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

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March 3, 2023

Mr. Calvin Terada
Director, Superfund and Emergency Management Division
U.S. Environmental Protection Agency, Region 10
1200 Sixth Avenue, Suite 155
Seattle, Washington 98101

Ms. Linda Jackson
Forest Supervisor
Payette National Forest
500 North Mission Street, Building 2
McCall, Idaho 83638

Re: Reinitiation of Endangered Species Act Section 7(a)(2) Biological Opinion and Magnuson–Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the Stibnite Administrative Settlement and Order on Consent for Removal Actions Project; Headwaters East Fork South Fork Salmon River Subwatershed, HUC 170602080201, Valley County, Idaho.

Dear Mr. Terada and Ms. Jackson:

Thank you for your letter of November 14, 2022, requesting reinitiation of consultation with NOAA's National Marine Fisheries Service (NMFS) pursuant to section 7 of the Endangered Species Act of 1973 (ESA) (16 U.S.C. 1531 et seq.) and pursuant to section 305(b) of the Magnuson–Stevens Fishery Management Act [16 U.S.C. 1855(b)] for the Stibnite Administrative Settlement and Order on Consent for Removal Actions Project (Stibnite ASAOC). The original biological opinion for the Stibnite ASAOC project was issued on June 1, 2022 (NMFS tracking number WCRO-2022-00316). The U.S. Environmental Protection Agency (EPA) and Payette National Forest (PNF) submittal included an addendum for the biological assessment (BA) that was submitted to NMFS on February 15, 2022. The addendum supplements the 2022 BA, and includes: (1) a description of the proposed action modifications; (2) new environmental baseline information; and (3) additional effects analyses. The stream diversion activities described in the 2022 BA and 2022 Stibnite ASACO biological opinion were completed in the summer and fall of 2022. Because these stream diversion activities are completed, they are not subject to this consultation. The remaining three activities, as described in the 2022 BA, are anticipated to be implemented in 2023/2024, and are subject to this consultation.

We understand that adult Chinook salmon (*Oncorhynchus tshawytscha*) were outplanted in the East Fork South Fork Salmon River upstream of the box culvert in August and September of 2022. This activity was not anticipated or evaluated in our original opinion. As a result, the proposed action previously analyzed could have effects on Chinook salmon and their designated critical habitat that were not previously considered. Further, in response to this out planting, the EPA and PNF have modified their proposed action to incorporate additional measures to minimize potential effects on Chinook salmon. For these reasons, your agencies have requested reinitiation. We agree that the new information and project modifications will not result in effects not previously considered for Snake River Basin steelhead (*O. mykiss*) or their designated critical habitat. The enclosed biological opinion (opinion) supersedes the original opinion issued on June 1, 2022 (NMFS tracking number WCRO-2022-00316); however, for efficiency purposes, we have explicitly incorporated by reference material in the original opinion that is still relevant, accurate, and based on the best available scientific information, including the steelhead analysis and conclusions.

On July 5, 2022, the U.S. District Court for the Northern District of California issued an order vacating the 2019 regulations that were revised or added to 50 CFR part 402 in 2019 ("2019 Regulations," 84 FR 44976, August 27, 2019) without making a finding on the merits. On September 21, 2022, the U.S. Court of Appeals for the Ninth Circuit granted a temporary stay of the district court's July 5 order. On November 14, 2022, the Northern District of California issued an order granting the government's request for voluntary remand without vacating the 2019 regulations. The District Court issued a slightly amended order 2 days later on November 16, 2022. As a result, the 2019 regulations remain in effect, and we are applying the 2019 regulations here. For purposes of this consultation, and in an abundance of caution, we considered whether the substantive analysis and conclusions articulated in the opinion and incidental take statement would be any different under the pre-2019 regulations. We have determined that our analysis and conclusions would not be any different.

In this opinion, NMFS concludes that the action, as proposed, is not likely to jeopardize the continued existence of Snake River spring/summer Chinook salmon or Snake River Basin steelhead. NMFS also concludes that the action will not destroy or adversely modify designated critical habitat for these species. Rationale for our conclusions is provided in the attached opinion.

As required by section 7 of the ESA, NMFS provides an incidental take statement (ITS) with the opinion. The ITS describes reasonable and prudent measures 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 EPA, PNF, and any permittee who performs any portion of the action, must comply with in order to be exempt from the ESA take prohibition. The ITS included in this opinion supersedes the original ITS provided on June 1, 2022.

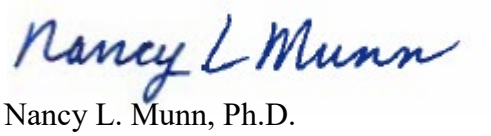
The EPA and PNF also requested reinitiation of consultation for Pacific Coast salmon essential fish habitat (EFH). This enclosed opinion includes the results of our analysis of the action's effects on EFH pursuant to section 305(b) of the MSA, and includes five Conservation Recommendations to avoid, minimize, or otherwise offset potential adverse effects on EFH.

These Conservation Recommendations are similar, but not identical to the ESA terms and conditions. Section 305(b)(4)(B) of the MSA requires Federal agencies to provide a detailed written response to NMFS within 30 days after receiving these recommendations.

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

You may contact Johnna Sandow, Boise NMFS, at (208) 378-5737 or Johnna.sandow@noaa.gov if you have any questions concerning this consultation, or if you require additional information.

Sincerely,



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

Enclosure

cc: C. Nalder – PNF
K. Hendricks – USFWS
M. Lopez – NPT
C. Colter – SBT

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

Reinitiation of Consultation for the EPA Stibnite Administrative Settlement and Order on Consent for Removal Actions Project

NMFS Consultation Number: WCRO-2022-03035

Action Agencies: U.S. Environmental Protection Agency, Region 10 and USDA Forest Service, Payette National Forest

Affected Species and NMFS' Determinations:

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

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

Date: March 3, 2023

TABLE OF CONTENTS

TABLE OF TABLES ..... **iii**
TABLE OF FIGURES ..... **iii**
ACRONYMS ..... **iv**
1. Introduction **1**
1.1. Background 1
1.2. Consultation History 1
1.3. Proposed Federal Action 3
1.3.1. Project Design Features Added or Modified 4
2. Endangered Species Act: Biological Opinion And Incidental Take Statement **5**
2.1. Analytical Approach 5
2.2. Rangewide Status of the Species and Critical Habitat 6
2.3. Action Area 11
2.4. Environmental Baseline 12
2.5. Effects of the Action 13
2.5.1. Effects to Chinook Salmon Designated Critical Habitat 14
2.5.1.1. Spawning Gravel/Substrate 14
2.5.1.2. Water Quality 16
2.5.1.3. Water Temperature 17
2.5.1.4. Food/Forage 18
2.5.1.5. Cover/Shelter 20
2.5.2. Effects to Species 20
2.5.2.1. Disturbance/Noise from Equipment Operation 20
2.5.2.2. Cofferdam Installation, Fish Salvage, and Dewatering 22
2.5.2.3. Habitat-Related Effects 23
2.6. Cumulative Effects 25
2.7. Integration and Synthesis 25
2.7.1. Designated Critical Habitat 25
2.7.2. Species 27
2.8. Conclusion 30
2.9. Incidental Take Statement 30
2.9.1. Amount or Extent of Take 31
2.9.2. Effect of the Take 33
2.9.3. Reasonable and Prudent Measures 33
2.9.4. Terms and Conditions 33
2.10. Conservation Recommendations 35

2.11. Reinitiation of Consultation 36
3. Magnuson–Stevens Fishery Conservation and Management Act Essential Fish Habitat Response 36
3.1. Essential Fish Habitat Affected by the Project 37
3.2. Adverse Effects on Essential Fish Habitat 37
3.3. Essential Fish Habitat Conservation Recommendations 38
3.4. Statutory Response Requirement 38
3.5. Supplemental Consultation 39
4. Data Quality Act Documentation and Pre-Dissemination Review 39
4.1. Utility 39
4.2. Integrity 39
4.3. Objectivity 39
References 41

TABLE OF TABLES

Table 1. Listing status, status of critical habitat designations and protective regulations, and relevant Federal Register decision notices for ESA-listed species considered in this opinion. 7

Table 2. Summary of viable salmonid population (VSP) parameter risks, current status, and proposed recovery goal for each population in the Snake River spring/summer Chinook salmon evolutionarily significant unit. 8

Table 3. Summary of viable salmonid population (VSP) parameter risks and overall current status and proposed recovery goals for each population in the Snake River Basin steelhead distinct population segment. 10

TABLE OF FIGURES

Figure 1. 7-day average of the daily maximum temperatures (degrees Celsius) in the East Fork South Fork Salmon River gage (13311000) for July through September. Data shown for years 2016–2022. A 7DADM of 13°C has been deemed to be fully protective of Chinook salmon spawning and is illustrated as the horizontal, dashed line. 13

ACRONYMS

7DADM	7-Day Average of the Daily Maximum Temperature
ASAOC	Administrative Settlement and Order on Consent
BA	Biological Assessment
BMP	Best Management Practice
CFR	Code of Federal Regulations
°C	Degrees Celsius
dB	Decibels
DQA	Data Quality Act
DPS	Distinct Population Segment
EFH	Essential Fish Habitat
EFSFSR	East Fork South Fork Salmon River
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
FR	Federal Register
HAPC	Habitat Area of Particular Concern
IDFG	Idaho Department of Fish and Game
ITS	Incidental Take Statement
MPG	Major Population Group
MSA	Magnuson–Stevens Fishery Conservation and Management Act
NMFS	National Marine Fisheries Service
NPT	Nez Perce Tribe
NTU	Nephelometric Turbidity Unit
Opinion	Biological Opinion
PBF	Physical or Biological Feature
PCE	Primary Constituent Element
PDF	Project Design Feature
Perpetua	Perpetua Resources, Inc.
PFMC	Pacific Fishery Management Council
PNF	Payette National Forest
RCA	Riparian Conservation Area
RPA	Reasonable and Prudent Alternative
RPM	Reasonable and Prudent Measure
SFSR	South Fork Salmon River
SRB	Snake River Basin
µPa	Micropascal
VSP	Viable Salmonid Population
YPP	Yellow Pine Pit

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.), as amended, and implementing regulations at 50 CFR 402.

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

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

1.2. Consultation History

On July 5, 2022, the U.S. District Court for the Northern District of California issued an order vacating the 2019 regulations that were revised or added to 50 CFR part 402 in 2019 ("2019 Regulations," see 84 FR 44976, August 27, 2019) without making a finding on the merits. On September 21, 2022, the U.S. Court of Appeals for the Ninth Circuit granted a temporary stay of the district court's July 5 order. On November 14, 2022, the Northern District of California issued an order granting the government's request for voluntary remand without vacating the 2019 regulations. The District Court issued a slightly amended order 2 days later on November 16, 2022. As a result, the 2019 regulations remain in effect, and we are applying the 2019 regulations here. For purposes of this consultation and in an abundance of caution, we considered whether the substantive analysis and conclusions articulated in the biological opinion and incidental take statement would be any different under the pre-2019 regulations. We have determined that our analysis and conclusions would not be any different.

On February 15, 2022, the U.S. Environmental Protection Agency (EPA) and the Payette National Forest (PNF) requested initiation of consultation for the Stibnite Administrative Settlement and Order on Consent for Removal Actions Project. Their submittal included a biological assessment (BA) describing the potential effects of the proposed action on Snake River spring/summer Chinook salmon (*Oncorhynchus tshawytscha*), Snake River Basin (SRB) steelhead (*O. mykiss*), and their designated critical habitats. In addition, the EPA and PNF requested EFH consultation for Pacific Coast salmon (Chinook salmon). NMFS issued the Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion and Magnuson–Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the EPA Stibnite

Administrative Settlement and Order on Consent for Removal Actions Project on June 1, 2022 (NMFS 2022a) (NMFS tracking number WCRO-2022-00316). NMFS's 2022 consultation will hereinafter be referred to as the "ASAOC Opinion." The contents of the BA and the ASAOC Opinion remain relevant and are hereinafter incorporated by reference, as appropriate.

The originally proposed action includes four separate activities (Schoolhouse Tailings Removal [Schoolhouse], Northwest Bradley Dumps Stream Waste Removal and Slope Stabilization [NW Bradley Dump], Bradley Man Camp Dumps Removal and On-Site Repository [Bradley Man Camp], and Stream Diversions). Perpetua Resources, Inc. (Perpetua) began implementing the proposed action during the summer of 2022. The stream diversion activities were completed in 2022. The other three activities are scheduled to occur in 2023 (Bradley Man Camp and Schoolhouse) and 2024 (NW Bradley Dump).

