UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
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Refer to NMFS No: WCRO-2020-00629
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July 08, 2020

Charles A. Mark
Forest Supervisor
USDA Forest Department
Salmon–Challis National Forest
1206 S. Challis Street
Salmon, ID 83467

Re: Endangered Species Act Section 7(a)(2) Biological Opinion, and Magnuson–Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the Ongoing Grazing Actions in the Upper Salmon River Basin, Squaw Creek Section 7 Watershed (Squaw Creek Allotment) HUC# 1706020109; Salmon River–Slate Creek 1706020108, and Bayhorse Creek–Salmon River 1706020114, Custer County, Idaho (One Project)

Dear Mr. Mark:

Thank you for your letter of February 28, 2020, 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 Squaw Creek Grazing Allotment. This consultation was conducted in accordance with the 2019 revised regulations that implement section 7 of the ESA (50 CFR 402, 84 FR 45016).

The Salmon–Challis National Forest (SCNF) determined that the proposed action "may affect" and is "likely to adversely affect" Snake River Basin steelhead, and "may affect" but is "not likely to adversely affect" designated critical habitats for Snake River Basin steelhead and Snake River spring/summer Chinook salmon. In a March 20, 2020, letter, NMFS informed the SCNF that we would be unable to provide concurrence with the draft biological assessment's "Not Likely to Adversely Affect" determination for Snake River Basin steelhead and Snake River spring/summer Chinook salmon designated critical habitats, because the allotment is not meeting riparian management objectives at multiple monitoring locations. NMFS also noted that formal consultation would be required.

In this opinion, NMFS concludes that the action, as proposed, is not likely to jeopardize the continued existence of Snake River Basin steelhead, and is not likely to result in the destruction or adverse modification of designated critical habitat for Snake River Basin steelhead and Snake River spring/summer Chinook salmon.

The SCNF also determined the proposed action would have "no effect" on Snake River spring/summer Chinook salmon, Snake River sockeye salmon, and designated critical habitat for Snake River sockeye salmon. The regulations implementing section 7 of the ESA do not require NMFS to review or concur with "no effect" determinations; therefore NMFS will not address effects to these species or designated critical habitats 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 (RPMs) NMFS considers necessary or appropriate to minimize the impact of incidental take associated with this action. The take statement sets forth nondiscretionary terms and conditions, including reporting requirements, that the SCNF and any permittee who performs any portion of the action must comply with to carry out the RPM. Incidental take from actions that meet these terms and conditions will be exempt from the ESA take prohibition.

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

If the response is inconsistent with the EFH Conservation Recommendations, the SCNF 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 Mr. Dennis Daw, Snake River Branch, (208) 378-5698, or dennis.daw@noaa.gov, if you have any questions concerning this consultation or require additional information.

Sincerely,

Michael Tehan
Assistant Regional Administrator
Interior Columbia Basin Office

Enclosure

cc: T. Ford – SCNF
K. Krieger – SCNF
D. Garcia – SCNF
C. Colter – SBT
S. Fisher – USFWS

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

Squaw Creek Grazing Allotment

NMFS Consultation Number: WCRO-2020-00629

Action Agency: USDA Forest Service, Salmon–Challis 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 steelhead (*Oncorhynchus mykiss*)	Threatened	Yes	No	Yes	No
Snake River spring/summer Chinook salmon (*Oncorhynchus tshawytscha*)	Threatened	N/A	N/A	Yes	No

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

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

Issued By: 

Michael Tehan
Assistant Regional Administrator

Date: July 08, 2020

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Allotment	Squaw Creek Grazing Allotment
AOI	annual operating instructions
BA	biological assessment
BLM	Bureau of Land Management
DMA	designated monitoring area
DPS	distinct population segment
DQA	Data Quality Act
EFH	essential fish habitat
ESA	Endangered Species Act
ESU	evolutionarily significant unit
Forest Plan	Land Resource Management Plan for the Challis National Forest
GES	greenline ecological status
HAPC	habitat areas of particular concern
ICTRT	Interior Columbia Technical Recovery Team
IDEQ	Idaho Department of Environmental Quality
IDFG	Idaho Department of Fish and Game
ISAB	Independent Scientific Advisory Board
ITS	incidental take statement
Level 1 Team	SCNF Interagency Level 1 Streamlining Team
LWD	large woody debris
MIM	multiple indicator monitoring
MPG	major population groups
MSA	Magnuson–Stevens Fishery Conservation and Management Act
NMFS	National Marine Fisheries Service
opinion	biological opinion
PACFISH	Interim Strategies for Managing Anadromous Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California
PCE	primary constituent elements
PFMC	Pacific Fishery Management Council
PIBO	PACFISH/INFISH Biological Opinion
PNC	potential natural community
RHCA	riparian habitat conservation areas
RMO	riparian management objective
RPM	reasonable and prudent measure
SCNF	Salmon–Challis National Forest
USBWP	Upper Salmon Basin Watershed Project
USFWS	U.S. Fish and Wildlife Service
VSP	Viable Salmonid Population
W:D	width-to-depth ratio

1. INTRODUCTION

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

1.1 Background

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

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

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

1.2 Consultation History

NMFS previously completed Formal ESA consultation on the Squaw Creek Allotment on March 19, 2012 (NMFS tracking number: 2011/02493). The Salmon–Challis National Forest (SCNF) submitted a draft biological assessment (BA) to NMFS for review on January 11, 2020. NMFS provided comments to the SCNF on January 24, 2020, for discussion during the January 29, 2020, Level 1 meeting. NMFS expressed concern regarding habitat conditions not meeting resource management conditions and missed monitoring schedules.

On February 28, 2020, NMFS received a letter from the SCNF requesting ESA consultation on the effects of authorizing proposed grazing activities on the Squaw Creek Grazing Allotment (Allotment). The BA (USFS 2020) accompanying that letter described proposed livestock grazing activities, the environmental baseline, and the potential effects of those activities on Snake River Basin steelhead, and Snake River Basin steelhead and Snake River spring/summer Chinook salmon designated critical habitats. In the BA, the SCNF determined that the proposed action "may affect, and is "likely to adversely affect" Snake River Basin steelhead. The SCNF has also determined that the action may affect, but is "not likely to adversely affect" designated critical habitat for these species.

The SCNF also determined the proposed action would have "no effect" on Snake River spring/summer Chinook salmon, Snake River sockeye salmon, and designated critical habitat for Snake River sockeye salmon. The regulations implementing section 7 of the ESA do not require

NMFS to review or concur with "no effect" determinations; therefore NMFS will not address effects to these species or designated critical habitats in this opinion.

On March 20, 2020, NMFS informed the SCNF, by letter and electronic correspondence, that NMFS would be unable to provide concurrence with the "Not Likely to Adversely Affect" determinations for designated critical habitat because many of the Allotment monitoring locations were not meeting riparian management objectives (RMOs), and due to missing monitoring reports. NMFS also noted that formal consultation would be required.

The SCNF's proposed authorization of cattle grazing on the Allotment would likely affect tribal trust resources. Because the action is likely to affect tribal trust resources, NMFS contacted the Shoshone–Bannock Tribes pursuant to the Secretarial Order (June 5, 1997). A copy of the draft proposed action and terms and conditions were sent to the Shoshone–Bannock Tribes on May 28, 2020, with a request for comments. NMFS did not receive any response.

Grazing activities prior to the issuance of this document will be considered in the baseline, and grazing going forward will be addressed in the effects section. This opinion will only cover incidental take that will occur after the issuance of the opinion.

1.3 Proposed Federal Action

"Action" means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by federal agencies (50 CFR 402.02). The SCNF proposes to issue two grazing permits to graze cattle on the Squaw Creek Allotment through 2034. One permit allows for a total of 473 cow/calf pairs to graze for a season of 6/16 to 9/30 (1,664 head months), and 60 cow/calf pairs to graze from 7/16 to 9/30 (152 head months). The second permit authorizes a total of 142 cow/calf pairs to graze from 7/16 to 9/30 (359 head months).

