.
- Death or injury from crushing during ford use.

The likelihood of exposure and the magnitude of response to these effects of the action are discussed below.

2.4.1.1. Noise and Disturbance

Noise from construction equipment will not rise to the decibel level known to physically harm fish (FHWA 2008; Wysocki et al. 2007). Construction noise or visual stimulus may disturb nearby adult Chinook salmon and juvenile steelhead and Chinook salmon and cause them to move away from the worksites and/or ford location. If fish move, they are expected to move short distances to an area where they feel more secure, and only for a few hours in any given day (Grant and Noakes 1987; Ries 1995; Olson 1996; SNF 2009). Because the stream habitat near the worksite site is relatively uniform, we expect that fish will be temporarily displaced into nearby areas. It is possible some fish could relocated to less-suitable habitats where they may find less food or cover and where they could experience increased stress, but that impact is expected to be minor given short movement distances and nearby suitable habitat. It is also possible displaced fish would compete with other fish currently occupying that habitat. Competition for resources and security could have impacts on foraging effectiveness, which could influence individual fish growth if prolonged or severe, neither of which are expected with this temporary action. Individual disturbances will last minutes to days and span several weeks of time. Although some fish may be disturbed and move multiple times over the course of construction, the impacts are expected to be limited to minor behavioral modifications and not rise to biologically meaningful effects.

Adult Chinook salmon are likely to be displaced away from security cover found in the deep water beneath the bridge. This is most likely to occur when removing the current bridge deck and abutments/fill, and during placement of the new bridge deck. Displaced fish are expected to move up or downstream to other security cover present in the action area. The short movements will occur intermittently over the course of construction activities and some fish could move back and forth several times. We do not know with certainty the actual effect on exposed fish. However, there are several other deep pools within several hundred feet and adequate security cover is believed to exist in the action area for the number of fish expected to be present in the affected pool. Although the action proposes to use an ATV to haze adult fish from the ford (if present) before it is used by equipment, NMFS finds little chance that adult fish will be in the shallow ford crossing during the proposed implementation period, several weeks prior to spawning. The ford's depth averages about 18 inches, but lacks cover typically associated with adult use during pre-spawn staging. It is possible migrating fish could be moving through the ford when equipment or ATV attempts to cross. If exposed, effects are expected to be limited to minor behavioral modifications, with fish continuing to migrate unharmed.

2.4.1.2. Fish Salvage

Dewatering at the new headgate location is expected to require fish salvage, the goal being to prevent fish from being stranded and/or crushed during construction. Trained fisheries biologists, using NMFS electrofishing criteria (2000), will first attempt to herd fish out of the isolated area. Electrofishing will follow in order to capture remaining fish. Captured fish will be expediently released in a safe location with minimal handling. Adhering to the established conservation measures will minimize the risk of injury and mortality to ESA-listed fish to the extent possible. However, capturing and handling fish causes short-term stress for all individuals (Frisch and Anderson 2000; Hemre and Krogdahl 1996; Olla et al. 1995) and is likely to cause harm or death to some individuals, particularly those exposed to electrofishing (McMichael et al. 1998; Nielson 1998). Additionally, a small number of fish may not be found by the fish capture crew and could end up stranded. However, stranding has a low likelihood here given the small size of the area dewatered (approximately 800 square feet) and because only a portion of the streamside channel area will be isolated, not the entire channel width; facilitating ready access to temporary refugia.

Electrofishing can cause spinal injury to individual fish, which can lead to slower growth rates (Dalbey et al. 1996). Following NMFS' (2000) electrofishing guidelines will minimize the levels of stress and mortality related to electrofishing. McMichael et al. (1998) found a 5.1 percent injury rate for juvenile Middle Columbia River steelhead captured by electrofishing in the Yakima River sub-basin. A literature review by Nielson (1998), on the other hand, suggests that up to 25 percent of the total number of fish electro-fished could be injured.

For this project, we make the following assumptions and estimates about injury and death rates during fish salvage activities.

- An area of up to 800 square feet of the EFSR channel will be dewatered and salvaged.

- Juvenile fish densities are assumed to be high (BPA 2021), but there are no fish density data available for the action area. We applied the estimated fish densities identified in Hall-Griswold and Petrosky (1996) associated with "good" habitat conditions. We did not apply values for excellent rearing habitat due to the degraded baseline conditions. This corresponds to fish densities of approximately 1.5 juvenile steelhead and 8.3 juvenile Chinook salmon per 100 square feet.

- Based on these assumptions, we estimate that up to 12 juvenile steelhead and up to 66 juvenile Chinook salmon could be present in the de-watered area.

- Fifty percent of fish present will likely volitionally leave dewatered areas as streamflow is cut off and avoid capture/salvage and 50 percent (6 juvenile steelhead and 33 juvenile Chinook salmon) may be salvaged and handled, a portion of which may be injured, killed, and/or stranded.

2.4.1.3. Effects of Ford Use and Other In-water work

Accessing the east side of the EFSR will require fording the river an estimated 51 times in 15 different crossing events (BPA 2021). Equipment fording the river is expected to include loaded and unloaded cement trucks, excavators, ATVs, and dump trucks. IDFG anticipates building the new bridge first, which will reduce the need for fording is by smaller vehicles, but weight restrictions prevent its use by other equipment.

The proposed ford site is currently used to cross tractors and other ranch equipment when access to the east side of the EFSR is required by the landowner. Substrate in the ford consists of small gravels up to large cobbles and depths average about 18-inches with a max depth of about 24 inches expected during the proposed work window. Although about 100 feet of riverbed will be traversed, only 60 feet are expected to be wet when crossings occur.