The Nez Perce Tribe (NPT), in coordination with the Idaho Department of Fish and Game (IDFG), released adult Chinook salmon into the East Fork South Fork Salmon River (EFSFSR) upstream of the box culvert in August and September of 2022. At the time we completed the 2022 ASAOC Opinion, we did not expect this release to occur. However, because these adult fish spawned in the EFSFSR upstream of the Yellow Pine Pit (YPP), we now expect juvenile Chinook to likely be present when the Schoolhouse and Bradley Man Camp activities are implemented. The potential presence of juvenile Chinook salmon in the EFSFSR in the vicinity of these activity areas was not considered in the ASAOC Opinion. Furthermore, we expect the IDFG and NPT to out plant additional adult Chinook salmon during the late summer and/or early fall when annual returns of adult Chinook salmon to the South Fork Salmon River are high enough to support out planting of adult fish. Therefore, all life stages of Chinook salmon could be exposed to effects that last beyond the construction period.

Given the likelihood of adult and juvenile fish presence in the EFSFSR during implementation of the activities upstream of the YPP, there will be effects to the species that were not previously considered. Further, the EPA and PNF have modified the proposed action in order to minimize potential effects on Chinook salmon. For these reasons, the EPA and PNF are seeking to reinitiate consultation. The EPA and PNF also requested reinitiation of EFH consultation for Pacific Coast salmon in order to address the additional effects on recently occupied EFH.

The new information regarding Chinook salmon presence and resultant project modifications will not result in any effects to SRB steelhead or their designated critical habitat that were not previously considered in the ASAOC Opinion. Regardless, SRB steelhead and its designated critical habitat are included in this opinion because this opinion supersedes the ASAOC Opinion. For efficiency purposes, we have explicitly incorporated by reference material in the original opinion that is still relevant, correct, and based on the best available scientific information, including the steelhead analysis and conclusions.

Staff from NMFS, EPA, and PNF visited the Schoolhouse activity area on August 17, 2022. During this field visit, the agencies discussed methods to minimize effects to Chinook salmon. On August 22, 2022, the PNF shared a draft document summarizing additional project design features (PDFs) that would be incorporated into the proposed action as well as the additional information and effects analyses that would be included in the BA addendum. After reviewing

this document, NMFS requested the addition of a PDF requiring early coordination with the IDFG regarding the potential for and timing of adult out planting in the EFSFSR. NMFS also requested the beginning of the in-water work window be adjusted to June 15 in order to accommodate the potential for later emergence of Chinook salmon fry.

These recommendations were incorporated into a revised addendum, which was provide to NMFS for review on October 5, 2022. After addressing comments provided by NMFS, the EPA and PNF submitted a formal request to reinitiate ESA and MSA consultation on November 14, 2022. NMFS determined the BA addendum accompanying the reinitiation request contained sufficient information and initiated consultation on November 14, 2022.

In preparing this opinion, NMFS relied upon information from the BA (Stantec 2022), BA Addendum (EPA & PNF 2022), supporting documentation of the BA and its addendum, published scientific literature, the ASAOC Opinion, and other documents (e.g., government reports). This information provided the basis for our determinations as to whether the EPA and PNF can ensure that their proposed action is not likely to jeopardize the continued existence of ESA-listed species, and is not likely to result in the destruction or adverse modification of designated critical habitat.

On December 21, 2022, NMFS provided a copy of the proposed action and terms and conditions section of the draft opinion to the EPA, PNF, NPT, and Shoshone Bannock Tribes. NMFS did not receive any comments.

1.3. Proposed Federal 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 (see 50 CFR 402.02). Under the MSA, "Federal action" means any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken by a Federal agency (see 50 CFR 600.910). We considered, under the ESA, whether or not the proposed action would cause any other activities and determined that it would not. A greater explanation for this conclusion is provided in Section 1.3 of the ASAOC Opinion, which is incorporated by reference (NMFS 2022a).

The purpose and need of the proposed action are to eliminate or reduce potential ecological and human exposure to metals by mitigating sources of contamination from contact with sediment and surface water. This will be accomplished through the removal of mill tailings and mine waste located within the channels and floodplain of the EFSFSR and select tributaries, and the diversion of surface water around mine wastes that are sources of metals. The EPA will continue to provide project oversight and is the lead Federal action agency for this reinitiation of consultation. The PNF will also continue to provide project oversight and is a secondary action agency for this reinitiation of consultation.

The proposed action is described in Section 1.3 (pages 2-38) of the ASAOC Opinion (NMFS 2022a), which is incorporated by reference. Additional detail regarding the proposed action is included in Section 2.2 (pages 2-1 through 2-28) of the BA (Stantec 2022), which is also incorporated by reference. As mentioned in the ASAOC Opinion, the proposed action descriptions were based on the 50 percent designs. Perpetua provided the 90 percent designs to

the EPA and PNF in 2022. Upon review, the EPA and PNF concluded the 90 percent designs were consistent with information presented in the BA, which is reflected in this opinion. Given the potential for Chinook salmon to be present in the EFSFSR upstream of the YPP, and because the Schoolhouse activity involves in-water work as well as fish salvage, the EPA and PNF modified the proposed action to incorporate additional PDFs. No other modifications to the original proposed action were made. These new PDFs are summarized below and were added to minimize potential adverse effects to Chinook salmon in the EFSFSR upstream of the YPP.

1.3.1. Project Design Features Added or Modified

Key mitigation measures and PDFs specific to the Schoolhouse activity are described in Section 1.3.1.4 of the ASAOC Opinion. The EPA and PNF provided additional or modified design features involving the timing of instream work; work area isolation; fish salvage; rewatering procedures; and work year contingencies.

Timing of Instream Work. Instream work will not occur prior to June 15 in the reach of the EFSFSR between the Meadow Creek confluence and 300 feet downstream of the box culvert on National Forest System Road 50375 (Thunder Mountain Road).

Work Area Isolation. Prior to the construction season, the EPA and/or PNF will schedule a meeting with NMFS and the IDFG to discuss the potential for out planting adult Chinook salmon in the EFSFSR above the YPP. The goal of this meeting will be to assess which of the proposed mitigation measures will need to be implemented to minimize impacts to Chinook salmon. If adult Chinook salmon will be outplanted above the YPP during the year of construction, temporary weirs will be placed to prevent spawning from occurring in the EFSFSR. This blocked reach will extend from the Meadow Creek confluence downstream to approximately 600 feet below the box culvert.

Fish Salvage. The following fish salvage PDFs will be implemented in addition to those listed in Appendix A of the 2022 BA and as listed on drawing number G5 of the Schoolhouse Tailings Removal Project 50 percent Design Drawings (Appendix B of the 2022 BA). Features intended to replace those from the 2022 BA are explicitly identified.

- NMFS Electrofishing Guidelines (2000) will be followed for all salvage using electrofishing methods. Personnel conducting the fish salvage efforts will be qualified and trained or experienced in applying the NMFS electrofishing guidelines.

- Fish salvage for reaches to be dewatered will occur over 2 days to provide additional effort to capture young-of-year Chinook salmon.

    - The first effort will use lower power settings to remove larger fish from the work area.

    - The second effort (the next day) will use higher power settings to salvage as many of the remaining young-of-year Chinook salmon as possible (small fish require higher power settings, than larger fish).

- All young-of-year fish (< 80 millimeters length) will be placed downstream of the work area (the original design feature placed all fish upstream). This will minimize the risk of entrainment on the block net.

Rewatering Procedures. Prior to introducing streamflow, the newly constructed channel areas will be wetted down at least two times by spraying water on the surface to facilitate embedding finer material into the interstitial spaces. Additional efforts to wet down the material may be required by the On-Scene Coordinator if excessive turbidity is observed during the initial wetting events. All turbid water will be captured and pumped as originally described. Staged rewatering of the newly constructed channel will also be performed as originally described.

Work Year Contingency. In the event of project delays, the EPA and PNF will coordinate reviews with NMFS and the U.S. Fish and Wildlife Service to assess consistency with this consultation.

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

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

2.1. Analytical Approach

This opinion includes both a jeopardy analysis and an adverse modification analysis. The jeopardy analysis relies upon the regulatory definition of "jeopardize the continued existence of" a listed species, which is "to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species" (50 CFR 402.02). Therefore, the jeopardy analysis considers both survival and recovery of the species.

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

The designations of critical habitat for Snake River spring/summer Chinook salmon and SRB steelhead use the term primary constituent element (PCE) or essential features. The 2016 final rule (81 FR 7414; February 11, 2016) that revised the critical habitat regulations (50 CFR 424.12) replaced these terms with physical or biological features (PBFs). The shift in terminology does not change the approach used in conducting a "destruction or adverse

modification" analysis, which is the same regardless of whether the original designation identified PCEs, PBFs, or essential features. In this opinion, we use the term PBF to mean PCE or essential feature, as appropriate for the specific critical habitat.
The ESA Section 7 implementing regulations define effects of the action using the term "consequences" (50 CFR 402.02). As explained in the preamble to the final rule revising the definition and adding this term (84 FR 44976, 44977; August 27, 2019), that revision does not change the scope of our analysis, and in this opinion, we use the terms "effects" and "consequences" interchangeably.

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

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

2.2. Rangewide Status of the Species and Critical Habitat

This opinion examines the status of each species that would be adversely affected by the proposed action. The status is determined by the level of extinction risk that the listed species face, based on parameters considered in documents such as recovery plans, status reviews, and listing decisions. This informs the description of the species' likelihood of both survival and recovery. The species status section also helps to inform the description of the species' "reproduction, numbers, or distribution" for the jeopardy analysis. The opinion also examines the condition of critical habitat throughout the designated area, evaluates the conservation value of the various watersheds that make up the designated area, and discusses the function of the PBFs that are essential for the conservation of the species. The Federal Register notices and notice dates for the species and critical habitat listings considered in this opinion are included in Table 1.

Table 1. Listing status, status of critical habitat designations and protective regulations, and relevant Federal Register decision notices for ESA-listed species considered in this opinion.

Species	Listing Status	Critical Habitat	Protective Regulations
Chinook salmon (*Oncorhynchus tshawytscha*)			
Snake River spring/summer-run	T 4/22/92; 57 FR 14653	12/28/93; 58 FR 68543	6/28/05; 70 FR 37160
Steelhead (*O. mykiss*)			
Snake River Basin	T 8/18/97; 62 FR 43937	9/02/05; 70 FR 52630	6/28/05; 70 FR 37160

Note: Listing status 'T' means listed as threatened under the ESA.
[1]The listing status for Snake River spring/summer Chinook salmon was corrected on 6/3/92 (57 FR 23458).
[2]Critical habitat for Snake River spring/summer Chinook salmon was revised on 10/25/99 (64 FR 57399).

The status of Snake River spring/summer Chinook salmon, SRB steelhead, and their designated critical habitats were thoroughly described in Sections 2.2.1 and 2.2.2 of the ASAOC Opinion. Those descriptions are incorporated by reference here, with summaries included below. The summaries below also include updated information contained in the most recent 5-year review documents for each species. In addition, Section 2.2.3 of the ASAOC Opinion described the role that climate change has had on the status of species and critical habitat and remains the best available scientific information available. That section is also incorporated by reference here, with a brief summary below. Together, this information represents the best scientifically or commercially available for these two species.

The Snake River spring/summer Chinook salmon evolutionarily significant unit (ESU) is at a moderate-to-high risk of extinction. NMFS completed its 5-year review of this species in 2022 and concluded the species should remain listed as threatened (NMFS 2022b). Spatial structure risk is low to moderate for most populations in this ESU (Ford 2022) and is generally not preventing the recovery of the species. Diversity risk, on the other hand, is somewhat higher, driving the moderate and high combined spatial structure/diversity risks shown in Table 2 for some populations. Several populations have a high proportion of hatchery-origin spawners—particularly in the Grande Ronde, Lower Snake, and South Fork Salmon major population groups (MPGs). While there have been improvements in abundance/productivity in several populations since the time of listing, the majority of populations experienced sharp declines in abundance in recent years. No populations within the ESU meet the minimum abundance threshold designated by the Interior Columbia Technical Recovery Team (NMFS 2022b), and the vast majority of the extant populations are considered to be at high risk of extinction due to low abundance/productivity (Ford 2022). Therefore, all currently extant populations of Snake River spring/summer Chinook salmon will likely have to increase in abundance and productivity, and diversity risk will need to be lowered in multiple populations in order for the ESU to recover (ICTRT 2007; ICTRT 2010; Ford 2022). See Table 2 below. This ESU continues to face threats from disease; predation; harvest; habitat loss, alteration, and degradation; and climate change (NMFS 2022b).

Table 2. Summary of viable salmonid population (VSP) parameter risks, current status, and proposed recovery goal for each population in the Snake River spring/summer Chinook salmon evolutionarily significant unit.