For EFH, federal action means any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken by a federal agency (50 CFR 600.910).

We considered whether or not the proposed action would cause any other activities and determined that it would not.

The Squaw Creek Allotment is located on the Challis–Yankee Fork Ranger District, approximately 30 air miles southwest of Challis, Idaho, on SCNF system lands (Figure 1). The Allotment is 52,086 acres and is located within three separate U.S. Geologic Survey 5th-field hydrologic unit code (HUC) watersheds: Squaw Creek, HUC 1706020108; Salmon River–Slate Creek, HUC 1706020109; and Bayhorse Creek–Salmon River, HUC 1706020114. The Squaw Creek HUC is a PACFISH priority watershed. The perennial fish-bearing streams in this Allotment include: Squaw, Martin, Cinnabar, Bayhorse, and Cash Creeks. The Allotment consists of the seven pasture Units: Lower Squaw Creek, Riparian Pasture, Trealor Creek, Upper Squaw Creek, Kinnikinic Creek, Happy Hollow, and Juliette Units (Figure 2).

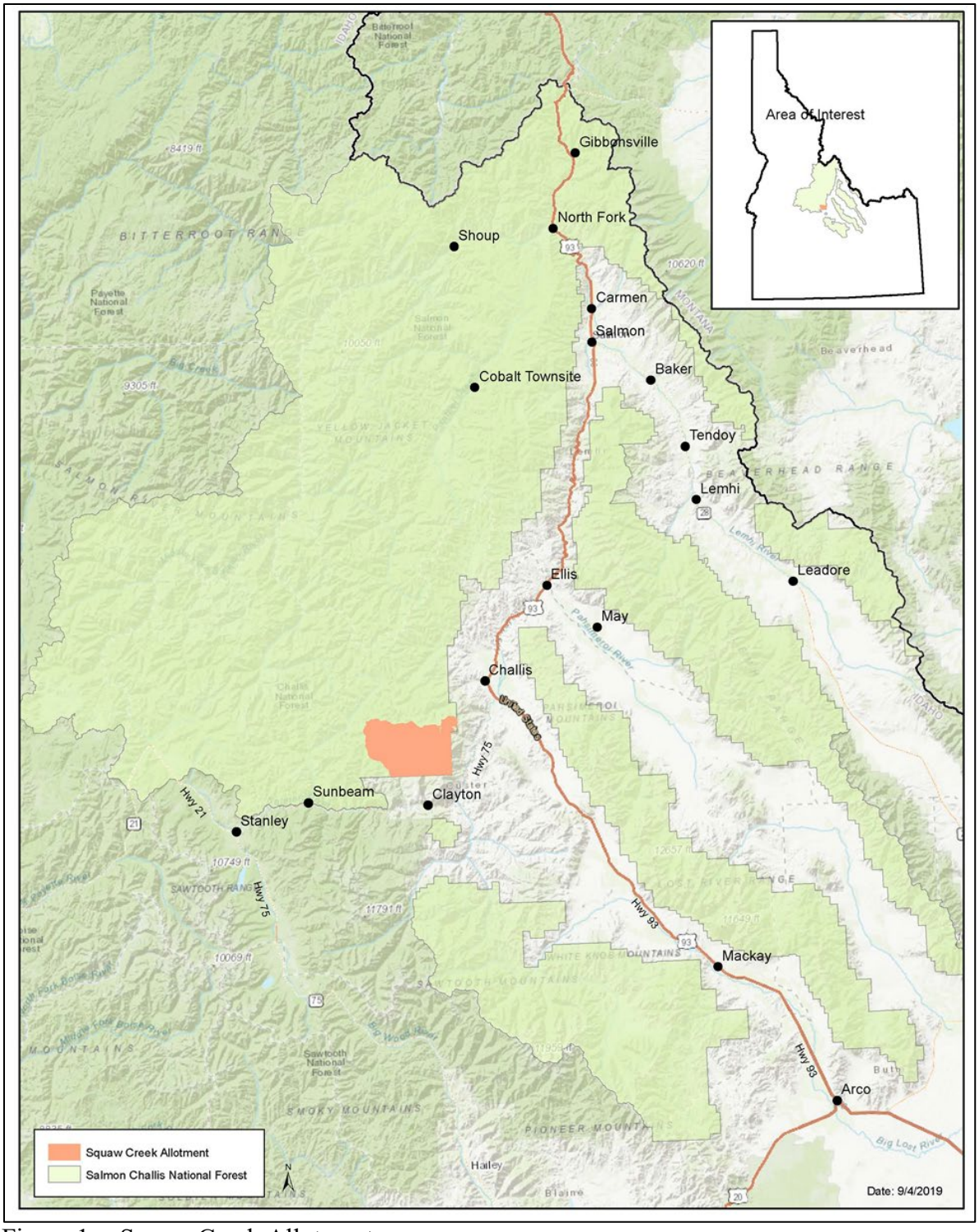

Figure 1. Squaw Creek Allotment

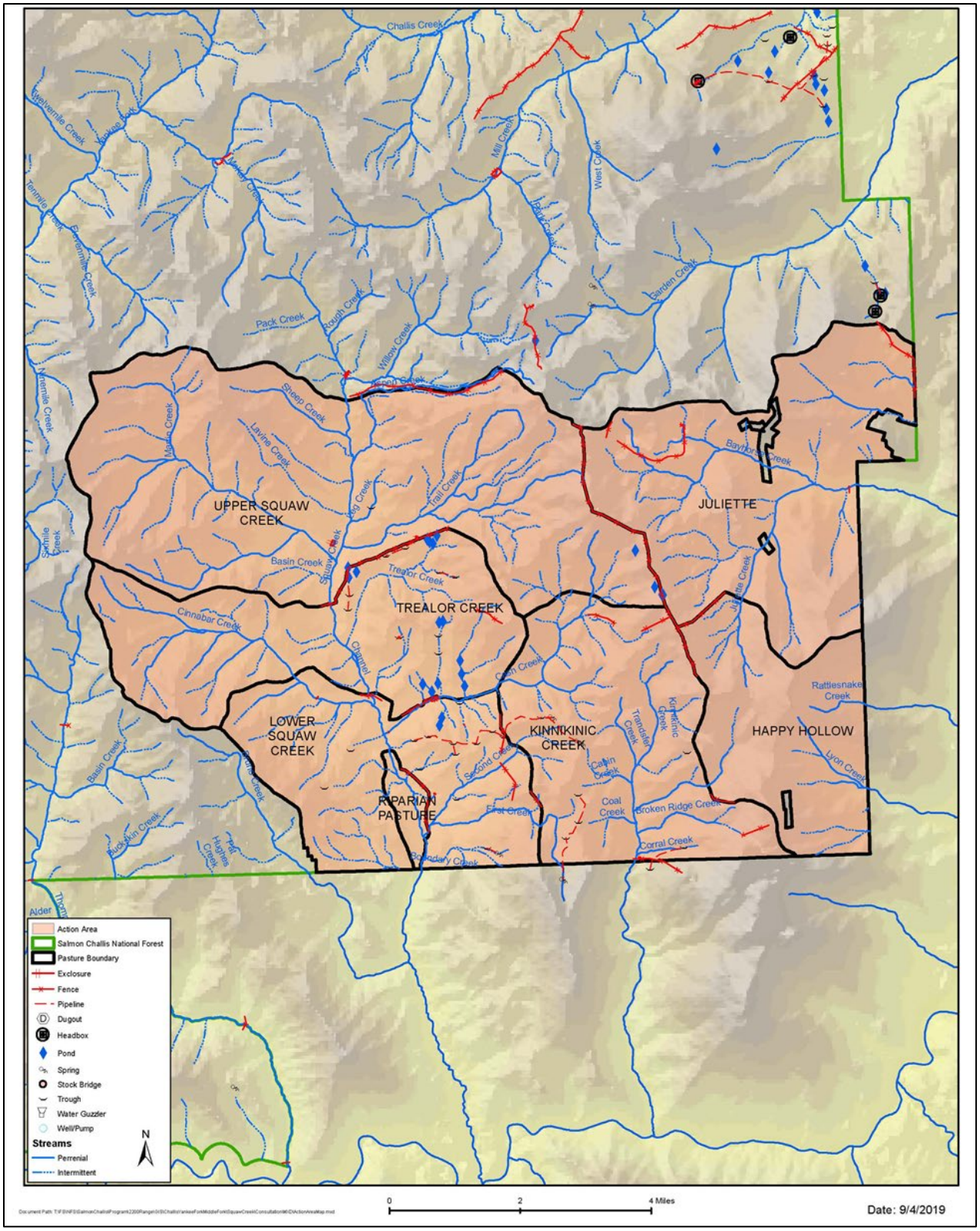

Figure 2. Squaw Creek Allotment action area and Unit boundaries.

1.3.1 Current Permit

There are two permits issued on the Squaw Creek Allotment. One permit allows for a total of 473 cow/calf pairs to graze for a season of 6/16 to 9/30 (1,664 head months) in the Lower Squaw Creek/Riparian Pasture, Trealor Creek, Kinnikinic Creek, and Upper Squaw Creek Units (Herd 1), and 60 cow/calf pairs in the Happy Hollow and Juliette Units from 7/16 to 9/30 (152 head months). The second permit authorizes a total of 142 cow/calf pairs to graze in the Happy Hollow and Juliette Units from 7/16 to 9/30 (359 head months) (Herd 2). The Happy Hollow and Juliette Units (referred to as Herd 2) are locally referred to as the Bayhorse Subdivision.

Per direction in Forest Service Handbook 2209.13-10, an extension of grazing may be requested for a maximum of 2 weeks outside the dates on the term grazing permit. The use of extensions should be an exception rather than a standard practice. On this Allotment, it is not expected that a request for an extension will occur more than 4 years in 10. The Unit rotation schedule will dictate to which Units this may apply (i.e., entry and exit Units only which include the following Units: Lower Squaw Creek/ Riparian Pasture, Trealor Creek, and Juliette Units (Table 1). If an extension were to be approved the grazing season could potentially be 6/2 to 10/14 for Herd 1, and 7/2 to 10/14 for Herd 2.

1.3.2 Grazing System

The Squaw Creek Allotment consists of the Lower Squaw Creek, Riparian Pasture, Trealor Creek, Upper Squaw Creek, Kinnikinic Creek, Happy Hollow, and Juliette Units (Figure 2). The Lower Squaw, Trealor, Upper Squaw, Riparian Pasture, and Kinnikinic Units are grazed by one herd of cattle in a combination of rest rotation and deferred rotation. There are three annual deferred rotations that will be used on this Allotment. In addition, the Lower Squaw Creek, Riparian Pasture, and Trealor Creek Units will each be rested 1 year out of 3. The Happy Hollow and Juliette Units are used by another herd and are rotated annually (Table 1).

Range readiness (i.e., bluebunch wheatgrass in the first boot stage or the appearance of Idaho fescue flowerstalks) will be monitored as necessary to determine if the on-date is appropriate. Adjustments to the on date may be made if conditions warrant. Annual use indicators will drive when Unit moves or the off date occurs. Permittees are responsible for moving livestock to meet annual use indicators.

Table 1. Squaw Creek Allotment Unit rotations.

Herd 1 473 c/c pairs, 6/16–9/30			Herd 2 202 c/c pairs, 7/16–9/30	
