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

Refer to NMFS No: WCRO-2023-02966

https://doi.org/10.25923/zfwh-8623

April 15, 2024

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

Re: Endangered Species Act Section 7(a)(2) Biological Opinion and Magnuson–Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the Pony Creek Water Diversions Project, Pony Creek Watershed (HUC 170602080605), Valley County, Idaho

Dear Ms. Jackson:

Thank you for your November 21, 2023, email and letter requesting initiation of consultation with NOAA's National Marine Fisheries Service (NMFS) pursuant to Section 7 of the Endangered Species Act of 1973 (ESA) (16 U.S.C. 1531 et seq.) for the Pony Creek Water Diversions 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 [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 spring/summer Chinook salmon (*Oncorhynchus tshawytscha*) or Snake River Basin steelhead (*O. mykiss*). NMFS also determined the action will not destroy or adversely modify designated critical habitat for these two species. Rationale for our conclusions is provided in the attached opinion.

As required by Section 7 of the ESA, NMFS provides an incidental take statement (ITS) with the opinion. The ITS describes reasonable and prudent measures (RPM) NMFS considers necessary or appropriate to minimize the impact of incidental take associated with this action. The take statement sets forth terms and conditions, including reporting requirements, that the Payette National Forest (PNF) and any permittee who performs any portion of the action, must comply with in order to 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 three Conservation Recommendations to avoid, minimize, or otherwise offset potential adverse effects on EFH. These Conservation

Recommendations are an identical subset of the ESA terms and conditions. Section 305(b)(4)(B) of the MSA requires Federal agencies to provide a detailed written response to NMFS within 30 days after receiving these recommendations. If the response is inconsistent with the EFH Conservation Recommendations, the PNF must explain why the recommendations will not be followed, including the justification for any disagreements over the effects of the action and the recommendations. In response to increased oversight of overall EFH program effectiveness by the Office of Management and Budget, NMFS established a quarterly reporting requirement to determine how many Conservation Recommendations are provided as part of each EFH consultation and how many are adopted by the action agency. Therefore, in your statutory reply to the EFH portion of this consultation, NMFS asks that you clearly identify the number of Conservation Recommendations accepted.

Please contact Cortney Brown, Fish Biologist in the Southern Snake Branch of the Interior Columbia Basin Office at (208) 398-0053 or at cortney.brown@noaa.gov if you have any questions concerning this consultation, or if you require additional information.

Sincerely,

Nancy L Munn

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

Enclosure

cc: C. Nalder – PNF
L. Ferguson – PNF
A. Gonzalez – USFWS
M. Lopez – NPT
C. Colter – SBT

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

Pony Creek Diversions Project

NMFS Consultation Number: WCRO-2023-02966

Action Agency: United States Forest Service, Payette National Forest

Affected Species and NMFS' Determinations:

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

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

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

Issued By:

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

Date: April 15, 2024

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7-DADM	7-Day Average Daily Maximum
af	Acre Feet
BA	Biological Assessment
BMP	Best Management Practice
CFR	Code of Federal Regulations
CFS	Cubic feet per second
Corps (or COE)	U.S. Army Corps of Engineers
CR	Conservation Recommendation
CWA	Clean Water Act
DPS	Distinct Population Segment
DQA	Data Quality Act
EFH	Essential Fish Habitat
EFSFSR	East Fork South Fork Salmon River
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
FA	Functioning Appropriately
FMP	Fishery Management Plan
FR	Functioning Risk
FR	Federal Register
FRU	Functioning at Unacceptable Risk
HAPC	Habitat Area of Particular Concern
ICTRT	Interior Columbia Technical Recovery Team
IDFG	Idaho Department of Fish and Game
ISAB	Independent Scientific Advisory Board
IP	Intrinsic Potential
ITS	Incidental Take Statement
LWD	Large Woody Debris
MFSR	Middle Fork Salmon River
MPG	Major Population Group
MSA	Magnuson–Stevens Fishery Conservation and Management Act
MSL	Mean Sea Level
NFS	National Forest System
NMFS	National Marine Fisheries Service
NPT	Nez Perce Tribe
OMP	Operation and Maintenance Plan
opinion	Biological Opinion
PBF	Physical or Biological Feature
PCE	Primary Constituent Element
PFMC	Pacific Fishery Management Council
PNF	Payette National Forest
POD	Point of Diversion
PVC	Plastic Polyvinyl Chloride
RCA	Riparian Conservation Area
RPA	Reasonable and Prudent Alternative

RPM	Reasonable and Prudent Measure
SFSR	South Fork Salmon River
SKRW	Southern Resident Killer Whale
SRB	Snake River Basin
SRS	Snake River Spring/Summer
SUP	Special Use Permit
USFS	United States Forest Service
U.S.C.	U.S. Code
USGCRP	U.S. Global Change Research Program
VSP	Viable Salmonid Population
WSI	Watershed Condition Indicator
WUA	Weighted Usable Area

1. INTRODUCTION

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

1.1. Background

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

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

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

1.2. Consultation History

The Payette National Forest (PNF) provided a draft biological assessment (BA) to NMFS on May 15, 2023. The BA contained an analysis of the effects of the proposed action on Snake River spring/summer (SRS) Chinook salmon (*Oncorhynchus tshawytscha*), Snake River Basin (SRB) steelhead (*O. mykiss*), and their designated critical habitats. The BA also contained an analysis of the proposed action's effects on Pacific Coast salmon EFH. NMFS provided comments to the PNF on June 14, 2023. A revised BA was provided to NMFS on October 10, 2023, and NMFS provided comments on November 6, 2023. The BA was discussed during a Level 1 Team meeting on November 7, 2023, and NMFS indicated that once comments were addressed, the PNF could submit a request to initiate formal consultation. NMFS received the PNF's request to initiate formal consultation on November 21, 2023. On December 4, 2023, NMFS sent a 30-day letter to the PNF indicating that the information in the BA was sufficient to initiate formal consultation with an effective date of November 21, 2023. Additional information regarding specific data was requested and received on December 27–29, 2023.

The most recent consultation (NMFS Tracking Number 2008-06614) for one of the three special use permits (SUPs) for water diversions included in this proposed action was issued on December 3, 2008, and expired on December 31, 2017 (NMFS 2008). The remaining two SUPs have no prior associated consultations.

In preparing this opinion, NMFS relied on information from the BA (Ferguson 2023), and its supporting documentation, published scientific literature, other documents (e.g., government reports), and publicly available data. This information provided the basis for our determinations as to whether the PNF can ensure that their proposed action is not likely to jeopardize the continued existence of ESA-listed species, and is not likely to result in the destruction or adverse modification of designated critical habitat.

This project will likely affect tribal trust resources. Because the action is likely to affect tribal resources, a copy of the draft of the proposed action and terms and conditions was sent to the Nez Perce Tribe (NPT) and Shoshone–Bannock Tribes on February 13, 2023. Neither the Nez Perce Tribe nor the Shoshone–Bannock Tribes provided comments. NMFS also provided draft excerpts to the PNF on February 13, 2023, and received comments from the PNF on February 27, 2023. The PNF requested NMFS clarify several terms and condition and provided additional information.

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

1.3. Proposed Federal Action

Under the ESA, "action" means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies (see 50 CFR 402.02). Under the MSA, "Federal action" means any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken by a Federal agency (see 50 CFR 600.910).

The proposed action will authorize operation and maintenance of three water diversion and transmission facilities on PNF-administered land, in accordance with the terms and conditions of the SUPs. Water diversions on and across PNF-administered land, and use of that water on private land, will presumably not occur without the proposed action, and the effects of those diversions and use will therefore be described in the Analysis of Effects section (Section 2.5).

The project area is located approximately 30 miles northeast of McCall, Idaho in the Pony Creek subwatershed (hydrologic unit code [HUC] 170602080605) in Valley County at T21N, R7E, Section 2, Boise Meridian (45° 11' 25" N, 115° 34' 27" W). The points of diversion (PODs) and water conveyance infrastructure related to this project are accessible from Forest Road 340, east of Warren Summit (Figure 1).

The Federal actions covered by this opinion are the authorization of ongoing operation and maintenance of three diversions with current infrastructure on Pony Creek. These diversions consist of one reissuance of an existing SUP (Sandy Cove Water Inc.; Table 1) that supplies water for three water rights; one new SUP (Stritzke; Table 2) supplying water to four water rights; and one new SUP (Graves/Lightle; Table 3) supplying water for one water right. The diversion infrastructure (e.g., pipes, intake screen) are removed from Pony Creek prior to hard freezing temperatures (October–November) and placed back in the stream after peak flows in the spring (June–July). Descriptions of the water diversion facilities and the proposed operation and maintenance of those facilities are in Sections 1.3.1–1.3.3.

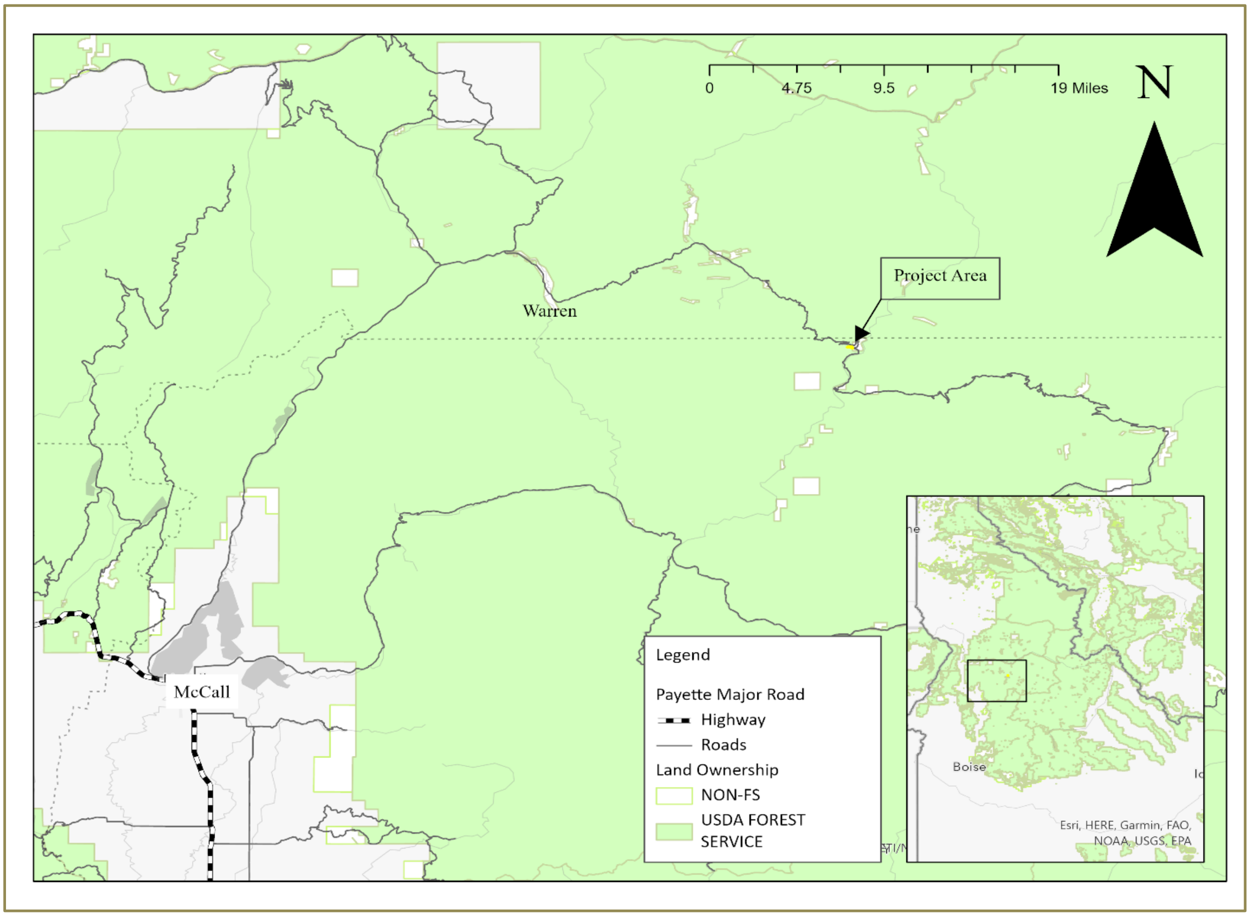

Figure 1. Pony Creek Diversions Project location (Ferguson 2023).

1.3.1. Diversions

The total diverted flow related to the three SUPs in this proposed action will be 0.76 cubic feet per second (cfs) (Figure 2; Sections 1.3.1.1–1.3.1.3). There are nine other active water rights on Pony Creek for an additional 0.47 cfs, but none of these are known to be diverting from, or transmitting across, National Forest. This 0.47 cfs of water diversion will be described in the baseline conditions and cumulative effects sections below.

The PNF will send the revised draft Operations and Maintenance Plan (OMP) to NMFS prior to finalization of the SUPs to ensure that all critical elements are included. The three water systems are currently installed, owned, and operated as described in the following three sections.

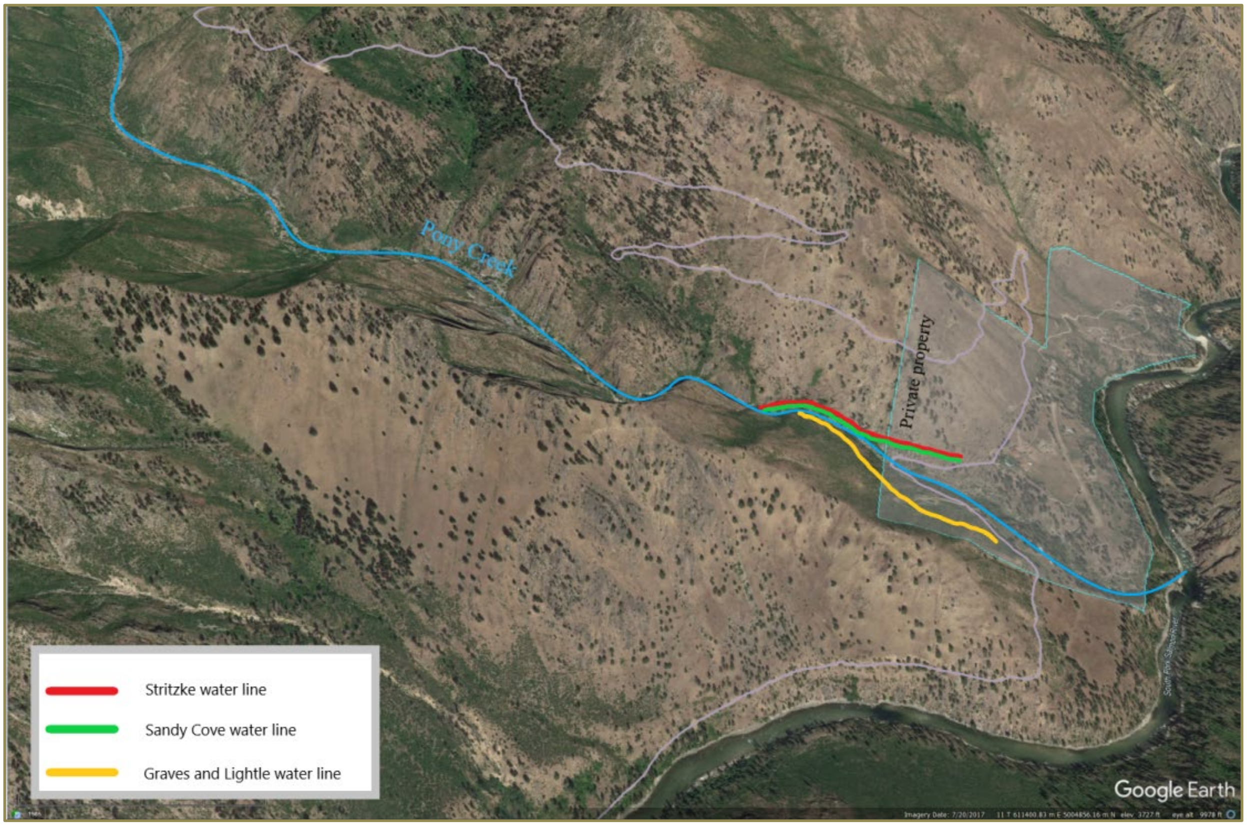

Figure 2. Aerial view of Pony Creek Water Diversions Project area and water lines (Ferguson 2023).

1.3.1.1. Sandy Cove Water, Inc. Diversion

The Sandy Cove Water, Inc. diversion is on the mainstem of Pony Creek approximately 0.75 miles upstream from the South Fork Salmon River (SFSR). The diversion includes 400 feet of buried plastic polyvinyl chloride (PVC) pipe, approximately 640 feet of 3" PVC pipe (Figure 3), and a submerged end-of-pipe fish screen. The diversion weir consists of rocks placed in the main channel and does not constitute an upstream passage barrier. The pipe has a previously-approved NMFS fish screen (Ferguson 2023). The Sandy Cove Water, Inc. diversion serves three water rights with a maximum total diversion rate of 0.18 cfs that is used for domestic purposes for nine residences (Table 1). This water right is used seasonally and operates from approximately May – November each year.

The Sandy Cove Water, Inc. diversion water rights have a priority date of January 1, 1879, and were decreed in 2006, suggesting that this diversion has been used for many years. It was originally installed in 1988. Their most recent SUP was issued under the PNF Ongoing Action opinion (NMFS Tracking Number 2008/06614) and expired on December 31, 2017.