Machinery fording within occupied habitat is likely to displace and/or harm fish that are present. Timing the project to occur between July 7 and August 15, and completing redd surveys before and during construction will avoid exposure to redds and actively spawning fish. Staging adult Chinook salmon and juvenile Chinook and steelhead may be present during the proposed construction window. Although fish are expected to temporarily avoid the work area during daytime construction periods, fish passage will be maintained throughout construction and no migration interruptions are expected.

All adult, and most juvenile fish, are expected to flee the ford area as equipment approaches and thus avoid harm. However, juvenile fish are known to seek refuge in stream substrate, with larger cobble more preferable than small gravel due to more useful interstitial space (Ligon et al. 2016; Thurow et al. 2020) and some juvenile fish could be crushed by equipment when fording. We assumed crushing is most likely to occur during the first vehicle crossing on any given day, and that effects may be reduced if multiple vehicles cross in close succession. BPA and IDFG estimate approximately 51 round trip ford crossings will occur and that they will be spread across 15 discreet crossing events[2] (BPA 2021). We assumed each of the 15 events will occur in one day and that each day's crossings will affect fish present in the crossing. Also, stream substrate will become less preferable as refugia with increasing ford crossings as substrate is compacted and size and number of interstitial spaces temporarily decreases—suggesting crushing potential will decrease over the course of the work period. The ford is not high quality juvenile rearing habitat, as it is fast moving riffle habitat with little cover. And most fish are likely to be present near the shoreline (Holecek et al. 2009). Therefore, the proposed fording is most likely to cause intermittent avoidance of the crossing site as vehicles ford the river. However, equipment is likely to crush juvenile fish electing to hide in substrate instead of fleeing. Because of a lack of data on number of fish expected to flee the site, we assumed up to 25 percent of pre-disturbance fish will be exposed to potential crushing.

Dump truck tires and excavator tracks are approximately 2 feet wide or less, and pickup tire tracks are about 1 foot wide. All equipment and pickups will use the same crossing, generally compacting the same gravels during each event. Fish hiding in substrate outside the compacted area are not expected to be crushed. The ford crossing is expected to be wet for about 60 feet when used, but juvenile fish habitat is only expected to be present near the shoreline, so we assumed 15 feet of habitat affected on each side of the ford (30 feet total) has potential for crushing. Applying the 2-foot-wide compacted area for each side of the vehicles (4 feet total), approximately 120 square feet of refugia will be affected. Applying the same fish densities as above, we estimate that no more than one juvenile steelhead and three juvenile Chinook may be crushed during each discreet ford event. Since 15 discrete events are expected, approximately 15 juvenile steelhead and 45 juvenile Chinook may be crushed.

[2] A number of ford crossings clustered together, likely within 1 day.

Removal of the existing push-up dam will occur in flowing water, although equipment will operate from the bank as much as practicable. Any excavation that occurs in live water may crush juvenile fish that do not flee the small work area. Only six excavator buckets of material will be removed, suggesting work will take less than 30 minutes to complete. Using the same fish densities and other assumptions noted above, and assuming approximately 100 square feet of substrate disturbance (Personal Communication, J. Bragg, IDFG Engineer) we estimate that up to one juvenile steelhead and up to two juvenile Chinook salmon could be inadvertently killed.

The removal and reconstruction of the push-up dam have occurred almost annually for the life of the diversion. Implementing the proposed action will eliminate this recurring impact, reducing both the frequency of disturbance and reducing the number of fish killed. Since the entire push-up dam is reconstructed in some years and they actively excavate material from the streambed, disturbance is assumed at least twice as large as the area proposed to be removed, resulting in about 200 square feet of annual disturbance that will no longer occur. This equates to approximately two juvenile steelhead and four juvenile Chinook salmon not killed each year due to the action.

2.4.1.4. Turbidity

The effects of increased suspended sediment on salmonids vary based on exposure time and concentration. These effects were reviewed by Newcombe and Jensen (1996) and range from avoidance response, to minor physiological stress from increased rate of coughing, to death. Salmonids are relatively tolerant of low to moderate levels of suspended sediment (Gregory and Northcote 1993) and they tend to avoid suspended sediment above certain concentrations (Servizi and Martens 1992; McLeay et al. 1987). Avoidance behavior can mitigate adverse effects when fish are capable of moving to an area with lower sediment concentrations. Researchers have reported thresholds for salmonid avoidance behavior at turbidities ranging from 30 to 70 NTU (Lloyd 1987; Servizi and Martens 1992; Berg and Northcote 1985).

The proposed action includes multiple conservation measures aimed at preventing sediment from entering the EFSR during construction, thus minimizing potential increases in turbidity. Despite implementation of conservation measures, turbidity plumes extending downstream from the construction site are likely during the following activities:

- During ford use. The BPA (2021) provided personal observations from IDFG fisheries biologist W. Schoby indicating an excavator and a herd of cows crossing at this ford showed no visible exceedance of 50 NTU and approximately 200 to 500 feet of river was affected. Given this observation, only minor behavioral effects are expected to occur in response to turbidity pulses generated by ford use.

- During installation and removal of cofferdams around the dewatered headgate installation site (approximately 800 square feet). Use of clean gravel-filled super-sacks, operating from the shore during low water, and use of pumps and onshore sediment retention for pump discharge are all expected to substantially minimize turbidity production. Monitoring of turbidity is also expected to keep turbidity plumes from exceeding 50

NTU, limiting effects to minor behavioral modifications for exposed fish immediately downstream.