Year 1	**Year 2**	**Year 3**	**Year 1**	**Year 2**
Lower Squaw Creek/ Riparian Pasture	Trealor Creek	Lower Squaw Creek/ Riparian Pasture	Happy Hollow	Juliette
Trealor Creek	Upper Squaw Creek	Trealor Creek[a] REST	Juliette	Happy Hollow
Upper Squaw Creek[a] (Trailing only)	Kinnikinic Creek	Upper Squaw Creek		
Kinnikinic Creek	Lower Squaw Creek/ Riparian Pasture REST	Kinnikinic Creek		

[a] Livestock will trail through the Unit for up to 10 days after August 15, to move from Trealor Creek Unit to Kinnikinic Creek Unit (to protect bull trout).
[b] Livestock will trail through the Unit to access the Upper Squaw Creek Unit.

1.3.3 Livestock Occupancy

The ESA-listed species presence and designated critical habitat (Figures 3 and 4) for each Unit in this Allotment are as follows:

- **Lower Squaw Creek Unit**
    - Steelhead: Occupied spawning habitat and designated critical habitat. Livestock will be in the Unit during spawning and incubation for up to 3 weeks for 2 years out of 3 (Years 1 and 3).
    - Chinook salmon: Unoccupied designated critical habitat.
- **Riparian Pasture Unit**
    - Steelhead: Occupied spawning habitat and designated critical habitat. Livestock will be in the Unit during spawning and incubation up to 3 weeks for 2 years out of 3 (Years 1 and 3).
    - Chinook salmon: Unoccupied designated critical habitat.
- **Trealor Creek Unit**
    - Steelhead: Occupied spawning habitat and designated critical habitat. Livestock will be in the Unit during spawning and incubation up to 3 weeks in Years 1 and 2. During Year 3, livestock will be trailed to get from Lower Squaw Creek to Upper Squaw Creek for up to 10 days during steelhead spawning and incubation.
    - Chinook salmon: Unoccupied designated critical habitat.
- **Upper Squaw Creek Un**it
    - Steelhead: Occupied spawning habitat and designated critical habitat. Livestock will not be in the Unit during spawning and incubation.
    - Chinook salmon: Unoccupied designated critical habitat.

- **Juliette Unit**
    - Steelhead: No occupied habitat or designated critical habitat.
    - Chinook salmon: No occupied habitat or designated critical habitat.
- **Happy Hollow Unit**
    - No ESA-listed fish populations or designated critical habitat.
- **Kinnikinic Creek Unit**
    - No ESA-listed fish populations or designated critical habitat.

Livestock could potentially impact steelhead spawning and incubation for an additional 2 weeks in the beginning of the season (turnout June 2) in Lower Squaw Creek/Riparian Pasture and Trealor Creek Units, if an extension is approved by the District Ranger. Extensions authorized at the end of the grazing season (exit October 14) would not impact spawning steelhead.

1.3.4 Trailing

1.3.4.1. Unit Moves

Stream crossings are necessary for moving livestock between Units and they depend on the rotation and location of the livestock within the Unit. Stream crossings are typically made over the course of 1 or 2 days, with the bulk of the herd typically crossing streams with riders (supervised trailing). Following or preceding this, several smaller groups may cross depending on the location of the cows, number of riders, weather, terrain and any number of other factors. Back riding to pick up animals that did not get gathered during the move date would also occur, with subsequent crossings of these smaller groups. There may be up to 10% livestock missed in this formal move; it is up to the permittee to gather the last livestock and move them so as to meet annual use indicators. During moves before July 7, steelhead streams that may be crossed include: Squaw Creek and Trealor Creek (Lower Squaw Creek, Trealor Creek, and Upper Squaw Creek Units).