Figure 3. Sandy Cove and Stritzke diversions in Pony Creek, July 7, 2015 (Ferguson 2023).

Table 1. Water rights and usage (cfs) under the Sandy Cove SUP.

Water Right Owner	Water Right #	Domestic	Stockwater	Irrigation	Total
Sandy Cove	77-7241	0.10	0.00	0.00	0.10
Leavitt Properties	77-4169U	0.04	0.00	0.00	0.04
Leland Kelly	77-4169H	0.04	0.00	0.00	0.04
					0.18

1.3.1.2. Donald K. Stritzke Diversion

The Stritzke diversion is on the mainstem of Pony Creek approximately 0.75 miles upstream from the SFSR. The diversion includes 400 feet of buried 10” pipe, 100 yards of 6” pipe, and 200 yards of 3” pipe above ground (Figure 3). The diversion weir (the same as Sandy Cove Water, Inc. above) consists of rocks placed in the main channel and does not constitute an upstream passage barrier. The pipe does not have a previously-approved NMFS fish screen. The Stritzke diversion serves four water rights (Table 2) with a maximum total diversion rate of 0.54 cfs that is used for domestic purposes (0.16 cfs), stock water purposes (0.13 cfs), and irrigation for 13.0 acres (0.25 cfs). This water right is used seasonally and operates from approximately May – November each year. Authorization of this diversion is dependent on the addition of a NMFS-approved fish screen.

The Stritzke diversion water rights have a priority date of January 1, 1879, and were decreed in 2000 and 2006, suggesting that this diversion has been used for many years. However, operation and maintenance of this diversion has not been previously consulted on.

Table 2. Water rights and usage (cfs) considered under the Stritzke SUP.

Water Right Owner	Water Right #	Domestic	Stockwater	Irrigation/acres	Total
Donald Stritzke	77-4169A	0.04	0.01	0.16/8.0	0.21
Paul & Betty Bull	77-10111 and 77-4169R	0.12	0.12	0.02/1.3	0.26
George Nourse	77-4169L	0.00	0.00	0.07/3.7	0.07
			0.25/13		0.54

1.3.1.3. Troy Graves and John Lightle Diversion

The Graves and Lightle diversion are on the mainstem of Pony Creek approximately 0.75 miles upstream from the SFSR. The diversion includes approximately 1,500 feet in length of an above-ground 2” black pipe across to private property (Figure 4). The diversion weir consists of rocks placed in the main channel and does not constitute an upstream passage barrier. The pipe does not have a previously-approved NMFS fish screen. The Stritzke diversion serves one water right with a maximum diversion rate of 0.04 cfs that is used for domestic purposes (Table 3). This water right is used seasonally and operates from approximately May – November each year. Authorization of this diversion will include a requirement that the user add a NMFS-approved fish screen.

The Graves diversion water right has a priority date of January 1, 1879, and was decreed in 2006, suggesting that this diversion has been in use for many years. However, operation and maintenance of this diversion and has not been previously consulted on.

Figure 4. Graves and Lightle diversions in Pony Creek on October 20, 2021 (Ferguson 2023).

Table 3. Water rights and usage (cfs) considered under the Graves and Lightle SUP.

Water Right Owner	Water Right #	Domestic	Stockwater	Irrigation	Total
Graves and Lightle	77-4169K	0.04	0.00	0.00	0.04
					0.04

1.3.2. Mitigations

The mitigations listed below will be included in all future OMPs (or specific SUPs, as identified):

- Prior to issuance of SUPs, NMFS-approved fish screens will be affixed to the intakes to prevent possible entrainment of fish. Sandy Cove has already installed a NMFS-approved fish screen on their intake (Figure 5; Ferguson 2023).
- Water systems that have the capacity to divert more water than the State water right will have a flow control and flow measuring device that are kept in good working condition. Within two years of SUP issuance, it will be determined whether flow control and measuring devices are needed and they will be installed if needed.
- Adjustments or movement of intake must have prior approval of the United States Forest Service (USFS).
- Regular cleaning and maintenance of fish screens (see above) and monitoring of diversions by permittees upon issuance of SUP.
- Use of heavy equipment for maintenance of facilities will require review by a Forest Service fisheries biologist.
- Any ground disturbance due to maintenance of permitted facilities will be mitigated with a high level of erosion control measures to prevent erosion and subsequent sediment deposition into streams. Examples of acceptable erosion control measures include slash, straw or wood mulch, and planting with a native seed mix.
- Any leakage due to malfunctioning diversion equipment will be repaired a soon as possible to prevent streambank washout or erosion and avoid sediment deposition in streams.
- Weirs constructed of river rock will be kept to the minimum size needed for the POD to function adequately and will not block fish passage.

In general, maintenance includes maintaining the PODs, removal of debris, replacing improvements within the footprint of the authorized system, replacing broken pipe, fixing leaks in the collection box, keeping the area clean of limbs, fallen trees, and trimming back brush and trees. Routine maintenance must not include any expansion of the existing facilities or otherwise changing the “footprint” of the existing diversion. Any conditions for environmental protections such as fish screen, flow control and measuring, and minimum instream flows, are included in the OMP. An OMP can be updated as needed during the term of the SUP.

Figure 5. Fish screen similar to the one currently in use by Sandy Cove (photo from Zinvent Inc.).

1.3.3. Project and Consultation Timeframe

This consultation will cover the current SUPs, and re-issuance once they expire (every 20 years from issuance) if none of the four conditions of reinitiating consultation are triggered (Section 2.11). Prior to reissuing a permit, the PNF will review the reinitiation triggers and provide the results of this review to the Level 1 team.

Minor changes to the SUP can be made by updating the OMP that accompanies each SUP. More substantial changes require an amendment to the SUP.

We considered, under the ESA, whether or not the proposed action would cause any other activities and determined that water diversions on and across PNF-administered land, and use of that water on private land, will not occur without the issuance of the SUPs. Therefore, water diversion is a consequence of the proposed action, and the effects of the diversions will be described in the effect's analysis.

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

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

2.1. Analytical Approach

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

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

The designations of critical habitat for SRS Chinook salmon or SRB steelhead use the term primary constituent element (PCE) or essential features. The 2016 final rule (81 FR 7414; February 11, 2016) that revised the critical habitat regulations (50 CFR 424.12) replaced these terms with physical or biological features (PBFs). The shift in terminology does not change the approach used in conducting a "destruction or adverse modification" analysis, which is the same regardless of whether the original designation identified PCEs, PBFs, or essential features. In this opinion, we use the term PBF to mean PCE or essential feature, as appropriate for the specific critical habitat.

The ESA Section 7 implementing regulations define effects of the action using the term "consequences" (50 CFR 402.02). As explained in the preamble to the final rule revising the definition and adding this term (84 FR 44976, 44977; August 27, 2019), that revision does not change the scope of our analysis, and in this opinion, we use the terms "effects" and "consequences" interchangeably.

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

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

2.2. Rangewide Status of the Species and Critical Habitat

This opinion examines the status of each species that would be adversely affected by the proposed action. The status is determined by the level of extinction risk that the listed species face, based on parameters considered in documents such as recovery plans, status reviews, and listing decisions. This informs the description of the species' likelihood of both survival and recovery. The species status section also helps to inform the description of the species' "reproduction, numbers, or distribution" for the jeopardy analysis. The opinion also examines the condition of critical habitat throughout the designated area, evaluates the conservation value of the various watersheds that make up the designated area, and discusses the function of the PBFs that are essential for the conservation of the species. The Federal Register notices and notice dates for the species and critical habitat listings considered in this opinion are included in Table 4.

Table 4. 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[1,2]	T 4/22/92; 57 FR 14653	12/28/93; 58 FR 68543	6/28/05; 70 FR 37160
Steelhead (*O. mykiss*)			
Snake River Basin	T 8/18/97; 62 FR 43937	9/02/05; 70 FR 52630	6/28/05; 70 FR 37160

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

2.2.1. Status of the Species

This section describes the present condition of the SRS Chinook salmon evolutionarily significant unit (ESU) and the SRB steelhead distinct population segment (DPS). NMFS expresses the status of a salmonid ESU or DPS in terms of likelihood of persistence over 100 years (or risk of extinction over 100 years). NMFS uses 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, an ESU or DPS should have multiple viable populations so that a single catastrophic event is less likely to cause the ESU/DPS to become extinct, and so that the ESU/DPS may function as a metapopulation that can sustain population-level extinction and recolonization processes (ICTRT 2007). The risk level of the ESU/DPS is built up from the aggregate risk levels of the individual populations and major population groups (MPGs) that make up the ESU/DPS.

Attributes associated with a VSP are: (1) abundance (number of adult spawners in natural production areas); (2) productivity (adult progeny per parent); (3) spatial structure; and (4) diversity. A VSP needs sufficient levels of these four population attributes in order to: safeguard the genetic diversity of the listed ESU or DPS; enhance its capacity to adapt to various environmental conditions; and allow it to become self-sustaining in the natural environment

(ICTRT 2007). These viability attributes are influenced by survival, behavior, and experiences throughout the entire salmonid life cycle, characteristics that are influenced in turn by habitat and other environmental and anthropogenic conditions. The present risk faced by the ESU/DPS informs NMFS' determination of whether additional risk will appreciably reduce the likelihood that the ESU/DPS will survive or recover in the wild.

The following sections summarize the status and available information on the species and designated critical habitats considered in this opinion based on the detailed information provided by the *ESA Recovery Plan for Snake River Spring/Summer Chinook Salmon & Snake River Basin Steelhead* (NMFS 2017); *Biological Viability Assessment Update for Pacific Salmon and Steelhead Listed Under the Endangered Species Act: Pacific Northwest* (Ford 2022); *2022 5-Year Review: Summary & Evaluation of Snake River Spring/Summer Chinook Salmon (NMFS 2022a)*; and *2022 5-Year Review: Summary & Evaluation of Snake River Basin Steelhead (NMFS 2022b)*. These four documents are incorporated by reference here.

2.2.1.1. Snake River Spring/Summer Chinook Salmon

A summary of the current status of the SRS Chinook salmon ESU can be found on NMFS' publicly available intranet site (https://www.fisheries.noaa.gov/s3/2023-02/feb-2023-status-snake-r-spring-summer-chinook.pdf), and is incorporated by reference here (NMFS 2023a). Overall, the species is at a moderate-to-high risk of extinction within the next 100 years.

The proposed action may affect the SFSR Mainstem Chinook salmon population, one of four extant populations in the SFSR MPG. Currently, the population has a "moderate" risk rating for the integrated spatial structure/diversity metric and a "high" risk rating for the integrated abundance/productivity metric (Ford 2022). Overall the population is considered to be at "high" risk and is one of two populations within the MPG that are targeted to achieve at least "viable" status to support recovery of the ESU (NMFS 2017). The most recent 5-year geometric mean abundance for natural-origin spawners was lower than the prior 5-year estimate by 82 percent, with estimates approaching or reaching those of the early 1980s. (Figure 6). This trend was reflected in the Secesh and East Fork SFSR populations in the SFSR MPG in smaller proportions (Ford 2022). Recent estimates for the fraction of natural to hatchery spawning population in this ESU show a significant decline in the recent past, and an overall negative trend since 1980 (Figure 7; Ford 2022).

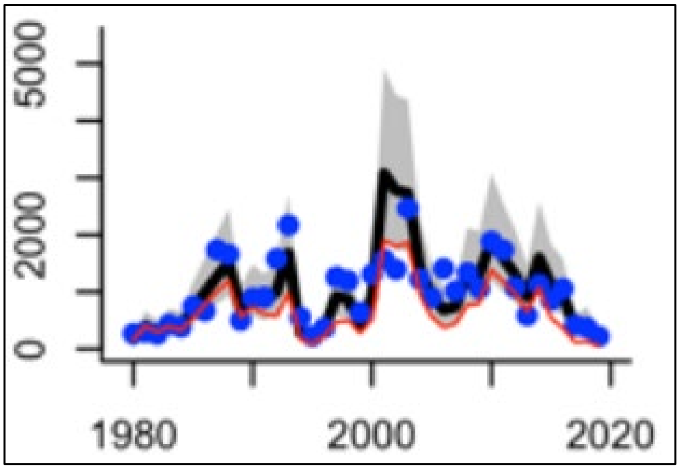

Figure 6. Smoothed trend in estimated total (thick black line, with 95 percent confidence interval in gray) and natural (thin red line) population spawning abundance. In portions of a time series where a population has no annual estimates but smoothed spawning abundance is estimated from correlations with other populations, the smoothed estimate is shown in light gray. Points show the annual raw spawning abundance estimates. For some trends, the smoothed estimate may be influenced by earlier data points not included in the plot.

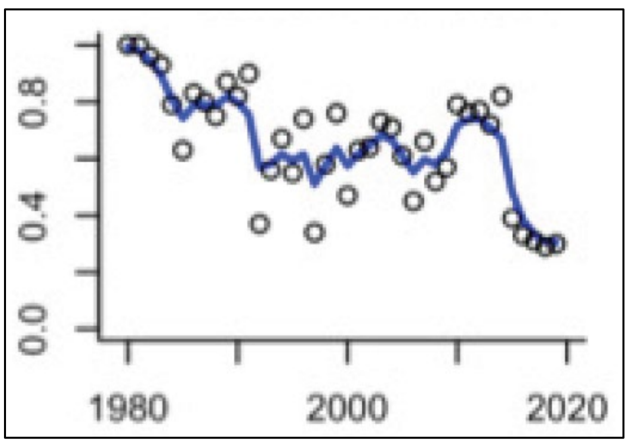

Figure 7. Smoothed trend in the estimated fraction of the natural spawning population consisting of fish of natural origin for the South Fork Salmon River Mainstem (Ford 2022). Points show the annual raw estimates.

2.2.1.2. Snake River Basin Steelhead

A summary of the current status of the SRB steelhead DPS can be found on NMFS' publicly available intranet site (https://www.fisheries.noaa.gov/s3/2023-02/feb-2023-status-snake-r-steelhead.pdf), and is incorporated by reference here (NMFS 2023b). Overall, available information suggests that SRB steelhead continue to be at a moderate risk of extinction within the next 100 years.

The proposed action may affect the SFSR population, one of 12 extant populations of the Salmon River MPG. Currently, the population has a "low" risk rating for the integrated spatial structure/diversity metric and a “moderate” risk rating for the integrated abundance/productivity metric (Ford 2022). Overall, the population is considered to be “maintained”; however, it is targeted to achieve a “viable” status to support recovery of the DPS (NMFS 2017). The 5-year geometric mean abundance estimates for the population in this DPS show significant declines in the recent past (Figure 8), and about 57 percent decrease from the most recent 5-year abundance estimate to the one prior (Ford 2022).

The SFSR was stocked with steelhead in the 1970s and 1980s, but is not currently stocked. It has one of the highest proportions of B-run fish, with a majority of fish being, on average, larger and older than most other populations of steelhead traveling over Lower Granite Dam (Hargrove et al. 2023).

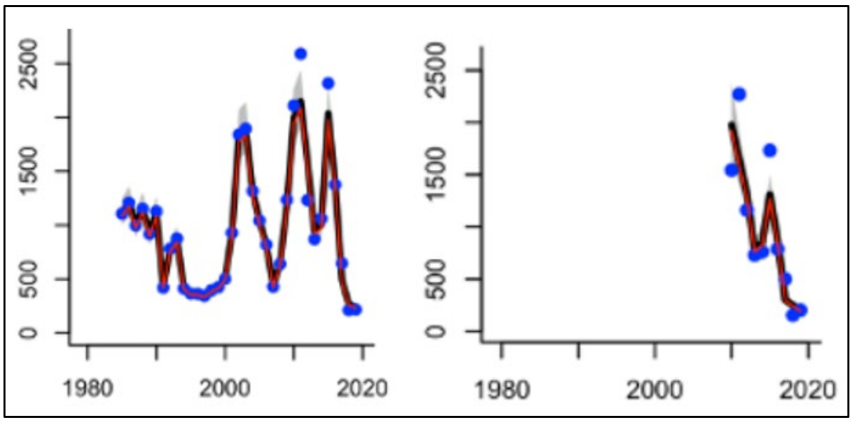

Figure 8. Smoothed trend in estimated total (thick black line, with 95 percent confidence interval in gray) and natural (thin red line) population spawning abundance (Ford 2022). Smoothed spawning abundance is estimated from correlations with other populations where no annual estimates exist (light gray). Points show the annual raw spawning abundance estimates. For some trends, the smoothed estimate may be influenced by earlier data points not included in the plot. *Left*: Long-term dataset from weir and redd surveys in the South Fork Salmon and Secesh rivers. *Right*: Super-population groups from GSI-based run partitioning of the run-at-large over Lower Granite Dam for the South Fork Salmon River.

2.2.2. Status of Critical Habitat

In evaluating the condition of designated critical habitat, NMFS examines the condition and trends of PBFs which are essential to the conservation of the ESA-listed species because they support one or more life stages of the species. Proper function of these PBFs is necessary to support successful adult and juvenile migration, adult holding, spawning, incubation, rearing, and the growth and development of juvenile fish. Modification of PBFs may affect freshwater spawning, rearing or migration in the action area. Generally speaking, sites required to support one or more life stages of the ESA-listed species (i.e., sites for spawning, rearing, migration, and foraging) contain PBFs essential to the conservation of the listed species (e.g., spawning gravels, water quality and quantity, side channels, or food) (Table 4).