Major Population Group	Population[2]	VSP Risk Rating[1]		Viability Rating	
		Abundance/ Productivity	Spatial Structure/ Diversity	2022 Assessment	Proposed Recovery Goal[3]
South Fork Salmon River (Idaho)	Little Salmon River	*Insuf. data*	Low	High Risk	Maintained
	South Fork Salmon River mainstem	High	Moderate	High Risk	Viable
	Secesh River	High	Low	High Risk	Highly Viable
	East Fork South Fork Salmon River	High	Low	High Risk	Maintained
Middle Fork Salmon River (Idaho)	Chamberlain Creek	High	Low	High Risk	Viable
	Middle Fork Salmon River below Indian Creek	High	Moderate	High Risk	Maintained
	Big Creek	High	Moderate	High Risk	Highly Viable
	Camas Creek	High	Moderate	High Risk	Maintained
	Loon Creek	*Insuf. data*	Moderate	High Risk	Viable
	Middle Fork Salmon River above Indian Creek	High	Moderate	High Risk	Maintained
	Sulphur Creek	High	Moderate	High Risk	Maintained
	Bear Valley Creek	Moderate	Low	Maintained	Viable
	Marsh Creek	Moderate	Low	Maintained	Viable
Upper Salmon River (Idaho)	North Fork Salmon River	*Insuf. data*	Low	High Risk	Maintained
	Lemhi River	High	High	High Risk	Viable
	Salmon River Lower Mainstem	High	Low	High Risk	Maintained
	Pahsimeroi River	High	High	High Risk	Viable
	East Fork Salmon River	High	High	High Risk	Viable
	Yankee Fork Salmon River	High	High	High Risk	Maintained
	Valley Creek	High	Moderate	High Risk	Viable
	Salmon River Upper Mainstem	High	Low	High Risk	Highly Viable
	Panther Creek[4]	*Insuf. data*	High	High Risk	***Reintroduction***
Lower Snake (Washington)	Tucannon River	High	Moderate	High Risk	Highly Viable
	Asotin Creek			***Extirpated***	***Consider Reintroduction***
Grande Ronde and Imnaha Rivers (Oregon/ Washington)[5]	Wenaha River	High	Moderate	High Risk	Highly Viable or Viable
	Lostine/Wallowa River	High	Moderate	High Risk	Highly Viable or Viable
	Minam River	Moderate	Moderate	Maintained	Highly Viable or Viable
	Catherine Creek	High	Moderate	High Risk	Highly Viable or Viable
	Upper Grande Ronde River	High	High	High Risk	Maintained
	Imnaha River	High	Moderate	High Risk	Highly Viable or Viable
	Lookingglass Creek			***Extirpated***	***Consider Reintroduction***

Major Population Group	Population[2]	VSP Risk Rating[1]		Viability Rating	
		Abundance/ Productivity	Spatial Structure/ Diversity	2022 Assessment	Proposed Recovery Goal[3]
	Big Sheep Creek			***Extirpated***	***Consider Reintroduction***

[1]Risk ratings are defined based on the risk of extinction within 100 years: High = greater than or equal to 25 percent; Moderate = less than 25 percent; Low = less than 5 percent; and Very Low = less than 1 percent.
[2]Populations shaded in gray are those that occupy the action area.
[3]There are several scenarios that could meet the requirements for ESU recovery (as reflected in the proposed goals for populations in Oregon and Washington). What is reflected here for populations in Idaho are the proposed status goals selected by NMFS and the State of Idaho.
[4]Although considered functionally extirpated in the late 1960s, redds have been documented in Panther Creek every year since 2005. Considering the natural spawning that has occur, the role of the Panther Creek population in the MPG recovery scenario may be reevaluated (NMFS 2022a).
[5]At least one of the populations must achieve a very low viability risk rating.

The SRB steelhead distinct population segment (DPS) is at a moderate risk of extinction within the next 100 years. NMFS completed its 5-year review of this species in 2022 and concluded the species should remain listed as threatened (NMFS 2022c). None of the five MPGs are meeting their recovery plan objectives and the viability of many populations remains uncertain. Table 3 summarizes the current risk ratings for the viable salmonid population (VSP) parameters and the proposed recovery goals for each population in the DPS. The spatial structure risk is considered to be low or very low for the vast majority of populations in this DPS. Diversity risk for populations in the DPS is either moderate or low. Large numbers of hatchery steelhead are released in the Snake River, and while new information about the relative abundance of natural-origin spawners is available, the relative proportion of hatchery adults in natural spawning areas near major hatchery release sites remains uncertain (Ford 2022). The 5-year geometric mean of wild steelhead migrating over Lower Granite Dam has declined since 2015. According to the most recent viability assessment (Ford 2022), the 5-year geometric mean abundance estimates for the populations in this DPS all show significant declines in the recent past, with each population decreasing by roughly 50 percent in the past 5-year period. The recent, sharp declines in abundance are of concern and are expected to negatively affect productivity in the coming years. In order for the species to recover, more populations will need to reach viable status through increases in abundance and productivity. Reductions in hatchery-related diversity risks would increase the likelihood of a number of populations reaching viable status. This DPS continues to face threats from tributary and mainstem habitat loss, degradation, or modification; predation; harvest; hatcheries; and climate change (NMFS 2022c).

Table 3. Summary of viable salmonid population (VSP) parameter risks and overall current status and proposed recovery goals for each population in the Snake River Basin steelhead distinct population segment.

Major Population Group	Population[2]	VSP Risk Rating[1]		Viability Rating	
		Abundance/ Productivity	Spatial Structure/ Diversity	2022 Assessment	Proposed Recovery Goal[3]
Lower Snake River[4]	Tucannon River	High	Moderate	High Risk	Highly Viable or Viable
	Asotin Creek	Low	Moderate	Viable	Highly Viable or Viable
Grande Ronde River	Lower Grande Ronde	High	Moderate	High Risk	Viable or Maintained
	Joseph Creek	Low	Low	Viable	Highly Viable, Viable, or Maintained
	Wallowa River	High	Low	High Risk	Viable or Maintained
	Upper Grande Ronde	Very Low	Moderate	Viable	Highly Viable or Viable
Imnaha River	Imnaha River	Very Low	Moderate	Viable	Highly Viable
Clearwater River (Idaho)	Lower Mainstem Clearwater River	Very Low	Low	Highly Viable	Viable
	South Fork Clearwater River	Very Low	Moderate	Viable	Maintained
	Lolo Creek	High	Moderate	High Risk	Maintained
	Selway River	Moderate	Low	Maintained	Viable
	Lochsa River	Moderate	Low	Maintained	Highly Viable
	North Fork Clearwater River			*Extirpated*	*N/A*
Salmon River (Idaho)	Little Salmon River	Very Low	Moderate	Viable	Maintained
	South Fork Salmon River	Moderate	Low	Maintained	Viable
	Secesh River	Moderate	Low	Maintained	Maintained
	Chamberlain Creek	Moderate	Low	Maintained	Viable
	Lower Middle Fork Salmon River	Moderate	Low	Maintained	Highly Viable
	Upper Middle Fork Salmon River	Moderate	Low	Maintained	Viable
	Panther Creek	Moderate	High	High Risk	Viable
	North Fork Salmon River	Moderate	Moderate	Maintained	Maintained
	Lemhi River	Moderate	Moderate	Maintained	Viable
	Pahsimeroi River	Moderate	Moderate	Maintained	Maintained
	East Fork Salmon River	Moderate	Moderate	Maintained	Maintained

Major Population Group	Population[2]	VSP Risk Rating[1]		Viability Rating	
		Abundance/ Productivity	Spatial Structure/ Diversity	2022 Assessment	Proposed Recovery Goal[3]
Salmon River (Idaho)	Upper Mainstem Salmon River	Moderate	Moderate	Maintained	Maintained
Hells Canyon	Hells Canyon Tributaries			*Extirpated*	

[1]Risk ratings are defined based on the risk of extinction within 100 years: High = greater than or equal to 25 percent; Moderate = less than 25 percent; Low = less than 5 percent; and Very Low = less than 1 percent.
[2]Populations shaded in gray are those that occupy the action area.
[3]There are several scenarios that could meet the requirements for Evolutionarily Significant Unit recovery (as reflected in the proposed goals for populations in Oregon and Washington). What is reflected here for populations in Idaho are the proposed status goals selected by NMFS and the State of Idaho.
[4]At least one of the populations must achieve a very low viability risk rating.

The status of critical habitat across the range of Snake River spring/summer Chinook and SRB steelhead designated is variable. Conditions range from being excellent in wilderness areas to being severely degraded in areas subject to intensive human land uses. Intensive agriculture; water withdrawals; channel modifications/simplifications; riparian vegetation disturbance; livestock grazing; road construction, maintenance, and use; mining, and urbanization have all had substantial impacts on aquatic habitat throughout the designation. Reduced summer flows, increased stream temperatures, impaired water quality, and reduced habitat complexity and floodplain access are common problems. The regional tributary habitat strategy set forth in the final recovery plans is to protect, conserve, and restore natural ecological processes at the watershed scale that support population viability. Actions such as conserving existing high-quality habitat, restoring floodplain function, and reducing floodplain and channel encroachment are a subset of actions that should be implemented to support species recovery (NMFS 2022b, 2022c).

Climate change generally exacerbates threats and limiting factors, including those currently impairing salmon and steelhead survival and productivity. Climate change is expected to alter critical habitat within the Snake River basin by generally increasing water temperature and peak flows and decreasing base flows. Although these changes will not be spatially homogenous, effects of climate change are expected to decrease the capacity of freshwater critical habitat to support successful spawning, rearing, and migration. Climate will also impact ocean productivity, and is likely to lead to a preponderance of low productivity years (Crozier et al. 2020). Reductions in ocean productivity can reduce the abundance and productivity of salmon and steelhead. Climate change is expected to make recovery targets for salmon populations more difficult to achieve as a result of its impacts on freshwater, estuarine, and ocean conditions (NMFS 2022b, 2022c).

2.3. Action Area

"Action area" means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02). The action area was thoroughly described in Section 2.3 of the ASAOC Opinion, did not change as a result of the circumstances leading to reinitiation, and is incorporated by reference here. In short, the action area encompasses the Upper EFSFSR fifth level hydrologic unit code (including the EFSFSR

from the Sugar Creek confluence upstream to its headwaters and its tributaries), as well as the access/haul routes and their adjacent streams (refer to Figure 10 of the ASAOC Opinion).

2.4. Environmental Baseline

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

The environmental baseline was thoroughly described in section 2.4 of the ASAOC Opinion, is still accurate and based on the best available scientific information, and is incorporated by reference. Since the issuance of the ASAOC Opinion, Perpetua has completed construction of stream diversions. Installation of these diversions should help reduce inputs of metal contaminants in the EFSFSR and select tributaries over time by reducing water infiltration into contaminated waste rock. Aside from implementation of the stream diversion aspects of the ASAOC proposed action, no other habitat-related changes have occurred since issuance of the ASAOC Opinion. Therefore, habitat conditions, including those specific to sediment/turbidity and the water quality PBFs remain the same as described in the ASAOC Opinion. Additional information regarding the water temperature PBF is summarized below.

Water temperatures have been monitored in the EFSFSR below the Meadow Creek confluence since 2011 (USGS EFSFSR at Stibnite; Site ID 13311000). This gage is approximately 600 feet downstream of the box culvert, which as the downstream end of the Schoolhouse activity area. Water temperatures often exceed the optimal spawning temperatures at the beginning of the spawning season (i.e., mid-August to early September). Figure 1 illustrates the 7-day average of the daily maximum temperatures (7DADM) recorded in July through September over the last 7 years in the EFSFSR. While these temperatures are within the functioning appropriately range for Chinook salmon, they are slightly elevated above temperatures identified as fully protecting Chinook salmon (EPA 2003; NMFS 2015).

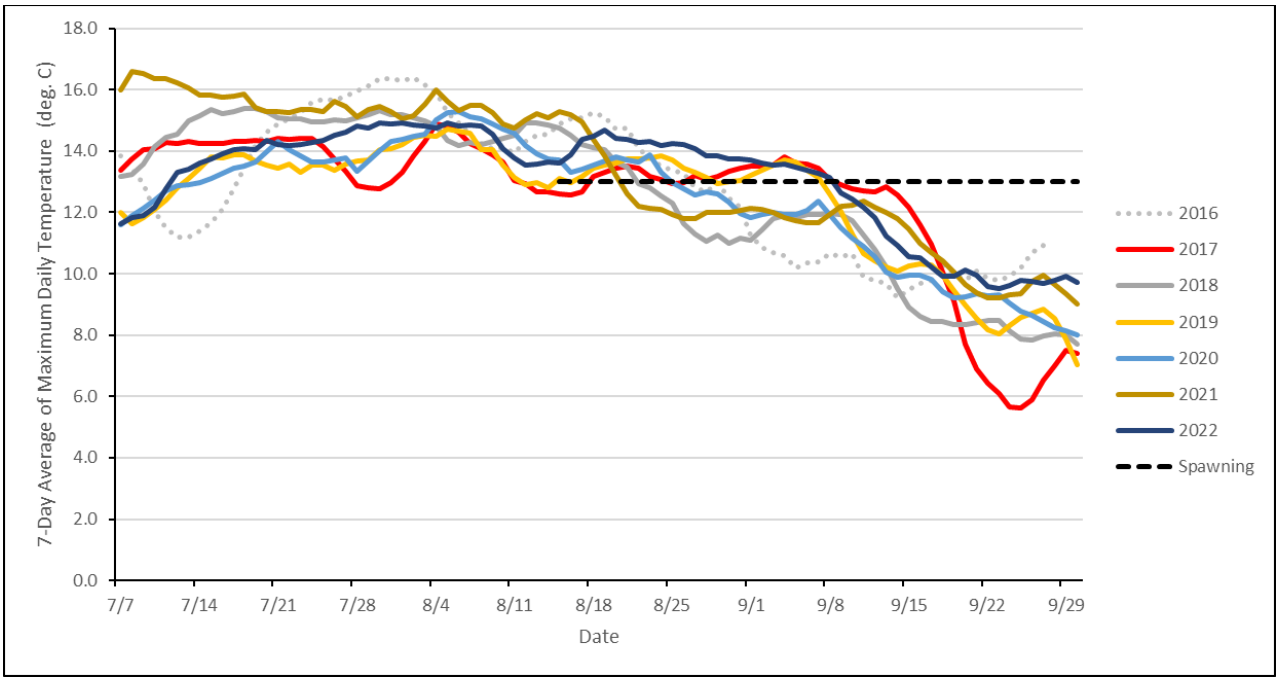


Figure 1. 7-day average of the daily maximum temperatures (degrees Celsius) in the East Fork South Fork Salmon River gage (13311000) for July through September. Data shown for years 2016–2022. A 7DADM of 13°C has been deemed to be fully protective of Chinook salmon spawning and is illustrated as the horizontal, dashed line.