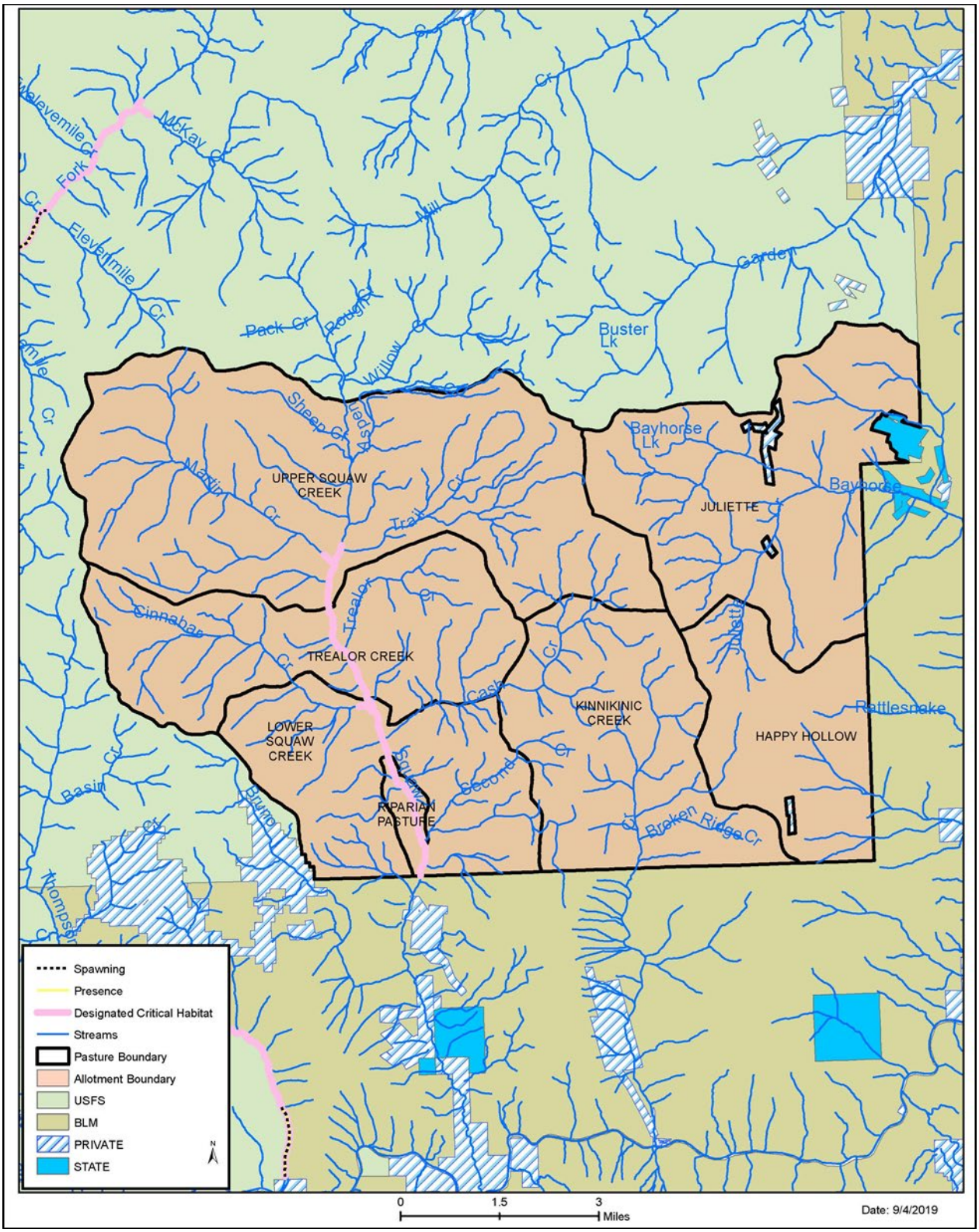

Figure 3. Map depicting Snake River spring/summer Chinook designated critical habitat.

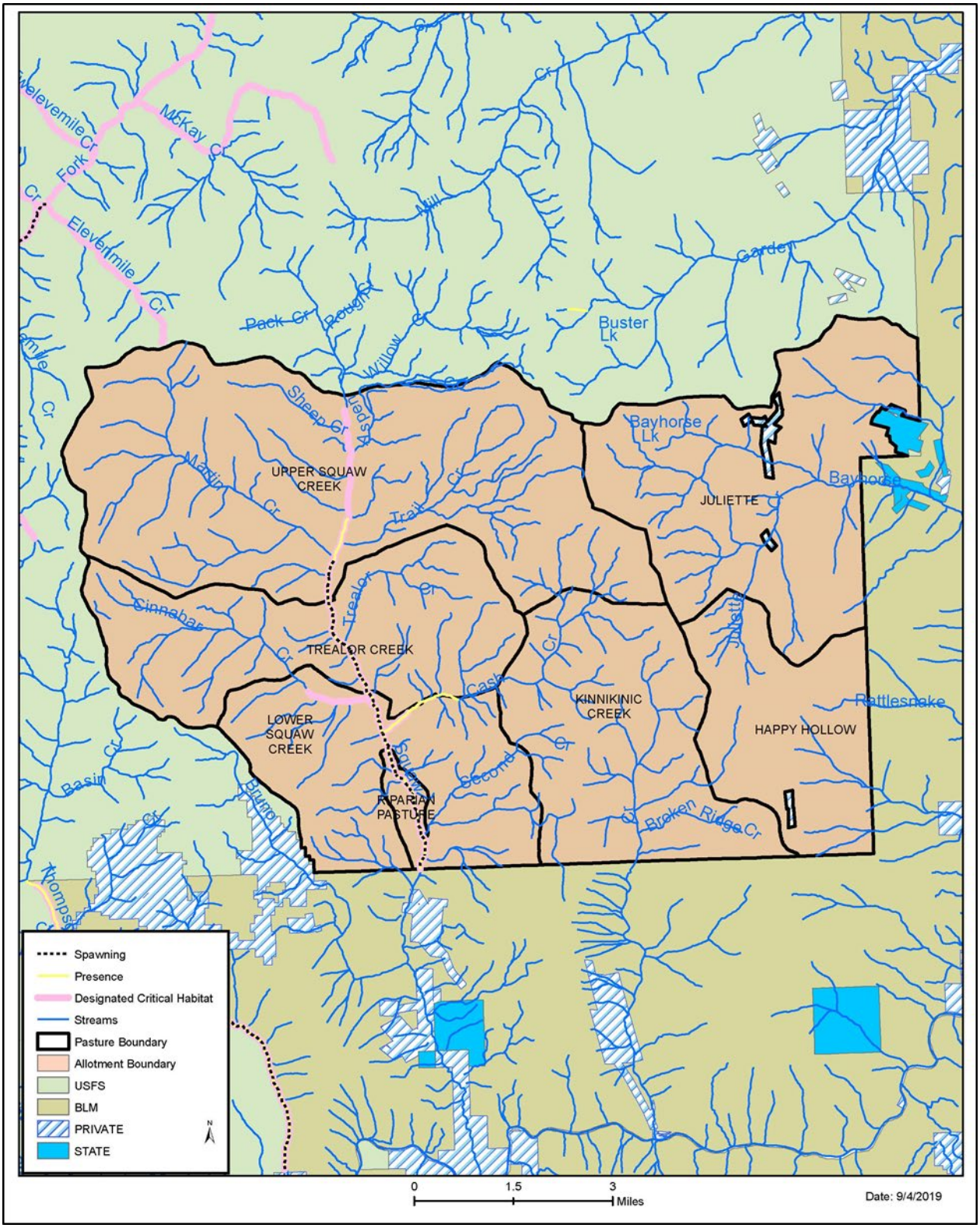

Figure 4. Map depicting Snake River Basin steelhead spawning areas and designated critical habitat.

1.3.5 Entry/Exit Off Allotment

Herd 1: Enters the Allotment from Bureau of Land Management (BLM) lands to the Lower Squaw Creek or Riparian Pasture Units during Years 1 and 3. Entry during Year 2 is also from the BLM through the Kinnikinic Unit to the Trealor Creek Unit. All trailing takes place either by road or upland trail.