- During removal of existing bridge abutments. Deep pool habitat at the abutments prevents traditional dewatering. Right and left bank treatments here are approximately 350 and 500 square feet, respectively. Material removal is anticipated to produce little sediment/turbidity. The right bank abutment sits on imported material atop a bedrock shelf above the river, allowing removal without disturbing the riverbank and outside the wetted area. The left bank abutment sits on imported material above large imported boulders and riprap at the water's edge, allowing its removal without disturbing the riverbank. These imported boulders and riprap contain very little fine material, and thus working without dewatering is not expected to increase the amount of turbidity or the effects from it. Turbidity generated from this work is expected to be limited to less than 50 NTU, per monitoring and absence of in-channel work, and thus effects to fish exposed to plumes will be minor behavioral modifications.

- During instream removal of about 20 feet of the existing push-up dam from the EFSR. IDFG estimates about six-excavator bucket scoops of material will be removed while working from the bank. The remainder of the dam's material will be removed by subsequent high flows, similar to what occurs under the baseline management. Turbidity generated from this work is expected to be limited to less than 50 NTU, per monitoring, and effects to fish exposed to plumes will be minor behavioral modifications.

Overall, fish are not expected to be exposed to turbidity plumes greater than 50 NTU over background. All turbidity pulses and plumes will be temporary, likely lasting less than an hour or two. All Chinook salmon and steelhead will likely respond to the short-term pulses or low intensity turbidity plumes by avoiding them and temporarily seeking nearby refuge. These effects are minor behavioral changes and are not expected to harm exposed individuals.

2.4.1.5. Chemical Contamination

Use of construction equipment and heavy machinery adjacent to stream channels poses the risk of an accidental spill of fuel, lubricants, hydraulic fluid, antifreeze, or similar contaminants into the riparian zone, or directly into the water. If these contaminants enter the water, the substances could adversely affect habitat, injure or kill aquatic food organisms, or directly impact ESA-listed species (e.g., Neff 1985; Staples et al. 2001). The proposed action includes multiple conservation measures aimed at minimizing the risk of fuel or oil leakage into the stream. Based on the past success of these types of conservation measures in other projects, negative impacts to ESA-listed fish and fish habitat from fuel spills or leaks are unlikely.

2.4.1.6. Sediment Deposition

Turbidity plumes from construction work will deposit a small amount of sediment in the EFSR downstream from the bridge replacement site, the new POD headgate, the ford, and the old POD. Effects to individual fish could include reduction of available cover for juveniles or changes to primary and secondary productivity, affecting food supply for the fish. As described above in the

Turbidity section, only small amounts of sediment are expected to be mobilized, thus there will only be a small amount of sediment available for deposition. Because of the expected effectiveness of the proposed sediment control BMPs, NMFS does not expect that enough sediment deposition will take place to alter salmonid use of the habitat. Additionally, it is unlikely that primary or secondary production will be meaningfully affected.

2.4.1.7. Effects of POD Relocation (Water Quantity)

The action will relocate the EF-16 POD upstream, resulting in future water withdrawals occurring about 1,000 feet farther upstream than would occur without the action. Although the quantity of water diverted from the POD will not change in any way, approximately 1,000 feet of the EFSR will experience slightly reduced flows. Up to 10.2 cubic feet per second (cfs) of water can be diverted from the EF-16 POD between March 1 and October 31. The new POD will include a lockable and adjustable headgate and a measuring device, and will not modify the Idaho Department of Water Resources (IDWR) approved water rights or change the place of use in any way. As a result, no change in the amount of water diverted will occur.

Water quantity is identified as a limiting factor in the population, and within the action area and having more water present in the action area would likely improve fish habitat conditions and thus improve fish growth and survival. Relocating the POD upstream is necessary to bypass fish into perennial stream sections, an improvement over current conditions. The relocation also eliminates the annual push-up dam construction at the current POD, reducing annual harm to fish and habitat. Current streamflow's below the existing POD is sufficient to provide fish passage for all species and life stages. Preliminary information presented in NMFS' draft 2021-status review (unpublished data) indicates the EFSR spring/summer Chinook population exhibits the second highest freshwater productivity index for the ESU and is comparable to wilderness populations with no flow impairments. This suggests the streamflow present in the population is meeting basic life history needs of Chinook salmon, although additional flow would likely still be beneficial. There is no population-specific freshwater productivity index for Snake River Basin steelhead, but we assume the EFSR population's productivity likely mirrors that exhibited for Chinook salmon. In addition to using the same mainstem habitats (although less frequently), steelhead rely on tributary habitat for spawning and rearing and most tributaries in the population lie within wilderness areas. For these reasons, steelhead habitat is expected to be of similar or higher quality than Chinook habitat and the impact of flow on the population is likely slightly less.

Tennant (1976) describes a reconnaissance-level habitat evaluation based on historic discharge records. This method has been applied to warm and cold-water streams in the Midwest, Great Plains, and Intermountain West, and is based on measured pre- and post-diversion stream widths, average depths, and average velocities in 11 streams in Montana, Wyoming, and Nebraska. The results of these measurements indicated that the quality of instream habitat changed more rapidly from a flow of 10 percent of the average to no flow, than in it did in any higher range. As a result of these measurements, Tennant (1976) concluded that optimum habitat was provided by flows of 60 to100 percent of the average annual flow.