While habitat conditions and steelhead usage of the action area have remained largely the same, the presence of Chinook salmon in the EFSFSR and Meadow Creek has changed since issuance of the ASAOC Opinion. The action area is occupied by Chinook salmon from two populations: the EFSFSR and South Fork Salmon River (SFSR) populations. These two populations are part of the SFSR MPG. The upper portion of the action area (i.e., above the YPP) was historically occupied by Chinook salmon; however, anadromous fish presence in this part of the watershed was blocked in the 1930s. As summarized in the ASAOC Opinion, adult Chinook salmon releases into the upper EFSFSR and Meadow Creek began in 2011. No adult releases occurred between 2018 and 2021, and the ASAOC Opinion assumed no releases would occur in the foreseeable future. However, in August and September, 2022, the NPT and IDFG released 387 adult Chinook salmon into the EFSFSR, just below the Meadow Creek confluence. Redd surveys were performed in September by both the NPT and PNF. The NPT surveyed stream segments above the YPP where redds were historically documented and identified 29 redds in Meadow Creek (upstream of the Schoolhouse area) and three redds in the EFSFSR between Fiddle Creek and Meadow Creek. The PNF surveyed the EFSFSR reach between the box culvert and Meadow Creek and identified one redd.

2.5. Effects of the Action

Under the ESA, "effects of the action" are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action (see 50 CFR 402.02). 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 the factors set forth in 50 CFR 402.17(a) and (b).

The effects of the action were thoroughly described in Section 2.5 of the ASAOC Opinion, which remains correct and based on the best available scientific information with the limited exceptions identified and updated below. In our previous analysis, NMFS concluded that only the Northwest Bradley Dump site bordered stream segments occupied by anadromous fish; therefore, that was the only activity with the potential to directly impact Chinook salmon and steelhead. NMFS concluded that work at the Bradley Man Camp and Schoolhouse areas would occur in and alongside unoccupied Chinook salmon designated critical habitat. For this opinion, we are incorporating Section 2.5 of the ASAOC Opinion; however, because the EFSFSR and Meadow Creek are now occupied by Chinook salmon, we are modifying and adding additional detail to our analysis of effects on Snake River spring/summer Chinook salmon and their designated critical habitat from activities at the Bradley Man Camp and Schoolhouse areas. Modifications of, or additions to, our effects analysis are described in more detail in the following sections.

2.5.1. Effects to Chinook Salmon Designated Critical Habitat

Proper function of critical habitat PBFs (refer to Table 5 of the ASAOC Opinion) is necessary to support successful adult and juvenile migration, adult holding and spawning, and the growth and development of juvenile fish. Any modification of these PBFs may affect freshwater spawning, rearing, or migration in the action area. As described in Section 2.5.1 of the ASAOC Opinion, the proposed action has the potential to affect the following PBFs: (1) spawning gravel/substrate; (2) water quality (i.e., turbidity and chemical contamination); (3) water temperature; (4) floodplain connectivity; (5) food/forage; (6) cover/shelter; and (7) riparian vegetation. All remaining PBFs will not be affected by the proposed action. The proposed action incorporates a variety of PDFs and best management practices (BMPs) that will minimize the potential for and magnitude of adverse effects to these PBFs.

Considering the project modifications and changed environmental conditions since issuance of the ASAOC Opinion, we are adding additional detail to our analysis of effects to the spawning gravel/substrate, water quality (i.e., turbidity), temperature, food/forage, and cover/shelter PBFs for Chinook salmon designated critical habitat. Effects to these PBFs are described in section 2.5.1.1 through 2.5.1.5 below. Effects to the floodplain connectivity and riparian vegetation PBFs will not be different from what was previously considered; therefore, we fully incorporate by reference sections 2.5.1.3 and 2.5.1.4 of the ASAOC Opinion.

2.5.1.1. Spawning Gravel/Substrate

Salmonid spawning habitats are created by and depend on channel characteristics and complexities that cause hydraulic sorting and gravel accumulation into suitable spawning beds. The amount and quality of spawning habitat can greatly influence the productivity of salmonid populations. High quality spawning substrate can be characterized as having appropriately sized gravels with adequate interstitial spaces that allow for unobstructed flow of oxygen-rich water.

Increased sediment delivery to streams can lead to increased embeddedness of downstream substrates. Fine, redeposited sediments have the potential to adversely affect primary and secondary productivity (Spence et al. 1996), reduce incubation success (Bell 1991), and reduce cover for juvenile salmonids (Bjornn & Reiser 1991). As described in the ASAOC Opinion, some sedimentation of substrates potentially used for spawning and rearing of Chinook and steelhead will likely occur downstream in the mainstem EFSFSR. Sedimentation of substrates used for spawning and rearing of Chinook salmon is also likely to occur in the EFSFSR upstream of the YPP.

The proposed action has the potential to cause sediment delivery and resuspension in action area streams as a result of road use and ground disturbing activities. Effects associated with road use will not be any different from what was previously described on pages 62 through 64 of the ASAOC Opinion; therefore, we are incorporating that analysis by reference here. As described in the ASAOC Opinion, sediment generation and mobilization resulting from increased traffic use will be low and should not result in large increases in sediment contribution and deposition in area streams. Similarly, temporarily reopening the short segment of road at the Bradley Man Camp will not result in a measurable increase in turbidity or sediment deposition because of the flat nature of the road, the short distance of road to be reopened (0.4 miles), the anticipated effectiveness of proposed erosion control BMPs, and the staged revegetation of the area as work progresses.

With the exception of the EFSFSR channel realignment at the Schoolhouse area, the various project components are not expected to result in more than minimal introductions of sediment to habitat occupied by Chinook salmon and/or steelhead. When considering the amount of traffic, combined with the large amount of ground disturbance (e.g., road opening/rehabilitation, drilling, fill removal, channel realignment, etc.) taking place within riparian conservation areas (RCAs) over a relatively short timeframe, NMFS cumulatively expects enough fine sediment to enter action area streams to at least locally affect instream habitat conditions in the near term. Rewatering the new EFSFSR channel at the Schoolhouse site will contribute the largest volumes of sediment to the stream network, although PDFs will be implemented to reduce the amount of sediment delivered. Those PDFs include: working in the dry, wetting the substrate down prior to introducing streamflow, and implementing a staged rewatering plan of the newly constructed channel.

Given the proposed PDFs and setbacks from stream for most activities, the turbidity pulses and plumes associated with sediment delivery are expected to be infrequent, of low magnitude, and short duration (i.e., minutes to a few hours). Sediment deposition is expected to occur in localized pockets where lower stream velocities allow suspended sediment to settle out. Other than for the NW Bradley Dump site, the majority of sediment produced will likely settle out in the YPP. Although the substrate PBF will be locally affected in the short term, high flushing stream flows in the spring are expected to clean most if not all project-generated sediment out of substrate within a year or two of project completion. Therefore, project-related sediment is not expected to affect the long-term conservation value of substrate PBFs.

2.5.1.2. Water Quality

Clean water is essential for successful spawning, rearing, and migration of Chinook salmon and steelhead. The water quality PBF may be impacted by project activities that cause increased sediment delivery and chemical contamination of surface water. The following components of the proposed action that have the potential to impact water quality include: drilling, ground disturbance and equipment operation in RCAs, suspension of contaminated soils, or refueling of equipment and transportation of fuel.

Chemical Contamination. The risk of chemical contamination of surface water is described on pages 64–66 of the ASAOC Opinion, and is incorporated by reference. Information supplementing that analysis is presented below.

Material extraction and equipment operation within the RCA will also occur at the Schoolhouse area. Excavation of tailings will occur in areas immediately adjacent to and within the existing channel of the EFSFSR. Various PDFs and BMPs (e.g., cleaning, maintaining, and refueling equipment will be done at least 300 feet away from open water; work will be conducted in the dry; equipment will be maintained in good condition, and inspected regularly for leaks and damage; etc.) will be implemented to minimize the risk of contamination of designated critical habitat.

As described on page 66 of the ASAOC Opinion, ground disturbing activities in the action area have the potential to liberate contaminants from the soil and tailings. Arsenic and antimony could be released from project area tailings during fill removal activities. However, water quality within Meadow Creek, the EFSFSR, and their tributaries are already exposed to these contaminants due to streamside tailings, channel instability, and groundwater infiltration, and the primary purpose of the project is to relocate these stream channels away from these contaminated tailings. Completing instream work in the dry, pulling material back from the vegetated buffer at tailing removal sites when working along streambanks, and standard placement of erosion control measures, should help ensure that few if any contaminants are released to action area streams as a result of project implementation. Use of clean fill materials from non-contaminated borrow source locations should ensure contaminated soils are not used in reclamation efforts. The proposed action should address some of the chronic delivery of metals to action area waters from past mining activities, resulting in a localized beneficial effect to water quality.

Turbidity. As mentioned above for the spawning gravel/substrate PBF, sediment delivery is expected to occur to action area streams from road use and ground disturbing activities. Given the proposed BMPs and setbacks from stream for most activities, resulting turbidity pulses and plumes are expected to be infrequent, of low magnitude, localized, and of short duration (i.e., minutes to a few hours). Introducing streamflow into the newly created stream channel at the Schoolhouse area is expected to cause the largest turbidity plume in the EFSFSR. Elevated turbidity will occur within the newly created channel, and is expected to be greatest at the lowermost extent of this reach. Turbidity concentrations are expected to diminish as the plume travels downstream. Turbidity levels for similar channel creation actions across Idaho have been highly variable, influenced by the type of BMPs implemented, local geology, and porosity of

subsurface materials.[1] Oftentimes, turbidity pulses lasted less than an hour and were generally no more than 50 nephelometric turbidity units (NTUs) at a monitoring point downstream. However, there were instances of turbidity plumes lasting more than 2 hours and experiencing temporary (less than 30 minutes) turbidity spikes above 1,000 NTUs.

For the proposed action, pertinent PDFs that will be implemented to minimize turbidity include, but are not limited to: (1) working in the dry; (2) wetting down the newly constructed channel prior to introducing streamflow; (3) capturing and pumping turbid water the results from wetting down the newly placed channel materials; (4) monitoring turbidity concentrations in receiving streams; and (5) ceasing work if established turbidity thresholds (i.e., 50 NTUs above background concentrations over two consecutive monitoring periods). Given successful implementation of the PDFs, we expect suspended sediments will settle out within 600 to 1,000 feet from project activities. Furthermore, we expect turbidity concentrations to be below 50 NTU above background within 500 feet of the project activities. The water quality PBF will be negatively impacted in localized areas for brief periods of time as a result of elevated turbidity concentrations. However, project-related increases in sediment delivery or resuspension is not expected to affect the long-term conservation value of water quality PBF.

Summary. Elevated suspended sediment concentrations will reduce the water quality PBF in localized area for brief periods of time. The risk of chemical contamination of surface water due to equipment operation, drilling, suspension of contaminated soils, refueling equipment, and transporting fuel is extremely unlikely to occur. Over time, implementation of the proposed action is anticipated to result in a small improvement in water quality as a result of the removal of contaminated materials in the floodplain and broader RCA.

