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

Refer to NMFS No: WCRO-2019-00430

June 19, 2019

Charles Mark
Forest Supervisor
Salmon-Challis National Forest
1206 South Challis
Salmon, Idaho 83467

Lt. Col. Christian Dietz
U.S. Army Corps of Engineers
Walla Walla District
201 North Third Avenue
Walla Walla, Washington 99362

Re: Reinitiated Endangered Species Act Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the Salmon-Challis National Forest's Challis Creek Road Repair Project, HUC #1706020117 - Challis Creek, Custer County, Idaho

Dear Mr. Mark and Lt. Col. Dietz:

Thank you for your letter of April 29, 2019, 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.) for the Challis Creek Road Repair Project.

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

In this biological opinion (Opinion), NMFS concludes that the action, as proposed, is not likely to jeopardize the continued existence of Snake River Basin steelhead. NMFS also determined the action will not destroy or adversely modify designated critical habitat for Snake River spring/summer Chinook salmon. Rationale for our conclusions is provided in the attached Opinion. The Salmon Challis National Forest (SCNF) determined the proposed action would have no effect on Snake River spring/summer Chinook salmon and designated critical habitat for Snake River Basin steelhead. The ESA does not require NMFS to evaluate no effect determinations and therefore, this species and designated critical habitat are not discussed further.

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

This document also includes the results of our analysis of the action's effects on EFH pursuant to section 305(b) of the MSA, and includes four Conservation Recommendations to avoid, minimize, or otherwise offset potential adverse effects on EFH. These Conservation Recommendations are a non-identical set of the ESA Terms and Conditions. Section 305(b)(4)(B) of the MSA requires federal agencies provide a detailed written response to NMFS within 30 days after receiving these recommendations.

If the response is inconsistent with the EFH Conservation Recommendations, the SCNF and/or the COE must explain why the recommendations will not be followed, including the justification for any disagreements over the effects of the action and the 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 agencies. Therefore, in your statutory reply to the EFH portion of this consultation, NMFS asks that you clearly identify the number of Conservation Recommendations accepted.

Please contact Mr. Chad Fealko, Salmon Field Office, 208-756-5105, chad.fealko@noaa.gov if you have any questions concerning this consultation, or if you require additional information.

Sincerely,

Michael P. Tehan
Assistant Region Administrator
Interior Columbia Basin Office

Enclosure

cc: K. Pindel – SCNF
J. Joyner – COE
S. Fisher – USFWS
L. Dlugolecki – USFWS
C. Colter – SBT
K. Krieger – SCNF

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

Reinitiation of Challis Creek Road
Repair Project

NMFS Consultation Number: WCRO-2019-00430

Action Agencies: Salmon Challis National Forest (Lead) and U.S. Army Corps of Engineers

Affected Species and NMFS' Determinations:

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

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

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

Issued By:

Michael P. Tehan
Assistant Regional Administrator

Date: July 2, 2019

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ACRONYMS

Acronym	Definition
BA	Biological Assessment
BMP	Best Management Practice
COE	U.S. Army Corps of Engineers
CWA	Clean Water Act
dB	decibel
DPS	Distinct Population Segment
DQA	Data Quality Act
EFH	Essential Fish Habitat
ESA	Endangered Species Act
ESU	Evolutionarily Significant Units
HAPC	Habitat Areas of Particular Concern
ICTRT	Interior Columbia Basin Technical Recovery Team
ISAB	Independent Scientific Advisory Board
ITS	Incidental Take Statement
MPGs	Major Population Groups
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NMFS	National Marine Fisheries Service
NTU	Nephelometric Turbidity Unit
OHWM	Ordinary High Water Mark
Opinion	Biological Opinion
PBFs	Physical or Biological Features
PCEs	Primary Constituent Elements
PFMC	Pacific Fishery Management Council
RHCAs	Riparian Habitat Conservation Areas
RMO	Riparian Management Objectives
RPM	Reasonable and Prudent Measures
SCNF	Salmon-Challis National Forest
SPPP	Stormwater Pollution Prevention Plan
Tribes	Shoshone-Bannock Tribes
V:H	Vertical:Horizontal
VSP	Viable Salmonid Population
yd^3	cubic yard

1. INTRODUCTION

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

1.1 Background

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

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. A complete record of this consultation is on file at the Snake Basin Area Office, Boise, Idaho.

The Challis Creek Road (Forest Road Number 40-080) is a 9-mile long route located on the Salmon Challis National Forest (SCNF) within the Challis and Mill Creek drainages west of Challis, Idaho. The 2013 Lodgepole Fire burned extensive portions of the Challis Creek watershed, with some areas being burned at high intensity. Post-fire rain events triggered numerous debris flows, affecting Challis Creek Road at five locations between Bear and Lodgepole Creeks. Following peak flows in spring of 2016, eight additional road locations were identified as needing repair by the SCNF and the sites were addressed through emergency consultation in July, 2017 (see consultation history below). Challis Creek is still working through the substrate and debris and is continuing to adjust its plan form and profile.

The SCNF, with the assistance of Custer County, completed some road repairs in the fall of 2017. Portions of the completed work did not successfully implement the project as consulted on by NMFS in 2016 (NMFS. No. WCR-2016-5445). Specifically, implementation did not complete required fish salvage measures and the proposed bypass channel was not constructed to the design specification. For this reason, any incidental take that occurred is not exempt from Section 9 of the ESA. Exceeding the quantity of incidental take is a trigger for reinitiation of ESA consultation. For this reason, the SCNF reinitiated consultation, generating this Opinion.

For the five work sites addressed in the 2016 Opinion, the SCNF has completed work at Sites 2, 3, and 4, and the first phase of Site 1. For the work addressed in the emergency consultation, all eight sites (A–H) are complete. This Opinion addresses only the remaining work from NMFS' 2016 Opinion. Remaining work includes Phase 2 of Site 1 and all of Site 5. Specific actions are discussed in the following Proposed Action section.

1.2 Consultation History

NMFS previously completed formal consultation on the Challis Creek Road Repair Project on September 19, 2016 (NMFS No.: WCR-2016-5445). History for that consultation can be found in the referenced Opinion. The 2016 consultation addressed five individual road repair sites with work occurring over a 3-year period. The Level 1 Team visited the site in June, 2017, following high water events. Some Team members recommended reinitiating consultation due to changed conditions. The SCNF evaluated the changes and determined no reinitiation of consultation was necessary (Krieger 2018).

The SCNF initiated emergency consultation on July 19, 2017, to stabilize an additional eight sites along the Challis Creek Road within the original 2016 consultation's action area. These eight sites were destabilized during high runoff events in the spring of 2017. NMFS responded to the emergency initiation with a July 21, 2017, memo recommending appropriate conservation measures and providing direction on closing out the emergency consultation after work was complete.

On December 13, 2017, the SCNF provided NMFS a report addressing work completed during 2016. The report addressed work proposed under the 2016 consultation and the 2017 emergency consultation. The Level 1 Team discussed the report and implementation problems on December 15, 2017. The Level 1 Team recommended reinitiating ESA consultation since the 2016 action had not been implemented as proposed and because effects of the action were different than originally considered (i.e., amount or extent of take was exceeded).

NMFS received a draft biological assessment (BA) for the reinitiation on July 11, 2018, and NMFS provided suggested edits to the document by email on July 23, 2017. The Level 1 Team discussed NMFS' comments at the July 25, 2018, meeting. A revised draft BA was received on April 3, 2019, and NMFS provided comments on April 10, 2019. The SCNF Level 1 Team gave preliminary agreement with the BA's effects determinations and recommended it be submitted for formal consultation on April 15, 2019.

NMFS received a signed request for reinitiation of formal consultation on May 6, 2019. NMFS responded to the SCNF and the U.S. Army Corps of Engineers (COE) by letter on May 16, 2019, documenting the reinitiation of formal consultation on the date the reinitiation package was received in Boise.

NMFS shared copies of the draft proposed action and terms and conditions with the SCNF on June 10, 2019, requesting comments within 1-week. The SCNF responded with minor edits on June 18, 2019.

NMFS also provided copies of the draft proposed action and terms and conditions to the Shoshone-Bannock Tribes (Tribes) and requested comments by June 14, 2019, because the proposed action will likely affect tribal trust resources. The Tribes did not respond.

This Opinion is based on information provided in the May 6, 2019, request for reinitiation of consultation, the December 13, 2017 report, Level 1 Team discussions, Custer County's undated

letter to the SCNF describing the 2017 work, the COE' Clean Water Act (CWA) permit (COE 2016), and the best available scientific and commercial data.

1.3 Proposed Federal Action

"Action" means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by federal agencies (50 CFR 402.02). Under the MSA, Federal action means any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken by a federal agency (50 CFR 600.910). The SCNF proposes to authorize or carry out road repair work at two sites along Challis Creek Road – Site 1 and Site 5 - and is the lead action agency for the consultation. The project will be implemented by Custer County under a project agreement, with guidance from the SCNF. Custer County will be informed of, and expected to follow, all design criteria and best management practices (BMPs) identified in the BA intended to protect fish and fish habitat. Engineering designs will be given to Custer County and they will contain all design features and BMPs. A communication plan will be in place between relevant points of contacts for the SCNF and Custer County. None of the remaining work varies from the original 2016 proposal.

All Site 1 work will be isolated from open stream flow and occur above the low-water line. Proposed barbs (discussed below) are designed to protect the road in the event of another debris flow or major flood event. If stream channel changes occur and worksite isolation from Challis Creek becomes necessary, the SCNF will notify NMFS of new mitigations before any work is completed. This process will determine if reinitiation of consultation is warranted.

Because the remaining work requires a COE authorization under Section 404 of the CWA NMFS also included effects of the COE's permit, which has already been issued, in the analysis. Work is proposed to occur during 2019 through 2021. Specific activities proposed for each work site are described below.