Table 5. Types of sites, essential physical and biological features (PBFs), and the species life stage each PBF supports.

Site	Essential Physical and Biological Features	Species Life Stage
Snake River Basin Steelhead[a]		
Freshwater spawning	Water quality, water quantity, and substrate	Spawning, incubation, and larval development
Freshwater rearing	Water quantity and floodplain connectivity to form and maintain physical habitat conditions	Juvenile growth and mobility
	Water quality and forage[b]	Juvenile development
	Natural cover[c]	Juvenile mobility and survival
Freshwater migration	Free of artificial obstructions, water quality and quantity, and natural cover[c]	Juvenile and adult mobility and survival
Snake River spring/summer Chinook salmon		
Spawning and juvenile rearing	Spawning gravel, water quality and quantity, cover/shelter, food, riparian vegetation, space, water temperature	Juvenile and adult
Migration	Substrate, water quality and quantity, water temperature, water velocity, cover/shelter, food[d], riparian vegetation, space, safe passage	Juvenile and adult

[a] Additional PBFs pertaining to estuarine areas have also been described for Snake River steelhead. These PBFs will not be affected by the proposed action and have therefore not been described in this opinion.
[b] Forage includes aquatic invertebrate and fish species that support growth and maturation.
[c] Natural cover includes shade, large wood, log jams, beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks.
[d] Food applies to juvenile migration only.

Table 6 describes the geographical extent of critical habitat within the Snake River basin for both of the ESA-listed salmon and steelhead species. Critical habitat includes the stream channel and water column with the lateral extent defined by the ordinary high-water line, or the bank full elevation where the ordinary high-water line is not defined. In addition, critical habitat for the 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 6. Geographical extent of designated critical habitat within the Snake River basin for ESA-listed salmon and steelhead.

Evolutionarily Significant Unit (ESU)/ Distinct Population Segment (DPS)	Designation	Geographical Extent of Critical Habitat
Snake River spring/summer Chinook salmon	58 FR 68543; December 28, 1993 64 FR 57399; October 25, 1999	All Snake River reaches upstream to Hells Canyon Dam; all river reaches presently or historically accessible to Snake River spring/summer Chinook salmon within the Salmon River basin; and all river reaches presently or historically accessible to Snake River spring/summer Chinook salmon within the Hells Canyon, Imnaha, Lower Grande Ronde, Upper Grande Ronde, Lower Snake–Asotin, Lower Snake–Tucannon, and Wallowa subbasins.
Snake River Basin steelhead	70 FR 52630; September 2, 2005	Specific stream reaches are designated within the Lower Snake, Salmon, and Clearwater River basins. Table 21 in the Federal Register details habitat areas within the DPS's geographical range that are excluded from critical habitat designation.

Spawning and rearing habitat quality in tributary streams in the Snake River varies from excellent in wilderness and roadless areas to poor in areas subject to intensive human land uses (NMFS 2015; NMFS 2017). Critical habitat throughout much of the Interior Columbia (which includes the Snake River and the Middle Columbia River) has been degraded by intensive agriculture, alteration of stream morphology (i.e., channel modifications and diking), riparian vegetation disturbance, wetland draining and conversion, livestock grazing, dredging, road construction and maintenance, logging, mining, and urbanization. Reduced summer stream flows, 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, stream flows 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 SRS Chinook and SRB steelhead in particular (NMFS 2017).

Many stream-reaches designated as critical habitat for these species are listed on the Clean Water Act 303(d) list for impaired water quality, such as elevated water temperature (IDEQ 2022). 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 2001; IDEQ and USEPA 2003).

The construction and operation of water storage and hydropower projects in the Columbia River basin, including the eight run-of-river dams on the mainstem lower Snake and lower Columbia Rivers, have altered biological and physical attributes of the mainstem migration corridor. Hydro system development modified natural flow regimes, resulting in warmer late summer and fall water temperature. Changes in fish communities led to increased rates of piscivorous predation on juvenile salmon and steelhead. Reservoirs and project tailraces have created opportunities for avian predators to successfully forage for smolts, and the dams themselves have created migration delays for both adult and juvenile salmonids. Physical features of dams, such as turbines, also kill out-migrating fish. In-river survival is inversely related to the number of hydropower projects encountered by emigrating juveniles. However, some of these conditions have improved. The Bureau of Reclamation and U.S. Army Corps of Engineers have implemented measures in previous Columbia River System hydropower consultations to improve conditions in the juvenile and adult migration corridor including 24-hour volitional spill, surface passage routes, upgrades to juvenile bypass systems, and predator management measures. These measures are ongoing and their benefits with respect to improved functioning of the migration corridor PBFs will continue into the future.

The proposed action will affect designated critical habitat for SFSR populations of SRS Chinook and SRB steelhead. The SFSR Chinook salmon population is one of three independent Chinook salmon populations in the SFSR drainage, the others being the East Fork South Fork (EFSFSR) and the Secesh River populations. For steelhead, the SFSR population is one of two independent steelhead populations in the SFSR drainage, the other one being the Secesh River steelhead population. The SFSR drainage encompasses approximately 850,320 acres, 99 percent of which is administered by the USFS, 0.16 percent by the Bureau of Land Management, 0.27 percent is owned by the state of Idaho, and approximately 0.62 percent is privately owned.

Habitat in the SFSR drainage has been severely impacted by historic grazing; historic timber harvest; extensive road building, mostly associated with timber harvest; mining, although mostly confined to the EFSFSR drainage; and wildland fire. Also, topography in the drainage is very steep and soils have high levels of decomposed granite, resulting in habitat that is especially vulnerable to grazing, timber harvest, and road building. This vulnerability was obvious by the 1960s and the USFS implemented a timber harvest and road construction moratorium in 1965, and closed most of the grazing allotments before 1970. The USFS also started implementing habitat restoration actions in the mid-1970s and continues to restore habitat throughout the drainage.

With very little water use on state and Federal land, and with only 5,300 acres of private land in the SFSR drainage, water use in the SFSR drainage is very light, likely constituting less than 0.6 percent of the water budget. Much of the water use is concentrated around the community of Yellow Pine, Idaho in the EFSFSR drainage; in the summer home and recreational developments near Warm Lake in the upper part of the SFSR drainage; and at the remote ranches along the lower SFSR mainstem. Consequential effects on aquatic resources are generally confined to localized reaches of smaller streams. The vast majority of streams in the SFSR drainage have little or no water development and, consequently, have essentially unimpaired flow regimes.

Summer water temperatures in the SFSR drainage are generally indicative of high-quality salmonid habitat (Isaak et al. 2018). However, during most years, summer water temperatures in the lower mainstem SFSR reach levels that can stress rearing Chinook salmon and steelhead (Table 7). Tributary streams in the Salmon River drainage are typically colder than the mainstems and can provide important cold water refugia for salmonids rearing in the mainstems (Curet et al. 2009; Flinders et al. 2013). Information from the USFS Rocky Mountain Research Station NorWeST website (https://www.fs.fed.us/rm/boise/AWAE/projects/NorWeST.html) indicates that lower SFSR tributaries provide important cold water refugia for rearing Chinook salmon and steelhead.

Elevated levels of fine sediment continue to be an issue throughout the drainage. However, approximately 50 years without large scale grazing, timber harvest, and road building; along with 40 years of active habitat restoration, including road obliteration; has facilitated substantial habitat recovery. Although wildland fire has caused short-term adverse impacts, the resultant increased recruitment of large woody debris has improved fish habitat quality throughout much of the drainage. The combined effect of all of these factors has resulted in generally good to excellent quality of Chinook salmon designated critical habitat in the SFSR Chinook salmon population area (NMFS 2017). Because the SFSR steelhead population area also includes the EFSFSR, legacy effects of historic mining have greater influence on the SFSR steelhead designated critical habitat than on the SFSR Chinook salmon population. However, due to the factors described above, the condition of SFSR steelhead designated critical habitat outside of the EFSFSR drainage is generally good to excellent (NMFS 2017).

Table 7. Water temperature recorded in the South Fork Salmon River mainstem at river mile 10 from the USFS Rocky Mountain Research Station NorWeST database.

Year	Maximum Daily Temperature		Maximum 7-Day Average Maximum Temperature		Mean August Temperature	
	°C	°F	°C	°F	°C	°F
1999	18.3	65.0	17.9	64.2	15.7	60.2
2000	21.4	70.5	20.8	69.4	16.6	61.9
2001	22.4	72.3	21.6	70.9	18.2	64.8
2003	21.3	70.3	20.4	68.7	17.6	63.6
2004	20.5	68.8	19.8	67.6	16.8	62.3

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

One factor affecting the rangewide status of Snake River salmon and steelhead, and aquatic habitat at large is climate change. As observed by Siegel and Crozier in 2019, long-term trends in warming have continued at global, national, and regional scales. The five warmest years in the 1880 to 2019 record have all occurred since 2015, while 9 of the 10 warmest years have occurred since 2005 (Lindsey and Dahlman 2020). The year 2020 was another hot year in national and global temperatures; it was the second hottest year in the 141-year record of global land and sea measurements and capped off the warmest decade on record (https://www.ncei.noaa.gov/access/monitoring/monthly-report/global/202013). Events such as the 2014–2016 marine heatwave (Jacox et al. 2018) are likely exacerbated by anthropogenic warming, as noted in the annual special issue of Bulletin of the American Meteorological Society on extreme events (Herring et al. 2018). The U.S. Global Change Research Program (USGCRP) reports average warming in the Pacific Northwest of about 1.3ºF from 1895 to 2011, and projects an increase in average annual temperature of 3.3ºF to 9.7ºF by 2070 to 2099 (compared to the period 1970 to 1999), depending largely on total global emissions of heat-trapping gases (predictions based on a variety of emission scenarios including B1, RCP4.5, A1B, A2, A1FI, and RCP8.5 scenarios). The increases are projected to be largest in summer (USGCRP 2018).

Climate change generally exacerbates threats and limiting factors, including those currently impairing salmon and steelhead survival and productivity. The growing frequency and magnitude of climate change related environmental downturns will increasingly imperil many ESA-listed stocks in the Columbia River basin and amplify their extinction risk (Crozier et al. 2019, 2020, 2021). This climate change context means that opportunities to rebuild these stocks will likely diminish over time. As such, management actions that increase resilience and adaptation to these changes should be prioritized and expedited. For example, the importance of improving the condition of and access and survival to and from the remaining functional, high-elevation spawning and nursery habitats is accentuated because these habitats are the most likely to retain remnant snow packs under predicted climate change (Tonina et al. 2022).

Climate change is already evident. It will continue to affect air temperatures, precipitation, and wind patterns in the Pacific Northwest (ISAB 2007; Philip et al. 2021), resulting in increased droughts and wildfires and variation in river flow patterns. These conditions differ from those under which native anadromous and resident fishes evolved and will likely increase risks posed by invasive species and altered food webs. The frequency, magnitude, and duration of elevated water temperature events have increased with climate change and are exacerbated by the Columbia River hydro system (EPA 2021a and b; Scott 2020). Thermal gradients (i.e., rapid change to elevated water temperatures) encountered while passing dams via fish ladders can slow, reduce, or altogether stop the upstream movements of migrating salmon and steelhead (e.g., Caudill et al. 2013). Additional thermal loading occurs when mainstem reservoirs act as a heat trap due to upstream inputs and solar irradiation over their increased water surface area (EPA 2021a, b, and c). Consider the example of adult sockeye salmon in 2015, when high summer water temperatures contributed to extremely high losses of Columbia River and Snake River stocks during passage through the mainstem Columbia and Snake River (Crozier et al. 2020), and through tributaries such as the Salmon and Okanogan rivers, below their spawning areas. Some stocks are already experiencing lethal thermal barriers during a portion of their adult migration. The effects of longer or more severe thermal barriers in the future could be catastrophic. For example, Bowerman et al. (2021) concluded that climate change will likely increase the factors contributing to prespawn mortality of Chinook salmon across the entire Columbia River basin.

Columbia River basin salmon and steelhead spend a significant portion of their life-cycle in the ocean, and as such the ocean is a critically important habitat influencing their abundance and productivity. Climate change is also altering marine environments used by Columbia River basin salmon and steelhead. This includes increased frequency and magnitude of marine heatwaves, changes to the intensity and timing of coastal upwelling, increased frequency of hypoxia (low oxygen) events, and ocean acidification. These factors are already reducing, and are expected to continue reducing, ocean productivity for salmon and steelhead. This does not mean the ocean is getting worse every year, or that there will not be periods of good ocean conditions for salmon and steelhead. In fact, near-shore conditions off the Oregon and Washington coasts were considered good in 2021 (NOAA 2022). However, the magnitude, frequency, and duration of downturns in marine conditions are expected to increase over time due to climate change. Any long-term effects of the stressors that fish experience during freshwater stages that do not manifest until the marine environment will be amplified by the less-hospitable conditions there due to climate change. Together with increased variation in freshwater conditions, these downturns will further impair the abundance, productivity, spatial structure, and diversity of the region's native salmon and steelhead stocks (ISAB 2007; Isaak et al. 2018). As such, these climate dynamics will reduce fish survival through direct and indirect impacts at all life stages (NOAA 2022).

All habitats used by Pacific salmon and steelhead will be affected by climate dynamics. However, the impacts and certainty of the changes will likely vary by habitat type. Some changes affect salmon at all life stages in all habitats (e.g., increasing temperature), while others are habitat-specific (e.g., stream-flow variation in freshwater, sea-level rise in estuaries, upwelling in the ocean). How climate change will affect each individual salmon or steelhead stock also varies widely, depending on the extent and rate of change and the unique life-history characteristics of different natural populations (Crozier et al. 2008; Crozier and Siegel 2023). The continued persistence of salmon and steelhead in the Columbia basin relies on restoration actions that enhance climate resilience (Jorgensen et al. 2021) in freshwater spawning, rearing, and migratory habitats, including access to high elevation, high quality cold-water habitats, and the reconnection of floodplain habitats across the interior Columbia River basin.

The proposed action may occur while climate change-related effects are expected to become more evident within the range of the SRS Chinook salmon ESU and the SRB steelhead DPS. Flow in Pony Creek is largely dependent on high elevation snow which could increase, on average, due to climate change, but could also become more variable, resulting in lower base flow during droughts. Climate change could therefore reduce or exacerbate the effects of the proposed action.

2.3. Action Area

"Action area" means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02). The action area in this BA is located within the Pony Creek (6^{th} field HUC 170602080605) and Grouse Creek-South Fork Salmon River (6^{th} field HUC 170602080606) subwatersheds (Figure 9).

The proposed action is authorization of operation and maintenance of water diversions which will result in diversion and use of water for irrigation, domestic, and stock water use. Diverted water will reduce flows in all stream reaches downstream from the PODs. The sum of the maximum allowable diversion rates is 0.76 cfs; therefore, the theoretical maximum reduction in flow in downstream reaches of Pony Creek is 0.76 cfs. Low-flow frequency statistics for streamflow-gaging stations used in low-flow regression analyses indicate a 1-day, 10-year low flow of 177 cfs near Mackay Bar on the SFSR (Gaging station #13314300; Hortness 2006). Therefore, the PODs will divert and equivalent of less than 1 percent of the lowest estimated flows in the reach of the SFSR downstream from Pony Creek.

The reduction in flow due to the proposed action will affect fish habitat in Pony Creek from the PODs downstream to the mouth. The flow reduction in Pony Creek will also likely affect cold water refugia in the Pony Creek plume within the SFSR[1]. The action area therefore includes Pony Creek from the POD downstream to the mouth, and the Pony Creek plume in the mainstem SFSR. The action area also includes riparian and stream channel habitat near the PODs that may be affected by maintenance activities. Because the flow reduction is less than one percent of the lowest recorded flow in the SFSR, the action area does not include the mainstem SFSR below the downstream extent of the Pony Creek plume (Tehan 2014).

[1] The precise size of the plume is not known, and it varies in size from year to year, but it likely encompasses approximately 7,200 square feet (670 square meters) within the mainstem SFSR (see Section 2.5.1.3).