Herd 2: Enters the Bayhorse Subdivision directly into either the Juliette or Happy Hollow Units from BLM lands. Entry onto the Allotment takes part over the course of a day or two and livestock are trailed with sufficient rider(s).

Streams that have the potential to be crossed during the exit off the Allotment include: Trealor and Squaw Creek (Lower Squaw Creek, Trealor Creek, and Upper Squaw Creek Units).

1.3.5.1 Total Removal from NFS Lands

Livestock will be removed from the Allotment by September 30, unless there is a District Ranger approved extension in the Juliette Unit, following the language above.

1.3.6 Changes from Existing Management

This proposed action includes the following changes from the management described in the 2011 BA:

- Administrative addition of the Bayhorse Subdivision which includes the Juliette and Happy Hollow Units; these Units will be grazed in deferred rotation.

- The Juliette Unit multiple indicator monitoring (MIM) location has changed from M66 to M84. Data has been consistently collected at M84 since 2014 and is proposed to continue.

- The Riparian Pasture Unit will be incorporated into the grazing rotation with 6-inch greenline stubble height and 10% bank alteration annual use indicators applied, and will be reevaluated in 3 years following the adaptive management strategy. The Unit was built in 1989 and was intended for experimentation. It has not been actively grazed since then. The Riparian Unit designated monitoring area (DMA) will be read prior to turnout in 2020, since it has not been read since 2014.

- M330 in Martin Creek will be dropped from required monitoring due to field assessments revealing no representative riparian monitoring site that would be affected by livestock management (per the MIM protocol).

- Upper Squaw Creek, Trealor Creek, and Juliette Creek will have a 4-inch stubble height annual use indicator based on effectiveness monitoring and following the adaptive management strategy. The Upper Squaw Creek DMA will be read prior to turnout in 2020 since it has not been read since 2014.

- Trealor Unit will have a 15% bank alteration annual use indicator based on effectiveness monitoring and following the adaptive management strategy.

- M70 and M77 will be dropped from required monitoring due to sufficient DMA representation existing within the Lower Squaw Creek and Trealor Creek Units. Data from these DMAs are not expected to differ nor is management different between the adjacent DMAs to warrant continued data collection.

- M69 and M78 will be dropped from required monitoring due to the Kinnikinic and Happy Hollow Units having no ESA-listed fish populations or designated critical habitat.

1.3.7 Improvements

New Improvements: No new improvements are proposed at this time.

Existing improvements: Existing improvements, as displayed in Figure 2, will be maintained in accordance with the term grazing permit. For example, fences are maintained to serve their intended purpose, and water troughs are maintained to keep the trough functional and water from overflowing the side.

1.3.8 Resource Objectives

Grazing management on this Allotment focuses on achieving specific resource objectives in riparian and aquatic communities. These resource objectives were established by the Interim Strategies for Managing Anadromous Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California (PACFISH), the ESA consultations associated with PACFISH, A Strategy for Managing Livestock Grazing Within Stream Riparian Communities on the Salmon–Challis National Forest (riparian strategy) (Gamett et al. 2008), and the Land Resource Management Plan for the Challis National Forest (Forest Plan).

- Greenline Successional Status (Riparian Strategy): At least late seral (greenline successional status value ≥61) or the current value, whichever is greatest.
- Bank Stability (Riparian Strategy, PACFISH): Within PACFISH priority watersheds, bank stability is at least 90% or the current value, whichever is greatest. Outside of PACFISH priority watersheds, bank stability is at least 80% or the current value, whichever is greatest[1]. Those portions of this Allotment that contain ESA-listed fish and designated critical habitat that are within a PACFISH priority watershed are: Lower Squaw, Trealor, and Upper Squaw Creek Units.

[1] The PACFISH environmental assessment and the riparian strategy both established a bank stability objective of 80%. However, during PACFISH consultation, the PACFISH objective was increased to 90% in PACFISH priority watersheds. In order to ensure compliance with PACFISH, the bank stability objective of 90% is used in PACFISH priority watersheds.

- Woody Species Regeneration (Riparian Strategy): Sufficient woody recruitment to develop and maintain healthy woody plant populations[2].
- Water Temperature (PACFISH): No measureable increase in maximum water temperature[3]. For steelhead and Chinook salmon, less than 64°F (17.8°C) in migration and rearing areas. For Chinook and steelhead, less than 60°F (15.6°C) in spawning areas, except in steelhead priority watersheds where the objective is less than 45°F (7.2°C) in steelhead spawning areas during the incubation period[4]. Those portions of this Allotment that contain steelhead are within a PACFISH priority watershed are: Lower Squaw, Trealor, and Upper Squaw Creek Units.

  Sediment (PACFISH, Forest Plan): Within Chinook salmon and steelhead spawning areas PACFISH priority watershed, less than 20% surface fines [substrate less than 0.25 inches (6.4 mm) in diameter]. Outside of PACFISH priority watersheds, sediment should not increase fine sediment by depth (within critical reaches) of perennial streams by more than 2% over existing levels[5]. Where existing levels are at 30% or above, new activities that would create additional stream sedimentation would not be allowed. If these levels are reached or exceeded, activities that are contributing sediment will be evaluated and appropriate action will be taken to bring fine sediment within threshold levels. Those portions of this Allotment that contain ESA-listed fish and designated critical habitat that are within a PACFISH priority watershed (i.e., Lower Squaw Creek, Trealor Creek, and Upper Squaw Creek Units), the priority watershed objective applies. In non-priority watershed, the other objectives apply.

PACFISH also established a width-to-depth ratio (W:D) objective and, in the past, the SCNF included this objective as one of the primary objectives in the management of livestock grazing. The MIM protocol (Burton et al. 2011), which is the primary method used by the SCNF to monitor habitat conditions on grazing allotments, no longer collects data on W:D, and now uses greenline-to-greenline width. This metric is not an appropriate surrogate for W:D. The SCNF believes that by effectively managing the greenline successional status and bank stability resource objectives that livestock grazing will not prevent the attainment of the W:D objective. Therefore, the SCNF has elected to no longer use W:D as one of the primary resource objectives in the management of livestock grazing.

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[2] There is substantial temporal and spatial variation in woody species regeneration within riparian areas which makes it extremely difficult to develop quantifiable standards that can be applied across large temporal and spatial scales. Therefore, a qualitative standard for woody species regeneration is used. The natural ability of the site to generate woody species should be taken into consideration when monitoring, evaluating, and managing for this objective.

[3] In this case, maximum water temperature is expressed as the 7-day moving average of daily maximum temperatures measured as the average of the maximum daily temperature of the warmest consecutive 7-day period.

[4] The PACFISH environmental assessment established a stream temperature objective of less than 60°F in spawning areas. However, during PACFISH consultation this standard was changed to less than 45°F in steelhead spawning areas within steelhead priority watersheds during the spawning and incubation period.

[5] The Forest Plan established the following sediment objective: "Impacts of activities may not increase fine sediment by depth (within critical reaches) of perennial streams by more than 2% over existing levels. Where existing levels are at 30% or above new activities that would create additional stream sedimentation would not be allowed. If these levels are reached or exceeded, activities that are contributing sediment will be evaluated and appropriate action will be taken to bring fine sediment.

1.3.9 Management Standards and Guidelines

The following are Forest Plan standards and guidelines that apply to the management of livestock grazing relative to ESA-listed fish and their habitats:

1.3.9.1. PACFISH

GM-1 - Modify grazing practices (e.g., accessibility of riparian area to livestock, length of grazing season, stocking levels, timing of grazing, etc.) that retard or prevent attainment of RMOs or are likely to adversely affect listed anadromous fish. Suspend grazing if adjusting practices is not effective in meeting RMOs and avoiding adverse effects on listed anadromous fish (PACFISH).