1.3.1 Site 1 (Challis Creek)

See Appendix A for design drawings. Proposed work includes the following elements:

- Approximately 890 linear feet of the reconstructed road will be raised an average of four feet above the current elevation to prevent stream flows and any future debris flows from impacting the road.

- Approximately 200 feet of the existing road, east of the reconstructed section, will be raised to match elevations.

- The area between Challis Creek and the reconstructed road will be regraded to provide an accessible floodplain. Regrading will reduce the current road base width (40 feet) to the 24-foot average design specification[1], with excavated material used to raise road elevation. Road surface width will be approximately 14 feet, with some sections around

[1] Proposed road base width is approximately 7 feet wider than the original road width.

the apex of the corner approaching 24-feet for safe sight distances. Road cut and fill slopes will be 2 Vertical:1 Horizontal (2V:1H).

- The sides of the reconstructed road will be armored with class VI riprap, placed at maximum slope of 1V:3H, to protect it from potential future flood or debris flow events.

- Up to seven buried rock barbs will be constructed along the outside radius of the reconstructed road to help reduce the impact of high stream flows and future debris flows to the road. Barbs will not influence the current stream course. The top of barbs will be roughly two times bankfull depth and installed at or just below the constructed floodplain elevation. Barbs will consist of 2- to 4-foot diameter rocks, be up to 15 feet long, 8 feet high, and 6 feet wide. Barbs will face upstream at approximately 30 degrees from the road and be sloped at about a 1V:4H angle.

- A small culvert will be replaced on the east side of Site 1 to drain a small seep through the road prism.

- With the exception of the small culvert, all other work at Site 1 will occur in the dry; no dewatering or fish handling are proposed.

- Cut slopes above the reconstructed road segment will be reshaped where necessary to stabilize the slopes (maximum 1V:2H) and prevent material form sloughing onto the road.

- Willow clumps will be transplanted from the floodplain area downstream of Site 1 to midpoints between the barbs within the constructed floodplain. Disturbed sites will be seeded with weed-free seed.

1.3.2 Site 5 (Lodgepole Creek)

See Appendix A for design drawings. Proposed work includes the following elements:

The section of road that was obliterated following the 2013 fire will be reconstructed in the original location. This involves rebuilding approximately 400 feet of obliterated roadway, removing a buried culvert, and building up to three armored fords over Lodgepole Creek.

To maintain fish passage, the ford structures' downstream grade will not be more than 1.5 times the grade of the streambed immediately upstream of the road. The toe of the apron will be shaped to concentrate low water flow enough to ensure aquatic organism passage during low flow periods (Michael Carroll, SCNF Engineer email comments July 21, 2016). It is expected that all work at Lodgepole Creek will be completed between July 15 and August 15. If work at this site cannot be completed by August 15, the work window may be extended to October 31.

Given the unstable nature of the floodplain and the presence of multiple stream channels across the road, the SCNF decided to use hardened ford crossings instead of culverts. The number of fords will not exceed three, but will depend on the number of active streams channels present at

construction[2]. The SCNF will reclassify this section of Challis Creek Road from a road maintenance level 3 (suitable for passenger cars) to a road maintenance level 2 (suitable for high clearance vehicles). Ford approaches will be hardened with rock to ensure stability and minimize erosion.

Channels with flowing water will be dewatered during ford construction using either a temporary bypass channel or a pump and hose. If a bypass channel is used, it will originate a short distance upstream of the road and terminate into Lodgepole Creek a short distance downstream of the road/ford. The bypass channel will be constructed in the dry and will be lined (i.e., pipe or plastic) to limit sediment production. Temporary dam(s) will dewater Lodgepole Creek at the upstream end of the bypass channel. After building the ford(s), flows will return to the natural channel by removing the temporary dam and the bypass channel will be rehabilitated. If pumps are used, they will be placed a short distance upstream of the road and hoses will bypass the work area, terminating a short distance downstream. A temporary dam will be used to check water elevation for pump screen submersion. The process will be reversed after ford construction. All pumps will have intake screens meeting NMFS specification (NMFS 2011). Dewatered sections will not exceed 200-feet and will have an average width of approximately 5 feet. Natural stream flows will be maintained below sites at all times during implementation.

To the extent possible, the stream channel(s)/bypass channel(s) will be gradually dewatered to provide an opportunity for fish to move downstream. SCNF fisheries staff will walk dewatered areas looking for fish, collect them with dip nets, place them in buckets, and release them into Lodgepole or Challis Creeks at least 300 feet below the project site. No electrofishing will be used.

Road reconstruction material not obtained onsite will come from two borrow pits. The first pit is an established administrative borrow pit on White Valley Creek. The second pit (approximately one acre) is new, and is located in the Bear Creek drainage along the north side of the Sleeping Deer Road. Material will generally be hauled from these borrow pits as needed for repair work and there will be no long-term stockpiling of material for this project. A small amount of material such as large rock may be stored for a short period of time at a pullout on the Challis Creek Road that is located approximately 0.7 miles below Site 1.

1.3.3 Best Management Practices

In addition to the site-specific BMPs described above, the SCNF proposes the following general BMPs to be employed over the course of the project to minimize impacts to aquatic resources:

1. All heavy equipment will be free of noxious weeds and aquatic invasive species prior to entering the project area.

2. All heavy equipment will be free of fuel or oil leaks that could wash off into water, inspected daily, and any significant leaks will be repaired immediately.

[2] Currently just one stream channel is present. Three channels were present as recently as 2017.

3. No storage of fuel, oil, or other toxicants will be allowed in Riparian Habitat Conservation Areas (RHCAs) of perennial streams. The RHCAs extend 300 feet from perennial fish bearing streams (i.e., Bear, Challis, Lodgepole, and White Valley Creeks) and 150 feet from perennial non-fish bearing streams.

4. Refueling will not occur in RHCAs unless there are no reasonable alternatives. If fueling does occur within an RHCA, it must be approved by a SCNF fish biologist or hydrologist and use an approved spill containment plan. This plan must include a spilled fuel containment/catchment device.

5. Any fuel or oil contamination will be cleaned up and disposed of properly.

6. No blasting will occur.

7. Any excess debris will be stockpiled in a dry upland area away from any wetlands or waterbodies.

8. The project will require: (1) A CWA 404 permit from the COE; (2) a permit from the Idaho Department of Water Resources; and (3) a Stormwater Pollution Prevention Plan (SPPP). The SPPP will be prepared by or approved by the SCNF, will conform to the National Pollutant Discharge Elimination System general permit requirements, and will contain a description of the specific hazardous materials, procedures, and spill containment that will be used, including inventory, storage, and handling of hazardous materials.

"Interrelated actions" are those that are part of a larger action and depend on the larger action for their justification. "Interdependent actions" are those that have no independent utility apart from the action under consideration (50 CFR 402.02). Neither NMFS, the SCNF, nor the COE identified the any interrelated or interdependent actions.

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

The ESA establishes a national program for conserving threatened and endangered species of fish, wildlife, plants, and the habitat upon which they depend. As required by section 7(a)(2) of the ESA, each federal agency must ensure that its actions are not likely to jeopardize the continued existence of endangered or threatened species, or adversely modify or destroy their designated critical habitat. Per the requirements of the ESA, federal action agencies consult with NMFS and section 7(b)(3) requires that, at the conclusion of consultation, NMFS provides an Opinion stating how the agency's actions would affect listed species and their critical habitats. If incidental take is reasonably certain to occur, section 7(b)(4) requires NMFS to provide an ITS that specifies the impact of any incidental taking and includes non-discretionary 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 "to jeopardize the continued existence of" a listed species, which is "to engage in an action that would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species" (50 CFR 402.02). Therefore, the jeopardy analysis considers both survival and recovery of the species.

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

The critical habitat designation for Snake River spring/summer Chinook salmon uses the term essential features. The new critical habitat regulations (81 FR 7414) replace this term 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 primary constituent elements (PCEs), PBFs, or essential features. In this Opinion, we use the term PBF to mean PCE or essential feature, as appropriate for the specific critical habitat.

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

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

- Describe the environmental baseline in the action area.

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

- Describe any cumulative effects in the action area.

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

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

If necessary, suggest a reasonable and prudent alternatives to the proposed action.

2.2 Rangewide Status of the Species and Critical Habitat

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

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

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

Species	Listing Status	Critical Habitat	Protective Regulations
Chinook salmon *(Oncorhynchus tshawytscha)*			
Snake River spring/summer-run	T 6/28/05; 70 FR 37160	10/25/99; 64 FR 57399	6/28/05; 70 FR 37160
Steelhead (*O. mykiss*)			
Snake River Basin	T 1/05/06; 71 FR 834	9/02/05; 70 FR 52630	6/28/05; 70 FR 37160

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

2.2.1 Status of the Species

This section describes the present condition of the Snake River Basin steelhead distinct population segment (DPS). No other species are affected by the action. NMFS expresses the status of a salmonid DPS in terms of likelihood of persistence over 100 years (or risk of extinction over 100 years). NMFS uses McElhany et al.'s (2000) description of a viable salmonid population (VSP) that defines "viable" as less than a 5 percent risk of extinction within 100 years and "highly viable" as less than a 1 percent risk of extinction within 100 years. A third category, "maintained," represents a less than 25 percent risk within 100 years (moderate risk of extinction). To be considered viable a DPS should have multiple viable populations so that a single catastrophic event is less likely to cause the DPS to become extinct, and so that the DPS may function as a metapopulation that can sustain population-level extinction and recolonization processes (ICTRT 2007). The risk level of the DPS is built up from the aggregate risk levels of the individual populations and major population groups (MPGs) that make up the DPS.