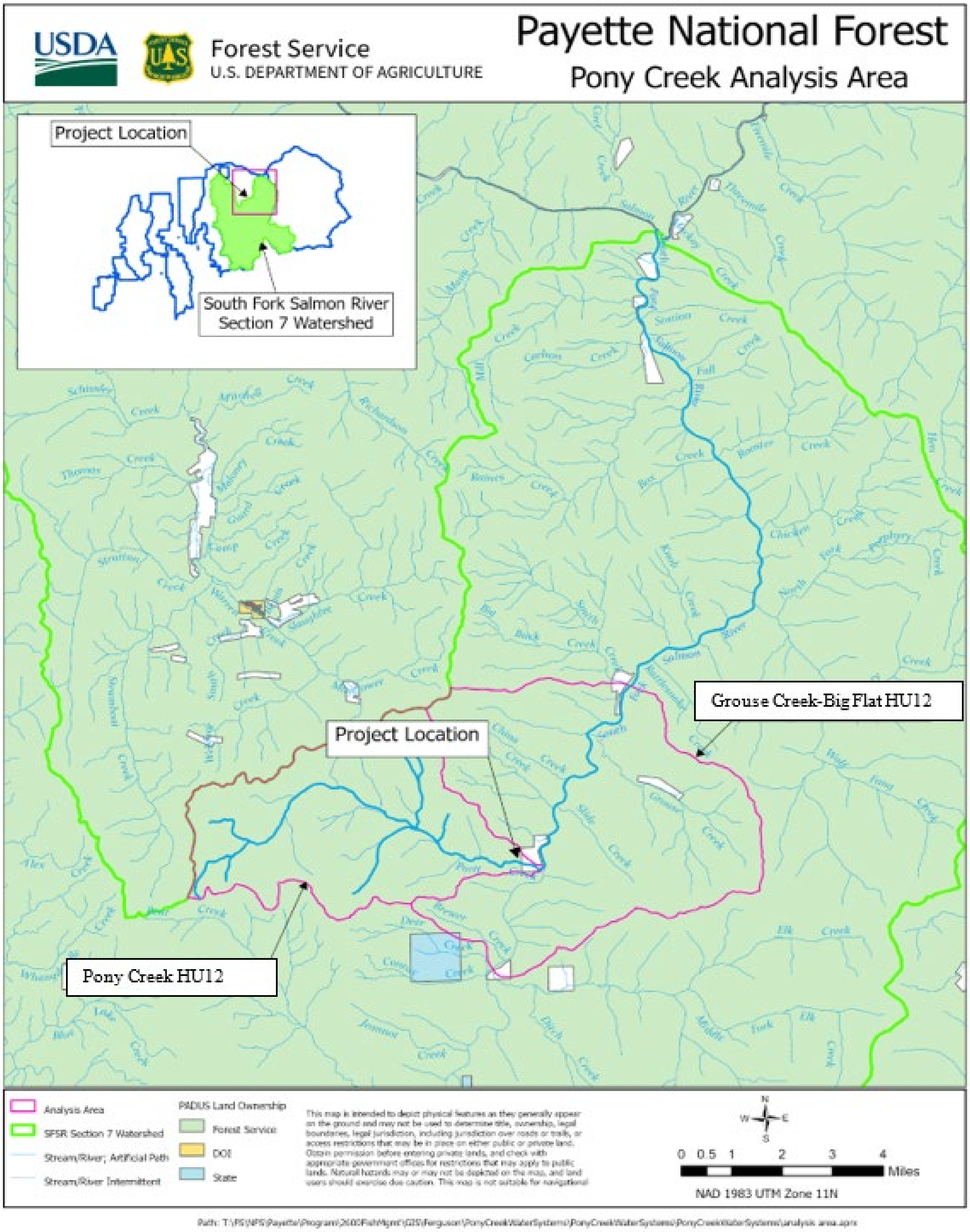

Figure 9. Pony Creek Diversions Action Area comprised of Pony Creek (Hydrologic Unit Code [HUC] 170602080605) and Grouse Creek-Big Flat (HUC 170602080606) subwatersheds.

The action area is used by the freshwater life history stages of threatened SRS Chinook salmon and SRB steelhead. Designated critical habitat for the SRS Chinook salmon includes all river reaches presently or historically accessible to the species within the SFSR. Designated critical habitat for SRB steelhead includes specific reaches of streams and rivers, including Pony Creek and other stream segments found within the SFSR. The action area is also EFH for Pacific Salmon (Chinook Salmon; Pacific Fishery Management Council [PFMC] 2014) and is in an area where environmental effects of the proposed project would adversely affect EFH for this species.

2.4. Environmental Baseline

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

The environmental baseline is described first as an overview of the ESA-listed species that utilize the action area (Section 2.4.1), then 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 (Section 2.4.2). The SRS Chinook salmon and SRB steelhead reside in and migrate through the action area. Thus, the biological requirements are the PBFs essential to spawning, rearing, and freshwater migration.

2.4.1. <u>Anadromous Salmonids in the Action Area</u>

The action area is used by rearing and migrating freshwater life history stages of SRS Chinook salmon and all life history stages of SRB steelhead. Streams within the action area are designated critical habitat for both species. The condition of the listed species and designated critical habitats in the action area are described further below.

2.4.1.1. Snake River Spring/Summer Chinook Salmon

SRS Chinook Salmon may use Pony Creek for rearing and migrating purposes. Chinook salmon have not been observed in the majority of Pony Creek during snorkel surveys (1995, 2014, 2021) or eDNA sample (2022; Ferguson 2023), apart from a 2021 snorkel survey near the mouth of the stream, where the PNF observed juvenile Chinook salmon (both young of the year and year-1 fish). This area, i.e., the mouth and adjacent, is good rearing habitat for juvenile Chinook salmon. Juvenile Chinook salmon are not likely to travel upstream of the mouth in Pony Creek because of the steep gradient (10–20 percent). Likewise, there are no known adult Chinook salmon observations in Pony Creek. While Chinook salmon may be able to move upstream in the gradients found in Pony Creek, the combination of sustained steepness, large substrate, and small channel width (less than 2 m) substantially limit fish movement and the amount of useable habitat.

Designated Critical Habitat. Designated critical habitat for SRS Chinook salmon includes presently and historically accessible habitat within the Pony Creek tributary. Intrinsic Potential (IP) is intended to provide a simple and objective overview of the distribution of historical production potential across tributary habitats (Cooney and Holzer 2006) and is used to identify important areas for reproduction. There is a total of 1,266 m^2 of modeled IP habitat for Chinook salmon near the mouth of Pony Creek below the PODs (Figure 10). This is approximately 0.19 percent of the total potential production in the SFSR population that is provided by this tributary (Cooney and Holzer 2006).

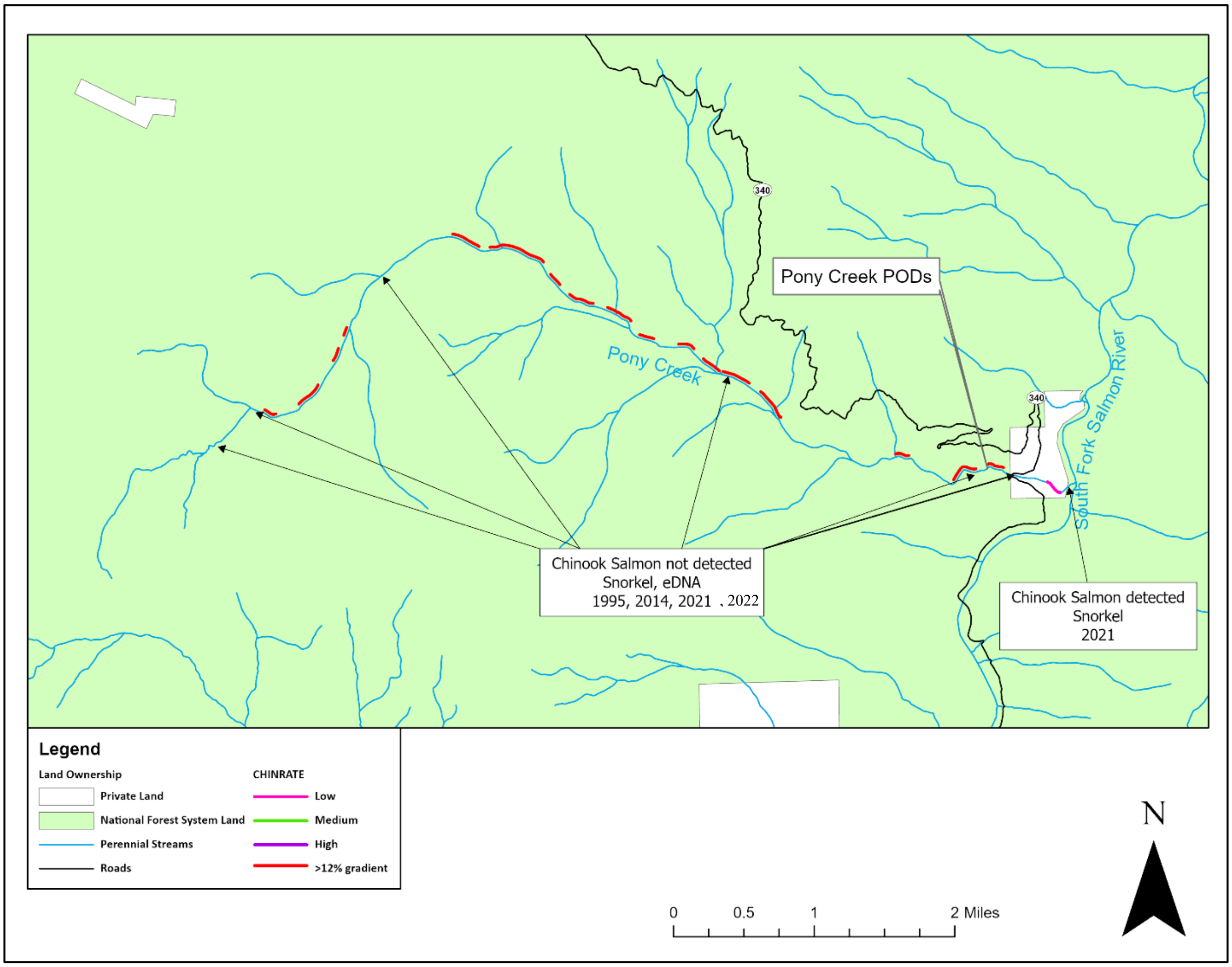

Figure 10. Snake River spring/summer Chinook salmon distribution and Intrinsic Potential in the project area. CHINRate is defined as a measure of Chinook spawning habitat Intrinsic Potential (1=low, 2=moderate, 3 high; Cooney and Holzer 2006). Percent gradient was determined using NMFS GIS data with 20-meter horizontal resolution DEM. Figure from Ferguson 2023.

2.4.1.2. Snake River Basin Steelhead

Steelhead use the SFSR as a migratory corridor, as rearing habitat, and possibly as spawning habitat. Steelhead could use Pony Creek for spawning and rearing. Juvenile steelhead rear in

Pony Creek but movement upstream of the diversions is likely limited by sustained steep gradients and small channel width and depth (Figure 8).

The PNF has conducted snorkel surveys in Pony Creek, where resident rainbow trout are included in steelhead counts. In Pony Creek, both juvenile and adult rainbow trout (less than 300 mm) observations are present up to two miles from the mouth, albeit in low densities. Snorkel surveys from 1995 indicate that upstream from the uppermost steelhead/rainbow detections, passage barriers exist (Young et al. 2018). Steelhead/rainbow and other species (cutthroat trout, bull trout, brook trout, Chinook salmon) were not observed above these apparent barriers, and may be indicative of blocked upstream passage. Environmental DNA samples in 2021 and 2022 have indicated steelhead/rainbow are present near the mouth of Pony Creek.

Designated Critical Habitat. Designated critical habitat for SRB steelhead extends partway up to the headwaters of Pony Creek (Figure 11). Pony Creek has one section of modeled high IP near the mouth, and the SFSR has low and moderate IP for steelhead. There is a total of 1,321 m^2 of modeled IP habitat for steelhead near the mouth of Pony Creek below the PODs. This is approximately 0.04 percent of the total potential production in the SFSR population that is provided by this tributary (NMFS n.d.).

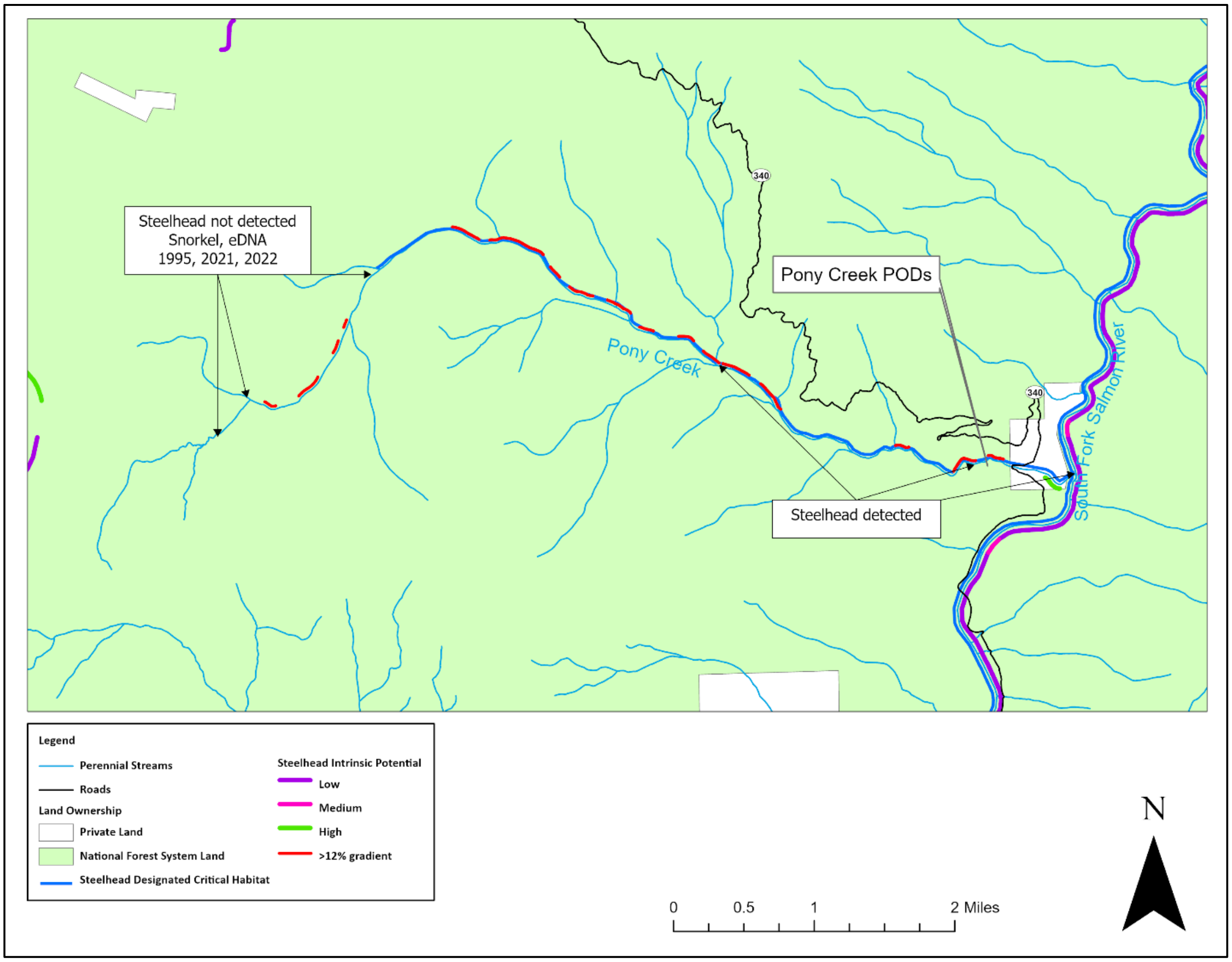

Figure 11. Snake River Basin Steelhead Designated Critical Habitat and Intrinsic Potential in the South Fork Salmon River and Pony Creek (NMFS; Figure from Ferguson 2023).

2.4.2. Environmental Conditions in the Action Area

All of the PBFs for Chinook salmon and steelhead are represented to varying degrees in the PNF's Land and Resource Management Plan (hereinafter referred to as the Forest Plan) Matrix of Pathways and Watershed Condition Indicators (hereinafter referred to as the Matrix; Appendix B in USDA FS 2003). A watershed condition indicator (WCI) is a particular aquatic, riparian, or hydrologic measure that is relevant to the conservation of ESA-listed salmonids. In some instances, a WCI is synonymous with a PBF. In other instances, many WCIs comprise a PBF. For example, the large woody debris (LWD), pool frequency and quality, large pools/pool quality, and off-channel habitat WCIs provide insight into the natural cover and cover/shelter PBFs.

The PNF uses the Matrix as a tool for assessing environmental baseline conditions and evaluating the potential effects of an action on WCIs which are representative of the PBFs essential for the conservation of ESA-listed species. The WCIs are described in terms of their functionality, i.e., Functioning Appropriately (FA), Functioning at Risk (FR), or Functioning at Unacceptable Risk (FUR). A watershed comprised of WCIs that are FA is considered to be meeting the biological requirements of listed anadromous species, whereas WCIs that are FR or FUR suggest that the relevant PBFs are not adequately provided for. The PNF describes an intersection of the Forest Plan's WCI Matrix and NMFS' Matrix of Pathways and Indicators (NMFS 1996) for both SRS Chinook salmon and SRB steelhead in the BA for this project (Ferguson 2023). Additional baseline information for relevant environmental characteristics are presented below.

2.4.2.1. Subwatershed Baseline

Basin Characteristics. The proposed action would affect a short reach of Pony Creek and a small portion of the mainstem SFSR at the mouth of Pony Creek. Pony Creek flows into the SFSR from the west at approximately river mile 13 and is classified as a Rosgen A type channel. It is a small stream with a drainage basin of approximately 17.5 square miles. The drainage is steep (mean slope of 37.7 percent), with a mean basin elevation of 6,510 feet mean sea level (msl) (range 2,900 to 8,110 msl) (StreamStats 2023). One hundred percent of the drainage area is characterized as surficial volcanic rock (Hortness 2006). The stream channel in the action area is relatively steep, with limited spawning habitat. A stand-replacing fire in 2007 significantly reduced shading in Pony Creek and may have impacted stream temperatures.