There are no stream gage data for the EFSR in the action area. An Idaho Power stream gage has recorded discharge at the mouth of the EFSR (https://idastream.idahopower.com/), approximately 15 miles downstream of the action area, from 2005 through the present. This is the closest river gauge to the facility and may not accurately reflect conditions at the site, but it does provide an approximate comparison to river flows in absence of reach-specific flow data. StreamStats is an online model (https://streamstats.usgs.gov/ss/) provided by the U.S. Geologic Service that estimates stream flow statistics for user-delineated basin areas by applying regional regression curves (Hortness and Berenbrock 2001; Hortness 2006). Stream flows from both sources are provided in Table 4, along with the percent of flow the EF-16 POD would remove if all appropriated water is removed, which rarely occurs.

Table 4. EFSR mean monthly discharge values at Idaho Power Gage 13298050, StreamStat's 50 percent exceedance flow estimates for the action area and the percent of flow maximum EF-16 diversion withdrawals represent for each month.

Month	Mean Monthly Flow @ Idaho Power Gage (cfs)	% Gage Flow Removed @ EF-16	50% Exceedance Estimate (cfs) for Action Area (i.e., StreamStat estimate)	% StreamStat Estimate Removed @ EF-16
March	103.2	9.9%	63.9 (*54.7*)	16.0%
April	156.1	6.5%	78.6 (*40.9*)	13.0%
May	477.4	2.1%	418 (*52.1*)	2.4%
June	856.6	1.2%	988 (*73.5*)	1.0%
July	436.0	2.3%	421 (*64.4*)	2.4%
August	169.2	6.0%	202 (*86.1*)	5.0%
September	134.2	7.6%	153 (*81*)	6.7%
October	143.1	7.1%	94.4 (*103*)	10.8%

Based on the Tennant method (1976), because about 84 to 99 percent of monthly river flow would remain in the river under all maximum monthly diversion scenarios, suitable instream habitat conditions should persist over the hydrograph through the 1,000-foot long EFSR reach affected by POD relocation. These impacts fall within the 60 to100 percent of mean flow Tennant (1976) identified as optimal habitat conditions for salmonids. This, combined with the small length of habitat affected (1,000 feet) are expected to result in minor adverse effects on growth and survival on all life stages of Chinook salmon and steelhead using the action area.

2.4.2. Effects to Critical Habitat

Implementation of the proposed project is likely to affect freshwater spawning, rearing, and migration habitat for Snake River Basin steelhead and Snake River spring/summer Chinook salmon. The PBFs that could be affected by the proposed action are water quality, water quantity, spawning substrate, natural cover, fish passage, and natural cover. Most effects were discussed in the preceding section addressing species, where applicable, those sections are incorporated into this section by reference to avoid redundancy.

Water Quality. The proposed action could negatively affect water quality through chemical contamination or short-term increases in turbidity. As described above in Section 2.4.1.5, we expect the proposed conservation measures will prevent leaks or spills from machinery from entering the EFSR. As discussed in Section 2.4.1.4, we expect turbidity increases during dewatering and rewatering of the new POD site, when removing historic bridge abutment fill, during equipment use of the stream ford, and during removal of about 100 square feet of the abandoned POD. All turbidity increases will be temporary (less than a couple hours) and be low intensity (less than 50 NTU) due to continual monitoring and real-time modification of activities as necessary. Effects will likely extend 500 feet to 1,000 feet downstream of individual sources and most pulses/plumes will only affect a portion of the channel width. These impacts will not reduce the conservation value of critical habitat at the scale of the action area because the effects are temporary and of low intensity.

Water Quantity. Although no changes in the amount of water diverted or applied to irrigated fields will result from the proposed action, approximately 1,000 feet of EFSR spawning, rearing, and migration habitat will experience up to 10.2 cfs less water during the irrigation season (i.e., May 1 to October 31) as a result of moving the POD upstream. As discussed in Section 2.4.1.6, the affected reach will still carry between 84 and 99 percent of the estimated monthly flow during irrigation season. This is within the 60 to100 percent range identified by Tennant (1976) as optimal for salmonids. Therefore, the small amount of water removed from a short distance is expected to have little effect on the conservation value of the action area's habitat.

Substrate. The turbidity plumes caused by proposed construction work will also deposit small quantities of sediment on stream substrates within the areas affected by the plumes. As previously mentioned, the plumes will affect 500 to 1,000-foot-long reaches with all but the ford's plumes being limited to narrow sections of channel. Ford crossings will likely generate substrate deposition across the entire channel. Regardless, in all cases, keeping turbidity less than 50 NTU and less than 1 to 2 hours is expected to generate only a fine surface film on affected substrates. This type of effect will have little to no influence on embeddedness or aquatic macroinvertebrates in these areas. Additionally, it is not expected to alter salmonid use of the habitat. Sediment will be mobilized during subsequent storm events, such as fall rain and snowmelt events. No long-term impacts area expected.

Ford crossing will occur in a riffle that does occasionally support Chinook salmon spawning. All ford crossings will occur prior to redd construction and after redd surveys confirm their absence, precluding direct impacts to redds. Regardless, repeated crossings with heavy equipment (e.g., excavators, concrete trucks, dump trucks, etc.) will temporarily compact potential spawning gravel. Impacts are anticipated to be short term, lasting until the next season's high water redistributes gravel and cobble material. High quality Chinook salmon spawning habitat is plentiful (C. Fealko, NMFS Biologist, professional opinion) and we believe the EFSR is likely consistent with recent modeling in other sub-basins, which suggests spawning habitat is not limiting anadromous fish production (OSC 2019). Given the affected substrate will be limited to one ford crossing location, the total width of compacted substrates will be limited to about 8 feet across the one cross section, and habitat quality will recover during high flows, the action is not expected to reduce the conservation value of affected habitat in the action area.