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

NMFS' determination of whether additional risk will appreciably reduce the likelihood that the DPS will survive or recover in the wild.

2.2.1.1 Snake River Basin Steelhead

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

Life History. Adult Snake River Basin steelhead enter the Columbia River from late June to October to begin their migration inland. After holding over the winter in larger rivers in the Snake River basin, steelhead disperse into smaller tributaries to spawn from March through May. Earlier dispersal occurs at lower elevations with higher elevation having later dispersal. Juveniles emerge from the gravels in 4 to 8 weeks, and move into shallow, low-velocity areas in side channels and along channel margins to escape high velocities and predators (Everest and Chapman 1972). Juvenile steelhead then progressively move toward deeper water as they grow in size (Bjornn and Rieser 1991). Juveniles typically reside in fresh water for 1 to 3 years, although this species displays a wide diversity of life histories. Smolts migrate downstream during spring runoff, which occurs from March to mid-June depending on elevation, and typically spend 1 to 2 years in the ocean. Adults can spawn more than once (iteroparous) but the rate ranges from less than 1 percent to over 50 percent depending on biological, ecological and anthropogenic influences.

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

The Interior Columbia Basin Technical Review Team (ICTRT) identified 24 extant populations within this DPS, organized into five MPGs (ICTRT 2003). The ICTRT also identified a number of potential historical populations associated with watersheds above the Hells Canyon Dam complex on the mainstem Snake River, a barrier to anadromous migration. The five MPGs with extant populations are the Clearwater River, Salmon River, Grande Ronde River, Imnaha River,

and Lower Snake River. In the Clearwater River, the historic North Fork population was blocked from spawning and rearing habitat by Dworshak Dam. Current steelhead distribution extends throughout the DPS, such that spatial structure risk is generally low. For each population in the DPS, Table 2 shows the current risk ratings for the parameters of a VSP (spatial structure, diversity, abundance, and productivity).

The Snake River Basin DPS steelhead exhibit a diversity of life-history strategies, including variations in fresh water and ocean residence times. Traditionally, fisheries managers have classified Snake River Basin steelhead into two groups, A-run and B-run, based on ocean age at return, adult size at return, and migration timing. A-run steelhead predominantly spend 1-year in the ocean; B-run steelhead are larger with most individuals returning after 2 years in the ocean. New information shows that most Snake River populations support a mixture of the two run types, with the highest percentage of B-run fish in the upper Clearwater River and the South Fork Salmon River; moderate percentages of B-run fish in the Middle Fork Salmon River; and very low percentages of B-run fish in the Upper Salmon River, Grande Ronde River, and Lower Snake River (NWFSC 2015). Maintaining life history diversity is important for the recovery of the species.

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

Abundance and Productivity. Historical estimates of steelhead production for the entire Snake River basin are not available, but the basin is believed to have supported more than half the total steelhead production from the Columbia River basin (Mallet 1974, as cited in Good et al. 2005). Historical estimates of steelhead passing Lewiston Dam (removed in 1973) on the lower Clearwater River were 40,000 to 60,000 adults (Ecovista et al. 2003), and the Salmon River basin likely supported substantial production as well (Good et al. 2005). In contrast, at the time of listing in 1997, the 5-year mean abundance for natural-origin steelhead passing Lower Granite Dam, which includes all but one population in the DPS, was 11,462 adults (Ford 2011). Counts generally increased since then, with the most recent 5-year period's geomean wild abundance being 18,255 adults. Of note are extremely low returns in 2017 and 2018 at 10,717 and 7,439 adults, respectively.

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

Presence of Snake River Basin Steelhead in the Action Area. Steelhead are not known to spawn within the action area but do spawn in Challis Creek approximately 2.5 miles downstream of the action area (SCNF 2019). Adult steelhead begin arriving near the action area in early March with spawning activity extending through mid-June in some locations (USBWP 2005). Depending on spawning initiation timing and water temperature, incubation can extend from mid-March through the first week in July. Multiple age classes of *O. mykiss* have been observed in the Challis Creek segment of the action area (SCNF 2019). These fish could be juvenile steelhead or resident rainbow trout. *O. mykiss* have not been observed in Lodgepole Creek, but the stream is accessible from Challis Creek and occupied by other species. For this Opinion, we assume juvenile steelhead are present in action area reaches of Challis and Lodgepole Creeks and that spawning could occur, but has not been documented. The action area is within the East Fork Salmon River population (Table 2).

Table 2. Summary of viable salmonid population parameter risks and overall current status for each population in the Snake River Basin steelhead DPS (NWFSC 2015). Risk ratings with "?" are based on limited or provisional data series.

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

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

2.2.2 Status of Critical Habitat

Designated critical habitat for steelhead does not occur in the action area and will not be discussed further given lack of exposure. The focus of this section is on critical habitat for Snake River spring/summer Chinook salmon (hereafter Chinook salmon). In evaluating the condition of designated critical habitat, NMFS examines the condition and trends of PBFs essential to the conservation of the ESA-listed species because they support one or more life stages of the species. Proper function of PBFs is necessary to support successful adult and juvenile migration, adult holding, spawning, incubation, rearing, and the growth and development of juvenile fish. Modification of PBFs may affect freshwater spawning, rearing, or migration in the action area. Generally speaking, sites required to support one or more life stages of the ESA-listed species (i.e., sites for spawning, rearing, migration, and foraging) contain PBFs essential to the conservation of the listed species (e.g., spawning gravels, water quality and quantity, side channels, or food) (Table 3).

Table 3. Types of sites, essential PBFs, and the species life stage each PBF supports.

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

[a] Food applies to juvenile migration only.

Table 4 describes the geographical extent of critical habitat for Chinook salmon. Critical habitat includes the stream channel and water column with the lateral extent defined by the ordinary high-water mark (OHWM), or the bankfull elevation where the OHWM is not defined. In addition, critical habitat for Chinook salmon includes the adjacent riparian zone, which is defined as the area within 300 feet of the line of high water of a stream channel or from the shoreline of standing body of water (58 FR 68543). The riparian zone is critical because it provides shade, streambank stability, organic matter input, and regulation of sediment, nutrients, and chemicals.

Table 4. Geographical extent of Snake River spring/summer Chinook salmon designated critical habitat.

ESU/DPS	Designation	Geographical Extent of Critical Habitat
Snake River spring/summer Chinook salmon	58 FR 68543; December 28, 1993. 64 FR 57399; October 25, 1999.	All Snake River reaches upstream to Hells Canyon Dam; all river reaches presently or historically accessible to Snake River spring/summer Chinook salmon within the Salmon River basin; and all river reaches presently or historically accessible to Snake River spring/summer Chinook salmon within the Hells Canyon, Imnaha, Lower Grande Ronde, Upper Grande Ronde, Lower Snake-Asotin, Lower Snake-Tucannon, and Wallowa subbasins.

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

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

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

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

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

- Releasing water from storage to increase summer flows;

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

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

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

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

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

The present condition of PBFs within Chinook salmon designated critical habitat and the human activities that affect PBF trends within the action area are further described in the environmental baseline.

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

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

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

Higher water temperatures and lower spawning flows, together with increased magnitude of winter peak flows are all likely to increase salmon mortality. The Independent Scientific Advisory Board (ISAB) (2007) found that higher ambient air temperatures will likely cause water temperatures to rise. Salmon and steelhead require cold water for spawning and incubation. As climate change progresses and stream temperatures warm, thermal refugia will

be essential to persistence of many salmonid populations. Thermal refugia are important for providing salmon and steelhead with patches of suitable habitat while allowing them to undertake migrations through or to make foraging forays into areas with greater than optimal temperatures. To avoid waters above summer maximum temperatures, juvenile rearing may be increasingly found only in the confluence of colder tributaries or other areas of cold water refugia (Mantua et al. 2009).

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

2.3 Action Area

"Action area" means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02). This project's action area includes the extent of project-generated noise disturbances, surface disturbances, and potentially turbidity. Specifically:

(1) Lodgepole Creek, from the dewatering points downstream to Challis Creek (about 300 feet), potentially in three separate channels;

(2) Challis Creek, from the Lodgepole Creek confluence downstream about 600 feet (extent of turbidity);

(3) Approximately 500 feet upstream and downstream of all work areas to account for noise-related effects.

(4) The area occupied by the borrow pits; and

(5) The area extending from the borrow pits out to the nearest road or 100 feet, whichever is less.

Snake River Basin steelhead are assumed present in action area stream reaches. These reaches are designated critical habitat only for Chinook salmon (Table 1) and Chinook salmon are not present in the action area. The closest observed Chinook salmon was approximately six stream miles downstream. Designated critical habitat for Chinook salmon includes all river reaches presently or historically accessible to the species (64 FR 57399) as well as their RHCAs. The action area's stream reaches are also EFH for Chinook salmon (PFMC 1999), and could be affected by the action.

2.4 Environmental Baseline

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

NMFS describes the environmental baseline in terms of the biological requirements for habitat features and processes necessary to support all life stages of each listed species within the action area. Snake River Basin steelhead occur in the action area. Thus, for this action area, the biological requirements for steelhead are the habitat characteristics that support successful completion of spawning, rearing, and freshwater migration.

The environmental baseline information submitted by the SCNF (2019) provides a description of the environmental baseline within the action area and for the Challis Creek subwatershed (5th field hydrologic unit code: 1706020117). The following environmental baseline discussion is based on information presented in that BA (SCNF 2019).