Flow Characteristics. Flows are dependent on annual snowpack with snowmelt percolating into the granitic soils and reappearing in springs through the summer, fall, and winter. Rainfall does significantly contribute to flows particularly in the spring and fall. Water quality is generally excellent with low levels of organic matter and bed load movement except during high intensity storms or rain on snow events. For the most part, flows are generally stable from year to year and seasonally predictable.

Except for the private properties near the mouth of Pony Creek, the drainage is undeveloped upstream apart from National Forest System (NFS) roads 340, 355, 359, and Warren Wagon Road. There is one stream crossing on Pony Creek at the lower end of the drainage, located below the PODs, and two crossings on the uppermost section of Pony Creek. Water diversions in Pony Creek (including the ones being permitted in the proposed action) are currently in operation and have been operating for many years. The three systems included in this opinion total 0.76 cfs, and an additional 0.47 cfs is removed from diversions occurring on non-NFS land.

There are no streamflow gage data available for the Pony Creek drainage. We used data from StreamStats (website) and the SFSR gage near the Krassel Ranger Station (13310700) to estimate the 80 percent, 50 percent, and 20 percent mean monthly exceedance flows (Appendix A). Estimated 50 percent exceedance flows range from 13 cfs in February to 209 cfs in July, with relatively small variation in base flows between dry and wet years (Table 8).

Table 8. Estimated 80 percent, 50 percent, and 20 percent mean monthly exceedance flows based on data from StreamStats and the SFSR gage near the Krassel Ranger Station (ID – 13310700).

	Exceedance Flow (% and cfs)		
Month	**80%**	**50%**	**20%**
January	16.68	16.44	23.82
February	16.60	17.80	27.13
March	22.12	23.51	42.84
April	30.05	46.68	69.35
May	153.76	209.15	263.53
June	121.83	200.06	310.82
July	30.82	48.12	86.48
August	14.57	17.85	24.46
September	11.70	13.21	16.90
October	13.29	14.01	18.80
November	14.44	16.97	27.41
December	16.87	16.89	29.69

Due to the proposed action, baseflows may be impaired in dry years by up to 6.50 percent, and in 50 percent exceedance years by up to 5.75 percent. Based on the estimated flows, a Tennant (1976) characterization of baseflow conditions would be "excellent" or better from December through July during drought years (Appendix A). During median flow years, flows would be characterized as "excellent" or better from November through July. The characterization of high flows would be "excellent" or better from October through August. These characterizations would not change appreciably with the non-project flow depletions, or the proposed action depletions, suggesting that flow conditions in Pony Creek are approaching FA. The available information indicates that Pony Creek supports year-round occupancy by salmonids, however, due to its small size, use could be somewhat limited during baseflow periods.

Mean monthly flow in the lower SFSR ranges from 544 cfs in September to 7,057 cfs in July. The maximum and minimum flows recorded during the period of record (i.e., October 1993 to September 2003[2]) were 21,600 cfs and 139 cfs, respectively (USGS stream gage 13314300). There are approximately 31.5 cfs of water rights in the SFSR drainage, approximately a third of which are for small hydropower facilities that do not result in consumptive use (NMFS 2019). Assuming that the remainder are used for irrigation, then total impact on the lower mainstem SFSR would be approximately seven cfs, or 1.2 percent of the normal base flow. These data indicate that impacts of water diversion and use on flow within the mainstem SFSR portion of the action area are very light.

Temperature Characteristics. NorWeST[3] indicates that the mean August water temperature in lower Pony Creek (57.96° F) was modeled at 3.11°F colder than the mainstem SFSR just at the confluence downstream (61.07°F). This suggests that Pony Creek provides cold-water refugia for rearing Chinook salmon and steelhead. Observed water temperatures from August of 1999–2009 in upper and lower Pony Creek corroborate the cold-water influence of the tributary to the mainstem SFSR (Table 9). It is of note that the temperature logger located in lower Pony Creek for this time period was positioned below the PODs, which had been in operation prior to the

[2] This is the most recent measurement data available.
[3] https://www.fs.usda.gov/rm/boise/AWAE/projects/NorWeST.html

data collection. It is unknown how much of an influence the PODs had on resultant temperature measurements, and actual baseline temperatures without POD operations may be slightly cooler than observed.

Table 9. Water temperature observations (°F) recorded in Pony Creek in August of 1999–2004 and 2008–2009. The upstream temperature loggers (PERMA_FIDs 12130 and 10836) were located near the headwater, and the downstream temperature logger (PERMA_FID 11080) was located near the mouth of the stream. Data from the USFS Rocky Mountain Research Station NorWeST database.

Year	Maximum Daily August Temperature		Minimum Daily August Temperature		Mean August Temperature	
	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream
1999	61.2	-	42.8	-	52.5	-
2000	65.0	68.8	39.4	49.4	50.8	57.8
2001	63.2	68.2	40.3	50.4	49.4	59.8
2002	-	65.7	-	49.3	-	56.5
2003	-	66.5	-	53.8	-	60.6
2004	-	66.5	-	50.4	-	59.2
2008	61.7	-	41.7	-	50.2	-
2009	-	69.4	-	48.2	-	58.6

For spawning, rearing, and migration, 7-day average daily maximum temperatures (7DADMs) of 50–57°F indicate an FA rating (Table 10; USDA FS 2003). For an FR rating, spawning temperatures would fall between 57–60°F and migration and rearing temperatures would fall between 57–64°F. For FUR, spawning temperatures would be greater than 60°F and migration and rearing temperatures would be greater than 64°F. During eight years of monthly temperature monitoring in lower Pony Creek and within the action area, the maximum August temperature recorded was 69.4°F. Mean August temperatures were greater than 60°F for only one of six years of data, however, maximum daily August temperatures exceeded all spawning, rearing, and migrating 7DADMs in all years at the lower Pony Creek site. Though the cited temperature statistics are not directly comparable, the temperature observation data may indicate that lower Pony Creek supports some habitat use. However, it is likely FR for water temperature because mean August temperatures are already within the 57–64°F range.

Table 10. Water quality watershed condition indicator framework from the Payette National Forest (2003).

Water Quality	Rating		
	FA	FR	FUR
Temperature (steelhead, Chinook)	7-day average maximum. Spawning, rearing, and migration: 50–57°F (10–13.9°C)	Spawning: 57–60°F (13.9–15.6°C) Migration and rearing: 57–64°F (13.9–17.8°C)	Spawning: >60°F (>15.5°C) Migration and rearing: >64°F (>17.8°C)

Based on temperature data from nearby reaches upstream and downstream from the action area, summer water temperatures in the mainstem SFSR portion of the action area probably reach levels that stress rearing salmonids (NorWeST). Modeled average temperatures of tributaries are typically at least 3°F cooler than the mainstem SFSR. However, even with the cold-water tributary input, water temperatures in the lower SFSR mainstem regularly reach levels that would prompt rearing salmonid to seek temperature refugia in cooler tributaries such as Pony Creek.

Current modeled temperature data indicates that water temperatures in the Pony Creek plume in the SFSR is probably FR on average.

2.4.2.2. Climate Change Considerations

Climate change will affect future baseline conditions, particularly by influencing hydrologic processes through decreased snowpack, earlier spring runoff, greater frequency of winter flooding, and lower summer baseflows (Rieman and Isaak 2010). These projected changes may have far-reaching effects on aquatic ecosystems, especially as frequency of drought and large-scale wildfire increases. Chinook salmon, whose eggs overwinter in streambed gravels, could be especially impacted by increased winter flooding and greater movement of streambed gravels and cobbles during winter rain-on-snow events. Lower summer base flows and higher water temperatures will likely impact all ESA-listed fish species in the action area as perennial streams shrink during the summer dry period, forcing fish into smaller wetted channels and less diverse habitats. These changes to habitat conditions, driven by climate change, will occur after the proposed action is completed, but likely also during the POD's operation lifespan.

Water Temperature. The importance of temperature in defining aquatic environments is arguably second only to the presence of water (Isaak et al. 2017). Temperature: (1) dictates metabolic rates, physiological processes, and life history events across taxa; (2) constrains the distribution and abundance of ectothermic species that constitute most aquatic communities; (3) is used to measure habitat impairment; and (4) serves as the basis for regulatory actions (multiple sources cited in Isaak et al. 2017).

Modeled climate change projections of mean daily August water temperatures in lower Pony Creek reach 60.4°F for 2030–2059 and 62.0°F for 2070–2099 (Isaak et al. 2016). Depending on life stage, salmonids can die at water temperatures ranging from 57.2–77.7°F (Crozier et al. 2019), but physiological and behavioral impacts can occur at lower temperatures, especially in absence of appropriate refugia.

Future projections suggest average temperatures in lower Pony Creek will exceed the spawning FR temperature by the short-term climate scenario (2040s), but remain in the FR rating for migration and rearing temperatures even into the long-term climate scenario (2080s). Future projections for the mouth of Pony Creek on the SFSR may average 63.6°F in the 2040s and 65.3°F in the 2080s, indicating high risk to all life history stages within the Pony Creek plume of the SFSR. Given the possible passage barrier in Pony Creek, water temperatures in the lower Pony Creek may play the biggest role in providing key refugia for spawning, migrating, and rearing populations of ESA-listed species.

2.4.2.3. Environmental Baseline Summary

Habitat in Pony Creek is probably in a near natural condition, but with long-term minor reductions in flow and potential minor increases in stream temperature due to legacy water diversions. August water temperatures may not be conducive to spawning for Chinook salmon. Habitat in the mainstem SFSR portion of the action area is influenced by past intensive mining, grazing, and logging activities, contributing to significant deposits of sediment (Burns and Edwards 1985). Summer water temperature in the mainstem SFSR portion of the action area are probably sufficiently warm to prompt rearing salmonids to seek temperature refugia, possibly in Pony Creek and/or in the Pony Creek plume within the mainstem SFSR. Future climate change projections indicate that lower Pony Creek water temperatures will further depart from spawning temperature requirements, but may remain at acceptable levels for migrating and holding adult Chinook salmon and migrating and rearing juvenile Chinook salmon and steelhead to use as a cold-water refugia through the 2080s.

2.5. Effects of the Action

Under the ESA, "effects of the action" are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action (see 50 CFR 402.02). A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (see 50 CFR 402.17). In our analysis, which describes the effects of the proposed action, we considered the factors set forth in 50 CFR 402.17(a) and (b).

2.5.1. Effects on Chinook Salmon and Steelhead Species

Authorizing the operation and maintenance of diversions on USFS land in the Pony Creek watershed could result in a variety of adverse effects. Potential effects that are not related to flow reduction include physical damage to riparian and stream channel habitat from maintenance activities, failure of the diversions resulting in minor impacts on riparian and stream channel habitat, blockage of upstream migration by diversion structures, and entrainment or impingement of juvenile fish. Flow-related impacts include impairment of migration, increase in settling of fine sediment, increase in stream temperatures, reduced availability of cold-water refuges, and reduced productivity of rearing habitat. The use of heavy equipment for maintenance of diversions needs to be evaluated by the Forest Service fishery biologist to ensure it falls within the effects evaluated in this opinion, otherwise the activity will not be covered.

Each SUP has a duration of 20 years; however, the PNF structured their proposed action to include automatic SUP reissuance if no reinitiation triggers are met. The residences are summer cabins that are unoccupied during the winter months, therefore seasonal use of diversions is expected to occur. As a result, the most significant effects from the diversion occur July through October when the residences are occupied and many of the water rights including irrigation are in use.

2.5.1.1. Non-Flow Effects of the Proposed Action on Riparian and Stream Channel Habitat

Operation and maintenance of water diversion facilities could result in physical damage to occupied Chinook salmon rearing and steelhead spawning and rearing habitat. The physical damage, in turn, could negatively impact fish that occupy the stream.

Operation and Maintenance. Maintenance of the water systems will generally include activities such as removing accumulated debris, replacing or fixing broken pipes, and brushing around water diversion and conveyance facilities. General maintenance will be performed with hand tools only. General maintenance does not include any expansion of the existing facilities or otherwise changing the existing footprint of the water system. If the footprint of the existing facilities is proposed to be expanded, a permit amendment will be required, which could require additional ESA consultation if any of the reinitiation triggers (Section 1.3.3) are met. Failure of the water diversion pipes may cause minor and temporary adverse effects on riparian vegetation and habitat, though the chance of diversion failure is small. Failure of pipes located in the stream will not cause adverse effects. Those pipes placed alongside the stream may transport sediment to the stream until the failure is fixed. Underground pipes are not disturbed and are disconnected for overwintering purposes before the season end to prevent breakage, so there is a relatively small chance of failure. Lastly, low water volume is expected to cause only minor adverse effects if pipes located on the streambank were to fail due to the watershed's granitic, permeable soils and the surrounding riparian vegetation filtering strip located adjacent to the stream. Water is used daily for irrigation or domestic purposes, therefore, a pipe failure would likely be recognized and rectified in the short term.

We expect that diversion maintenance could potentially damage riparian vegetation, streambanks and stream channels; which could reduce shade, increase water temperature, reduce instream habitat for rearing fish, and increase sediment delivery and deposition. Alteration of vegetation is expected to occur only infrequently to access pipe structures and only to a limited extent; therefore, there will not be a measurable impact on stream shading nor water temperature. Actions that result in soil disturbance require PNF approval under the annual OMPs. Such activities will require erosion control and other mitigations to minimize sediment delivery. There may be periodic spikes in turbidity as a result of ground disturbance or from clearing debris from the PODs; however, these spikes are expected to be low in magnitude, infrequent, and last only minutes, and all work is required to be done by hand. Individual fish are not expected to be affected, lethally or sub-lethally, by these turbidity pulses because of the limited extent and small size of the turbidity pulses.

Fish Passage Barriers. Fish passage barriers that limit the movement of adult and/or juvenile salmonids within a watershed can ultimately reduce successful spawning and rearing. Although fish often spawn in limited portions of a watershed, juveniles spread out and occupy any suitable areas that are accessible. Therefore, tributary streams that do not support spawning still play a very important role in the salmonid life cycle (Scrivener et al. 1994). Generally speaking, greater habitat availability results in greater carrying capacities of a watershed, which could in turn lead to greater population productivity. The proposed action can create passage barriers as a result of either the physical presence of the diversion structure or the removal of water from a stream reach. This section addresses the physical presence of diversion dams and weirs.

The types of diversion structure included in the proposed action are a rock weir and pipes placed directly in the stream channel to divert water into the water conveyance structures (also pipes). The OMP for each SUP includes a requirement that rock weirs be kept to the minimum size needed and will not block fish passage. Minor manipulation of flows with rock weirs that only impact flow on the channel margins (i.e., channel spanning weirs are not permitted) are not expected to impede upstream or downstream fish passage. The pipes used to convey water run parallel to flow and are made of 2-inch and 3-inch pipes that take up minimal space by design, therefore the likelihood of the pipe structures impeding fish passage is low.

Entrainment or Impingement of Juvenile Salmonids. Entrainment occurs when a fish passes through a POD and becomes stuck in the water system. If the fish is unable to return to the stream either at the POD or at some point farther downstream in the water system, then that fish will die. Entrainment typically occurs when a POD in occupied habitat is not appropriately screened. If improperly designed, screened diversion structures could also harm or even kill ESA-listed fish through impingement. Impingement occurs when a fish is not able to avoid contact with a screen surface, trash rack, or debris accumulated at the intake. This happens when the stream velocity at the screen exceeds the swimming capability of the fish. Such contact may cause bruising, descaling, and other injuries. Direct mortality can also occur if impingement is prolonged, repeated, or occurs at high velocities. To minimize the potential for adverse effects to ESA-listed fish, NMFS developed design criteria and guidelines for fish screens and bypass facilities (NMFS 2022c).

There is low risk of entrainment because: (a) one of the active PODs, Sandy Cove Water Inc., has a NMFS-approved fish screen; (b) the other two PODs will be fitted with NMFS-approved fish screens prior to SUP issuance; and (c) a small proportion of the available flow will be diverted. Because all the PODs will have appropriately-sized screens and placement, entrainment is likely to be very rare.

Summary. In summary, the non-flow related effects associated with the ongoing operation and maintenance of the facilities will have minor impacts on ESA-listed species. Fish may temporarily relocate to other habitats while fish screens are cleared of debris or instream weirs are adjusted. If streams experience elevated turbidity from maintenance activities, the turbidity pulses will be short-lived, low in magnitude, and infrequent. Entrainment in diversion facilities will be eliminated and there is a very low risk of impingement at all PODs.

2.5.1.2. Flow-Related Effects of the Operation and Maintenance of Pony Creek Water Diversions

Permitting the operation of water systems on NFS lands in the Pony Creek drainage will reduce flow in streams that Chinook salmon use for migration and rearing, and steelhead use for incubation, rearing, migration, holding (pre-spawn), and/or spawning. As indicated previously, flow reductions would only occur when the residences are inhabited during the spring, summer, and fall months.

Streamflow Pathways of Effects. A reduction in streamflow may have several different pathways of effects, including through streamflow quantity, food availability, habitat access and quality, and cold-water refugia that ESA-listed species rely on.