GM-2 – Locate new livestock handling and/or management facilities outside of Riparian Habitat Conservation Areas (RHCAs). For existing livestock handling facilities inside RHCAs, assure that facilities do not prevent attainment of RMO or adversely affect listed anadromous fish. Relocate or close facilities where these objectives cannot be met.

GM-3 – Limit livestock trailing, bedding, watering, salting, loading, and other handling efforts to those areas and times that will not retard or prevent attainment of RMOs or adversely affect listed anadromous fish.

1.3.9.2. Land Resource Management Plan for the Challis National Forest – Forest-Wide Direction

- Protect anadromous fish spawning areas from disturbance by livestock and other activities.
- Utilize grazing systems on allotments which provide for deferment or rest whenever possible. Season-long grazing or common use will be allowed only where resources can sustain such use.
- Range improvements will be maintained annually by permittees to standards adequate for public safety and established use, and control and proper distribution of livestock. Maintenance will be completed before livestock are allowed on the Allotment.
- Rehabilitate existing stock driveways where damage is occurring. Relocate them outside riparian areas if possible.
- Browse utilization within the riparian ecosystem will not exceed 50% of new leader production.
- Ensure that all management-induced activities meet state water quality standards, and Forest water quality goals, including sediment constraints.
- Impacts of activities may not increase fine sediment by depth (within critical reaches) of perennial streams by more than 2% over existing levels. Where existing levels are at 30% or above, new activities that would create additional stream sedimentation would not be allowed. If these levels are reached or exceeded, activities that are contributing sediment

will be evaluated and appropriate action will be taken to bring fine sediment within threshold levels.

- Retain at a minimum, 75% of natural stream shade provided by woody vegetation.
- Discourage livestock concentrations in riparian areas and within 100 feet of lakes and perennial streams. Restrict livestock grazing in identified problem areas where necessary.
- Livestock driveways and trailing areas will be located away from riparian or streamside areas.

1.3.9.3 Land Resource Management Plan for the Challis National Forest – Management Area Specific Direction

- Emphasize habitat management to improve streambank cover and stability.
- Incorporate riparian guidelines in range management.

1.3.10 Annual Use Indicators

Annual use indicators are used to ensure that grazing does not prevent the attainment of the riparian resource objectives directly affected by livestock grazing. Riparian annual use indicators used on the SCNF generally include greenline stubble height, bank alteration, and woody browse. In general, greenline stubble height is used to regulate grazing impacts on greenline ecological status, bank alteration is used to regulate grazing impacts on bank stability, and woody browse is used to regulate impacts on woody recruitment. The specific indicators selected for a specific Unit should be those that correspond with the riparian resources that are most sensitive to the impacts of livestock grazing. For example, if bank stability was the riparian feature most likely to be impacted by livestock grazing in a unit, then bank alteration would be selected as the annual use indicator for that Unit.

The annual use indicators in Table 2 determine when a Unit moves or the off date occurs. Permittees are responsible for moving livestock to meet these annual use indicators. In addition to the Annual use indicators described in Table 2, upland use will not exceed 50%. Although upland use is typically not monitored on an annual basis, experience has shown that use is generally less than 50% when the other indicators are achieved.

1.3.10.1. Triggers

Triggers are used by permittees to help determine livestock moves so that annual use indicators are not exceeded. Potential trigger values for this Allotment are shown in Table 2. However, the value of a trigger can vary considerably from year to year based on a number of factors including growing conditions and time to complete the move. Subsequently, trigger values can change from year to year and may be different from those shown in Table 2. While the Forest Service works with the permittees to help them know how to monitor stubble height, bank alteration, and woody browse, trigger monitoring by permittees is not documented and is it not reported. The stated direction in the term grazing permit(s) is for the permittees to ensure annual use indicators

are met. These triggers are in no way considered to be a measure of success or failure in terms of implementing the grazing system or evaluating impacts to ESA-listed species or habitat.

Table 2. Designated monitoring areas and annual use indicators.

Location	Unit–Stream	Monitoring Attribute	Annual Use Indicator	Estimated Use Triggers	Key Species
MIM # 84	Juliette Unit– Juliette Tributary	Browse use	≤30% single ≤50% multi-stemmed	≤25% single ≤45% multi-stemmed	aspen willow/alder/birch
		Greenline stubble	≥4 inches	≥5 inches	hydric species
		Bank Alteration	≤20%	≤15%	
MIM # 284	Riparian Pasture Unit– Squaw Creek	Browse use	≤30% single ≤50% multi-stemmed	≤25% single ≤45% multi-stemmed	aspen willow/alder/birch
		Greenline stubble	≥6 inches	≥7 inches	hydric species
		Bank Alteration	10%	5%	
MIM # 72	Lower Squaw Creek Unit–Squaw Creek	Browse use	≤30% single ≤50% multi-stemmed	≤25% single ≤45% multi-stemmed	aspen willow/alder/birch
		Greenline stubble	≥6 inches	≥7 inches	hydric species
		Bank Alteration	≤10%	≤5%	
MIM # 71	Trealor Creek Unit– Squaw Creek	Browse use	≤30% single ≤50% multi-stemmed	≤25% single ≤45% multi-stemmed	aspen willow/alder/birch
		Greenline stubble	≥4 inches	≥5 inches	hydric species
		Bank Alteration	≤15%	≤10%	
MIM # 285	Upper Squaw Creek Unit–Squaw Creek	Browse use	≤30% single ≤50% multi-stemmed	≤25% single ≤45% multi-stemmed	aspen willow/alder/birch
		Greenline stubble	≥4 inches	≥5 inches	hydric species
		Bank Alteration	≤20%	≤15%	

Key species are preferred by livestock and are an important component of a plant community, serving as an indicator of change (USDI Bureau of Land Management 1999). Season-end annual use indicators will be monitored by Forest Service personnel or a person authorized by the Forest Service. For further discussion of monitoring annual use see the Monitoring section below.

1.3.11 Monitoring and Reporting

1.3.11.1 Required Implementation Monitoring

The purpose of implementation monitoring is to determine if the action was implemented correctly. On allotments, this typically focuses on determining if the annual use indicators were met. This monitoring is typically conducted on an annual basis at DMAs using the MIM method (Burton et al. 2011) or other best available published science. Each DMA is to be located in an area that is representative of streamside livestock use, reflecting typical use of riparian vegetation and streambanks (Burton et al. 2011) and are representative of areas that have ESA-listed fish and/or designated critical habitat within the Unit. The timing of this monitoring is based on its purpose. Bank alteration and woody browse monitoring is typically conducted within 2 weeks of livestock being moved from a Unit, whereas monitoring for greenline stubble height is conducted at the end of the growing season. This monitoring is completed by Forest Service personnel or a person trained and authorized by the Forest Service.

1.3.11.2 Required Effectiveness (Long Term)

The purpose of effectiveness monitoring is to determine if the action is achieving the desired resource objectives. On allotments, this focuses on determining if the greenline successional status, bank stability, woody species regeneration, water temperature, and sediment objectives are being met. Greenline successional status, bank stability, and woody species regeneration is typically evaluated at least every 5 years at DMAs using the MIM method (Burton et al. 2011) or other best available published science. Water temperature and sediment is typically evaluated at established long-term monitoring sites using established SCNF protocols. Although there are not specific fish population objectives relative to grazing management, fish population data are also typically collected at established long-term monitoring sites using established SCNF protocols to help inform grazing management decisions. The water temperature, sediment, and fish population monitoring sites may or may not be located at DMAs. The frequency of water temperature, sediment, and fish population monitoring will vary depending on trends and other factors but will occur on this allotment at least twice every 10 years.

Reporting: Results of required monitoring identified above will be hard copy mailed, to the respective Regulatory Agency, to their office by March 1 each year.