Natural Cover. Natural cover includes shade, large wood, logjams, beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks. The action will not negatively affect any natural cover elements. Removal of the existing POD's push-up dam may improve cover by restoring natural substrate composition and facilitating bank restoration where the ditch is reclaimed. No riparian vegetation will be impacted. Because the existing streambank adjacent to the bridge is already hardened and constrained with no mature vegetation (or prospect for mature vegetation to develop in the future), installing new riprap or the retaining wall will not affect natural cover at the project site and will not reduce the conservation value of critical habitat. Increasing the width of the bridge is not expected to reduce downstream bank stability. As conditions improve over time, riparian vegetation may establish, facilitating site-scale improvements in cover. Impacts are likely too small to meaningfully influence the conservation value of the action area habitat.

Floodplain Connectivity. Increasing the current bridge span from 44 feet to 75 feet will dramatically improve floodplain connectivity at the site-scale. However, bankfull width in the action area is estimated to be approximately 120 feet, meaning the new bridge falls short of fully restoring floodplain access. Because of this, the new bridge will continue to constrain flood flows for the next several decades. Bank stability is compromised immediately downstream of the current crossing, likely to the structures' confinement of high flows, which increases shear stress. Increasing the structure's width by 31 feet will undoubtedly improve upon the current situation, but some impairment will continue into the future. The area affected by the confined crossing is likely less than a few hundred feet as extensive side channels are present along the east bank and overbank flows are frequent there. The small amount of habitat that will continue to be impaired by the restricted crossing is expected to have minor effects on the conservation value of action area's habitat.

Free Passage. Replacing the existing fish screen with a more modern and NMFS (2011) compliant structure, along with improving the bypass outlet location, will improve fish passage in the action area for the next several decades. Fish passage will remain unaffected during construction and following construction as only small areas will be dewatered and fording or work adjacent to the channel will not affect passage conditions. Adequate flow will remain in the 1,000-foot-long reach between the new and old POD to provide passage for all life stages of salmonids, even during the temporary timeframe.

Riparian Vegetation. No riparian vegetation exists in the proposed project footprint. Disturbed areas contain heavily grazed pasture grasses, rocks, or weeds. No woody vegetation will be removed or otherwise affected. Disturbed areas will be revegetated with native species following project completion, allowing for minor improvement in conditions. Woody vegetation clumps will also be installed at the upstream and downstream terminus of the new bridge's abutments, providing a minor site-scale benefit. These effects will not meaningfully affect the conservation value of the action area's habitat.

2.5. 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.

All of the action area is privately owned. Because of the existing infrastructure in the action area, NMFS assumes that current private land use associated effects will continue into the future at their current rate. Specifically, riparian vegetation will continue to be suppressed, bank stability on the EFSR and adjacent side channels will continue to vary from unstable to stable, as livestock management influences grazed areas. Sediment will also continue to be delivered to the EFSR, potentially affecting incubation of anadromous fish and growth and survival of juveniles. Water diversion will also continue and action area habitats will experience slight reductions in flow volume, likely maintaining this action's current influence on growth and survival of Chinook salmon and steelhead using the action area.

2.6. Integration and Synthesis

In this section, we add the effects of the action (Section 2.4) to the environmental baseline (Section 2.3) and the cumulative effects (Section 2.5), taking into account the status of the species and critical habitat (Section 2.1), 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 for the conservation of the species. This action is a restoration project, with the intention of reducing impacts on fish and habitat. Incidental to the restoration activities, construction actions will create incidental one-time adverse effects to the species. Our analyses addressed both the benefits to the species and the incidental harm caused. No net benefit analysis was performed. It is important to consider the full complement of restoration action's impacts on both species and habitat when making determinations regarding species jeopardy and adverse modification of critical habitat.

Species. Snake River Basin steelhead and Snake River spring/summer Chinook salmon abundance experienced population increases, relative to time of ESA listing, through the mid-2000s. During the past 5 years, abundance has dropped, with many populations nearing levels observed when the species were listed. All individual populations, including those affected by this action, are still below recovery plan abundance and productivity targets, and the species remain threatened with extinction. Current abundance/productivity estimates for the EFSR population of steelhead remains at a moderate risk for abundance/productivity due to the high uncertainty associated with current estimates, which are only available for adults passing Lower Granite Dam (NWFSC 2015). For the EFSR Chinook salmon population, the overall viability risk rating remains high. In addition, climate factors will likely make it more challenging to increase abundance and recover the species (NMFS 2017). Stream habitat in the action area exhibits many of problems identified as limiting the individual populations: poor riparian condition, excess sediment delivery, compromised downstream passage, reduced summer flow, low instream complexity, and elevated water temperatures.

The proposed actions are intended to improve fish survival in the action area for the next 30 years. Specifically, downstream passage will be improved by replacing the EF-16 fish screen with a NMFS-approved design, eliminating screen impingement and inadvertent ditch entrainment. NMFS did not calculate the number of fish potentially benefited, but impacts are expected to be significant at the population scale given the amount of spawning and rearing habitat upstream of the POD. Relocating the screen will also eliminate fish being bypassed from the current screen into an intermittent side channel—benefiting future generations of migrating juvenile fish. Relocating the EF-16 POD will also eliminate the need to for annual push-up dam construction, which is estimated to have previously killed up to two juvenile steelhead and up to four juvenile Chinook salmon annually. Push-up dam construction also regularly disrupted habitat-forming processes at the site, reducing the quality of available habitat and generating minor sediment loads.