Because of their size, the adult life stages of salmonids are often perceived to be the most limiting with respect to streamflow. Inadequate streamflow can impair upstream migration of adults (Cragg-Hine 1985; Mitchell & Cunjak 2007), which could limit adult access to spawning grounds. Inadequate streamflow could also adversely affect holding and spawning adults. However, available literature indicates that flow during the rearing life stages is often a limiting factor (Arthaud et al. 2010; Beecher et al. 2010; Elliott et al. 1997; Mathews & Olson 1980; Mitro et al. 2003; Nislow et al. 2004) and can be the primary limiting factor (Arthaud et al. 2010; Beecher et al. 2010; Elliott et al. 1997; Mathews & Olson 1980). This is because in order to grow and survive, juvenile salmon need access to abundant food, have adequate space and cover, and have access to cold-water refuges during warmer periods.

Forage availability, opportunities, and efficiency may also be affected by streamflow. Food availability for stream dwelling salmonids is generally positively related to streamflow across the entire range of base flows (Davidson et al. 2010; Harvey et al. 2006; Hayes et al. 2007) and this relationship can extend into spring (i.e., higher) flows (Davidson et al. 2010). Jager (2014) reported juvenile salmon grow measurably faster during years in which floodplains are inundated, presumably due to increased production of invertebrates. This indicates that flood flows are also important for rearing salmon. Furthermore, reducing streamflow reduces overall habitat quantity, which in turn reduces the foraging opportunities and foraging efficiency of salmonids (Boulton 2003; Nislow et al. 2004; Stanley et al. 1994).

Streamflow reductions can alter other habitat features that salmonids rely upon for growth, survival, and successful reproduction such as shelter, substrate embeddedness, and rearing habitat. Juveniles must have access to instream object cover and in-water escape cover to rear successfully (Harvey et al. 2006). Therefore, reducing flow can reduce the amount and types of habitat accessible to rearing salmonids. Reduction in streamflow caused by surface water diversions can also result in long-term increases in fine sediments in stream substrates (Baker et al. 2011), which reduces the quality and quantity of spawning and rearing habitat, as well as forage potential.

Streamflow and stream temperature are strongly linked environmental variables, and salmonids are particularly susceptible to stressful temperatures. Thermal regimes are influenced by energy exchange across the air-water interface and between the stream bed and banks, and through groundwater or hyporheic upwelling (Bois et al. 2023; Miralha et al. 2022; Noa-Yarasca et al. 2023). Reducing streamflow can result in increased stream temperatures during the summer (Arismendi et al. 2012; Meier et al. 2003; Miller et al. 2007; Rothwell & Moulton 2001; Tate et al. 2005). Salmon and steelhead are poikilotherms, meaning their body temperature is variable and linked to the surrounding environment. Juvenile salmonids need cooler stream temperatures to grow, resist disease, efficiently forage, and successfully smolt. Coldwater refuges, such as those provided by tributaries, are vitally important for rearing juvenile Chinook salmon and steelhead (Richter & Kolmes 2005; Sauter et al. 2001) and for pre-spawning adult Chinook salmon (Berman & Quinn 1991; Torgersen et al. 2012). As mainstem temperatures increase, salmon and steelhead may behaviorally thermoregulate by moving into thermal plumes near the mouths of these tributaries or move into the tributaries themselves (Torgersen et al. 2012).

The degree to which changes in streamflow can alter stream temperatures depends on a number of factors including, but not limited to, stream size, stream shading, stream gradient, and hyporheic exchange. Additionally, Tate et al. (2005) identified time the date of sampling, stream order, canopy cover, and daily maximum air temperature as factors influencing stream temperature. Meier et al. (2003) found that for a steep (14.4 percent), 70 percent shaded mountain stream with 88 cfs, there was almost no temperature change as a result of a 50 percent water diversion. Model results for a lower gradient (3.8 percent), lesser-shaded (14 percent) stream with flows of 53 cfs indicated a 0.3°C temperature increase with a 50 percent diversion.

Stream temperature monitoring related to diversions on Smith Creek (SFSR; Ferguson 2019), and Pioneer Creek and Government Creek (MFSR; Ferguson 2019) did not detect substantial changes in stream temperatures following the diversion of 2.03 cfs (less than 50 percent of low flow), 0.64 cfs (6 percent of low flow) and 0.71 cfs (36 percent of low flow), respectively. Absent paired studies on streams not impacted by diversions, it is difficult to differentiate effects associated with water withdrawal versus background variability, natural stream warming in the downstream direction, and measurement error. Differences in the 7-DADM stream temperatures upstream and downstream of diversions on Government and Pioneer Creeks from 2015–2017 were typically between 0.2 and 0.4°C, respectively. The difference was more pronounced during the 2018 monitoring season (up to 0.65°C in Government Creek).

Reduced water flow may impact stream temperatures, especially during the summer months when air temperatures and irrigation needs are highest. While reduction of streamflow can reduce the overall thermal inertia of a water body, it is likely that the high quantity of sub-surface flow (due to the granitic geomorphology of the region and the steep gradient of the channel) buffers Pony Creek from significant temperature increases. Even with these increases in stream temperatures, overall conditions in Pony Creek appear to support usage by Chinook salmon and steelhead (Section 2.4.2.1), and the PODs are not likely to alter temperature noticeably from baseline. Over time, it is possible that climate change will exacerbate the effect of these small diversions.

Quantifying Diversion Effects. To quantify the effects of the proposed action on Chinook salmon and steelhead, relationships of "rearing" streamflow in Pony Creek and population productivity were analyzed. These metrics are presumably driven by food availability, access to suitable cover, and possibly by water temperature. Methods used to quantify the effects include quantifying the proposed action's flow reduction, identifying comparable juvenile densities, and quantifying reduction in habitat availability.

Flow Reduction. Operation of the three water diversions will result in a total diversion of 0.76 cfs from Pony Creek approximately 0.75 miles upstream from the SFSR. Valley County average per capita domestic water use was utilized in calculations (Murray 2018). Water use for each diversion is as follows:

- Operation of the Sandy Cove Water, Inc. diversion will result in diversion of up to 0.18 cfs from Pony Creek approximately 0.75 miles upstream from the SFSR. This diversion supplies water for seven homes under Sandy Cove Water, Inc.; Leavitt Properties; and Leland Kelly. The diverted water will be used for domestic purposes only. Operation is expected to occur after high flows and before hard-freezing temperatures. Assuming domestic use watering of up to one acre of lawn per residence, nine residences would consumptively use 10.17-acre feet (af) of water for lawn watering (lost through evapotranspiration; Appendix B), and 3.06 af for drinking, washing, etc. Operating the Sandy Cove Water, Inc. diversion will reduce flow in Pony Creek downstream from the POD and will reduce amount of water available for cold water refugia in the SFSR.

- Operation of the Donald K. Stritzke diversion will result in diversion of up to 0.54 cfs from Pony Creek approximately 0.75 miles upstream from the SFSR. This diversion supplies water for Donald Stritzke, Paul and Betty Bull, and George Nourse. Some of the diverted water will be used for domestic purposes for a total of 0.16 cfs. Stockwater may be used for a total of 0.13 cfs. A total of 0.25 cfs will irrigate all three properties, including parcels of 8.0, 3.7, and 1.3 acres, resulting in a consumptive use of approximately 14.68 af per season (lost through evapotranspiration). Domestic use would consume 1.02 af per season. Operation is expected to occur after high flows and before hard-freezing temperatures. Operating the Donald K. Stritzke diversion will reduce flow in Pony Creek downstream from the POD and will reduce amount of water available for cold water refugia in the SFSR.

- Operation of the Troy Graves and John Lightle diversion will result in diversion of up to 0.04 cfs from Pony Creek approximately 0.75 miles upstream from the SFSR. This diversion supplies water for both parties. The diverted water will be used for domestic purposes only. Operation is expected to occur after high flows and before hard-freezing temperatures Assuming watering of up to one acre of lawn per residence, two residences would consumptively use 2.26 af of water through evapotranspiration and up to 0.68 af for drinking, washing, etc. Operating the Graves and Lightle diversion will reduce flow in Pony Creek downstream from the POD and will reduce amount of water available for cold water refugia in the SFSR.

During the diversion use season, water is transmitted from the diversions to private properties through pipe systems. The Donald Stritzke and Graves and Lightle water rights include properties adjacent to Pony Creek, whereas the Sandy Cove, Inc. water right diverts water to properties adjacent to the SFSR. Impacts on flow immediately below the PODs will be equal to the amount of water being diverted. These impacts will decline with distance downstream from the diversion as water that is not consumptively used makes its way back to the stream. A portion of the water diverted will be lost due to evapotranspiration (i.e., "consumptively used") and will be permanently removed from the water budget (Appendix B). Water used for domestic purposes may not return to the stream for a long time (i.e., septic tank seepage). Water that is consumptively used due to the proposed action will permanently reduce streamflow in waterbodies downstream from the PODs. Based on maximum flow calculations provided by the PNF, the pipe diversions are not capable of diverting more than a total of ~0.60 cfs (Luke Ferguson, pers. comm.). As part of the proposed action, once SUPs are issued there is a period of two years before non-self-limiting diversions must be measured and fitted with flow control and measuring devices. Because maximum total withdrawal rate for all three diversions is 0.60 cfs, it is not likely that the diversions will meet or exceed the total withdrawal right allowance.

NMFS used estimates of evapotranspiration (Allen and Robison 2017) for McCall, Idaho, to determine the amount of water that could be permanently lost from the water budget due to irrigation (Appendix B). For the Stritzke diversion, the estimated average monthly amount of diverted water that is lost to evapotranspiration during irrigation season is 0.07 cfs. If all properties with domestic water rights were to irrigate up to an acre of lawn, the maximum amount of water lost to evapotranspiration would be 13.45 af for the season of use. Additionally, the 0.18 cfs non-consumptive water use by the properties adjacent to the SFSR (i.e., the Sandy Cove Water Inc. diversion), is assumed to be permanently removed from Pony Creek flows, but would return to the SFSR downstream of the Pony Creek confluence. For our analysis, we assumed that all active water rights would be used for the entire season of use (April through October) and the maximum water right would be withdrawn.

Given the above assumptions, the effect of the proposed action on flow was calculated in Pony Creek for April through October (Table 12). This flow reduction may be overestimated because the proposed action does not provide specifics on lawn watering, number of livestock, variable usage of households, and water would not be diverted for 24 hours a day. The percent flow reductions were calculated by dividing the rate of diversion (above) by the estimated and corrected 50 percent exceedance flows (Table 8).

Table 11. Estimated monthly percent reduction in corrected estimated 50 percent exceedance flows in Pony Creek, assuming full use of Special Use Permit-authorized water rights. Water rights are expected to be used post-high flows in late April and removed before hard freezing temperatures occur in late fall (period of effective water diversion is highlighted in gray).

Month	50% Exceedance Mean Monthly Discharge (cfs)	Water Right (cfs)	Flow Reduction (%)
January	16.44	0.00	0.00
February	17.80	0.00	0.00
March	23.51	0.00	0.00
April	46.68	0.76	1.63
May	209.15	0.76	0.36
June	200.06	0.76	0.38
July	48.12	0.76	1.58
August	17.85	0.76	4.26
September	13.21	0.76	5.75
October	14.01	0.76	5.42
November	16.97	0.00	0.00
December	16.89	0.00	0.00

Assuming all diverted water is permanently removed from the Pony Creek water budget results in a maximum removal of 5.75 percent. This reduction in flow will affect steelhead in Pony Creek and Chinook salmon and steelhead in the Pony Creek mouth and plume in the SFSR. Most of the water is expected to return to the SFSR mainstem drainage network eventually, apart from evapotranspiration (0.17 cfs), but not all will return back to Pony Creek.

Flow Characterization. Tennant (1976) describes a method for qualitatively describing flow conditions for stream dwelling salmonids over the range of flows typically seen in northern Rocky Mountain streams, dubbed the "Montana Method." NMFS compared flow-related habitat quality in Pony Creek under the flow regime expected both with and without the proposed action (Table 13).

Table 12. Estimated mean monthly flows and Tennant (1976) classification of conditions in Pony Creek due to Pony Creek diversions (April–October).

Month	50% Exceedance		50% Exceedance (reduced)	
	cfs	Flow classification	cfs	Flow classification
January	16.44	Excellent	16.44	Excellent
February	17.80	Excellent	17.80	Excellent
March	23.51	Outstanding	23.51	Outstanding
April	46.68	Optimum	45.92	Optimum
May	209.15	Flushing or maximum	208.39	Flushing or maximum
June	200.06	Flushing or maximum	199.3	Flushing or maximum
July	48.12	Optimum	47.36	Optimum
August	17.85	Fair or degrading	17.09	Fair or degrading
September	13.21	Poor or minimum	12.45	Poor or minimum
October	14.01	Good	13.25	Good
November	16.97	Excellent	16.97	Excellent
December	16.89	Excellent	16.89	Excellent

Tennant (1976) flow ratings may overestimate the quality of flows in some systems (Arthaud et al. 2010). The proposed action will reduce habitat quality, and thus growth and survival, of juvenile steelhead and Chinook salmon rearing in Pony Creek. The available literature and Tennant evaluation of flows indicate that the proposed action will have a small impact on steelhead and Chinook salmon due to the small reduction in flows. This reduction is quantified below.

Steelhead within Pony Creek. In one of the few studies of the effects of reducing flow on steelhead biomass and growth in small streams, Harvey et al. (2014) found that a 24 percent reduction in dry season (June–October) flow resulted in a 5–10 percent (depending on the model) reduction in juvenile steelhead biomass. The researcher's models predicted a positive relationship between biomass of trout and percent of undiverted streamflow, indicating there may be an impact on steelhead biomass with a reduction of flow. The greatest impacts on trout population would occur when populations do not persist (about 25 percent of 50 replicates for a 24 percent flow reduction). Visual estimations of the sub-daily modeled rate of change in biomass due to flow shows an approximately 0.05 g/m, or 0.39 percent, decrease in biomass per 1 percent reduction in flow. The daily model shows an approximately 0.12 g/m, or 1.14 percent, decrease in biomass per 1 percent flow reduction. The average reduction in dry season flow, due to the proposed action, will be 3.48 percent. Using these approximations, the proposed action would reduce steelhead biomass in the affected reaches of Pony Creek by 1.38 percent to 3.98 percent, or an average of 2.68 percent.

The PNF (Ferguson 2023) has observed resident native rainbow trout or steelhead within Pony Creek, including juvenile steelhead/rainbow trout and mature resident rainbow trout (less than 300 mm) through snorkel surveys. A snorkel survey conducted in Pony Creek in 2015 above the POD location found a density of 12.4 steelhead parr per 100 m^2 (Belnap et al. 2015). Intrinsic potential models indicate there is 1,321 m^2 of steelhead IP habitat in lower Pony Creek. Therefore, we assume there would be approximately 163.8 juvenile steelhead rearing in Pony Creek between the diversions and the mouth. Reduction of flow due to the proposed action would reduce steelhead rearing in this reach by approximately 2.68 percent, or 4.4 juvenile steelhead.

Chinook Salmon within Pony Creek. Juvenile Chinook salmon likely do not utilize upper Pony Creek because of the steep gradient and possible passage barriers, but may occupy the lower reaches. Adults primarily use this section of the SFSR as migratory habitat but may hold in lower Pony Creek or the Pony Creek plume.

There are 1,266 m^2 of Chinook salmon IP habitat in Pony Creek, approximately 0.19 percent of the IP in the SFSR population area. We presume that effects on rearing Chinook salmon would be similar to that for steelhead given the nearly identical overlap and size of intrinsic potential habitat for each species (1,321 m^2 versus 1,266 m^2). Therefore, the 3.48 percent reduction in flow would reduce productivity of Chinook salmon rearing in Pony Creek by 2.68 percent.

Average tributary density of Chinook salmon juveniles in Pony Creek is not available. Snorkel survey data was collected above the PODs where possible passage barriers exist and no juveniles were found. However, the nearest lower tributary location with Chinook salmon juveniles is located approximately 10.68 miles upstream in the SFSR in Pigeon Creek. Density was estimated at 2.7 juvenile Chinook per 100 m^2, and therefore Pony Creek is assumed to have a similar density in lower reaches. Given this density and the modeled 1,266 m^2 of low IP Chinook salmon habitat in lower Pony Creek, there would be approximately 34.2 juvenile Chinook salmon rearing in Pony Creek between the diversions and the mouth. Reduction of flow due to the proposed action would potentially reduce Chinook salmon rearing in this reach (in proportion to the habitat reduction) by approximately 2.68 percent, or 0.92 juvenile Chinook salmon.

Juvenile Salmonids in the Pony Creek Plume of the SFSR. Small tributary streams are an important source of invertebrate foods for rearing salmonids (Wipfli and Gregovich 2002; Wipfli et al. 2007; Wipfli and Baxter 2010) and areas below tributary streams may be important for foraging. However, Flinders et al. (2013) determined that salmonid preference for plume habitat was dependent on temperature differential between plume and non-plume mainstem habitat, suggesting that the primary function was as cold water refugia. We therefore assumed that the primary function of Pony Creek tributary plume habitat, for rearing juvenile Chinook salmon and steelhead in the SFSR, is cold water refugia.