2.5.1.3. Water Temperature

Potential effects to stream temperatures as a result of activities at the NW Bradley Dump and Bradley Man Camp areas are described on page 67 of the ASAOC Opinion and that analysis is incorporated by reference. Most of the EFSFSR streambanks within the Schoolhouse area support a narrow band of shrub-type riparian vegetation (dominated by willows) with few coniferous trees scattered throughout the RCA. This vegetation provides some, albeit limited, shade to the EFSFSR during various parts of the day. Much of this vegetation will be removed as the new stream channel (approximately 850 linear feet) is constructed and the existing stream channel (approximately 750 linear feet) is filled in. All disturbed areas will be revegetated as soon as practicable following construction, with a goal of achieving 70 percent ground cover within 3 years of planting. An effort will be made to transplant trees and shrubs that are removed.

A similar channel reconstruction and riparian restoration effort took place in 2005 on Meadow Creek, a tributary of the EFSFSR just upstream of the Schoolhouse area. Photos of this restoration reach are available for 2005, 2007, 2010, and 2015 (Arkle & Pilliod 2021; Zurstadt 2022). In 2007, grasses and some small shrubs were growing along the streambank. In 2010, the

[1]Information obtained from project completion forms for the following projects: Bonanza City Floodplain Restoration; Eagle Valley Ranch Restoration Sub-Reach 1 and Sub-Reach 2; Yankee Fork/West Fork Confluence 2016 (Phase III); Wimpey Creek (Skinner) Restoration; Crooked River Valley Rehabilitation; and Collette Mine Stream Restoration.

grasses and shrubs were denser along the streambanks, but were not large enough to provide much shade to the stream. By 2015, alder and willow had grown to sizes that afforded some stream shading. Arkle and Pilliod (2021) collected stream temperature data upstream and downstream of restored reaches on Meadow Creek. Maximum downstream temperatures were about 5°C greater than upstream temperatures in 2006 and 2007. In addition, no temperatures greater than 16°C were recorded at the upstream monitoring location, but there were 78 and 171 occurrences of stream temperatures greater than 16°C at the downstream location in 2006 and 2007, respectively. While the monitoring locations were located about 1.4 miles apart and temperature data immediately upstream and downstream of the restored reach are not available, it is reasonable to infer that water traveling through the restored reach will be exposed to greater solar radiation and as a result, stream temperatures will likely rise. The impact will persist until vegetation is established along the new channel and is capable of providing shade. Because existing stream temperatures are typically near the upper limit of optimal temperatures to support Chinook salmon spawning earlier in the season, any increases to those temperatures will likely reduce the ability of the PBF to support ESA-listed fish in the vicinity of the restored reach in the temporary to short-term time frame (i.e., up to 15 years).

Replacement of contaminated material with clean fill, regrading of land adjacent to the EFSFSR down to the historical floodplain, and revegetation efforts will support the establishment of a more robust and healthy vegetative community in the RCA that will provide increased overhead canopy and stream shade into the future. As such, we anticipate there will be slight improvements in stream temperatures in the short- to long-term timeframe, depending on revegetation success.

2.5.1.4. Food/Forage

Access to diverse and abundant prey items is critical for the growth and survival of juvenile fish. Juvenile Chinook salmon and steelhead are opportunistic predators that depend upon aquatic- and terrestrial-derived macroinvertebrate prey. Suitable invertebrate prey items are those that are small enough to be readily captured and swallowed and vulnerable to capture (i.e., not taxa that are burrowers or are armored) (Keeley & Grant 2001; Quinn 2018; Suttle et al. 2004). Some other apparently suitable taxa such as water mites (Hydracarina) appear to taste bad to salmonids and others, like copepods, are too small to provide much energy for the effort it takes to eat them (Keeley & Grant 1997). Mayflies and chironomid midges are a particularly important prey species of salmonids (Chapman & Bjornn 1969; Chapman & Quistorff 1938; Clements & Rees 1997; Iwasaki et al. 2009; Mullan et al. 1992; Rader 1997; Sagar & Glova 1987, 1988; Syrjänen et al. 2011; White & Harvey 2007).

The proposed action has the potential to reduce forage available to salmonids as a result of new channel construction, channel dewatering, removal of riparian vegetation, increased sediment delivery to streams as a result of ground disturbance, and chemical contamination. The analysis of effects on the food/forage PBF (page 69) of the ASAOC Opinion is incorporated by reference and is supplemented with the additional information below.

Given the likely presence of rearing juvenile Chinook salmon in the EFSFSR upstream of the YPP during and following project implementation, impacts to the food/forage PBF at the Schoolhouse site is of greater consequence than previously considered. Approximately 750 feet

of the existing EFSFSR channel will be dewatered and filled in, causing the loss of macroinvertebrates inhabiting that reach. Additionally, removal of existing riparian vegetation along this reach will diminish sources of terrestrial-derived invertebrates and allocthonous organic matter that supports diverse aquatic communities. Measurable reductions in food availability are expected to occur in the immediate vicinity of the Schoolhouse area, and there will be some reduction in macroinvertebrate drift farther downstream in the EFSFSR, extending to the YPP in the temporary timeframe. Minor losses of terrestrial-derived macroinvertebrate drift from in the short-to long-term timeframes (i.e., 3–15 years and greater than 15 years, respectively) will also occur; however, rapid recolonization of the new channel by aquatic invertebrates should lessen this impact. Ultimately, removal of contaminated a material and reestablishment of floodplain and riparian vegetation function is expected to improve forage availability in the short- to long-term timeframes.

Food availability in the newly constructed channel will be limited and dependent upon macroinvertebrate drift from upstream habitats until a macroinvertebrate community can become established. We expect reductions in aquatic-derived prey items to last no more than a year or two. Arkle and Pilliod (2021) researched colonization of newly constructed stream channels in Meadow Creek (a tributary to the EFSFSR immediately upstream of the Schoolhouse area). They reported macroinvertebrate densities and composition in a newly created stream reach with diverse habitat features as being similar to those in an unaltered reach within 2 years of construction. Because this research was conducted within the action area, it is reasonable to conclude that colonization of the newly constructed EFSFSR channel will be similar.

Reduced terrestrial-derived invertebrates is expected to persist until riparian vegetation can become established along the banks of the newly created channel. Additionally, reduced inputs of allocthonous organic material will also persist and potentially limit the diversity of the aquatic macroinvertebrate community (i.e., fewer species from the “shredder” functional feeding group). Exactly how long these impacts will persist is unknown; however, the impact is expected to be relatively minor for the following reasons: (1) only a small area of habitat will be impacted; (2) the presence of intact riparian habitat habitats both upstream and downstream will provide sources of allocthonous material and terrestrial-derived prey items; (3) juvenile salmonids are opportunistic feeders can feed on aquatic-derived invertebrate forage; (4) juvenile salmonids are mobile and can move to nearby habitats if prey is limited in the newly constructed channels.

In summary, the greatest impact to the food/forage PBF is associated with the channel reconstruction and dewatering in the Schoolhouse area. As described in the ASAOC Opinion, turbidity pulses and subsequent sediment deposition in localized areas will not be sufficient enough to alter the benthic community. Similarly, in the unlikely event that drilling fluids daylight in or are transported to nearby streams, the bentonite material and sediment are not expected to be in sufficient concentrations, nor are they expected to persist for a sufficient amount of time to alter the benthic community. As described above, the food/forage PBF will be negatively impacted for at least 2 years in the reach of the EFSFSR within the Schoolhouse area. Minor reductions in prey diversity will persist until the riparian vegetation reestablishes along the streambanks. In the long term, we anticipate the food/forage PBF will improve over existing conditions as a result of the removal of contaminated materials and reestablishment of a functional floodplain.

2.5.1.5. Cover/Shelter

In low flows, juveniles depend on cover provided by undercut banks and overhanging vegetation to provide locations for resting, feeding, and protection from predation. During periods of high streamflow, juveniles often seek refuge in low velocity microhabitats, including undercut banks and off-channel habitat. Adult Chinook salmon also rely on cover/shelter to take refuge from potential predators. Cover and shelter are currently compromised in action area streams from historical mining activities and an overall lack of instream habitat complexity and overhanging vegetation.

Mine tailings artificially confine significant portions of Meadow Creek and the EFSFSR in the project area. The proposed removal of these tailings from the floodplain and restoring of the floodplain to its natural elevation are expected to restore floodplain function in these areas long term. Maintenance of a vegetated buffer between removal actions at the Bradley Man Camp and NW Bradley Dump areas and adjacent streams will minimize damage to existing undercut banks and overhanging vegetation. Designs for the new stream channel within the Schoolhouse area incorporate large woody debris structures and pool habitats. This will increase habitat complexity relative to baseline conditions in the EFSFSR. Although the project will affect riparian vegetation in the RCA in the short term, the replanting of these areas with native vegetation following removal actions should result in the long-term improvement of riparian vegetation in the action area. This, coupled with the addition of large woody debris structures and pool habitat, will result in long-term improvements in available cover and shelter in project area streams.

2.5.2. Effects to Species

The ASAOC Opinion concluded Chinook salmon and steelhead could be directly impacted by work performed at the NW Bradley Dump. Because Chinook salmon were outplanted in the upper EFSFSR in 2022, activities at the Bradley Man Camp and the Schoolhouse areas can also directly impact Chinook salmon. Fish may be impacted as a result of disturbance from machinery, sound pressure level changes and ground vibrations associated with geotechnical drilling, and fish salvage. In addition, Chinook salmon and steelhead may be indirectly affected through impacts to critical habitat. As described in the previous section, habitat-related effects include effects to water quality (i.e., turbidity, temperature, and chemical contamination), spawning gravel/substrate, food/forage, floodplain connectivity, and riparian vegetation. Each of these potential pathways of effect, with the exception of geotechnical drilling, are discussed in more detail below. Effects associated with geotechnical drilling will not change as a result of Chinook salmon being outplanted in the upper EFSFSR nor will they change as a result of the project modifications described in section 1.3 of this opinion. Therefore, the geotechnical drilling effects described in Section 2.5.2.2 of the ASAOC Opinion are incorporated by reference.

2.5.2.1. Disturbance/Noise from Equipment Operation

Implementation of the proposed action will include operation of equipment as close as 15 feet to occupied habitat in the EFSFSR at the NW Bradley Dump site. Effects to Chinook salmon and steelhead from this work are fully described in section 2.5.2.1 of the ASAOC Opinion and are incorporated by reference. Chinook salmon located in the upper EFSFSR in the vicinity of the

Bradley Man Camp and Schoolhouse areas may also be disturbed as a result of equipment operation near and within the EFSFSR. As explained in the ASAOC Opinion, steelhead do not occur upstream of the YPP.

Noise and vibration from heavy equipment operating adjacent to live water will disturb fish in the immediate vicinity causing short-term displacement. Heavy equipment operation near the EFSFSR will create noise, vibration, and potentially water surface disturbance. Popper et al. (2003) and Wysocki et al. (2007) discussed potential impacts to fish from long-term exposure to anthropogenic sounds, predominantly air blasts and aquaculture equipment, respectively. Popper et al. (2003) identified possible effects to fish including temporary, and potentially permanent hearing loss (via sensory hair cell damage), reduced ability to communicate with conspecifics due to hearing loss, and masking of potentially biologically important sounds. Studies evaluated noise levels ranging from 115 to 190 decibels (dB) [referenced at 1 micropascal (μPa) for water]. In the studies identified by Popper et al. (2003) that caused ear damage in fishes, all evaluated fish were caged and thus incapable of moving away from the disturbance. Wysocki et al. (2007) did not identify any adverse impacts to rainbow trout from prolonged exposure to three sound treatments common in aquaculture environments (115, 130, and 150 dB) (re: 1 μPa). Popper and Hastings (2009) discussed how differences in how fish use sound (i.e., generalist versus specialists), fish size, development, and possibly genetics, can lead to different effects from the same sounds. As a result, they caution that studies on the effects of sound, particularly if they are from different sources, are not readily extrapolated between species, fish sizes, or geographic location.

Machinery operation adjacent to the EFSFSR will be intermittent with actual activity near the stream occurring only in daylight hours on any given day. The Federal Highway Administration (FHWA 2008) indicates that for the types of equipment that will be operating onsite backhoe, excavator, dozer, and dump truck noise production will range between 80 and 88 dB (referenced at 20 μPa for air). These noises are in-air and cannot be directly compared against the 150 dB root mean squared disturbance threshold for underwater noise. This considered, noise from equipment may cause fish to temporarily move away from the disturbance. However, because the decibel scale is logarithmic, there is nearly a 100-fold difference between noise levels expected from the action and noise levels known to have generated adverse effects to surrogate species, as discussed above. Therefore, although noise related disturbances of this magnitude may cause fish to temporarily relocate or avoid work areas during work days, they are unlikely to result in injury or death.

Although they are not likely to be killed as a result of disturbance, rearing juvenile salmonids could be periodically displaced from habitat in the EFSFSR when work is occurring at the Northwest Bradley Dump, Bradley Man Camp, and Schoolhouse sites. If fish respond in this manner, they are expected to generally migrate only short distances to an area where they feel more secure and only for a few hours in any given day. Although not likely, it is possible that some disturbed juvenile salmon may be subject to predation as they attempt to find more suitable cover, particularly in the EFSFSR below the YPP, where large bull trout and westslope cutthroat trout are more abundant.