Action area water quantity is functioning at risk, but affected populations appear to be maintaining high freshwater productivity, relative to other populations in the MPG. Relocating the POD upstream about 1,000 feet increases the amount of habitat affected by the current diversion practices. This will cause a small reduction in productivity of the affected 1,000-foot-long reach. The new POD site is the closest available option and during planning, was identified as appropriate to gain the benefits of a new fish screen, improved bypass location, and eliminate the annual push-up dam construction. Although this is a long-term adverse effect on habitat and the species residing there, the affected area is small and will extend the current baseline conditions upstream 1,000 feet. This impact was determined acceptable to gain the described benefits.

Construction activities are expected to scare adult Chinook salmon out of deep water holding habitat or habitat in the ford, if present when it is used. These temporary displacements are expected to be behavioral modifications with little to no influence on affected fish's survival. Adult steelhead will not be affected. Juvenile Chinook salmon and steelhead in the action area could potentially experience adverse effects associated with noise, chemicals, and turbidity/sediment; however, these effects are expected to be minor to none because of the proposed conservation measures and the ability of fish to move out of the action area during construction. The following adverse effects to the EFSR steelhead and Chinook salmon populations are also expected:

- Up to 6 juvenile steelhead and 33 juvenile Chinook salmon are expected to be subject to fish salvage efforts, where up to two steelhead and nine Chinook could be inadvertently harmed or killed. An unknown number of fish may be may be stranded due to dewatering at the new dewatered POD construction site.

- Each discreet ford crossing (multiple vehicles crossing the ford in relatively rapid succession—i.e., 1 day) is estimated to crush one juvenile steelhead and three juvenile Chinook salmon. Since 15 discrete events are expected, approximately 15 juvenile steelhead and 45 juvenile Chinook may be crushed during ford use.

- Up to one juvenile steelhead and up to two juvenile Chinook salmon could be inadvertently killed during the proposed removal of 100 square feet of the existing POD.

- Up to 10.2 cfs of irrigation water will be removed from 1,000 linear feet of the EFSR due to POD relocation. This will likely have minor reductions in habitat quality, including access to cover.

Given mean smolt-to-adult return rates of approximately 0.54 percent (Chinook) and 2.52 percent (Upper Salmon MPG of steelhead) over the past 20 years (Columbia River DART, 2020), the total cumulative injury or loss of up to 22 juvenile steelhead and 80 juvenile Chinook salmon from the EFSR populations would equate to a one-time loss of less than one adult equivalent (each species) returning to spawn several years post-construction. This is likely an overestimate as we included all fish handled at the POD dewatering site as mortalities, and most are actually anticipated to be released safely. Minor behavioral effects caused by turbidity, noise, and disturbances are not expected to result in harm or long-term effects. The estimated impact at the population scale is too small to reduce the abundance and productivity of the affected populations. Reduced flow in 1,000 feet of the EFSR during irrigation season will also reduce growth and survival, likely mirroring the conditions currently found downstream of existing POD. The change is expected to be minor given the amount of water remaining in the channel and based on the current productivity of the affected populations. There will also be a long-term benefit to the populations due to improved screening and better bypass conditions. Overall, we do not anticipate an adverse effect on the viability of the EFSR steelhead and Chinook salmon populations from the action; we also find that the action will not likely adversely affect the survival of the affected MPGs. Similarly, the adverse effects will not affect the MPGs' probability of recovery. Because we find that the proposed action will not impede the survival and recovery of the subject MPGs, we do not expects that the proposed action will impede the survival or recovery of the ESU and DPS. Long-term benefits provided by the action address recommended actions in the species' recovery plans (NMFS 2017) and are expected to have a long term, but minor positive effect on the populations, that may over time, support recovery of the subject MPGs.

Critical Habitat. Critical habitat for Snake River Basin steelhead and Snake River spring/summer Chinook salmon is present in the action area. The proposed action will cause minor temporary turbidity effects that have little impact on PBFs. Extensive ford use required to construct the new POD, fish screen, and bridge is expected to compact potential spawning gravels. Compaction may reduce the spawning habitat's value temporarily (1 to 2 years) until high flows mobilize material and restore pre-project conditions. However, due to the extremely small (a few hundred square feet) and short-lived nature of these effects, the conservation value of critical habitat at the designation scale would not likely be meaningfully affected.

2.7. Conclusion

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

2.8. Incidental Take Statement

Section 9 of the ESA and Federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without a special exemption. “Take” is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. “Harm” is further defined by regulation to include significant habitat modification or degradation that actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering (50 CFR 222.102). “Incidental take” is defined by regulation as takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant (50 CFR 402.02). Section 7(b)(4) and section 7(o)(2) of the ESA 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.

2.8.1. Amount or Extent of Take

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

- Fish handling. We anticipate that up to six juvenile steelhead and 33 juvenile Chinook salmon could be captured and handled. We also anticipate that no more than two juvenile steelhead or nine juvenile Chinook will be killed during salvage activities. The amount of take will be exceeded if the number of fish handled or killed during salvage at the new POD site exceeds these estimates.

- Equipment fording the EFSR is expected to crush approximately 15 juvenile steelhead and 45 juvenile Chinook that hide in ford substrates during their use. Because crushed fish will be trapped below the streambed, it is impossible to monitor the number of fish killed. In these instances we use a surrogate to describe the extent of incidental take, pursuant to 50 CFR 402.14[I]. For ford-related crushing, the number of fish killed is directly related to the number of discreet crossing events, which we defined as all ford events occurring within 1 day. In this instance, the extent of take will be exceeded if: (1) cumulative equipment crossings exceed 51 round trip ford crossings; and/or (2) if ford crossings occur on more than 15 individual days.