Reducing flow in Pony Creek during summer would presumably reduce the amount of cold water refugia available for juvenile rearing Chinook salmon and steelhead. Information needed to precisely quantify impacts of reducing flow on cold water refugia is not available and we therefore assumed that reduction in cold water refugia in the Pony Creek plume would be directly proportional to the reduction in “surplus” water (i.e., precipitation – evapotranspiration) as described by Ebersole et al. (2014).

To estimate cold-water refugia impacts on salmonids, we looked at consumptive use of flow during the hottest months of the summer (July, August, and September) and the resultant averaged 5.14 percent flow reduction in Pony Creek plume habitat. In the absence of precipitation and snowmelt data for the Pony Creek drainage, we assumed that estimated flow at the mouth of Pony Creek was a reasonable approximation of mean water surplus without the proposed action. We also assumed estimated flow minus consumptive use for the hottest summer months (0.17 cfs from evapotranspiration and 0.18 cfs for SFSR-adjacent properties) due to the proposed action is a reasonable approximation of water surplus with the proposed action. Under these assumptions, the proposed action would reduce water "surplus" in Pony Creek by a maximum of 2.7 percent. Assuming that amount of cold water refugia is proportional to water surplus, the proposed action would reduce cold water refugia in the SFSR at the confluence of Pony Creek by 2.7 percent.

Information on density of rearing Chinook salmon and steelhead in tributary plumes in the mainstem SFSR is lacking; however, fish density data derived from snorkel surveys are available for non-plume habitat in the SFSR. There is additionally one study of salmonid use of tributary plume habitat in the Middle Fork Salmon River ([MFSR]; Flinders et al. 2013). Snorkel survey data collected between 1986 and 2012 at sampling sites near Smith Creek downstream on the SFSR found average densities of 0.31 Chinook salmon and 0.35 steelhead per 100 square meters. Flinders et al. (2013) found that salmonid density in tributary plume habitat in the lower MFSR was 1.9 times as high as in non-plume habitat. We therefore assume that density of fish in the Pony Creek plume is approximately 0.59 juvenile Chinook salmon per 100 m^2 and 0.67 juvenile steelhead per 100 m^2. Information on size of the Pony Creek plume is not available, but Idaho Department of Fish and Game (IDFG) snorkeled plume habitat in the upper Salmon River and determined that the plume of a comparable size tributary was 7,143 ft^2 (663.6 m^2). Assuming the Pony Creek plume habitat is approximately the same size, approximately 3.92 (i.e., four) juvenile Chinook salmon and 4.45 (i.e., five) juvenile steelhead would utilize cold water refugia in the Pony Creek plume. Assuming the proposed action reduces cold water refugia in the Pony Creek plume by 2.7 percent, approximately 0.10 Chinook salmon and 0.12 steelhead would be displaced from cold water refugia by the proposed action. This would equate to displacement of approximately one Chinook salmon and one steelhead every ten years. Fish displaced from cold water refugia may be forced to rear in areas of higher water temperature which could reduce growth and survival. For purposes of this analysis, we assumed no survival of fish displaced from cold water refugia in the Pony Creek plume of the SFSR.

2.5.1.3. Summary of Effects on Chinook Salmon and Steelhead

Effects of maintaining the diversions on habitat should be very minor and will not likely result in mortality of Chinook salmon or steelhead. Chance of diversion failure is small and therefore chance of adverse effects due to diversion failure is also small. Operating the diversions is not likely to entrain Chinook salmon or steelhead or impair upstream passage of adults. Operating the diversions will reduce flow in steelhead rearing habitat and will reduce cold water refugia for steelhead and Chinook salmon. These flow-related effects will likely result in mortality of approximately 1.0 juvenile Chinook salmon and 4.5 juvenile steelhead annually. Based on a smolt to adult return rate of 1.1 percent for Chinook salmon and 1.58 percent for steelhead (Tuomikoski et al. 2013), adverse effects due to the proposed action will reduce Chinook salmon and steelhead adult returns by 0.011 and 0.071 individuals, respectively. This reduced production will occur annually for as long as the diversions operate.

2.5.2. Effects on Chinook Salmon and Steelhead Designated Critical Habitat

The action area contains designated critical habitat for SRS Chinook salmon and SRB steelhead. Critical habitat within the action area has an associated combination of PBFs essential for supporting freshwater rearing, migration, and spawning for Chinook salmon and steelhead. Authorizing the operation and maintenance of diversions on NFS land in the upper and lower

Pony Creek watersheds has the potential to affect Chinook salmon water quantity, water quality, water temperature, cover/shelter, space, safe passage, riparian vegetation, and food PBFs; and steelhead water quantity, water quality, natural cover, free of artificial obstructions, and forage PBFs. Modification of these PBFs may affect freshwater spawning, rearing and/or migration in the action area. Proper function of these PBFs is necessary to support successful adult and juvenile migration, adult holding, spawning, incubation, rearing, and the growth and development of juvenile fish. In the following sections, we describe how the proposed action may affect these PBFs.

2.5.2.1. Water Quantity PBF

Authorizing operation of water diversions will reduce flow in SRS Chinook salmon and SRB steelhead designated critical habitats. The magnitude of these flow alterations is described in Section 2.5.1.2. While the proposed action is expected to maintain annual floods and channel-forming processes and retain seasonal flow variability and timing, the overall reduction in flow will reduce the potential productivity of designated critical habitat for Chinook salmon and steelhead.

The most significant flow reductions will occur in tributary stream reaches immediately below the PODs. As previously discussed, the proposed action contributes to a reduced flow in Pony Creek, particularly during the coincidence of irrigation season and summer low flows. Reducing streamflow will affect the ability of that habitat to function appropriately and support salmon and steelhead. In total, habitat in the lower Pony Creek area from the PODs to the mouth and plume may be affected by a maximum of 5.75 percent reduction in flow, though qualitative flow characterization will not change. There is only one coinciding section of IP for Chinook salmon and steelhead located near the mouth of Pony Creek, representing 0.19 percent of the available habitat for the Chinook salmon SFSR population and 0.04 percent of habitat available for the steelhead SFSR population.

Overall, implementation of the proposed action will result in streamflow reductions of minor magnitude in Pony Creek and its tributaries and this reduction will reduce the functioning condition of the water quantity PBF in lower Pony Creek.

2.5.2.2. Riparian Vegetation and Cover/Shelter/Space PBFs

As described in 2.5.1, alterations in streamflow and maintenance of diversion facilities can affect the availability of cover and shelter for salmonids, which include undercut streambanks (where appropriate for the channel type), overhanging vegetation, LWD, and deep pools. These features of habitat are supported by a flow regime characterized by annual floods and channel forming processes and a healthy riparian vegetation community that includes trees. Maintenance and failure of the diversion facilities can also impact the functioning condition of riparian conservation areas (RCAs). Riparian vegetation within the RCA provides shade for streams, forage (terrestrial invertebrates) for fish, stabilizes streambanks, filters sediment inputs from the surrounding landscape, and contributes LWD and organic material.

Reduction in streamflow is expected to have localized impacts on cover/shelter and space provided by pools or other in water refuges in tributary streams. These impacts are expected to occur in the summer and fall months when the diversions are actively used. The stream reaches that may experience these reductions represent less than 0.2 percent of the overall habitat available to salmon and steelhead. Effects on available cover, shelter, and space PBFs are too small to meaningfully measure, but the overall effect is likely to reduce productivity of juvenile Chinook salmon and steelhead habitat in Pony Creek by approximately 0.0009 percent and 0.009 percent, respectively. These numbers were calculated from the reduction in adult returns compared to the average annual adult returns.

2.5.2.3. Safe Passage and Free of Artificial Obstruction PBFs

The presence of weirs and alterations in streamflow may affect the quality of salmonid migration habitat (Cragg-Hine 1985; Mitchell & Cunjak 2007; Thompson 1972). None of the diversion structures will impede upstream or downstream fish passage. Maximum base flow reductions for Pony Creek will likely reduce the depth of fish habitat. At an average of 2 m (6.56 ft.) wide and with a width/max depth ratio of 3.8–7.5 (Ferguson 2023), maximum depth on average in Pony Creek would be 0.354 m (1.16 ft). Pony Creek maximum depths may be reduced by an average of 0.012 m (0.04 ft) with constant diversion. These reductions are not expected to impede upstream or downstream juvenile fish passage. The available habitat is steep and maintains a greater than 12 percent gradient both above and below the PODs. Adult Chinook salmon passage is not likely to be affected due to passage barriers just upstream of the PODs. Likewise, steelhead passage is not likely impeded due to timing of migration and spawning during higher flows.

2.5.2.4. Water Quality/Temperature PBFs

Routine operation and maintenance of the diversion structures has the potential to contribute sediment to streams and increase water temperatures. Periodic maintenance of the water diversion and transmission facilities (e.g., clearing debris from the intake, adjusting the weir, or using hand tools to maintain pipes) can cause temporary spikes in turbidity. Considering the limited amount of disturbance that will occur, and requirements to implement erosion control best management practices, any associated turbidity pulses are expected to be low in magnitude, short in duration (minutes), and infrequent.

Some small temperature increases are likely to occur downstream of the PODs as a result of flow reductions. Even with these small increases in stream temperatures, stream temperatures are adequate to support the current habitat usage of salmonids in Pony Creek. Over time, it is possible that climate change will exacerbate the effect of these small diversions, particularly in the SFSR, though temperatures in lower Pony Creek will likely support migrating and rearing through even the 2080s.

2.5.2.5. Forage/Food PBF

Streamflow reductions can decrease the amount of food available, foraging opportunities, and foraging efficiency. Caldwell et al. (2018) examined the impacts of flow reductions on invertebrate drift in the Upper Shasta River and their results suggested decreased streamflow can reduce the total biomass of invertebrate drift. The proposed action is expected to have minor impact on Pony Creek forage due to the small average percent of flow reduction (3.78 percent).

Altered riparian vegetation can also decrease the availability of forage. The proposed action is expected to cause small, localized, and temporary adverse effects on riparian vegetation. Therefore, the contribution of terrestrial invertebrates to the aquatic ecosystem from riparian vegetation will be only minorly affected.

2.5.2.6. Summary of Effects on Designated Critical Habitat

The SUP terms and conditions should reduce adverse effects of water diversion maintenance activities to minimal levels and should minimize the chance of adverse effects due to pipe failure and maintenance of the diversions. Potential non-flow related effects of the proposed action would therefore not likely reduce the conservation value of Chinook salmon or steelhead designated critical habitat. The reduction of flow in Pony Creek due to the proposed action will adversely affect PBFs for Chinook salmon and steelhead, but the overall effect on designated critical habitat will reduce less than 0.2 percent for each species. The reduction of flow in Pony Creek will reduce the amount of cold water refugia in the SFSR at the mouth of the creek by 1.9 percent, adversely affecting water quality PBFs for rearing Chinook salmon and steelhead at a minor level.

2.6. Cumulative Effects

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

The action area consists of land managed by the PNF and adjacent private land. Some activities on private land that have the most effect on aquatic resources, such as irrigated agriculture, are consequences of the proposed action and the effects of those activities are analyzed in Section 2.5.

According to the Idaho state water-right database, there are active water rights on Pony Creek totaling 1.23 cfs, with 0.76 cfs related to the SUPs described above in the Federal action. The diversion the 0.47 cfs on non-FS system lands would incrementally add to the potential impacts from stream flow reductions. Baseflows would be reduced by a maximum of 9.3 percent (September) based on flows presented in this opinion, and habitat quality/quantity would be reduced for rearing Chinook salmon and steelhead. Cumulative effects are exactly as described in the baseline conditions section and will not change the baseline.

Other activities on private land that are not consequences of the Federal actions, such as minor road maintenance, are ongoing and will not likely change appreciably. Therefore, they are not likely to result in changes to the baseline conditions.

2.7. Integration and Synthesis

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

Habitat in Pony Creek is probably in a near natural condition, but with long-term minor reductions in flow and potential minor increases in stream temperature due to legacy water diversion. August water temperatures may not be conducive to spawning for Chinook salmon, and flow may likewise marginally limit refugia for salmonids during late summer months. Habitat in the mainstem SFSR portion of the action area is marginally affected by water withdrawals. Past land management practices, including mining, grazing, and road development have contributed fine sediments to the drainage. Summer water temperature in the mainstem SFSR portion of the action area are probably sufficiently warm to prompt rearing salmonids to seek temperature refugia, possibly in Pony Creek and/or in the Pony Creek plume within the mainstem SFSR. Future climate change projections indicate that Pony Creek water temperatures will further depart from spawning temperature requirements, but may remain at acceptable levels for migrating and rearing populations of Chinook salmon and steelhead through the 2080s.

As previously described, up to an annual average of 1.0 juvenile Chinook salmon and 4.5 juvenile steelhead might be killed due to reduced habitat quality in Pony Creek and reduced cold water refugia in the SFSR. This reduction in juvenile abundance translates to an average annual reduction of 0.011 adult Chinook salmon and 0.071 adult steelhead returns. Compared to typical adult returns of 1,200 Chinook salmon and 768 steelhead, reduction in production due to the proposed action represents less than 0.001 percent and 0.01 percent of the SFSR Chinook salmon and SFSR steelhead populations, respectively. This effect will occur annually for as long as the diversions are operated.

The SFSR Chinook salmon population is not meeting VSP criteria. The proposed action could result in mortality of an annual average of 1.0 juvenile Chinook salmon, which would not likely reduce the number of Chinook salmon adult returns for the foreseeable future. Considering the existing condition of the environmental baseline and the lack of influence of potential cumulative effects, NMFS has determined that the displacement of juveniles from cold water refugia due to the proposed action, as well as the reduction in habitat and related population productivity, should not appreciably reduce the likelihood that the SFSR Chinook salmon population will achieve its desired status. Because the effects will not be substantial enough to negatively influence VSP criteria at the population scale, the proposed action would also not likely reduce viability of the SFSR MPG. For this reason, it will also not likely reduce the likelihood of the survival or recovery of the Snake River spring/summer Chinook salmon ESU.

Similarly, the SFSR steelhead population is not meeting VSP criteria. Because the potential reduced productivity and the displacement of juveniles from cold water refugia due to the proposed action is very small, it will not likely influence the number of adult steelhead returning to the SFSR for the foreseeable future. Therefore, the proposed action should not influence the abundance, productivity, spatial structure, or genetic diversity of the SFSR steelhead population.

Considering the existing condition of the environmental baseline and the minor influence of potential cumulative effects, NMFS has determined that the loss of 4.5 juvenile steelhead per year due to the proposed action should not appreciably reduce the likelihood that the SFSR steelhead population will achieve its desired status. Because the effects will not be substantial enough to negatively influence VSP criteria at the population scale, the proposed action would also not likely reduce viability of the Salmon River MPG. For this reason, it will also not likely reduce the likelihood of the survival or recovery of the Snake River Basin steelhead DPS.

The proposed action will have adverse effects on all of the Chinook salmon and steelhead freshwater rearing PBFs. However, the adverse effects will be small and will be confined to lower Pony Creek and the Pony Creek plume in the SFSR. Some of the action area is on land managed by the PNF, however, there are additional, smaller water rights on properties downstream of the diversions. Coupling the potential effects of the proposed action with the baseline condition and cumulative effects within the action area, NMFS concludes that the proposed action is not likely to appreciably diminish the function and conservation role of the PBFs within the action area. Because the function and conservation value of PBFs will not be appreciably reduced in the action area, they will also not be appreciably reduced at the designation scale.

2.8. Conclusion

After reviewing and analyzing the current status of the listed species and critical habitat, the environmental baseline within the action area, the effects of the proposed action, the effects of other activities caused by the proposed action, and the cumulative effects, it is NMFS' biological opinion that the proposed action is not likely to jeopardize the continued existence of SRS Chinook salmon and SRB steelhead; and is not likely to destroy or adversely modify their 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). "Harass" is further defined by interim guidance as to "create the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns, which include but are not limited to, breeding, feeding, or sheltering." "Incidental take" is defined by regulation as takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant (50 CFR 402.02). Section 7(b)(4) and Section 7(o)(2) provide that taking that is incidental to an otherwise lawful agency action is not considered to be prohibited taking under the ESA if that action is performed in compliance with the terms and conditions of this ITS.

2.9.1. Amount or Extent of Take

In the opinion, NMFS determined that incidental take is reasonably certain to occur as follows: the proposed action will reduce flows in the lower reaches Pony Creek and the Pony Creek plume of the SFSR mainstem. Juvenile Chinook salmon are likely to use lower Pony Creek and the Pony Creek plume for rearing; and juvenile steelhead are likely use all affected reaches for rearing. This will result in reduced productivity for juvenile Chinook salmon and steelhead. This reduced productivity is assumed to encompass the indirect effects of flow reduction on stream temperatures, space, forage quantity, and foraging efficiency.