Work in this location also has the potential to disturb spawning Chinook salmon given the timing of the work. However, as outlined in the Stantec BA (2022), the section of the EFSFSR adjacent to the NW Bradley Dump site is rarely used by Chinook salmon spawning. Minimal spawning habitat is available in the EFSFSR adjacent to the Bradley Man Camp site. Even if adult fish are outplanted in the upper EFSFSR, it is unlikely that they would be disturbed by activities at this location. If adult Chinook salmon are outplanted in the EFSFSR when the Schoolhouse activity is being implemented, a weir will be installed to prevent adult fish from entering the construction area. For the reasons described above, disturbance to adults is unlikely to occur.

2.5.2.2. Cofferdam Installation, Fish Salvage, and Dewatering

Fish salvage will occur as part of the Schoolhouse activity. More specifically, salvage will occur within areas that are dewatered to advance construction of the new channel as well as in the existing EFSFSR channel prior to diverting all water into the newly constructed channel. Cofferdams will be installed to isolate work areas that are below the ordinary high-water mark and to function as a means to control water introduction into the new channel. Our analysis includes electrofishing in these smaller, isolated areas. For the EFSFSR reach-wide dewatering, the sequencing of flow reductions and electrofishing is described in Appendix A of the 2022 BA. The sequencing is designed to enhance volitional fish movement out of the reach being dewatered prior to conducting fish salvage. Not all fish will move volitionally out of the existing channel, and will therefore be exposed to capture with via seining and/or electrofishing. All electrofishing will follow NMFS' (2000) guidelines to reduce the risk of mortality and to minimize harm.

Cofferdam installation and fish salvage may cause the following effects to juvenile Chinook salmon:

- Potential crushing of juveniles in stream substrate as cofferdam material is placed in the river.
- Harassment, handling, harm, and potentially death caused by fish salvage.
- Fish stranding could occur during dewatering.

It is difficult to predict the number of fish that will be exposed to these pathways of effect. Schroder et al. (2008) investigated the breeding success of hatchery and wild spring Chinook salmon from the upper Yakima River and reported a 46.3 percent (average) conversion of eggs to fry. Assuming a female Chinook salmon carries 5,000 eggs (Quinn 2018), and applying a 46.3 percent conversion, each redd would contribute 2,315 fry. Similar Chinook salmon fry production findings were reported by Field-Dodgson (1983). This author installed fry traps over four separate Chinook salmon redds, and the total numbers of fry in two of the traps[2] were 2,678 and 2,604. Applying these estimates to the number of redds observed in the EFSFSR would not be appropriate because these estimates do not account for mortality that occurs following emergence nor do they account for dispersal that is likely to happen following emergence as

[2] A third trap had far fewer fry; however, the trap was disturbed during the experiment and it is possible that fry escaped. The fourth trapped experienced siltation and 100 percent mortality ensued.

juvenile fish established feeding territories to optimize their growth. The NPT has operated the Johnson Creek Artificial Propagation Enhancement project for over 20 years. As part of that project, the NPT conducts multiple-pass spawning ground surveys and operates a rotary screw trap on Johnson Creek to monitor migrating juveniles. Between 1998 and 2020, annual redd counts upstream of the screw trap ranged from 24 (1999) to 407 (2014). The average number of juvenile recruits per redd were estimated to range from 386 to 1,207 with an average of 745 (Rabe 2022).

A total of 32 redds were counted in the EFSFSR and Meadow Creek, upstream of the YPP. The box culvert functions as an upstream fish passage barrier; therefore, we have assumed that juvenile fish from 30 redds could be present in the Schoolhouse Tailings Removal area[3]. Applying the estimate of 745 juvenile fish per redd would mean about 22,350 juvenile Chinook salmon could be present in aquatic habitat upstream of the YPP. The reach to be dewatered is approximately 750 feet in length, which represents approximately 6 percent of the habitat within the EFSFSR and Meadow Creek reaches with historic redd documentation. Assuming equal dispersal these fish in the EFSFSR and Meadow Creek, approximately 1,341 juvenile fish could be present in the reach during construction activities. Blocknets installed upstream and downstream will prevent fish movement into the area being dewatered and electrofished. Salvaged fish, smaller than 80 millimeters, will be relocated downstream of the reach to eliminate the potential for entrainment in the blocknets.

It is difficult to predict the number of fish that might volitionally move from the existing EFSFSR channel as flows are slowly reduced. Given the relatively short window of time, over which flow reductions will occur prior to electrofishing (i.e., 2 hours), we will assume that 10 percent of the fish rearing in the area will volitionally move downstream and the remaining 1,207 fish could be exposed to electrofishing. Each of these fish would experience varying levels of elevated stress and potentially harm, with some fish dying from the exposure to electrofishing and handling. Applying a 5 percent mortality estimate associated with electrofishing (McMichael et al. 1998), NMFS estimates up to 60 Chinook salmon parr mortalities may result from the proposed electrofishing salvage. It is possible that additional fish will evade capture and will be stranded in the dewatered channel. However, the chances of this will be reduced by conducting fish salvage over a period of 2 days to provide additional efforts to capture subyearling fish. Given that reported smolt-to-adult survival rates for natural-origin Chinook salmon in Johnson Creek is less than 1 percent (Rabe et al. 2019), it is unlikely that implementation of the proposed action will result in the loss of one adult equivalent return.

2.5.2.3. Habitat-Related Effects

As described in detail in the critical habitat effects section of this opinion, the proposed action has the potential to impact fish through impacts to water quality (i.e., temperature, turbidity, chemical contamination), substrate, forage, cover, and riparian vegetation. Of these effects, exposure to turbidity, elevated stream temperatures, and reduced forage are most likely to

[3] This assumption is based on the fact that only one of the three redds documented in the EFSFSR by the NPT between Fiddle Creek (downstream of the box culvert) and Meadow Creek (upstream of the box culvert) was observed by the PNF between the box culvert and Meadow Creek. We have assumed two of the documented redds were downstream of the box culvert.

adversely affect Chinook salmon in the EFSFSR. Because steelhead only occupy habitat within and downstream of the YPP, they are most likely to be adversely affected by exposure to turbidity.

Construction within and near stream channels will introduce sediment into the stream, although sediment delivery is expected to be effectively minimized through implementation of proposed PDFs and BMPs. Although increased sediment delivery will be localized, it will nevertheless create temporary negative effects on rearing and spawning salmon in the EFSFSR. Exposure of juvenile salmonids to multiple low intensity and temporary turbidity plumes is most likely to cause only minor behavioral modifications as these fish seek more suitable habitat conditions. Although not likely, it is possible that these fish could also be subject to predation as they attempt to relocate to more suitable habitats.

The reconstructed reach of the EFSFSR will likely experience slightly warmer water temperatures compared to baseline conditions until vegetation can grow to a sufficient size capable of shading portions of the stream. Elevated stream temperatures can adversely affect juvenile fish by impairing feeding, growth, disease resistance, and predator avoidance. Adult fish may experience bioenergetic stress in warmer temperatures that can lead to reduced spawning success. In addition, elevated temperatures can reduce gamete viability and reduce survival of incubating embryos (EPA 2003; NMFS 2015). In some years, baseline stream temperatures have been slightly elevated above temperatures identified as fully protecting Chinook salmon spawning. Given the relatively small area of impact, the anticipated small temperature increase, and addition of cooler water from tributary streams just downstream of the Schoolhouse area, the impacts of elevated stream temperatures are expected to only have minor, short-term impacts on juvenile fish inhabiting the immediate vicinity. It is possible that adult fish outplanted above the YPP and that hold and/or spawn in reconstructed channel could experience some reduced spawning success as a result of slight increases in stream temperatures in the temporary to short-term timeframes.

Reduced forage in the new reach of the EFSFSR is expected to persist for up to 2 years. Temporary reductions in food can lead to reduced growth, which in turn, can lead to reduced survival (Mebane & Arthaud 2010). We anticipate very minor impacts to juvenile Chinook salmon as a result of reduced forage for the following reasons: (1) only a small area of habitat will be impacted; (2) the presence of intact riparian habitats both upstream and downstream will provide sources of allocthonous material and terrestrial-derived prey items; (3) juvenile salmonids are opportunistic feeders and can feed on a variety of aquatic-derived invertebrate forage; (4) aquatic macroinvertebrate communities upstream and downstream of the project area are not expected to be negatively impacted and will provide an ongoing source of food for juvenile salmonids; and (5) juvenile salmonids are mobile and can move to nearby habitats if prey is limited in the newly constructed channels. Considering the reduction in forage will be localized and temporary and considering the reasons listed above, we do not expect individual fish to experience reduced growth or any other sublethal effects associated with reduced food.

Immediately following project completion and into the long term, salmon and steelhead should benefit as habitat conditions realize a localized improvement through restoration of floodplain

and riparian function, increase in instream habitat complexity, and reduction of a chronic source of metals contamination to streams within the action area.

2.6. Cumulative Effects

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

Some continuing non-Federal activities are reasonably certain to contribute to climate effects within the action area. However, it is difficult if not impossible to distinguish between the action area's future environmental conditions caused by global climate change that are properly part of the environmental baseline versus cumulative effects. Therefore, all relevant future climate-related environmental conditions in the action area are described earlier in the discussion of climate change implications for ESA-listed species and their critical habitat (Section 2.2).

The action area is primarily managed by the Boise National Forest and PNF. A few small parcels of private property and state-administered lands are scattered throughout the action area. Uses on these lands are not expected to change in the foreseeable future. Activities in the action area include road/trail maintenance performed by non-Federal entities (e.g., Valley County, Idaho State Parks and Recreation) and recreation (e.g., camping, fishing, hiking, etc.) These activities will continue to influence water quality and habitat conditions for anadromous fish in the action area. Riparian and stream corridors have been negatively impacted by roads and trails and these impacts will continue in the future. The impacts of these activities on the current condition of ESA-listed species and designated critical habitats within the action area was described in the Status of the Species, Status of Critical Habitat, and Environmental Baseline sections of this opinion and the related sections of the ASAOC Opinion. Current levels of these activities are likely to continue into the future and are unlikely to be substantially more severe than they currently are.

2.7. Integration and Synthesis

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

2.7.1. Designated Critical Habitat

Critical habitat throughout the Snake River spring/summer Chinook salmon and SRB steelhead designation ranges from excellent in roadless areas, to degraded in areas of human activity.

Historical mining pollution, sediment delivery from historical logging practices, and degraded riparian conditions from past grazing were major factors in the decline of anadromous fish populations in the action area. Habitat-related limiting factors for recovery of one or more populations within the action area include excess sediment, degraded riparian conditions, passage barriers, and elevated water temperatures (NMFS 2017). Climate change is likely to exacerbate several of the ongoing habitat issues, in particular, increased summer water temperatures.

The impacts of Federal and non-Federal land use activities on critical habitat are reflected in the environmental baseline section of this document. Current levels of these uses are likely to continue into the future and are unlikely to be substantially more severe than they currently are. It is difficult if not impossible to distinguish between the action area's future environmental conditions caused by global climate change that are properly part of the environmental baseline versus cumulative effects.

Streams within the action area are vitally important to the recovery of anadromous fish species. There are a number of heavily used Chinook salmon spawning areas in the action area (i.e., SFSR, Johnson Creek, etc.). Steelhead also use these areas. Tributary habitat will likely become even more important for thermal refugia in the face of climate change. Mining, recreation, and use of the existing road system are the primary human activities in the action area, although some private inholdings and associated homesteads exist. Roads from legacy logging remain on the landscape and are a threat to the aquatic ecosystem. In more recent times, wildfire has become the largest disturbance mechanism in the action area. Sediment conditions have generally been on an improving trend, likely due to restoration actions and changes to land management approaches in the action area. Water temperatures are currently warmer than optimal and will likely continue to warm into the future. Riparian conditions are degraded in historically mined areas and areas where roads are located in the RCAs. Although there are some localized areas of heavy impacts as described above, habitat conditions in mainstem rivers and tributary streams within the action area are good overall.

We anticipate that spawning and rearing habitat in localized areas of the EFSFSR will be negatively impacted as a result of increased sediment delivery; elevated stream temperatures; and reduced forage, cover, and riparian vegetation. Sediment delivery is expected to occur to action area streams from road use, ground disturbing activities, and diverting water into a newly constructed stream channel. Given the proposed BMPs and setbacks from stream for most ground-disturbing activities, sediment delivery will be effectively minimized and resulting turbidity pulses and plumes are expected to be infrequent, of low magnitude, localized, and of short duration (i.e., minutes to a few hours). In addition, the substrate PBF will be locally affected in the temporary timeframe; however, high flushing stream flows in the spring are expected to clean most if not all project-generated sediment out of substrate within a year or two of project completion. Project-related sediment is not expected to affect the long-term conservation value of the water quality or substrate PBFs.