1.3.12 Adaptive Management

The adaptive management strategy described below is intended for allotments requiring consultation. It will be used to ensure: (1) sites at desired condition remain in desired condition; (2) sites not in desired condition have an upward trend or an acceptable static trend to be agreed upon with the NMFS and the SCNF; and (3) direction from consultation with the NMFS is met. The overall strategy consists of a long-term Adaptive Management Strategy and an annual adaptive management strategy. The long-term strategy describes how adaptive management will be used to ensure the three resource objectives livestock directly affect are achieved and to maintain consistency with Forest Plan level direction. The annual Adaptive Management Strategy describes how adjustments will be made within the grazing season to ensure annual use

indicators and other direction from consultation is met. Both strategies describe when, and how, regulatory agencies will be contacted in the event direction from consultation is not going to be met (see also Section 1.3.13 Conservation Measures, Communication Plan).

Ideally, the value associated with the annual use indicator is customized to the specific circumstances in each Unit and is based on data and experience. However, customizing this value generally requires a significant amount of data and/or experience with a particular Unit. When sufficient data and/or experience are not available to establish the annual use indicators values, the SCNF has provided default recommendations for establishing the values. These recommendations will be used until such time as sufficient data and/or experience are available to customize the annual indicator values. The recommendations that apply to this Allotment are:

- When the greenline ecological status is 61 or greater, the end-of-season median greenline stubble height annual use indicator will be 4 inches.
- When the greenline ecological status is less than 61, the end-of-season median greenline stubble height annual use indicator will be 6 inches.
- When there is sufficient woody recruitment to develop and maintain healthy woody plant populations, the woody browse indicator will be 50% woody browse on multi-stemmed species and 30% woody browse on single-stemmed species.
- When there is not sufficient woody recruitment to develop and maintain healthy woody plant populations, the woody browse indicator will be 30% woody browse on multi-stemmed species and 20% woody browse on single-stemmed species.
- In priority watersheds, when bank stability is 90% or greater the bank alteration annual use indicator will be 20%. Outside of priority watersheds, if bank stability is 80% or greater, the annual bank alteration indicator is 20%.
- In priority watersheds, when bank stability is 70–89% the bank alteration annual use indicator will be 10–20%. Outside of priority watersheds, if bank stability is 60–79%, the bank alteration annual indicator is 15%.
- In priority watersheds, when bank stability is less than 70%, the bank alteration annual use indicator will be 10%. Outside of priority watersheds, if bank stability is less than 60%, the bank alteration annual indicator is 10%.

1.3.13 Conservation Measures

The following conservation measures which will be incorporated into the term grazing permit(s) when applicable, will be implemented as part of the proposed action to avoid and reduce potential impacts to ESA-listed fish and their habitat:

1. The SCNF will follow the Communication Plan—Implementing Livestock Grazing Consultation on the SCNF. Over the duration of this BA, the Communication Plan could be updated to better address livestock grazing management both within the Forest Service and between the Forest Service and NMFS/U.S. Fish and Wildlife Service (USFWS). The desired outcome of this Communication Plan is to conduct livestock grazing within the scope of this BA and subsequent opinion or concurrence letter while being consistent and timely in communication when something is observed to the contrary.

2. Per the Grazing System, the on-date may vary so livestock are placed on the Allotment at range readiness.
3. Livestock moves between Units and off the Allotment are made so as to meet annual use indicators.
4. Permittees will continue to salt at least one-quarter mile away from all streams.
5. Permittees will continue to distribute livestock away from perennial streams and associated riparian areas by frequent riding.
6. Permittees will maintain the improvements in accordance with the term grazing permit.

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

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

The SCNF determined the proposed action "May Affect" and is "Likely to Adversely Affect" Snake River Basin steelhead. The SNF also determined the proposed action is "Not Likely to Adversely Affect" Snake River Basin steelhead and Snake River spring/summer Chinook salmon designated critical habitat. However, NMFS was not able to concur with the "Not Likely to Adversely Affect" determinations for designated critical habitat determination due to degraded baseline habitat conditions, and lack of monitoring reports. We have issued this opinion with a "May Affect" and is "Likely to Adversely Affect" Snake River Basin steelhead and their designated critical habitat; further, we have also issued a "May Affect" and is "Likely to Adversely Affect" Snake River spring/summer Chinook salmon designated critical habitat.

2.1 Analytical Approach

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

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

The designations of critical habitat for Snake River Basin steelhead and Snake River spring/summer Chinook salmon use the term primary constituent element (PCE) or essential features. The 2016 critical habitat regulations (50 CFR 424.12) replaced this term with physical or biological features (PBFs). The shift in terminology does not change the approach used in conducting a "destruction or adverse modification" analysis, which is the same regardless of whether the original designation identified PCEs, PBFs, or essential features. In this opinion, we use the term PBF to mean PCE or essential feature, as appropriate for the specific critical habitat.

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

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

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

2.2 Rangewide Status of the Species and Critical Habitat

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

The opinion also examines the condition of critical habitat throughout the designated area, evaluates the conservation value of the various watersheds and coastal and marine environments that make up the designated area, and discusses the function of the essential PBFs that help to form that conservation value. Table 3 describes the Federal Register notices and notice dates for the species under consideration in this opinion.

Table 3. Listing status, status of critical habitat designations and protective regulations and relevant Federal Register decision notices for ESA-listed species considered in this opinion.

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

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

2.2.1 Status of the Species

This section describes the present condition of the Snake River spring/summer Chinook salmon, and the Snake River Basin steelhead distinct population segment (DPS). NMFS expresses the status of a salmonid evolutionarily significant unit (ESU) or DPS in terms of likelihood of persistence over 100 years (or risk of extinction over 100 years). NMFS uses McElhaney et al.'s (2000) description of a viable salmonid population (VSP) that defines "viable" as less than a 5% risk of extinction within 100 years and "highly viable" as less than a 1% risk of extinction within 100 years. A third category, "maintained," represents a less than 25% 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.

2.2.1.1 Snake River Basin Steelhead

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

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

Spatial Structure and Diversity. This species includes all naturally-spawning steelhead populations below natural and manmade impassable barriers in streams in the Snake River basin of southeast Washington, northeast Oregon, and Idaho, as well as the progeny of six artificial propagation programs (71 FR 834). The hatchery programs include Dworshak National Fish Hatchery, Lolo Creek, North Fork Clearwater River, East Fork Salmon River, Tucannon River, and the Little Sheep Creek/Imnaha River steelhead hatchery programs. The Snake River Basin steelhead listing does not include resident forms of *O. mykiss* (rainbow trout) co-occurring with steelhead.

The Interior Columbia Technical Recovery Team (ICTRT) identified 24 extant populations within this DPS, organized into five MPGs (ICTRT 2003). The ICTRT also identified a number of potential historical populations associated with watersheds above the Hells Canyon Dam complex on the mainstem Snake River, a barrier to anadromous migration. The five MPGs with extant populations are the Clearwater River, Salmon River, Grande Ronde River, Imnaha River, and Lower Snake River. In the Clearwater River, the historic North Fork population was blocked from accessing spawning and rearing habitat by Dworshak Dam. Current steelhead distribution extends throughout the DPS, such that spatial structure risk is generally low. For each population in the DPS, Table 4 shows the current risk ratings for the parameters of a VSP (spatial structure, diversity, abundance, and productivity).

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

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

Abundance and Productivity. Historical estimates of steelhead production for the entire Snake River basin are not available, but the basin is believed to have supported more than half the total steelhead production from the Columbia River basin (Mallet 1974, as cited in Good et al. 2005). The Clearwater River drainage alone may have historically produced 40,000 to 60,000 adults (Ecovista et al. 2003), and historical harvest data suggests that steelhead production in the Salmon River was likely higher than in the Clearwater (Hauck 1953). In contrast, at the time of listing in 1997, the 5-year geomean abundance for natural-origin steelhead passing Lower Granite Dam, which includes all but one population in the DPS, was 11,462 adults (Ford 2011). Abundance began to increase in the early 2000s, with the single year count and the 5-year geomean both peaking in 2015 at 45,789 and 34,179, respectively (ODFW and WDFW 2019). Since 2015, the numbers have declined steadily with only 10,717 natural-origin adult returns counted in 2018 (ODFW and WDFW 2019). Even with the recent decline, the 5-year geomean abundance for natural-origin adult returns was 23,100 in 2018 (ODFW and WDFW 2019) which is more than twice the number at listing and substantially greater than the 5-year geomean of 18,847 tabulated in the most recent status review (i.e., Ford 2011).