2.4.1 General Description of Habitat Conditions

Challis and Lodgepole Creek reaches of the action area have been significantly impacted by the 2013 Lodgepole Fire and the runoff and debris flow events that followed the fire. Challis Creek, at Site 1, has also been affected by recent SCNF efforts to reconstruct the subject road and stabilize the 2014 debris flow. Although fire is a natural process, fire-related impacts have substantially impacted the stream channel, riparian vegetation, sediment regime, and floodplain. Challis Creek is also impacted by flow alterations associated with Mosquito Flat Reservoir (approximately two miles upstream), and road construction, maintenance, and use (SCNF 2019). Construction, maintenance, and use of Challis Creek Road has also affected the lower end of Lodgepole Creek (SCNF 2019).

Current habitat conditions are relatively poor from lost shade, unstable banks, low pool frequency and quality, and a modified hydrograph. Fish passage through the action area remains possible and the action area likely serves as a potential transit route for steelhead using upstream/downstream habitats.

2.4.2 Major Limiting Factors

The most significant anthropogenic activities that have affected habitat in the action area are flow alterations associated with Mosquito Flat Reservoir; road construction, maintenance, and use; and the introduction of brook trout (*Salvelinus fontinalis*). As indicated above, the Lodgepole Fire and runoff events following the fire have substantially altered Challis and Lodgepole Creeks.

2.4.3 Description of the Matrix of Pathways and Indicators

The condition of the pathways and indicators (NMFS 1996) within this subwatershed are provided in full the BA (SCNF 2019). Habitat conditions at the subwatershed scale primarily range from functioning at risk to functioning appropriately. The temperature, sediment, water quality, physical barriers, substrate embeddedness, off-channel habitat, refugia, change in peak/base flows, road density and location, disturbance history, disturbance regime, and habitat quality and connectivity indicators are functioning at risk. Chemical characteristics, large woody debris, pool frequency and quality, channel width to depth ratio, streambank condition, floodplain connectivity, increase drainage network, and RHCA indicators are functioning appropriately.

Of these indicators, the proposed action is most likely to affect sediment (including turbidity), pool frequency and quality, width to depth ratio, streambank condition, floodplain connectivity, safe passage, and RHCAs. Indicator descriptions and subsequent analyses will focus on these seven indicators. The impact of the project on fish and fish habitat will be limited to the two identified project sites. Project work at the borrow sites is not expected to impact fish or fish habitat because they are set back from existing waterbodies, are internally sloped, and are not expected to generate any turbidity and/or noise related effects given the applied BMPs.

2.4.3.1 Sediment (Including Turbidity)

Runoff and debris flows following the Lodgepole Fire have substantially increased instream sediment levels in the subwatershed, particularly in Challis Creek. The SCNF has one long-term sediment monitoring site on Challis Creek approximately 2 miles downstream from the action area. In 2010 and 2014 (after the fire, but pre-debris flows) fine sediment levels (i.e., particles less than 0.25 inches in diameter) were 20 percent. Later in 2014, large runoff events delivered large amounts of sediment and depth fines increased to 49 percent. In 2015, depth fines increased to 75 percent before decreasing in 2016 (20.2 percent) and 2017 (14.4 percent). These data suggest the post-fire sediment pulse is moving through the stream system. Current watershed level sediment conditions are functioning at risk but appear to be improving rapidly.

Site 1 occurs within one of the 2014 debris flow fans. The debris flow buried Challis Creek (and the subject road) to a depth of more than ten feet. Road construction work completed by the SCNF and Custer County in 2017 removed between 4,000 and 5,000 cubic yards (yd^3) of material to construct a new channel through the debris fan allowing partial road reconstruction. The channel was undersized when built, as it was reported to have a 5-foot bankfull width compared to the 20-foot design width (SCNF 2017). During the 2018 spring runoff, the channel eroded both laterally and vertically as the channel adjusted toward a more appropriate morphology. In 2018, the south bank exhibited vertical sloughing up to 7 feet and was actively delivering fine sediment to Challis Creek (Figure 1). This condition will likely persist at the site scale until channel morphology equilibrates. Beaver are actively erecting dams in the immediate vicinity, which likely helps capture sediment and substrate. Ultimately, the channel trajectory is toward a stable condition, with beaver dams likely to raise the bed elevation to near pre-debris flow impact levels. This may take several years as vegetation and channel controls need to reestablish. Site-scale conditions are functioning at risk.

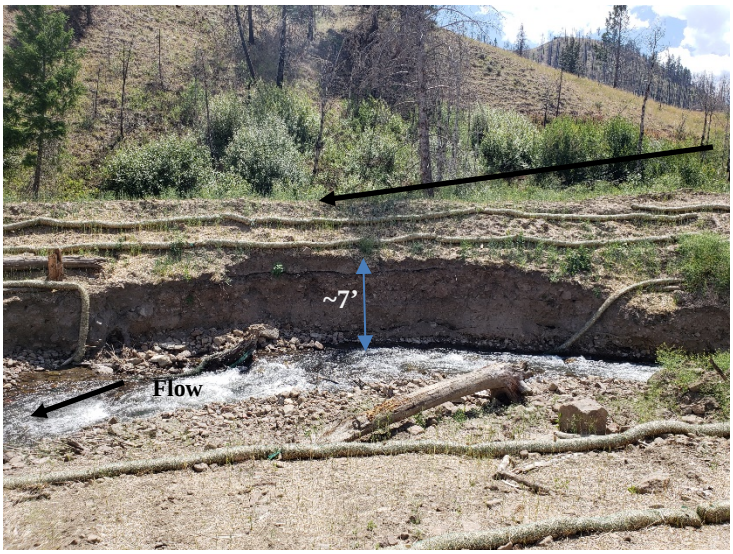

Figure 1. South side of Site 1 demonstrating current bank erosion and sediment delivery. Photo taken from Challis Creek Road looking south across Challis Creek (C. Fealko, July 17, 2018).

Site 5 was also affected by post-fire debris flows, but current substrate conditions are primarily cobble-sized material (Figure 2) (C. Fealko, personal observations). Fine sediment does not currently appear to be a limiting PBF in the affected reach of Lodgepole Creek.

Figure 2. Current Lodgepole Creek substrate and bank conditions. Photo taken looking upstream from immediately below the Challis Creek Road crossing, which is currently passable as an unimproved ford (C. Fealko, July 17, 2018).

2.4.3.2 Pool Frequency and Quality

Quantitative data are not available for this indicator in the action area. Flow alterations tied to Mosquito Flat Dam's operation and the valley bottom road have likely negatively influenced this indicator (SCNF 2019). Runoff and debris flows following the Lodgepole Fire also substantially

degraded conditions in the action area - but these changes are considered to be natural (SCNF 2019). Site-scale pool frequency and quality is likely functioning at risk, but due to natural influences. At the subwatershed scale, the indicator is believed to be functioning appropriately.

2.3.3.3 Width to Depth Ratio

The riparian management objectives (RMO) for width to depth ratio was originally set at less than 10, but the SCNF modified this RMO to better reflect natural channel dimensions. Modified values are based on the mean observed values for natural condition streams within the Salmon River (Overton et al. 1995). The modified RMO for B channel (Rosgen 1996) streams, such as Challis Creek and Lodgepole Creek, is 27. Quantitative data are not available for width to depth ratio at these sites. Although width to depth ratios in the action area are likely similar to natural conditions, runoff and debris flows following the Lodgepole Fire altered width to depth ratios. Where the SCNF has rebuilt the Challis Creek Road and constructed a berm along the unnamed tributary channel that produced the debris flow, Challis Creek is confined and likely not currently meeting the RMO (Figure 1). Farther downstream, and along Lodgepole Creek, width to depth ratios are likely within natural ranges for the Rosgen B channel types. Overall, this indicator is functioning appropriately.

2.3.3.4 Streambank Condition

The Lodgepole Fire, the 2017 road reconstruction, and construction of the berm adjacent to the unnamed tributary that produced the debris flow, have negatively affected streambank condition in the action area. The short-term loss of riparian vegetation and the debris flows reduced bank stability at reach scales.

A SCNF monitoring site downstream of the action area had bank stability change from 97 percent stable in 2017 to 85 percent after the debris flows. No more recent data are available. As discussed above and shown in Figure 1, Site 1 banks are unstable where the 2017 reconstructed channel and road were completed – particularly along the south bank. The constructed berm and possibly the undersized channel left in late 2017, resulted in the south bank now having vertical sloughing up to 7 feet high. With the exception of small quantities of annual grass planted in fall 2017, no riparian vegetation is present to stabilize banks. Unstable site conditions are expected to persist at the site scale until channel morphology equilibrates – which will likely take several years as vegetation and channel controls become established. Streambank condition is functioning at risk near Site 1.

Streambanks at Site 5 consist almost entirely of medium to large cobbles and are stable. However, channel morphology is still not in equilibrium with sediment, debris, and flows, and additional channel adjustments are anticipated – particularly as standing fire-killed trees are recruited to the channel and begin to influence planform. Streambank condition at Lodgepole Creek is functioning at risk.

2.3.3.5 Floodplain Connectivity

Streams should exhibit a natural level of connectivity to their floodplains. This is critical for maintaining channel pattern, form, and profile, off-channel habitats, wetland function, and riparian vegetation. Quantitative data are not available for floodplain connectivity within the action area. Dam-related flow alterations and road construction within the valley bottom of Challis and Lodgepole Creeks have reduced floodplain connectivity in some locations. Runoff and debris flows following the Lodgepole Fire increased floodplain connectivity within the action area (SCNF 2019). Road and berm construction completed by the SCNF and Custer County in 2017 reduced floodplain connectivity at Site 1, where the channel is now confined by the berm and the currently overwidened road base. This indicator is functioning at risk within the action area but likely functioning appropriately at the subwatershed scale.