- Up to one juvenile steelhead and up to two juvenile Chinook salmon could be inadvertently killed during in-the-wet removal of approximately 100 square feet of the existing POD. Similar to above, it is not possible to monitor the number of fish killed during excavation in the channel. Pursuant to 50 CFR 402.14[I], we provided a surrogate for the extent of take anticipated. Take is directly related to the areal extent of substrate excavated in the wet. The extent of take will be exceeded if excavation of the abandoned POD disturbs more than 100 square feet of EFSR substrate.

- Removing an additional 10.2 cfs of irrigation water from 1,000 linear feet of the EFSR is likely to have minor adverse effects on growth and survival of fish in this reach relative to baseline conditions. It is not possible to measure reduced growth and survival at this scale. In this type of situation, NMFS uses a surrogate to define the extent of take associated with this pathway. In this case, the surrogate is installation of the new POD within 1,100 feet of the old POD. This is an appropriate surrogate because the area effected by the flow change is causally related to the adverse effects, and because it can be monitored to ascertain whether the extent of take has been exceeded. For this reason, the amount of take will be exceeded if the new POD is installed more than 1,100 feet upstream from the current POD[3].

2.8.2. 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, destruction, or adverse modification of critical habitat.

2.8.3. Reasonable and Prudent Measures

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

The BPA and IDFG (as the project proponent) shall:

1. Minimize incidental take from construction activities.

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

2.8.4. Terms and Conditions

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

1. To implement RPM 1 (minimize take from construction activities), the BPA and IDFG shall ensure the following by imposing funding conditions (BPA) or through contract oversight (IDFG):

    a. Ensure construction contractor slowly dewaters the cofferdam area in order to maximize volitional fish emigration and reduce salvage-related handling.

[3] Although the estimated distance is a 1,000-foot difference, NMFS applied a 1,100-foot trigger to account for on-the-ground differences that may differ from the original estimate.

b. Ensure that construction contractor's equipment crosses the stream only at the designated temporary ford crossing location and that equipment uses the same tracked footprint during each and every discreet crossing event.

    i. Stakes with flagging, or other markings shall be used to identify the crossing.

c. Schedule ford crossings such that equipment, concrete trucks, and dump trucks ford the EFSR as close together in time as possible.

d. Install the new bridge as soon as possible and then utilize the bridge, as appropriate for its weight rating, to minimize the number of stream ford crossings.

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

    a. Report to NMFS the number of steelhead and Chinook salmon handled, injured, or killed during fish salvage (amount of take). Ensure that IDFG directs the construction contractor to immediately cease activities and contact NMFS if more than 6 juvenile steelhead and/or more than 33 juvenile Chinook salmon are handled during fish salvage or if more than two juvenile steelhead or nine juvenile Chinook salmon are killed during salvage.

    b. Record the number of round trip ford crossings and the number of days fording occurs to support project implementation. In the event more than 51 round trips or 15 days of ford use occur, immediately contact NMFS to reinitiate consultation.

    c. Record the area of substrate disturbed below the waterline. In the event more than 100 square feet of substrate disturbance occurs, immediately contact NMFS to reinitiate consultation.

    d. Measure the distance between the historic POD and the new POD and ensure it is less than 1,100 feet.

    Submit a monitoring report (with information on turbidity plumes[4], fish salvage, ford use, and disturbed areas) within 4 weeks of completing the project to: Snake River Basin Office email nmfswcr.srbo@noaa.gov.

2.9. 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).

[4] Monitored as part of the proposed action.

Conservation recommendations for this consultation are as follows:

1. The BPA and IDFG should continue to work with local water right holders to reduce the quantity of water diverted in the EFSR in order to improve survival of ESA-listed fish.

2. The BPA and IDFG should work with local landowners to improve riparian vegetation, floodplain access and function in the action area and wherever else conditions are degraded in the EFSR.

2.10. Reinitiation of Consultation

This concludes formal consultation for the East Fork Salmon River 16 Diversion, Screen, and Bridge Replacement Project. As 50 CFR 402.16 states, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained or is authorized by law and if: (1) the amount or extent of incidental taking specified in the ITS is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect on the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action.

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

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

This analysis is based, in part, on the EFH assessment provided by BPA 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 action area, as described in Section 2.2 of the above opinion is also EFH for Chinook salmon (PFMC 2014). The PFMC designated the following five habitat types as habitat areas of particular concern (HAPCs) for salmon: complex channel and floodplain habitat, spawning habitat, thermal refugia, estuaries, and submerged aquatic vegetation (PFMC 2014). The proposed action may adversely affect the spawning habitat HAPC. Complex channel and floodplain habitat will likely be improved by eliminating the annual push-up dam construction and increasing floodplain access at the bridge site, which will also improve bank stability and likely provide better long-term habitat. Thermal refugia is not expected to be affected by the action.

3.2. Adverse Effects on Essential Fish Habitat

In the above opinion, Section 2.4.2 discussed adverse effects of proposed ford use on stream substrate that is occasionally used for Chinook spawning habitat. Within the crossing, equipment will temporarily compact potential spawning gravel. Impacts are anticipated to be short term, lasting until the next season's high water redistributes gravel and cobble material. Effects could occur in 2 years if construction cannot be completed in 1 year. High quality Chinook salmon spawning habitat is plentiful (C. Fealko, NMFS Biologist, professional opinion) and we believe conditions in the EFSR are likely consistent with recent modeling in other sub-basins that suggests spawning habitat is not limiting anadromous fish production (OSC 2019). Given the affected substrate will be limited to one ford crossing location, the total width of compacted substrates will be limited to two 4-foot-wide cross sections. Habitat quality will recover during high flows so effects are temporary

3.3. Essential Fish Habitat Conservation Recommendations

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

1. To minimize disturbance to spawning gravel, the BPA should require the construction contractor's equipment to cross the stream only at the designated temporary ford crossing location and ensure equipment uses the same tracked footprint during each and every crossing event.