The take exempted by this ITS is the loss of SRS Chinook salmon and SRB steelhead. We have quantified a reduction in productivity of less than 0.01 percent for both SRS Chinook salmon and SRB steelhead. Changes in productivity cannot be monitored sufficiently to ensure that the amount and extent of take is not exceeded. This is because: (1) steelhead population estimates are derived from data collected at Lower Granite Dam and lack the precision needed to monitor small production changes at the scale anticipated due to the proposed action; (2) information on number of Chinook salmon are limited to redd counts and outmigration data, which lack the precision to detect changes at the scale anticipated due to the proposed action; (3) population density of Chinook salmon and steelhead varies greatly from year to year; and (4) fish harmed due to increased environmental stress caused by the proposed actions would be difficult to distinguish from fish harmed due to environmental stress that normally occurs or that is caused by baseline actions. Even if take that occurred within the action area could be adequately quantified, monitoring total take due to the proposed actions would still not be feasible because some mortality due to effects of the proposed actions in the action area is likely to occur during the downstream migration or in the estuary. Mortality from the proposed action is likely to occur during downstream migration or in the estuary because mortality is related to fish growth, which is related to streamflow (Davidson et al. 2010; Harvey et al. 2006). Reducing streamflow in rearing habitat likely reduces size of downstream migrating smolts. Smaller smolts have higher mortality outside of the natal tributaries (Zabel and Achord 2004), which results in lower smolt-to-adult return rates.

When take cannot be adequately quantified, NMFS describes the extent of take through the use of surrogate measures of take that would define the limits anticipated in this opinion. In this case, the extent of take will be described as the amount of water diverted and the amount of water remaining in the streams downstream of the PODs. As a quantifiable habitat indicator, flow can be measured accurately, flow is well correlated with upper Salmon River fish populations (Arthaud et al. 2010), and as established above in Section 2.5.1, reduction of streamflow is the principal cause of take due to the proposed actions. The extent of take exempted by this ITS will be exceeded if: (1) water diverted due to the proposed action exceeds the maximum diversion rate or seasonal volume allowed in the water rights listed in Tables 1, 2, 3; or (2) the amount of land irrigated due to the proposed action exceeds the amount listed in Table 2. Although these surrogates could be considered coextensive with the proposed action, monitoring and reporting requirements included in this ITS will provide opportunities to check throughout the course of the proposed action whether the surrogates are exceeded. For this reason, the surrogates function as effective reinitiation triggers.

2.9.2. Effect of the Take

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

2.9.3. Reasonable and Prudent Measures

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

The PNF and the permittee shall:

1. Minimize take due to reducing flow in Chinook salmon and steelhead habitat, and minimize entrainment of rearing Chinook salmon and steelhead at diversions.

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

2.9.4. Terms and Conditions

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

1. The following terms and conditions implement RPM 1 (minimizing take due to flow reductions):

    a. The PNF shall include, as a condition of the SUP or easement, that the volume of water removed shall not exceed the authorized water right. The permittees shall ensure the amount of water diverted does not exceed the authorized water right.

2. The following terms and conditions implement RPM 2 (monitoring and reporting):

    a. The PNF shall report to NMFS the results of the inspection proposed for once every fifth year, including the following information:

        i. Rates of diversion on systems that are not self-limiting.

        ii. Status and condition of water diversion and transmission structures, fish screens, head gates, flow measuring devices (if required), and access routes.

iii. Photos of the water diversion and transmission facilities.

b. As a condition of the SUP, the permittee shall report to the PNF, within one day of discovering, any stressed, stranded or dead salmonid at or downstream from the diversions. If the PNF is notified by the permittee(s) of such a discovery, the PNF will in turn notify NMFS and FWS within 1-business day of the PNF receiving a report of a stressed, stranded, or dead salmonid at or downstream from the diversions.

c. As a condition of the SUP, the permittee shall notify the PNF if the system is not operating as designed within one day. If the PNF is notified by the permittee(s) that the system is not operating as designed, the PNF will in turn notify NMFS and FWS within 1-day to determine the next course of action.

2.10. Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. Specifically, “conservation recommendations” are suggestions regarding discretionary measures to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information (50 CFR 402.02).

1. The PNF should consider continuing to monitor Pony Creek for usage by ESA-listed SRS Chinook salmon and SRB steelhead.

2. 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, mainstem, and estuarine habitat measures; as well as protective hydropower mitigation 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 stream flows.

3. The PNF should include, as a condition of the SUP or easement, that the volume of water removed from the stream be managed based on the minimum level of use needed by permittees in order to maintain as much water in the stream as possible. For example, when the permittee is not putting the water to its beneficial use as identified in the water right, water should be maintained in the stream as close to the point of diversion as possible.

2.11. Reinitiation of Consultation

This concludes formal consultation for the Pony Creek Water Diversions Project.

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

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

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

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

3.1. Essential Fish Habitat Affected by the Project

The action area, as described in Section 2.3 of the above opinion is also EFH for Chinook salmon (PFMC 2014). The PFMC designated the following five habitat types as habitat areas of particular concern (HAPCs) for salmon: complex channel and floodplain habitat, spawning habitat, thermal refugia, estuaries, and submerged aquatic vegetation (PFMC 2014). The proposed action may adversely affect the following HAPCs: complex channel and floodplain habitat, spawning habitat, thermal refugia, estuaries, and submerged aquatic vegetation. The proposed action may adversely affect spawning habitat as well as thermal refugia.

3.2. Adverse Effects on Essential Fish Habitat

The proposed action is described in Section 1.3 of this opinion. The proposed action may adversely affect EFH for Chinook salmon, as described in Section 2.5.2 of this opinion. Implementation of the proposed action will perpetuate water withdrawals in streams that are

EFH for Chinook salmon. Reduced flows will reduce the quality of Chinook salmon habitat throughout the lower Pony Creek, as well as the Pony Creek plume in the SFSR. Adverse effects from reduced flows include reduced cold-water refuge at the mouth of this tributary, potential slight increase in stream temperatures downstream of the PODs, and reduced forage. The proposed action will reduce amount of thermal refugia in approximately 7,143 square feet (665 square meters) of the SFSR. Salmon rearing habitat exists, and is utilized, in the action area.

3.3. Essential Fish Habitat Conservation Recommendations

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

1. The PNF should include, as a condition of the SUP, that the volume of water removed shall not exceed the authorized water right. The permittees shall ensure the amount of water diverted does not exceed the authorized water right.

2. The PNF should include, as a condition of the SUP, that the volume of water removed from the stream be managed based on the level of use in order to maintain as much water in the stream as possible. For example, when the permittee is not putting the water to its beneficial use as identified in the water right, water shall be maintained in the stream as close to the point of diversion as possible.

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

3.4. Statutory Response Requirement

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

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

3.5. Supplemental Consultation

The PNF must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH Conservation Recommendations (50 CFR 600.920[1]).

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 is the PNF. Other interested users could include the permittees. Individual copies of this opinion were provided to the PNF. The document will be available within 2 weeks at the NOAA Library Institutional Repository (https://repository.library.noaa.gov/welcome). The format and naming adhere to conventional standards for style.

4.2. Integrity

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

4.3. Objectivity

Information Product Category: Natural Resource Plan

Standards: This consultation and supporting documents are clear, concise, complete, and unbiased; and were developed using commonly accepted scientific research methods. They adhere to published standards including the NMFS ESA Consultation Handbook, ESA regulations, 50 CFR 402.01 et seq., and the MSA implementing regulations regarding EFH, 50 CFR 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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6. APPENDICES

APPENDIX A. PONY CREEK FLOW ESTIMATION.

Flow for Pony Creek was estimated using StreamStats and a correction factor from the nearest USGS stream gage. The nearest USGS gaging station is located on the SFSR near the Krassel Ranger Station (ID – 13310700). Mean monthly streamflow measurements from this station were taken for the period of record available (1966-2022) and the resultant 80 percent, 50 percent, and 20 percent exceedance flows were calculated using respective percentiles (Table A-1). The same exceedance flows were estimated using StreamStats (Hortness and Berenbrock 2001), and then the percent differences between actual (Krassel gage data) and estimated flows (StreamStats) were calculated. In general, flows were underestimated by StreamStats for the Krassel stream gage by an average of 30–50 percent for December through May. Contrastingly, flows in June through November were generally similar to, or within 20 percent of, actual flows (Table A-2). June, July, and October flows showed less than 10 percent difference; and August, September, and November flows almost always showed less than 20 percent difference.

Pony Creek corrected exceedance flows (when compared with mean annual discharge) were then associated with flow quality for aquatic species (Table A-3; Tennant 1976). Tennant splits base flow regimes into two periods: October through March, and April through September. Each regime has recommended percent base flow compared to annual flow and a corresponding rating in accordance with likelihood of protecting aquatic resources. At 50 percent exceedance levels, flows are generally rated “excellent” or better, apart from low flows in August, September, and October (Tennant 1976).

Table A-1. Actual 80 percent, 50 percent, and 20 percent mean monthly exceedance flows from USGS gaging station on the SFSR near the Krassel Ranger Station (ID – 13310700); estimated exceedance flows from StreamStats (Hortness and Berenbrock 2001); and percent difference between actual and estimated flows.

	Exceedance Flow (cfs and %)								
	80%			50%			20%		
Month	**Actual**	**Estimated**	**% Change**	**Actual**	**Estimated**	**% Change**	**Actual**	**Estimated**	**% Change**
January	130.12	78.00	-40.06	158.60	110.00	-30.64	233.32	143.00	-38.71
February	129.70	79.70	-38.55	178.00	111.00	-37.64	289.50	143.00	-50.60
March	179.50	112.00	-37.60	260.10	156.00	-40.02	480.90	238.00	-50.51
April	465.90	231.00	-50.42	703.40	446.00	-36.59	995.92	853.00	-14.35
May	1262.40	601.00	-52.39	1771.00	1050.00	-40.71	2270.40	1680.00	-26.00
June	917.44	866.00	-5.61	1623.50	1550.00	-4.53	2531.00	2280.00	-9.92
July	259.76	268.00	3.17	383.00	359.00	-6.27	696.36	682.00	-2.06
August	138.34	151.00	9.15	170.70	198.00	15.99	226.72	266.00	17.33
September	116.10	128.00	10.25	137.10	163.00	18.89	169.00	192.00	13.61
October	127.60	121.00	-5.17	147.05	148.00	0.65	187.96	188.00	0.02
November	131.66	114.00	-13.41	173.30	144.00	-16.91	260.06	185.00	-28.86
December	130.72	80.60	-38.34	159.55	120.00	-24.79	272.62	157.00	-42.41

Table A-2. Estimated 80 percent, 50 percent, and 20 percent mean monthly exceedance flows based on data from StreamStats and the SFSR gage near the Krassel Ranger Station (ID – 13310700).

	Exceedance Flow (cfs and %)								
	80%			50%			20%		
Month	**Actual (calc.)**	**Estimated**	**% Change**	**Actual (calc.)**	**Estimated**	**% Change**	**Actual (calc.)**	**Estimated**	**% Change**
January	**16.68**	10.00	-40.06	**16.44**	11.40	-30.64	**23.82**	14.60	-38.71
February	**16.60**	10.20	-38.55	**17.80**	11.10	-37.64	**27.13**	13.40	-50.60
March	**22.12**	13.80	-37.60	**23.51**	14.10	-40.02	**42.84**	21.20	-50.51
April	**30.05**	14.90	-50.42	**46.68**	29.60	-36.59	**69.35**	59.40	-14.35
May	**153.76**	73.20	-52.39	**209.15**	124.00	-40.71	**263.53**	195.00	-26.00
June	**121.83**	115.00	-5.61	**200.06**	191.00	-4.53	**310.82**	280.00	-9.92
July	**30.82**	31.80	3.17	**48.12**	45.10	-6.27	**86.48**	84.70	-2.06
August	**14.57**	15.90	9.15	**17.85**	20.70	15.99	**24.46**	28.70	17.33
September	**11.70**	12.90	10.25	**13.21**	15.70	18.89	**16.90**	19.20	13.61
October	**13.29**	12.60	-5.17	**14.01**	14.10	0.65	**18.80**	18.80	0.02
November	**14.44**	12.50	-13.41	**16.97**	14.10	-16.91	**27.41**	19.50	-28.86
December	**16.87**	10.40	-38.34	**16.89**	12.70	-24.79	**29.69**	17.10	-42.41

Table A-3. Estimated 80 percent, 50 percent, and 20 percent mean monthly exceedance flows in Pony Creek (StreamStats) corrected using a Krassel USGS stream gage comparison of actual and estimated flows, with corresponding quality of flow classified as described by Tennant (1976).

Month	80% Exceedance		50% Exceedance		20% Exceedance	
	cfs	Flow classification	cfs	Flow classification	cfs	Flow classification
January	16.68	Excellent	16.44	Excellent	23.82	Outstanding
February	16.60	Excellent	17.80	Excellent	27.13	Outstanding
March	22.12	Outstanding	23.51	Outstanding	42.84	Optimum
April	30.05	Outstanding	46.68	Optimum	69.35	Optimum
May	153.76	Flushing or maximum	209.15	Flushing or maximum	263.53	Flushing or maximum
June	121.83	Flushing or maximum	200.06	Flushing or maximum	310.82	Flushing or maximum
July	30.82	Outstanding	48.12	Optimum	86.48	Outstanding
August	14.57	Fair or degrading	17.85	Fair or degrading	24.46	Excellent
September	11.70	Poor or minimum	13.21	Poor or minimum	16.90	Fair or degrading
October	13.29	Good	14.01	Good	18.80	Excellent
November	14.44	Good	16.97	Excellent	27.41	Outstanding
December	16.87	Excellent	16.89	Excellent	29.69	Optimum
Mean annual discharge				47.8		

Assuming the estimated flows in Tables 8, 9, and 10 are accurate, unimpaired flow conditions in Pony Creek described in terms of Tennant (1976) are:

- "Excellent" or better during an 80 percent exceedance year for most months except August through November when they are "Good", "Fair or degrading", or "Poor or minimum."
- "Excellent" or better during a 50 percent exceedance year for most months except August through October when they are "Good", "Fair or degrading", or "Poor or minimum."
- "Excellent" or better during a 20 percent exceedance year for every month except September when it is "Fair or degrading."

APPENDIX B. CALCULATION OF THE CONSUMPTIVE USE OF WATER RESULTING FROM THE PROPOSED ACTION

Water diverted from streams will be used consumptively and non-consumptively. Water that is used non-consumptively (e.g., domestic, stock water, and hydropower purposes) will return to the drainage network at some point downstream. Water used consumptively (i.e., evapotranspiration of a portion of the water used for irrigation) is assumed to be lost permanently from the Pony Creek drainage network. Evapotranspiration is the combined process by which water is lost from the land surface via evaporation or plant transpiration. Rates of evapotranspiration are strongly affected by weather, type of vegetation, and availability of water. Rates of evapotranspiration have been estimated at various locations in Idaho (Allen and Robison 2017). To evaluate how much water could be lost from the Pony Creek drainage due to the proposed action, NMFS used an average of actual evapotranspiration rates (ET_{act}) for two crops at the McCall, Idaho, station (Allen and Robison 2017). These rates are shown in Table B 1.

Table B-1. Monthly mean actual evapotranspiration rates (mm/day) at the McCall, Idaho, station. Actual evapotranspiration (ET_{act}) rates vary by month during the irrigation season. The National Marine Fisheries Service used the average of the actual evapotranspiration rates for two crops.

Crops	**ET_{act} (mm/day)**						
	April	**May**	**June**	**July**	**August**	**September**	**October**
Grass Pasture (low management)	0.84	2.51	4.44	4.88	4.23	2.25	0.57
Grass Hay	0.83	2.80	5.26	6.60	5.15	2.49	0.61
Average	0.84	2.66	4.85	5.74	4.69	2.37	0.59

The amount of water lost due to evapotranspiration during the irrigation season as a result of the proposed action was then calculated using the following equation:

$$ET_{act}\ (cfs) = ET_{act}\ mm/day * 0.0033\ ft/mm * 0.0000118\ day/sec * X\ acres * 43{,}560\ ft^2/acre$$

The average rate of water loss (cfs) due to evapotranspiration during the irrigation for the total of 13.0 acres included in Pony Creek water rights vary from 0.01 cfs in October to 0.13 cfs in July (Table B-2). The mean monthly consumptive water use from irrigation would equate to 0.07 cfs over the course of the season.

Table B-2. Amount of water lost (cfs and acre feet/month) due to evapotranspiration during the irrigation season for the Stritzke diversion. Maximum allowed diversion is 0.25 cfs.

	April	**May**	**June**	**July**	**August**	**September**	**October**
ET_{act} (cfs)	0.019	0.059	0.107	0.127	0.103	0.052	0.013
ET_{act} (af/month)	0.556	1.818	3.208	3.924	3.206	1.568	0.403

Assuming domestic irrigation use of up to one acre, the Sandy Cove, Inc. and Graves and Lightle diversions have additional consumptive use through evapotranspiration (Tables B-3 and B-4).

Table B-3. Amount of water lost (cfs and acre feet/month) due to evapotranspiration during the irrigation season for the Sandy Cove, Inc. diversion for nine residences and up to one acre of domestic irrigation use. Maximum allowed diversion is 0.18 cfs.

	April	**May**	**June**	**July**	**August**	**September**	**October**
ET_{act} (cfs)	0.013	0.041	0.074	0.088	0.072	0.036	0.009
ET_{act} (af/month)	0.385	1.259	2.221	2.716	2.220	1.085	0.279

Table B-4. Amount of water lost (cfs and acre feet/month) due to evapotranspiration during the irrigation season for the Graves and Lightle diversion. Maximum allowed diversion is 0.04 cfs.

	April	**May**	**June**	**July**	**August**	**September**	**October**
ET_{act} (cfs)	0.003	0.009	0.016	0.019	0.016	0.008	0.002
ET_{act} (af/month)	0.085	0.280	0.494	0.604	0.493	0.241	0.062