2.3.3.6 RHCA Condition

The Lodgepole fire burned nearly all riparian vegetation within the action area in 2014. Visual observations suggest riparian vegetation is recovering quickly along Challis Creek, particularly outside the direct influence of the debris flow's fan. Where the debris flow's fan inundated the valley bottom, including Site 1, vegetation recovery has been slower and only forbs, grasses, and minor quantities of woody vegetation have reestablished. Overstory trees along Lodgepole Creek were all killed by the fire but willow and alder vegetation is recovering along most of the valley bottom in the action area. The Challis Creek Road is in the RHCA and has reduced riparian function to some degree. Action area RCHA conditions are believed to be functioning at risk, with an improving trend.

2.3.3.7 Fish Passage

Currently, no fish passage barriers are present in Challis or Lodgepole Creek segments of the action area. The old Lodgepole Creek culvert is full of alluvium and the channel has reestablished adjacent to the defunct structure. Natural periods of channel intermittency do occur in Lodgepole Creek and may seasonally influence fish passage. Currently, this indicator is functioning appropriately.

2.5 Effects of the Action

Under the ESA, "effects of the action" means the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline (50 CFR 402.02). Indirect effects are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur.

2.5.1 Effects on ESA-listed Species

The proposed action will directly affect ESA-listed steelhead through: (1) Disturbance of individuals from equipment and construction noise; (2) exposure to multiple turbidity plumes; (3) potential salvage-related harm and harassment; and, (4) potential chemical contamination.

The proposed action includes BMPs (Section 1.3.1) to avoid and/or minimize adverse effects to ESA-listed species and the following assessment presumes those measures will be implemented as described during all activities. The following sections will discuss each of these various effects pathways.

2.5.1.1 Disturbance and Noise-related Effects

Heavy equipment operation (i.e., excavator, graders, dump trucks, etc.) will create noise and vibration disturbances. Construction activities will occur between July 15 and August 15, with work potentially being extended to October 31. Project work could occur during 2019 and/or 2020; thus, juvenile steelhead may be exposed to construction noise.

The U.S. Federal Highway Administration (2008) found typical construction equipment (e.g., backhoe, excavator, and trucks) noise production ranges between 74 and 89 decibels (dB) at 50 feet. These noises are in-air and cannot be directly compared against the 150 dB root mean square disturbance threshold for underwater noise (FHWG 2008). It is unknown if fish will temporarily move away from these sounds or remain present. Because the dB 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. Therefore, noise-related disturbances of the magnitude anticipated are unlikely to result in injury or death. Disturbance from equipment noise will not likely extend more than 500 feet upstream or downstream of proposed activities.

Visual stimulus from the nearby activities may also cause temporary behavior modifications. Even if fish move, juveniles are expected to migrate short distances to more secure habitat and only for a few hours in any given day. Short-term movements caused by construction equipment are not expected to produce biologically meaningful impacts given the regular disturbances fish are exposed to daily (e.g., other fish, other animals, etc.). Harm, injury, or increased predation of exposed fish is not expected.

Following ford construction, regular vehicle use may disturb juvenile steelhead. The Challis Creek Road receives minor levels of use and crossing frequency is expected to be low (e.g., typically less than five daily crossings). Steelhead have never been documented in Lodgepole Creek, making exposure potential to fording vehicles low. In the event juveniles are present in the future, they could rear in/or near the crossing. At the approach of vehicles, fish are expected to flee from the vibrations/wave action and temporarily relocate to adjacent security cover – unharmed. Although ford monitoring conducted by the SCNF suggests individual fish could be harmed and even washed out of the ford crossing by passing vehicles (SCNF unpublished data), the long-term absence of steelhead in the affected stream presents a very small risk of displacement/harm. For this reason, NMFS concludes that harm/injury caused by future vehicle fording is not a reasonable effect to anticipate. Similarly, disturbance of steelhead redds is not expected given the absence of documented spawning within several miles of the action area. In the event spawning is documented in Lodgepole Creek at some future time, reinitiation of consultation may be required.

2.5.1.2 Turbidity/Sediment Effects

The proposed action is likely to suspend sediments and cause turbidity plumes. At Site 1, all proposed work will occur in the dry and with proven BMPs which are expected to prevent stormwater runoff from entering Challis Creek. Rock barb excavation will likely be below the channel invert elevation and thus groundwater may be present in excavated trenches. Water in the trenches will become turbid as excavation and rock placement occurs. Given trenches will be separated from Challis Creek and appropriate BMPs (i.e., silt fences or equivalent) will be in place, overland delivery of turbid water should occur infrequently and resultant effects should not lead to harm/injury.

Site 1 barbs will be buried beneath the current ground level. In the event future debris flows or channel adjustments in Challis Creek occur, this orientation is intended to direct Challis Creek toward the center of the valley, away from the reconstructed road. Although Challis Creek and the barbs will not have any immediate direct interaction, some level of interaction may occur in the future. NMFS cannot speculate on when or to what degree such interactions may occur. For this reason, NMFS cannot reasonably estimate the possible effects the barbs may have on sediment recruitment from the opposite bank (which consists of the highly erodible debris flow material. This material will likely erode, until the site stabilizes, with and without the action. There is no reasonable way for NMFS to consider the amount of sediment delivery with or without the barbs in place. For this reason, sediment-related effects from potential future bank erosion that may or may not occur, and which may or may not be caused by the barbs, are not further addressed in this Opinion. In the event the barbs do begin to interact with the channel, reinitiation of consultation may be required.

At Site 5, ford and road construction will deliver sediment to Lodgepole Creek, which could possibly extend downstream to Challis Creek. The amount of sediment generated at Site 5 will be limited by completing work in the dry and using a lined bypass channel or pump and pipe system to dewater the work area(s). A small amount of sediment will be resuspended when water is reintroduced to the constructed ford(s). Based on results of similar project implementations (IDFG unpublished data), turbidity plumes, as measured 600 feet downstream of the ford bypasses, are expected to persist less than 90 minutes and remain below 100 nephelometric turbidity units (NTU) above background.

Once completed, small quantities of sediment could be delivered to Lodgepole Creek when vehicles use the ford(s) or during storm events, which could deliver eroded material from the ford approaches. Data previously collected by the SCNF (unpublished) suggests vehicle crossings in fords are likely to generate minor turbidity plumes (i.e., average of about 9.8 NTUs over background, be 13 minutes long, and affect about 300 linear feet of stream). These effects would occur intermittently, corresponding with vehicle use levels. The impacts will likely extend into the foreseeable future, although the SCNF indicates long-term plans are to install culverts at the road crossings once the watershed has stabilized. There is no associated time commitment for potential replacement and it may or may not occur. For this reason NMFS considers ford to culvert conversion speculative and we will not consider it in our effects analysis. Based on projected use levels, approximately five vehicle crossings per day are reasonably expected. We estimated approximately five daily crossing could occur, (when

seasonally accessible). Although some sediment is likely to be contributed during future rain events, the cobble substrate dominating the valley bottom and future road prism along with use of hardened ford approaches is anticipated to result in only minor contributions during each event and cumulatively over time. Anticipated turbidity levels are not expected to raise to the level of harm and/or harassment.

Elevated turbidity can cause lethal, sublethal, and behavioral effects in juvenile and adult salmonids depending on the duration and intensity (Newcombe and Jensen 1996). Increased turbidity levels in the action area may result in temporary displacement of fish from preferred habitat or potential sublethal effects such as gill flaring, coughing, avoidance, and increase in blood sugar levels (Bisson and Bilby 1982; Sigler et al. 1984; Berg and Northcote 1985; Servizi and Martens 1992). Accumulated fine sediment in the gravel can restrict intergravel flow and block emergence of fry (Lisle and Lewis 1992), decrease growth and survival of juvenile fish, and decrease the availability of invertebrate prey species (Alexander and Hansen 1986).

Any fish exposed to dewatering related turbidity plumes could be temporarily displaced from preferred habitat or potentially exhibit the sublethal effects discussed above. Although turbidity may cause stress, Gregory and Northcote (1993) have shown that moderate levels of turbidity (35 to 150 NTUs accelerate foraging rates among juvenile Chinook salmon, likely because of reduced vulnerability to predators (camouflaging effect). Lloyd (1987) suggested that salmonids reacted negatively, by moving away, when turbidity reaches 50 NTU. Because there is potential for the 50 NTU net increase to be exceeded during bypass rewatering, there is potential that exposed juvenile steelhead could experience intermittent sublethal effects ranging from: (1) Minor physiological stress and increased rates of coughing and respiration; (2) moderate physiological stress; and/or (3) impaired homing. All these effects can be considered to 'harm' exposed fish. Potential for other plumes exist but additional plumes are expected to be mitigated by the location of the work (i.e., in the dry and on the floodplain) combined with anticipated effectiveness of proposed BMPs. Described turbidity levels will affect fish in 600 feet or less of stream. Juvenile steelhead have access to and may be present in Lodgepole Creek but have never been observed there making exposure potential low in Lodgepole Creek. Steelhead are present in Challis Creek, which is approximately 300 feet downstream of the fords. Below the confluence, any turbidity cloud is expected to hug the west shoreline, affording fish ample opportunity to find unaffected adjacent refugia – generally avoiding harm (i.e., behavioral effect only).

Overland sediment delivery from upland disturbances (i.e., road construction sites, material pits, etc.) could occur, but should be effectively minimized given the proposed use of general sediment containment measures, and location of work relative to the streams. For these reasons, adverse effects from overland sediment contributions are not expected as a direct or indirect effect of the proposed action.