2. To minimize spawning gravel disturbance the BPA should install stakes with flagging, or other markings to identify the crossing.

3. The BPA should install the new bridge as soon as possible and then utilize the bridge, as appropriate for its weight rating, to minimize the number of stream ford crossings.

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

3.4. Statutory Response Requirement

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

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

3.5. Supplemental Consultation

The BPA 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

Section 515 of the Treasury and General Government Appropriations Act of 2001 (Public Law 106-554) (DQA) specifies three components contributing to the quality of a document. They are utility, integrity, and objectivity. This section of the opinion addresses these DQA components, documents compliance with the DQA, and certifies that this opinion has undergone pre-dissemination review.

4.1. Utility

"Utility" principally refers to ensuring that the information contained in this consultation is helpful, serviceable, and beneficial to the intended users. The intended users of this opinion are the BPA and the IDFG (project sponsor) and any of their cooperators, contractors, or permittees. Individual copies of this opinion were provided to both parties. This consultation will be posted 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 NMFS ESA Consultation Handbook, ESA regulations, 50 CFR 402.01, et seq., and the MSA implementing regulations regarding EFH, 50 CFR 600.

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

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

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

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APPENDIX A: POPULATION AND ENVIRONMENTAL BASELINE CONDITIONS

Agency/Unit: Bonneville Power Administration

FLRMP 6th HUC(s): 170602011103

Steelhead Population: Snake River Basin/Salmon River

Chinook Population: Upper Salmon River/East Fork Salmon River **Bull Trout Core Area:** Upper Salmon River

Pathways Indicators [a]	Population and Environmental Baseline	
	Baseline[6]	**Discussion of Baseline**
Sub-pop Character		
Subpopulation Size	FR	Subpopulations of Chinook, steelhead, and bull trout all below historic amounts.
Growth and Survival	FA	Lack of instream and overhanging bank cover in East Fork.
Life History Diversity and Isolation	FA	Local populations are not isolated from other populations or subpopulations; rearing and overwintering habitat deficient in mainstem East Fork.
Persistence and Genetic Integrity	FR	No threats to genetic integrity to bull trout; hatchery stock currently influences the genetics of steelhead in the action area; Chinook genetics have been influenced by hatchery releases in the past (2004–2007).
Water Quality		
Temperature	FR	Grazing has eliminated much shrub and tree cover along mainstem and tributaries, exposing flows to solar heating.
Sediment	FA	Lack of riverbank vegetation and heavy grazing result in substantial sediment loads in the East Fork.
Chemical Contaminants/Nutrients	FR	Nutrient-rich runoff from adjacent agricultural and grazing lands.
Habitat Access		
Physical Barriers	UR	Irrigation diversions in action area do not hinder salmonid movement; Velocity barrier/fish trap upstream hinders movement when operated.
Habitat Elements		
Substrate Embeddedness	FA	Embeddedness appears to be low in the reach through the action area. Confined flows (from riprap) produce flow velocities during high flow periods that keep gravels and cobbles clear of sediment in the action area.
Large Woody Debris	FR	In-stream large woody debris (LWD) is lacking in the mainstem. Side channels and alcoves do have these elements.

Pathways Indicators [a]	Population and Environmental Baseline	
	Baseline[6]	Discussion of Baseline
Sub-pop Character		
Pool Frequency	FR	Pool frequency is low because of low availability of instream or bank features to create them in the mainstem.
Pool Quality & Large Pools	FR	Pool quality is low because of lack of in-pool and in-stream habitat structures.
Off-Channel Habitat	FR	Much has been lost historically from riprap and channeling of the East Fork, reducing its connection with its floodplain, but remaining off-channel habitat is believed to be FA.
Refugia	FA	Key overwintering refugia is known to be present in side channels and alcoves.
Channel Condition and Dynamics		
Width/Depth Ratio	FA	Conditions are believed to be near natural during low-flow periods. Channel artificially narrowed only at bridge location affecting even low flows.
Streambank Condition	FR	Stream banks are lacking vegetation and are riprapped in many areas.
Floodplain Connectivity	UR	Floodplain connectivity is highly constrained given extensive riprap along banks in many places in the action area.
Flow/Hydrology		
Change in Peak/Base Flows	FA	No change to flow regimes has likely occurred beyond that from past and ongoing irrigation withdrawals.
Drainage Network Increase	FA	No increase in drainage network is suspected.
Watershed Conditions		
Road Density and Location	FA	Road density is low; None of the roads are paved, but they are typically located on gentle to rolling topography, having little direct influence on in-stream habitats.
Disturbance History	FR	Disturbance primarily extensive pasture grazing and hay production in the floodplains; and water withdrawal from the mainstem for irrigation.
Riparian Conservation Areas	FR	None
Disturbance Regime	FA	Watershed integrity is high, as much of the watershed upslope from of the floodplains is in near-natural condition.
Integration of Species and Habitat Conditions	**FR**	**While the watershed and tributaries are functioning adequately with little disturbance from up-slope land uses or road construction, the floodplains have been greatly affected by grazing, agricultural modifications, and water withdrawals. The river is artificially confined within its banks and has minimal vegetation along its banks. The numbers of juvenile fish available to use habitat each year are likely greater than the habitat can support.**

[6] FA = Functioning Appropriately, FR = Functioning at Risk, UR = Functioning at Unacceptable Risk, N = Not Applicable