Stream temperatures are expected to rise slightly through the reconstructed EFSFSR channel. This impact will persist until vegetation is established along the new channel and is capable of providing shade. Replacement of contaminated material with clean fill, regrading of land

adjacent to the EFSFSR down to the historical floodplain, and revegetation efforts will support the establishment of a more robust and healthy vegetative community in the RCA that will provide increased overhead canopy and stream shade into the future. As such, we anticipate there will be slight improvements in stream temperatures in the short- to long-term timeframe, depending on revegetation success. Although stream temperature is expected to be impacted at the site scale, because the impacted areas are small, discrete, and in previously disturbed portions of the action area, we do not expect implementation of the proposed action to measurably alter stream temperatures at the broader reach scale in any timeframe.

Measurable reductions in food availability are expected to occur in the immediate vicinity of the Schoolhouse area, and there will be a slight reduction in macroinvertebrate drift farther downstream in the EFSFSR, extending to the YPP in the temporary (0–3 years). We expect reductions in aquatic-derived prey items to last no more than a year or two. Terrestrial-derived prey items in this short reach of the EFSFSR will be depressed until riparian vegetation can become reestablished. Ultimately, increased channel complexity, removal of contaminated material, and reestablishment of floodplain and riparian vegetation function is expected to improve forage availability.

Riparian vegetation will be negatively affected at all three activity locations. Maintenance of a vegetated buffer between removal actions at the Bradley Man Camp and NW Bradley Dump areas and adjacent streams, will minimize damage to existing banks and overhanging vegetation that provides cover. At the Schoolhouse area, the new EFSFSR channel will provide more instream cover, although cover provided by adjacent riparian vegetation will be depressed until the vegetation can become fully established. Although the project will affect riparian vegetation in the RCA in the short term, replanting areas with native vegetation following removal actions should result in the long-term improvement of riparian vegetation in the action area. Incorporation of large woody debris structures and pool habitat in the newly constructed EFSFSR channel will improve instream cover.

Ultimately, implementation of the proposed action is expected to positively impact designated critical habitat by eliminating chronic sources of metals contamination and sediment delivery, and through improving floodplain and RCA conditions. These actions directly address the excess sediment, poor water quality, floodplain connectivity, and water temperature limiting factors identified in the recovery plans. Furthermore, by restoring the landscape to more natural condition, the proposed action will increase the resilience of the action area to a changing climate.

When considering the status of the critical habitat, environmental baseline, effects of the action, and cumulative effects, NMFS concludes that EPA's and PNF's implementation of this proposed action will not appreciably diminish the value of designated critical habitat as a whole for the conservation of Snake River spring/summer Chinook salmon and SRB steelhead.

2.7.2. Species

As described in Section 2.2 of this opinion and Section 2.2 of the ASAOC Opinion, individuals belonging to two different populations within the Snake River spring/summer Chinook salmon ESU (SFSR and EFSFSR) and one population (SFSR) within the SRB steelhead DPS use the

action area to fully complete the migration, spawning, and rearing parts of their life cycle. The Snake River spring/summer Chinook salmon ESU is currently at a high risk of extinction. Recently, there has been a substantial downturn in adult abundance for both species. This downturn is thought to be driven primarily by marine environmental conditions and a decline in ocean productivity. Very large improvements in abundance will be needed to bridge the gap between the current status and proposed status for recovery for many of the ESU/DPS component populations.

The regional tributary habitat strategy set forth in the final recovery plans (NMFS 2017) is to protect, conserve, and restore natural ecological processes at the watershed scale that support population viability. Ongoing actions to support recovery of this ESU include, but are not limited to, conserving existing high-quality habitat and restoring degraded (and maintaining properly functioning) upland processes to minimize unnatural rates of erosion and runoff. Natal habitat recovery strategies and actions for populations within the action area include: (1) reduce road-related impacts (e.g., sediment delivery) on streams; (2) inventory stream crossings and replace any that are barriers to passage; (3) reduce floodplain and channel encroachment; and (4) restore floodplain function.

The environmental baseline incorporates effects of restoration actions implemented to date. It also reflects impacts that have occurred as a result of mining, recreation, and implementation of various programmatic activities. In addition, impacts from existing state and private actions are reflected in the environmental baseline. Cumulative effects from State and private actions in the action area are expected to continue into the future and are unlikely to be substantially more severe than they currently are. The environmental baseline also incorporates the impacts of climate change on both the species and the habitat they depend on. Several of the ongoing habitat issues that impact VSP parameters, in particular: increased summer temperatures and decreased summer flows, will continue to be affected by climate change.

Both populations of Chinook salmon occupying the action area are at a high risk of extinction. The SFSR population of steelhead is at a moderate risk of extinction. NMFS' preferred recovery scenario for the Snake River spring/summer Chinook salmon ESU targets the SFSR population to achieve a viable or highly viable status, and the EFSFSR population to be viable or maintained status. The preferred recovery scenario for the SRB steelhead DPS targets the SFSR population to be viable or highly viable. In order to achieve these goals, it is vitally important to preserve habitat conditions that are functioning appropriately and improve habitat conditions that are functioning at risk or at unacceptable risk.

The proposed action includes actions to specifically address chronic metals contamination associated with historical mining in the headwaters of this important subbasin. The EPA, PNF, Perpetua, and their contractors will implement the proposed action as proposed, with full adherence to the BMPs and PDF. Given this, we expect that adverse effects to ESA-listed species will be minimized to the extent practicable.

As described in the Effects of the Action (Section 2.5), noise and vibration of heavy equipment and drilling operations in RCAs have the potential to disturb individual Snake River spring/summer Chinook salmon and SRB steelhead. Although fish will temporarily be disturbed

by noise and vibration from construction and drilling activities, no fish are expected to be harmed or killed as a result of these activities. Juvenile Chinook salmon will likely be killed or harmed as a result of cofferdam installation, channel dewatering, and fish salvage activities at the Schoolhouse area. As described in Section 2.5.2.2, we expect that up to 1,207 fish could be exposed to electrofishing and experience varying levels of elevated stress and harm. We estimate that as many as 60 juvenile fish may be killed as a result of electrofishing. Additional fish may also be killed as a result of cofferdam installation and channel dewatering; however, we are unable to quantify the number of fish impacted. Considering fish are able to volitionally move from areas of disturbance/reduced flows and because multiple electrofishing attempts will be made, we expect only a few fish will be crushed or stranded.

Snake River spring/summer Chinook salmon and SRB steelhead will also be exposed to habitat-related effects associated with potential impacts to water quality (i.e., turbidity and chemical contamination), temperature, substrate, cover, forage, and disturbance to riparian vegetation. Of these effects, exposure to turbidity, increased sediment deposition, elevated stream temperatures, and reduced forage are most likely to adversely affect Chinook salmon in the EFSFSR. Exposure to turbidity is most likely to adversely affect steelhead in the EFSFSR.

Exposure of juvenile salmonids to multiple low intensity and temporary (i.e., minutes to hours) turbidity plumes is most likely to cause behavioral modifications as these fish seek more suitable habitat conditions. Although unlikely, these fish could also be subject to predation as they attempt to relocate to more suitable habitats. Increased sediment deposition may occur in localized areas; however, implementation of BMPs will minimize the amount of sediment delivered. As such, we do not expect sediment deposition to occur at levels that will harm or reduce survival of juvenile salmonids or incubating embryos.

The reconstructed reach of the EFSFSR will likely experience slightly warmer water temperatures compared to baseline conditions until vegetation can grow to a sufficient size capable of shading portions of the stream. Given the relatively small area of impact, the anticipated small temperature increase, and addition of cooler water from tributary streams just downstream of the project area, the impacts of elevated stream temperatures are expected to only have minor, short-term impacts on juvenile Chinook salmon inhabiting the immediate vicinity. If water temperatures are unsuitable, these fish may seek more suitable thermal environments nearby. It is possible that adult fish outplanted above the YPP and that hold and/or spawn in reconstructed channel could experience some reduced spawning success as a result of slight increases in stream temperatures in the temporary to short-term timeframes.

Reduced forage in the short, reconstructed reach of the EFSFSR is expected to persist for up to 2 years. However, we anticipate very minor impacts to juvenile Chinook salmon because: (1) only a small area of habitat will be impacted; (2) the presence of intact riparian habitat habitats both upstream and downstream will provide sources of allocthonous material and terrestrial-derived prey items; (3) juvenile salmonids are opportunistic feeders can feed on a variety of aquatic-derived invertebrate forage; (4) aquatic macroinvertebrate communities upstream and downstream of the project area are not expected to be negatively impacted and will provide an ongoing source of food for juvenile salmonids; and (5) juvenile salmonids are mobile and can move to nearby habitats if prey is limited in the newly constructed channels. We do not

expect individual juvenile Chinook salmon to experience reduced growth or reduced fitness as a result of these minor and temporary decreases in prey abundance.

Immediately following project completion and into the long term, fish should benefit as habitat conditions realize a localized improvement through restoration of floodplain and riparian function, and addressing the current source of chronic metals contamination to action area streams.

In summary, Chinook salmon and steelhead are expected to be adversely affected by disturbance associated with equipment operation and drilling near streams and increased sediment delivery to occupied streams. In addition, Chinook salmon are expected to be adversely affect by instream construction, dewatering, and fish salvage; reduced forage; and elevated stream temperatures. A few juvenile Chinook salmon are expected to be injured or killed as a result of cofferdam placement, dewatering, and fish salvage. Given estimated smolt-to-adult return rates of less than 1 percent, we do not expect the loss of these juveniles to measurably impact population productivity. Although some reduced spawning success may also occur as a result of elevated stream temperatures in the temporary to short-term timeframes, we don't anticipate these will measurably impact population productivity.

Because these impacts summarized above will not reduce the productivity of the affected populations, it is reasonable to conclude the action will not negatively influence VSP criteria at the population scale. Thus, the viability of the MPG and the ESU are also not expected to be reduced. When considering the status of the species, and adding in the environmental baseline, and cumulative effects, implementation of the proposed action will not appreciably reduce the likelihood of survival and recovery of Snake River spring/summer Chinook salmon.

2.8. Conclusion

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

2.9. Incidental Take Statement

Section 9 of the ESA and Federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without a special exemption. "Take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. "Harm" is further defined by regulation to include significant habitat modification or degradation that actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering (50 CFR 222.102). "Harass" is further defined by interim guidance as to "create the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns, which include but are not limited to, breeding, feeding, or sheltering." "Incidental take" is defined by regulation as takings that result from, but are not the

purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant (50 CFR 402.02). Section 7(b)(4) and section 7(o)(2) provide that taking that is incidental to an otherwise lawful agency action is not considered to be prohibited taking under the ESA if that action is performed in compliance with the terms and conditions of this ITS.

This ITS supersedes the original ITS provided with the ASAOC Opinion (WCRO-2022-00316) dated June 1, 2022.

2.9.1. Amount or Extent of Take

Implementation of the proposed action is reasonably certain to result in incidental take of ESA-listed species. NMFS is reasonably certain the incidental take described here will occur because adult and juvenile Chinook salmon and steelhead will occur in the action area during project implementation, and those fish will be exposed to effects of the proposed action. Take of Chinook salmon and steelhead is expected to occur due to effects from disturbance associated with equipment operation and drilling and by sediment delivery. In addition, take of Chinook salmon is expected to occur as a result of instream construction, fish salvage, dewatering, and elevated water temperatures. In some instances, NMFS is able to quantify the amount of take; however, where available information precludes our ability to quantify take, we use surrogates to describe the incidental take pursuant to 50 CFR 402.14 (I).

Equipment Operation/Drilling. Disturbance associated with equipment operation (i.e., from noise) and drilling (i.e., from noise and vibration) is likely to harass rearing juvenile salmonids (i.e., annoying juveniles sufficiently to disrupt normal behavioral patterns). As described in the species effects analysis, NMFS is unable to quantify the take associated with disturbance due to equipment operation in close proximity to the EFSFSR. It is not possible to tell whether fish are present and have been disturbed, and it is not possible to determine how many, if any, juvenile fish are subject to predation as a result of these activities. Because we are not able to define an amount of take, we have defined a surrogate instead. Equipment operation will produce noise (earth moving equipment and drilling equipment) and vibration (primarily drilling equipment) at sufficient intensities to cause behavioral modifications. The degree that juvenile salmon and steelhead will be harassed is directly correlated with both the amount of work done and the proximity of that work to streams. Equipment is expected to operate at the NW Bradley Dump for up to 18 weeks, operating during daylight hours only. Drilling activities are expected to be shorter in duration, also occurring during daylight hours, and are anticipated to take no more than four days. As such, NMFS will consider take exceeded if: (1) equipment operation takes longer than 18 weeks to complete removal actions at the NW Bradley Dump; (2) drilling at the NW Bradley Dump takes longer than four days to complete; or (3) any drilling locations take place closer than 15 feet of the EFSFSR. Although these surrogates could be considered coextensive with the proposed action, they function as effective reinitiation triggers because they can be readily monitored, and thus will serve as a regular check on the proposed action.