2.5.1.3 Dewatering and Fish Handling

Steelhead have been detected at Site 1 (Challis Creek), but the proposed action does not propose any dewatering/salvage at this site – precluding effects there. Steelhead have not been detected at Site 5 (Lodgepole Creek), where dewatering/salvage is still required. However, there is no

passage barrier precluding fish from accessing Lodgepole Creek when adequate flow is present. Therefore, Snake River Basin steelhead may be present at Site 5, but at very low densities. For these reasons, steelhead salvage potential is low given an absence of observations at the worksite and the simplified habitat present following the debris flow. To prevent fish stranding and death as ford sites are dewatered, the ramp-downs will occur in a controlled fashion giving fish time to volitionally leave. SCNF fisheries staff will walk the areas looking for fish, collect them with dip nets, and safely transport them in buckets to release sites at least 300 feet below the dewatered area. While this will minimize the impacts to individual fish, it is possible that some fish could be injured during capture/handling and some could become stranded and/or die. The SCNF 2016 BA (SCNF 2016) and NMFS' 2016 Opinion on the same action estimated up to five juvenile steelhead could be captured/handled. The 2019 BA (SCNF 2019) omitted steelhead capture estimates.

To be consistent with the prior analyses and to cover the potential for steelhead to be present, this Opinion retained the five fish salvage estimate. This estimate is likely conservative for the reasons described. Regardless, the estimate is the best available information and allows us to make a reasonable attempt to quantify and assess the effects of potential salvage. Of the five fish salvaged, up to one individual may die as a result of handling or stranding related harm. Dewatering and salvage would only occur one time at up to three separate ford crossings and all crossings would likely be completed in the same calendar year. The five fish estimate is for all three potential salvage events.

Because of the proposed work window for the project (i.e., July to October), adult steelhead are expected to be absent from the action area. For this reason adults will not be exposed to salvage efforts.

2.5.1.4 Chemical Contamination

Use of heavy machinery increases the risk for potential spills of fuel, lubricants, hydraulic fluid, or other similar contaminants into the riparian zone, or directly into the water where they could adversely affect habitat, injure or kill aquatic food organisms, or directly impact ESA-listed steelhead. The SCNF requires that all fueling, storing, and/or staging of fuel, oil, or other toxicants will not be allowed within perennial stream RHCAs. In addition, a SPPP will be developed and adhered to by the construction contractor to ensure spills are prevented/minimized and appropriate cleanup provisions are in place. It is unlikely that antifreeze, brake, or transmission fluid will be present onsite or spilled in volumes or concentrations large enough to harm salmonids in or downstream from the project site. Therefore, NMFS believes that fuel spill, and equipment leak contingencies and preventions described in the proposed action sufficiently minimize the risk of negative impacts to ESA-listed fish and fish habitat from chemical contamination. Therefore, effects to juvenile steelhead from chemical contamination are very unlikely to occur.

2.5.2 Effects on Designated Critical Habitat

The action area contains unoccupied designated critical habitat for Snake River spring/summer Chinook salmon. Critical habitat within the action area has an associated combination of PBFs

essential for supporting freshwater rearing and migration for Chinook salmon. Chinook salmon spawning is not known or expected to occur in the action area.

The critical habitat PBFs most likely to be affected by the proposed action include water quality (i.e., turbidity, and chemical contamination), riparian vegetation, cover/shelter, free passage, and space. Modification of these PBFs may affect potential rearing or migration in the action area. Proper function of these PBFs is necessary to support successful migration, rearing, and the growth and development of juvenile Chinook in the action area.

2.5.2.1 Effects on Water Quality

As discussed in the species effects section, water quality in the action area may be temporarily degraded due to suspended sediment (turbidity) and/or temporary chemical contamination (petroleum based fuels, and lubricants). However, proposed conservation measures (e.g., low-water work window, anticipated effectiveness of proposed erosion control BMPs, and dewatered work areas) are anticipated to reduce the amount of sediment suspended from the creek bottom or input into the action area, which is, in return, expected to reduce turbidity in action area streams. Direct sediment introductions and resulting turbidity are expected to be effectively minimized, resulting in effects of low magnitude and temporary nature. These effects will not result in the long-term reduction of the conservation value of critical habitat in the action area.

Long-term ford use following their construction will also periodically deliver and resuspend sediments at the Lodgepole Creek crossings, likely indefinitely. As described above, individual vehicle fordings can be expected to cause short term, minor turbidity increases. Also, rainstorms and runoff events have the potential to generated overland flow which could erode surface material into Lodgepole Creek. However, road base material as well as ford approaches will consist primarily of large cobble substrate, with little fine sediment available for erosion and subsequent delivery. Additionally, the road slope through the valley bottom is nearly flat, further reducing the potential for sediment inputs. Use of armored ford approaches and crossings will further limit the potential for sediment contributions. For these reasons the long-term use of the ford(s) is expected to have only minor effects on turbidity and sediment levels in the action area.

Although machinery will be used adjacent to Challis and Lodgepole Creeks, the risk of chemical contamination is minor. Fuel storage and equipment fueling will occur more than 300 feet from fish-bearing streams, and 150 feet from non-fish bearing streams to reduce the likelihood of water contamination. Equipment will be cleaned and inspected prior to arrival onsite, ensuring an absence of leaks or drips. Spill containment and cleanup materials will also be on hand to address any spills as quickly as possible. Together, these measures result in only a very small likelihood of chemical contamination.

2.4.2.2 Riparian Vegetation

The Lodgepole Fire burned a large amount of the riparian vegetation along Challis and Lodgepole Creeks within and outside the action area. This, and the large runoff events following the fire, impacted bank stability and riparian vegetation. Placing riprap along the new road's base and installing rock barbs will likely prevent long-term recovery of riparian vegetation in

hardened areas. The SCNF proposes to plant native grass seed on all disturbed soils in addition to planting transplanted willow clumps between individual barbs. Both activities will hasten revegetation at disturbed sites and promote future riparian recovery in un-rocked areas. Additionally, proposed regrading at Site 1 will provide a floodplain width of approximately 20 feet. Additional floodplain grading may have minor benefits to floodplain access, while proposed planting may have small improvements in riparian recovery rates at Site 1. Observations upstream and downstream of the action area suggest woody vegetation will likely reclaim the majority of the floodplain area over time. Negative effects will be limited to the site scale and will be minor in context of the overall designation of critical habitat. Size and duration of the described effects will not reduce the long-term conservation value of riparian vegetation at the site or other scales.

2.4.2.3 Cover/Shelter

The 2014 debris flow filled the Challis and Lodgepole Creek floodplains with a considerable amount of material, significantly reducing or eliminating cover, shelter, and pool quality and quantity. This is especially apparent at the site scale. Considering the minor inwater work proposed, combined with the anticipated effectiveness of proposed erosion control measures, the action is expected to resuspend and/or deliver only minor quantities of sediment to action area streams. Effects to rearing cover, in the form of filling interstitial spaces, should be minor and should not exhibit long-term effects.

As proposed, the action is not expected to enhance or create pool habitat (i.e., space), or other forms of natural cover and shelter. If future channel adjustments result in Challis Creek interaction with the proposed barbs (buried in floodplain as proposed), there may be some small increase in stream habitat complexity due to potential for barbs to cause localized scour. However, in the event of future channel migration or debris torrent, the barbs are designed to route Challis Creek to the center of the valley, away from the road and little to no long-term interaction between channel and barbs is anticipated. As such, the barbs are not expected to provide meaningful cover improvements in the short- or long-term.

Riprap will be placed at the toe of the rebuilt road as a precautionary erosion control measure. Current channel bed elevation is estimated to range from 7 feet to 9 feet below the proposed road toe elevation and the channel's current alignment is more than 25 feet from the proposed road edge. The intervening distance was resloped by the SCNF in 2017 and now allows a moderate level of floodplain access. Elevation and floodplain width are large enough that even low frequency flood events (i.e., 50-year recurrence) may produce water surface elevations that only infrequently interact with proposed riprap. In the event the channel migrates toward the road, a greater level of riprap/channel interaction may occur, but the barbs would limit interactions to high water events.

Riprap is known to cause adverse effects to stream morphology, fish habitat, and fish populations (Schmetterling et al. 2001; Garland et al. 2002; USFWS 2000). As reported by Washington Department of Fish and Wildlife (WDFW et al. 2002), juvenile life stages of salmonids are especially affected by bank stabilization projects. 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. Although no undercut banks or other suitable habitat is currently present at the riprap location, riprap will preclude the future development of riparian cover at the margins of the constructed floodplain area, but not within the channel. This will primarily affect off-channel rearing habitats along approximately 890 feet of streambank. Due to vertical and horizontal separation from the stream, riprap effects on cover/shelter will be infrequent and limited to the site scale.

Incorporating willow clumps between the barbs and seeding the constructed floodplain will provide small areas of hydraulic complexity and useable fish cover when overbank flows occur. This is an improvement from the current, partially entrenched condition of the post-debris torrent channel, which has marginal overbank access and thus only poor habitat at high flows.

Constructing the 20-foot wide floodplain along Site 1 should hasten recovery of channel morphology, including enhanced cover and pools in the reach. As described earlier, riparian vegetation and fish cover may recover more quickly because of action-related improvement to floodplain access and removal of material that would otherwise be transported by the stream over time. The barbs do place a long-term limit on horizontal migration potential, thus they will artificially confine lateral migration potential. However, the barbs' purpose is to prevent the channel from migrating into and eroding the reconstructed road. The artificial confinement affects potential channel morphology and thus space at the site scale, but it does not appear likely to restrict amount of cover/space likely to be available immediately after construction or in the future. The affected reach is less than 900 feet long and the barbs' influence on morphology is expected to be minor and limited to the immediate project footprint. Collectively, effects from riprap and up to seven buried barbs will not affect the conservation value of this PBF at the stream reach or watershed scale.

2.4.2.4 Free Passage

Work at Site 1, along Challis Creek, will have no direct or indirect effect on free passage. Road fords across Lodgepole Creek could potentially affect free passage. As proposed, the toe of the constructed ford aprons will be shaped to concentrate low water flow such that aquatic organism passage is provided. To meet this goal the segment below the road crossing itself, will be established at a grade no more than 1.5 times the grade of the stream bed immediately upstream of the road. The toe of the apron will be shaped to concentrate low water flow enough to ensure aquatic organism passage during low flow periods. NMFS engineers reviewed the proposed design and agreed that fish passage should be possible if built as proposed. Although ford crossings typically provide safe fish passage (Warren and Pardew 1998), there is potential that future runoff events could erode placed material or deposit new material, potentially affecting passage at the crossing(s) over time. Challis Creek Road is a SCNF system route, and we assume some level of regular route evaluation and maintenance will occur, depending on SCNF budgets and other needs. The BA and a July 21, 2016, SCNF email noted the fords will be added to the SCNF's list of aquatic organism passage projects once Lodge Pole Creek stabilizes from fire impacts. This would ultimately result in the crossing replacement with fish passable culvert when funds and staff allow. The site is traveled and inspected frequently enough that suitable passage conditions are expected to be maintained. Regular inspection should identify future

passage problems and allow for subsequent road maintenance necessary to ensure safe vehicle and fish passage over time.

2.4.2.5 Space

To the extent practical, a floodplain of approximately 20 feet wide will be created between the Challis Creek channel and the reconstructed road. The final footprint of the reconstructed road will remove approximately 0.2 acres of floodplain compared to the pre-fire and pre-debris flow condition. Given the project has been partially constructed and the road base is currently larger than originally proposed, the effects of the reinitiated action will actually reduce the current road's footprint, ultimately reducing the action's effects to the original 0.2-acre impact. Proposed work will not directly affect the amount of space. In the event of a future debris flow, the barbs are expected to direct Challis Creek north, nudging the channel back toward its current location. In that event, the amount of space should not be affected as the channel is likely to reform itself on the post-debris landscape, similar to the current condition.

Construction of up to three fords in Lodgepole Creek would modify the type of substrate in each cross section, but not reduce the amount of functional habitat at the road crossings. Armoring the road crossings will likely reduce the amount of interstitial space important to juvenile fish. Interstitial space is primarily beneficial for winter rearing salmonids (Huusko et al. 2007; Van Dyke et al. 2009), but can also be used for security cover during summer. The action area is not currently occupied by Chinook salmon and is generally too high and small to serve as valuable winter habitat. Thus, the small amount of space lost as result of ford armoring will not likely reduce the conservation value of this PBF in 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). Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

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

The action area contains Federal lands administered by the SCNF, which comprise the majority of the watershed acreage, interspersed with Bureau of Land Management, State, and privately-owned land. The BA did not identify any future state or private activities that will occur in the watershed and there are no state or private lands in the action area. NMFS is also not aware of any state, tribal, or private activities proposed in the action area at this time. Therefore, there are no cumulative effects.

2.7 Integration and Synthesis

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

The action area currently provides habitat used by the freshwater life history stages of threatened Snake River Basin steelhead (migratory and rearing). As noted above, successful implementation of the proposed action, including the described design criteria and BMPs, will have the following adverse effects on Snake River Basin steelhead and Snake River spring/summer Chinook salmon designated critical habitat:

1. Minor behavioral modifications from exposure to multiple low intensity and temporary turbidity plumes. These plumes may cause temporary behavioral modifications to exposed fish. Most exposed fish are expected to simply temporarily relocate to nearby non-turbid water during the exposure, likely within a 300-foot reach of Challis Creek below the Lodgepole Creek confluence and the 300 feet of Lodgepole Creek below the ford(s). Future ford use may cause more minor plumes and have similar behavioral effects on fish and habitat in Lodgepole Creek, below the fords.

2. Minor behavioral modifications, from construction noise and equipment use may occur. Fish are expected to move only short distances (likely only a few feet). Similar habitat types exist upstream and downstream of the affected areas and are expected to provide forage and hiding cover similar to the areas fish are displaced from. Thus, relocations should not affect individual fish's growth. Movements could result in an unknown level of predation increase. This risk is likely low due to the small area affected and anticipated short movement distances.

3. Handling and harassment of juvenile steelhead could occur as Site 5 is dewatered. Although most fish are anticipated to volitionally move in response to equipment noise and visual stimulus of the activities prior to salvage efforts, NMFS estimated up to five juvenile steelhead may be handled during channel dewatering and one fish may die.

4. Remaining road reconstruction will reduce the currently over-widened road base and ultimately result in reducing the current footprint impacts back to the level assessed in the 2016 Opinion (NMFS 2016) (i.e., a 0.2-acre floodplain reduction compared to pre-fire and pre-debris flow impacts). Riprap and buried barb placement in the Challis Creek floodplain will slightly reduce the amount of cover/shelter and riparian vegetation that may develop in the future. The remaining action's effects are isolated to site scale and are minor in context of available critical habitat in Challis and Lodgepole Creeks and even more minor in context of available habitat at the ESU designation scale. Impacts

will not reduce the long-term conservation value of the action area. The project, as described, is not expected to shrink the extent of the snowmelt-dominated habitat available to salmon due to future climate change effects on riverine hydrographs.

Action area conditions have been degraded by the 2014 debris flow, and to some degree, post-debris flow work already completed to restore road access. Current habitat conditions at the project sites are poor and do not currently support high densities of ESA-listed steelhead. With the exception of potential to harm four fish and kill one juvenile steelhead during handling, adverse effects to individual fish will primarily be temporary and minor with only small behavioral changes likely from exposure to turbidity. Proposed dewatering and salvage efforts, along with equipment noise/activity, are expected to avoid and/or minimize potential handling by causing most fish to temporarily move short distances. As described above, the fish handling should not kill more than one juvenile steelhead. The expected one-time loss of up to one juvenile steelhead from is too small to influence the productivity, spatial structure, or genetic diversity of the East Fork Salmon River population. Additionally, any potential habitat-related effects to individual steelhead are expected to be too minor to produce any discernable effect on VSP parameters. Because effects will not be substantial enough to negatively influence VSP criteria at the population scale, the viability of the MPG and DPS is also not expected to be reduced.

Described impacts to unoccupied designated critical habitat are minor, primarily temporary, and isolated to local sites. The nature of these effects are too small to meaningfully affect the available habitat's ability to provide the PBFs necessary for future Chinook salmon survival and recovery within the action area. For this reason, effects at higher scales (i.e., watershed, sub-basin, and designation scale), the conservation value of the designated critical habitat will not be reduced by the proposed action.

2.8 Conclusion

After reviewing and analyzing the current status of the listed species and critical habitat, the environmental baseline within the action area, the effects of the proposed action, any effects of interrelated and interdependent activities, and cumulative effects, it is NMFS' Opinion that the proposed action is not likely to jeopardize the continued existence of Snake River Basin steelhead. NMFS has also determined the action is not likely to destroy or adversely modify Snake River spring/summer Chinook salmon designated critical habitat.

2.9 Incidental Take Statement

Section 9 of the ESA and federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without a special exemption. "Take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. "Harm" is further defined by regulation to include significant habitat modification or degradation that actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering (50 CFR 222.102). On an interim basis, NMFS interprets "Harass" to mean "Create the likelihood of injury to wildlife by annoying it to such an extent as to

significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering." "Incidental take" is defined by regulation as takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the federal agency or applicant (50 CFR 402.02). Section 7(b)(4) and section 7(o)(2) provide that taking that is incidental to an otherwise lawful agency action is not considered to be prohibited taking under the ESA if that action is performed in compliance with the terms and conditions of this ITS.

2.9.1 Amount or Extent of Take

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 juvenile steelhead may currently occur in the action area, or could occur there in the future, and those fish may be exposed to effects of the proposed action. In the Opinion, NMFS determined that incidental take is reasonably certain to occur as follows:

1. Up to five juvenile steelhead may be handled during fish salvage at the three Lodgepole Creek Ford sites and up to one of those fish may die.

2. An unknown number of steelhead may experience temporary behavioral modification from proposed work and they may be exposed to increased predation when moving away from action related activities.

3. Temporary turbidity plumes will occur during dewatering/rewatering at up to three Lodgepole Creek ford locations. Plumes will last just minutes and could extend downstream up to 600 feet. Exposed fish may experience minor sublethal or behavioral modifications.

For salvage-related take, the extent of take can be quantified by counting the number of fish handled and/or killed. NMFS will consider the amount of take exceeded if more than five juvenile steelhead are collectively handled between all three potential ford construction sites, or if more than one juvenile steelhead dies as result of project-related fish salvage.

For habitat-related take, the number of individual fish present when effects occur cannot be accurately determined. In addition, there is no way for SCNF or other personnel to quantify how many fish are affected at a given site, how long they are affected, or what their ultimate fate is (i.e., cannot determine injury levels or changes in predation). These uncertainties make it impossible to quantitatively identify the amount of take (turbidity) that will occur as a result of implementing the proposed action. Because circumstances causing take are likely to arise, but cannot be quantitatively evaluated in the field, the extent of incidental take is described, pursuant to 50 CFR 402.14[I].

For construction related turbidity impacts (i.e., bullets 2 and 3 above), NMFS will consider the amount of habitat-related take exceeded if turbidity readings, taken approximately 600 feet downstream of construction generated sediment inputs last more than 90 minutes or exceed more than 100 NTUs instantaneously.

2.9.2 Effect of the Take

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

2.9.3 Reasonable and Prudent Measures

"Reasonable and prudent measures" are nondiscretionary measures that are necessary or appropriate to minimize the impact of the amount or extent of incidental take (50 CFR 402.02). The SCNF and the COE 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 conservation measures 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 SCNF and COE (for those measures relevant to the CWA section 404 permit) shall minimize incidental take by:

1. Reducing the potential for incidental take resulting from turbidity exposure.

2. Reducing the potential for incidental take resulting from fish salvage.

3. Ensuring completion of a monitoring and reporting program to confirm that the terms and conditions in this ITS are effective in avoiding and minimizing incidental take from permitted activities and ensuring incidental take is not exceeded.