Sediment Delivery. Increased sediment delivery into action area streams is likely to harass rearing juvenile salmonids (i.e., annoying juveniles sufficiently to disrupt normal behavioral patterns). Similar to equipment operation/drilling, take caused by the increased sediment delivery into action area streams cannot be accurately quantified as number of fish for a variety of reasons. The distribution and abundance of fish within the action area is dependent upon a

number of environmental factors that vary over time and space, potentially including exposure of both juvenile and adult salmon and steelhead to resulting turbidity plumes. It is not possible to monitor the number of fish that may be displaced by turbidity plumes. In these circumstances, NMFS can use the causal link established between the activity and the likely changes in habitat conditions affecting the listed species to describe the extent of take as a numerical level of habitat disturbance.

The best available indicators for the extent of take is the magnitude and extent of turbidity plumes in the receiving waters during project implementation. The magnitude and extent of the turbidity plume is proportional to the amount of harm that the proposed action is likely to cause through short-term degradation of water quality and instream habitat. Sediment levels are expected to rapidly peak and then steadily decrease in intensity within 1,000 feet downstream of construction areas that are immediately adjacent to or within the stream channel. Although we recognize the limitations of using turbidity as a surrogate for suspended sediment, it is a reasonable and cost-effective measure that can be readily implemented in the field. Most of the time turbidity measurements take 30 seconds, can be done on site, and therefore allow for rapid adjustments in project activities if turbidity approaches unacceptable levels. For these reasons, we have chosen turbidity as a surrogate for incidental take from sediment-related effects.

NMFS will consider the extent of take exceeded if turbidity readings, taken no more than 500 feet downstream of work at the NW Bradley Dump and Schoolhouse area, reveal turbidity concentrations greater than 50 NTU above background for more than 90 minutes, or 100 NTUs above background instantaneously. Literature reviewed in Rowe et al. (2003) indicated that NTU levels below 50 generally elicit only behavioral responses from salmonids thereby making this a suitable surrogate for sublethal incidental take monitoring. This take indicator functions as effective reinitiation trigger because it can be readily monitored, and thus will serve as a regular check on the proposed action.

Instream Construction, Fish Salvage, and Dewatering. Take caused by instream construction (placement of cofferdams) and dewatering activities cannot be accurately quantified as number of fish. It is not possible to monitor the number of fish that may be crushed by cofferdam installation nor is it possible to monitor the number of fish that may be stranded when the EFSFSR is dewatered. In these circumstances, NMFS can use the causal link established between the activity and the likely changes in habitat conditions affecting the listed species to describe the extent of take as a numerical level of habitat disturbance. For instream construction and dewatering, NMFS will consider the extent of take exceeded if more than 750 linear feet of stream is dewatered and more than four cofferdams are placed in the EFSFSR. Although these surrogates are coextensive with the proposed action, they function as effective reinitiation triggers because they can be readily monitored and can serve as a regular check on the proposed action.

Juvenile Chinook salmon will likely be harmed, harassed, handled, and/or killed during salvage of the EFSFSR reach being dewatered. We estimate that up to 1,207 juvenile Chinook salmon may be captured. Of these, up to 60 Chinook salmon parr may be killed during electrofishing. Exceeding either the total number of fish captured or the total number of mortalities would exceed the amount of take authorized for electrofishing.

Elevated Water Temperatures. Take caused by elevated water temperatures cannot be accurately quantified as a number of fish. It is not possible to measure reduced gamete viability in adult females nor is it possible to measure reduced embryo survival. In these circumstances, NMFS can use the causal link established between the activity and the likely changes in habitat conditions affecting the listed species to describe the extent of take. In this instance, NMFS will use revegetation success as a take surrogate because stream shading is directly related to stream temperatures. NMFS will consider the extent of take exceeded if the project does not achieve its goal of 70 percent revegetation success within 15 years of implementation. This extent of take will not be considered exceeded if 70 percent revegetation success is not achieved yet stream temperatures are not greater than what has been observed to date, while considering interannual variability.

2.9.2. Effect of the Take

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

2.9.3. Reasonable and Prudent Measures

"Reasonable and prudent measures" are measures that are necessary or appropriate to minimize the impact of the amount or extent of incidental take (50 CFR 402.02). The EPA and the PNF have the continuing duty to regulate the activities covered in this ITS where discretionary Federal involvement or control over the action has been retained or is authorized by law.

NMFS believes that full application of PDFs included as part of the proposed action, together with use of the RPMs and terms and conditions described below, are necessary and appropriate to minimize the likelihood of incidental take of ESA-listed species due to completion of the proposed action.

The EPA and PNF shall:

1. Minimize the potential for incidental take from water quality impacts to streams.

2. Minimize the potential for incidental take from instream work activities.

3. 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 and ensure incidental take is not exceeded.

2.9.4. 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 EPA, PNF, Perpetua, and any contractor implementing the proposed action 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, the EPA and PNF shall:

    a. Apply standard construction practices, including minimizing the amount of surface disturbance and clearly delineating all work zones before starting construction, to minimize the potential to deliver sediment to action area streams.

    b. Turbidity monitoring (both visual and measured) will be conducted by a qualified environmental monitor during all in-water work (i.e., placement and removal of cofferdams and when introducing water in to the newly constructed EFSFSR channel). Turbidity will be visually monitored by a qualified observer who will record size (width and length) and location of any visible plumes, and will also photograph all visible plumes. Turbidity measuring, during in-water work activities, will proceed as follows:

        i. Obtain a background measurement upstream from the work site at the beginning of each workday to determine background turbidity levels.

        ii. Conduct visual monitoring for turbidity plumes during cofferdam installation and removal and during watering of the newly constructed EFSFSR channel.

        iii. Should a visual sediment plume occur, obtain turbidity measurements on a regular basis (i.e., at least every 30 minutes) at a location 500 feet downstream. Should turbidity levels approach 50 NTUs over background levels for more than 90 minutes or approach 100 NTUs instantaneously, halt the activity for the time necessary to allow sediment to settle. After stopping the activities, contact NMFS to determine if and when work can proceed and if additional BMPs need to be employed to further minimize the intensity of remaining plumes to ensure extent of take is not exceeded. Activities may begin again after contacting NMFS, employing new BMPs (if required), and when turbidity measurements approach background levels.

    c. Initiate a visual turbidity monitoring program when drilling occurs in RCAs. Visual monitoring must occur at least two times during drilling activities at each location. If visible turbidity is present downstream of drilling activities, cease operations until the source of turbidity can be identified and mitigated.

1. To implement RPM 2, the EPA and PNF shall:

    a. Minimize the size of the dewatered work areas to the extent necessary to successfully complete the proposed activities.

    b. Install cofferdams slowly and incrementally to reduce flow to encourage fish to leave the area volitionally.

1. To implement RPM 3, the EPA and PNF shall:

a. Submit a project status/completion report to NMFS within 6 weeks of project completion for activities completed under the proposed action. In the event work spans more than 1-year, reports shall be provided each year work occurs. At a minimum, the report(s) shall include the following information:

   i. Project Name(s) and Agency Contact(s).

   ii. Starting and ending dates for completed work.

   iii. Labeled before and after site photos.

   iv. A summary of pollution and erosion control inspection results, including description of any erosion control failure, contaminant release, and efforts to correct such incidences.

   v. Total amount of time (in weeks and days) equipment operates on-site at the NW Bradley Dump. Identification of the drilling locations, their distance from the EFSFSR, and time needed to complete drilling at each location.

   vi. Results of turbidity monitoring to demonstrate the authorized extent of take was not exceeded.

   vii. The number of cofferdams installed and length of channel that was dewatered.

   viii. The total number of Chinook salmon handled and the number of Chinook salmon that were killed or injured during electrofishing.

   ix. Specific to revegetation efforts, annually submit post-construction revegetation reports documenting progress toward achieving the targeted goal of 70 percent ground cover within 3 years of planting. Considering difficulties establishing vegetation in the project area in past rehabilitation efforts, ground cover monitoring and annual updates shall continue for 15 years post-project or until the goal of 70 percent ground cover is achieved, whichever comes first.

b. The report shall provide the above identified information and confirm the project's proposed BMPs and that this opinion's terms and conditions were successfully implemented.

c. Reports must be submitted electronically to: nmfswcr.srbo@noaa.gov. The electronic submittal shall include the following NMFS Tracking Number: WCRO-2022-03035.

2.10. Conservation Recommendations

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

species or critical habitat or regarding the development of information (50 CFR 402.02). NMFS recommends the following:

- To mitigate the effects of climate change on ESA-listed salmonids, the EPA and PNF should follow recommendations by the ISAB (Independent Scientific Advisory Board) (2007) to plan now for future climate conditions by implementing protective tributary and mainstem habitat measures. In particular, implement measures to remove barriers and to protect or restore riparian buffers, wetlands, and floodplains.

- When drilling within RCAs, if anything other than water is used to increase viscosity or to reduce fluid loss, ensure that any additive used is non-toxic.

2.11. Reinitiation of Consultation

This concludes formal consultation for the Stibnite ASAOC action.

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

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

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

This analysis is based, in part, on the EFH assessment provided by the EPA and PNF and descriptions of EFH for Pacific Coast salmon contained in the fishery management plan developed by the Pacific Fishery Management Council (PFMC) and approved by the Secretary of Commerce (PFMC 2014).

3.1. Essential Fish Habitat Affected by the Project

The proposed action for this consultation is described in the Introduction (Section 1.3) to this document. The action area, is described in Section 2.3 of the above opinion, and includes areas designated as EFH for spawning, rearing, a migratory life history stages of Chinook salmon. The PFMC has identified five habitat areas of particular concern (HAPC) for salmon, which warrant additional focus for conservation efforts due to their high ecological importance. Three of the five HAPC are applicable to freshwater and include: complex channel and floodplain habitat, spawning habitat, and thermal refugia (PFMC 2014). The reaches of the EFSFSR and Meadow Creek include spawning habitat, thermal refugia, and the complex channels and floodplain HAPC.

3.2. Adverse Effects on Essential Fish Habitat

The proposed action and action area are described in the BA and prior opinion. The action area includes habitat designated as EFH for various life stages of Chinook salmon. The effects of the proposed action on fish habitat is described in the habitat effects section of the opinion. To summarize the conclusions in the opinion, the following adverse and beneficial effects to EFH will occur:

- Multiple turbidity plumes will produce brief and temporary adverse water quality-related impacts. Individual pulses are not expected to persist more than 90 minutes, will remain less than 100 NTUs over background, and will not extend more than 500 feet downstream. Individual plumes should be temporary, and affect narrow, short segments of EFH.

- Spawning habitat will be dewatered when the newly constructed EFSFSR channel, (which will contain spawning habitat) is activated.

- Slight temperature increases are expected to occur in the Schoolhouse activity area and are expected to persist in the temporary to short-term timeframes, depending on how quickly shade producing vegetation can be established.

- Forage will be reduced in short section of rearing habitat for a period of up to 2 years.

- There will be long-term beneficial effects to EFH, including: (1) improved habitat conditions the upper EFSFSR; (2) improved water quality (reduced levels of chronic metals contamination and sediment delivery; (3) improved floodplain connectivity; and, (4) improved riparian functions and processes.

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.

- Standard construction practices should be applied, including minimizing the amount of surface disturbance and clearly delineating all work zones before starting construction, to minimize the potential to deliver sediment to action area streams.

- The size of the dewatered work areas should be minimized to the extent necessary to successfully complete the proposed activities.

- Construction activities should be stopped if turbidity levels 500 feet downstream of their source begin to approach 100 NTUs above background, or begin to approach 50 NTUs for more than 90 minutes. At that time, activities should stop and additional BMPs should be employed to further minimize the intensity of remaining plumes.

- When drilling within RCAs, if anything other than water is used to increase viscosity or to reduce fluid loss, any additive used should be non-toxic.

- A visual turbidity monitoring program should be used when drilling occurs in RCAs. If visible turbidity is present downstream of drilling activities, operations should cease until the source of turbidity can be identified and mitigated.

Fully implementing these EFH Conservation Recommendations would protect, by avoiding or minimizing the adverse effects described in section 3.2, above, for Pacific Coast salmon.

3.4. Statutory Response Requirement

As required by section 305(b)(4)(B) of the MSA, the EPA and PNF 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 EPA and PNF must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH Conservation Recommendations [50 CFR 600.920(l)].

4. Data Quality Act Documentation and Pre-Dissemination Review

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

4.1. Utility

Utility principally refers to ensuring that the information contained in this consultation is helpful, serviceable, and beneficial to the intended users. The intended users of this opinion are the EPA, and PNF. Other interested users could include Perpetua and contractors implementing the proposed action. This document will be available within 2 weeks at the NOAA Library Institutional Repository at https://repository.library.noaa.gov/welcome. The format and naming adhere to conventional standards for style.

4.2. Integrity

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

4.3. Objectivity

Information Product Category: Natural Resource Plan

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