2.9.4 Terms and Conditions

The terms and conditions described below are non-discretionary, and the SCNF, the COE, and any applicant/permittee (e.g., Custer County) must comply with them in order to implement the RPMs (50 CFR 402.14). The SCNF, the COE, or any applicant/permittee 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 identified agencies or any applicant 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 SCNF and COE (as relevant to the CWA 404 permit) 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. Ensure that dewatered areas are rewatered in a slow controlled fashion to limit the intensity, duration, and extent of the turbidity plumes produced.

c. Stop construction activities if turbidity levels 600 feet downstream of their source begin to approach 50 NTUs above background or are visible for more than 90 minutes. At that time, additional BMPs shall be employed to further minimize remaining plumes to ensure extent of take is not exceeded.

d. Ensure appropriate sediment management BMPs (e.g., silt fences, coir logs, weed free straw bales, etc.) are utilized to reduce construction related activities potential delivery of sediment to action area streams.

e. Use portable pumps, as necessary, at each proposed barb's trench to prevent groundwater from splashing onto the floodplain and delivering sediment to Challis Creek. Pumps shall also be used if Challis Creek is observed to become turbid due to hyporheic delivery of turbid water from the pits during barb construction. Water shall be pumped to a location where turbid water will not re-enter Challis Creek. In the event such locations are not available, mechanical settling basins, Baker Tanks, or functional equivalents will be used to prevent delivery of turbid water.

2. To implement RPM #2 (fish salvage), the SCNF shall:

a. Employ a fish biologist when dewatering ford sites (if dewatering is necessary) to conduct or supervise the following activities: (1) Slowly remove approximately 80 percent of the streamflow from the work area to allow fish to leave volitionally; (2) install blocknets; capture fish through seining and dipping; continue to slowly dewater the stream reach; and (3) collect any remaining fish in cold-water buckets and relocate to the stream.

b. Regularly inspect any block nets used to remove fish to areas where further impingement will be avoided. Nets shall be kept unobstructed by debris for the period of use. Individual sites' salvage activities will be completed in 1-day.

c. Qualified fisheries biologist(s) conducting work area isolation shall have demonstrated experience conducting work area isolation and fish handling.

d. Handle ESA-listed fish with extreme care, keeping fish in water to the maximum extent possible during dip netting and transfer procedures to prevent the added stress of out-of-water handling.

e. Ensure that holding conditions for any captured fish provide the lowest level of stress to captured individuals by maintaining local stream conditions (temperature, dissolved oxygen, etc.) in holding vessels, minimizing holding time and avoiding any predation in holding vessels.

f. Release all transported fish to a safe location as quickly as possible. Fish should be

released upstream of the project site as sediment impacts would not likely affect individuals there. Place buckets into the water and slowly invert to allow captured fish to move into the selected release sites.

g. The SCNF shall maintain oversight of the project to ensure it is implemented in a manner producing effects consistent with those analyzed in this Opinion. The SCNF shall document the completed ford profile meets the target design criteria for slope and drop height to ensure fish passage is possible, when flows are sufficient, following construction.

3. To implement RPM #3 (monitoring and reporting) the SCNF and the COE shall:

a. Submit a project status/completion report to NMFS within 6 weeks of project completion for any 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 reports shall identify:

i. Project Name and Agency Contact;

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. Dates of dewatering and fish salvage at Site 5 ford(s) and any fish capture information, including: capture location; fish biologist; capture method; number and size of fish handled by species; pertinent environmental conditions; and any observed injuries or mortalities.

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

vii. Post-construction ford survey results confirming targeted design slope and drop height are met – inferring fish passage will be possible when surface water conditions allow.

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. Submit post-project report to:

National Marine Fisheries Service
NMFS Tracking Number: WCRO-2019-00430
800 Park Boulevard
Plaza IV, Suite 220
Boise, Idaho 83712-7743

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

2.11 Conservation Recommendations

Section 7(a)(1) of the ESA directs federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. Specifically, conservation recommendations are suggestions regarding discretionary measures to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information (50 CFR 402.02). The following recommendations are discretionary measures that NMFS believes are consistent with this obligation and therefore should be carried out by the SCNF:

1. Currently, the SCNF did not define an inspection or maintenance schedule to ensure fish passage is maintained into the future. The SCNF should develop a formal evaluation and response commitment in order to ensure successful fish passage is maintained for all species and life stages that could migrate through proposed ford crossing(s) at Site 5.

2. Following construction, the SCNF should plant native trees, shrubs, and other herbaceous riparian vegetation along the affected streambank reaches.

3. In the event the proposed barbs do begin to interact with Challis Creek in the future, the SCNF should carefully evaluate the interaction to evaluate the potential need for ESA consultation reinitiation.

4. To mitigate the effects of climate change on ESA-listed salmonids, follow recommendations by the ISAB (2007) to plan now for future climate conditions by

implementing protective tributary and mainstem habitat measures. In particular, implement measures to protect or restore riparian buffers, wetlands, and floodplains; remove stream barriers; and to ensure late summer and fall tributary streamflows. Focus should occur on known or suspected, or potential, cold-water refugia.

5. The SCNF should continue to work with Custer County to identify more suitable locations for this and other roads affecting the habitat and riparian condition of critical habitat. Evaluations should prioritize routes with the most severe current impacts or highest potential for future road failure.

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

2.12 Reinitiation of Consultation

This concludes formal consultation for the Reinitiation of the Challis Creek Road Repair Project.

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

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

Section 305(b) of the MSA directs federal agencies to consult with NMFS on all actions or proposed actions that may adversely affect EFH. The MSA (section 3) defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Adverse effect means any impact that reduces quality or quantity of EFH, and may include direct or indirect physical, chemical, or biological alteration of the waters or substrate and loss of (or injury to) benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality or quantity of EFH. Adverse effects on EFH may result from actions occurring within EFH or outside of it and may include site-specific or EFH-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810). Section 305(b) also requires NMFS to recommend measures that can be taken by the action agency to conserve EFH.

This analysis is based, in part, on the EFH assessment provided by the SCNF and descriptions of EFH for Pacific Coast salmon (PFMC 2014) contained in the fishery management plan

developed by the Pacific Fishery Management Council (PFMC) and approved by the Secretary of Commerce.

3.1 Essential Fish Habitat Affected by the Project

The proposed action and action area for this consultation are described in the Introduction to this document. The action area includes areas designated as unoccupied EFH for spawning, rearing, and migration life-history stages of Chinook salmon.

The reconstruction of the road would involve placing approximately 2,300 yd^3 of material in the floodplain below the OHWM and would result in a loss of approximately 0.2 acres of floodplain in addition to what the road originally occupied.

The PFMC has identified five habitat areas of particular concern (HAPC), which warrant additional focus for conservation efforts due to their high ecological importance. Three of the five HAPC are applicable to freshwater and include: (1) Complex channels and floodplain habitats; (2) thermal refugia; and (3) spawning habitat. This reach of Challis Creek does not include spawning habitat, and the project will not affect access to thermal refugia. However, as proposed, this project has the potential to affect the complex channels and floodplain habitats 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 unoccupied 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 effects to EFH will occur:

1. Multiple turbidity plumes will produce brief and temporary water quality-related impacts. Individual pulses are not expected to persist more than 90 minutes, will remain less than 100 NTUs over background, and not extend more than 600 feet downstream. Individual plumes should be temporary, and affect narrow, short segments of EFH.

2. Finishing reconstruction of the road will complete a total project-related loss of approximately 0.2 acres of floodplain compared to what the road originally occupied. However, the proposed work will actually reduce the floodplain impacts from the current, mid-project, baseline condition.

3. Riprap and barbs will likely fix the channel in its current location and have minor impacts on flood-level cover and shelter and minor impacts on riparian vegetation reestablishment.

3.3 Essential Fish Habitat Conservation Recommendations

NMFS believes that the following Conservation Recommendations are necessary to avoid, mitigate, or offset the impact that the proposed action has on EFH. These Conservation Recommendations are a non-identical set of the ESA Terms and Conditions.

1. To reduce the area of ground disturbance and its potential for delivering sediment to the stream, work areas should be flagged to minimize footprint of impacts caused by construction equipment.

2. Dewatered areas should be rewatered in a slow, controlled fashion to limit the intensity, duration, and extent of the turbidity plumes produced.

3. Ongoing construction practices should be modified when observed turbidity levels approach 50 NTUs over background 600 feet downstream of the source. All practicable means should be used to monitor the actual turbidity plume itself rather than proximal areas.

4. After the completion of construction, the SCNF should plant riparian vegetation along the riverbank and other disturbed areas and should include only native trees, shrubs, and other herbaceous vegetation.

NMFS expects that full implementation of these EFH Conservation Recommendations would protect, by avoiding or minimizing the adverse effects described in Section 3.2 above, approximately 0.2 acres of designated EFH for Pacific coast salmon.

3.4 Statutory Response Requirement

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

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

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

3.5 Supplemental Consultation

The SCNF and the COE must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH Conservation Recommendations (50 CFR 600.920(l)).

4. DATA QUALITY ACT DOCUMENTATION AND PRE-DISSEMINATION REVIEW

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

4.1 Utility

Utility principally refers to ensuring that the information contained in this consultation is helpful, serviceable, and beneficial to the intended users. The intended users of this Opinion are the SCNF and the COE. Other interested users could include Custer County. Individual copies of this Opinion were provided to the SCNF and the COE. The format and naming adheres to conventional standards for style.

4.2 Integrity

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

4.3 Objectivity

Information Product Category: Natural Resource Plan

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

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

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

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

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