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

Table 4. Summary of viable salmonid population parameter and risk and overall current status of each population in the Snake River Basin steelhead distinct population segment (NWFSC 2015). Risk rating with "?" are based on limited or provisional data series.

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

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

The steelhead within the action are within the Upper Mainstem Salmon River MPG. The MPG is a made up of all A-run steelhead. This population is listed as moderate productivity and moderate diversity. This population is at risk due to high numbers of hatchery fish being released and allowed to spawn, which impacts the diversity of the population. The Upper Mainstem Salmon River MPG has been subject to multiple anthropogenic disturbances over the last century. Mining, logging, and cattle grazing, as well as the road building and water diversions associated with these activities, are the main perpetrators of the disturbances. Though management of all the listed activities has decreased the effects, current and legacy impacts continue to exist.

The anadromous fish species in the upper Salmon River have seen increases in the past decade. However, over the past 2 years there has been a sharp decline in returning adult steelhead.

However, there is not sufficient data to determine if this decrease is a long term trend of just a short term phenomenon. This population of steelhead are still well below the threshold for delisting. Anthropogenic disturbances have been and continue to be a limiting factor for the full recovery of anadromous fish in the Upper 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 PBF essential to the conservation of the listed species (e.g., spawning gravels, water quality and quantity, side channels, or food) (Table 5).

Table 5. Types and 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 & 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		
Spawning & Juvenile Rearing	Spawning gravel, water quality and quantity, cover/shelter (Chinook only), food, riparian vegetation, space (Chinook only), water temperature and access (sockeye only)	Juvenile and adult
Migration	Substrate, water quality and quantity, water temperature, water velocity, cover/shelter, food[d], riparian vegetation, space, safe passage	Juvenile and adult

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

Table 6 describes the geographical extent within the Snake River of critical habitat for each of the ESA-listed salmon and steelhead species analyzed in this opinion. Critical habitat includes the stream channel and water column with the lateral extent defined by the ordinary high water line, or the bankfull elevation where the ordinary high water line is not defined. In addition, critical habitat for Snake River spring/summer 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 for ESA-listed salmon and steelhead.

Evolutionarily Significant Unit/ 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 5 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 streamflows, impaired water quality, and reduction of habitat complexity are common problems for critical habitat in non-wilderness areas. Human land use practices throughout the basin have caused streams to become straighter, wider, and shallower, thereby reducing rearing habitat and increasing water temperature fluctuations.

In many stream reaches designated as critical habitat in the Snake River basin, streamflows are substantially reduced by water diversions (NMFS 2015; NMFS 2017). Withdrawal of water, particularly during low-flow periods that commonly overlap with agricultural withdrawals, often increases summer stream temperatures, blocks fish migration, strands fish, and alters sediment transport (Spence et al. 1996). Reduced tributary streamflow has been identified as a major limiting factor for Snake River spring/summer Chinook and Snake River Basin 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 2011). Many areas that were historically suitable rearing and spawning habitat are now unsuitable due to high summer stream temperatures, such as some stream reaches in the Upper Grande Ronde.

Removal of riparian vegetation, alteration of natural stream morphology, and withdrawal of water for agricultural or municipal use all contribute to elevated stream temperatures. Water quality in spawning and rearing areas in the Snake River has also been impaired by high levels of sedimentation and by heavy metal contamination from mine waste (IDEQ and EPA 2003; IDEQ 2001).

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

- Minimizing winter drafts (for flood risk management and power generation) to increase flows during peak spring passage;
- Releasing water from storage to increase summer flows;
- Releasing water from Dworshak Dam to reduce peak summer temperatures in the lower Snake River;
- Constructing juvenile bypass systems to divert smolts, steelhead kelts, and adults that fall back over the projects away from turbine units;
- Providing spill at each of the mainstem dams for smolts, steelhead kelts, and adults that fall back over the projects;
- Constructing “surface passage” structures to improve passage for smolts, steelhead kelts, and adults falling back over the projects; and,
- Maintaining and improving adult fishway facilities to improve migration passage for adult salmon and steelhead.

Mineral exploration and mining were prevalent in the past but mining activity declined at the beginning of the 20th century. Livestock grazing is common in many of the subwatersheds in this population, and has led to sedimentation, bank instability, and loss of riparian vegetation. Gazing management has helped decrease the effects of cattle, and helped improve habitat conditions. However, the lasting impacts are still part of the limiting factors associated with depressed anadromous fish numbers. Increased water temperature and deposited fine sediment are the two main limiting factors in much of the habitat within the action areas streams.

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

One factor affecting the rangewide status of Snake River salmon and steelhead, and aquatic habitat at large is climate change. Several studies have revealed that climate change has the potential to affect ecosystems in nearly all tributaries throughout the Snake River (Battin et al. 2007; ISAB 2007). While the intensity of effects will vary by region (ISAB 2007), climate change is generally expected to alter aquatic habitat (water yield, peak flows, and stream

temperature). As climate change alters the structure and distribution of rainfall, snowpack, and glaciations, each factor will in turn alter riverine hydrographs. Given the increasing certainty that climate change is occurring and is accelerating (Battin et al. 2007), NMFS anticipates salmonid habitats will be affected. Climate and hydrology models project significant reductions in both total snow pack and low-elevation snow pack in the Pacific Northwest over the next 50 years (Mote and Salathé 2009) changes that will shrink the extent of the snowmelt-dominated habitat available to salmon. Such changes may restrict our ability to conserve diverse salmon life histories.

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

Higher water temperatures and lower spawning flows, together with increased magnitude of winter peak flows are all likely to increase salmon mortality. The Independent Scientific Advisory Board (ISAB) (2007) found that higher ambient air temperatures will likely cause water temperatures to rise. Salmon and steelhead require cold water for spawning and incubation. As climate change progresses and stream temperatures warm, thermal refugia will be essential to persistence of many salmonid populations. Thermal refugia are important for providing salmon and steelhead with patches of suitable habitat while allowing them to undertake migrations through or to make foraging forays into areas with greater than optimal temperatures. To avoid waters above summer maximum temperatures, juvenile rearing may be increasingly found only in the confluence of colder tributaries or other areas of cold water refugia (Mantua et al. 2009).

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

The grazing permit for this Allotment will run through the end of 2034. Climate change predicts warmer drier climates in much of the Northwest. One of the limiting factors in action area streams is water temperature. Restricting cattle use of riparian areas will help minimize the effects cattle have on the shade cover of streams, which will help minimize the effects on water

temperature. However, it is assumed that streams will continue to increase in temperature with climate change in the future, which will hinder the recovery of anadromous fish in the action area streams.

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 Allotment encompasses five perennial streams (Squaw, Martin, Cash, Cinnabar, and Bayhorse Creeks) which support populations of, and/or have designated critical habitat for ESA-listed fish species. There is no Snake River spring/summer Chinook salmon presence in this Allotment, although there is designated critical habitat for the species in Squaw Creek (5.64 miles), Cinnabar Creek (0.25 miles), and Martin Creek (0.25 miles). Snake River Basin steelhead are present in Squaw Creek (5.98 miles) and Cash Creek (1.38 miles) (Figure 3). Critical habitat for Snake River Basin steelhead has been designated in Squaw Creek (7.7 miles), Cash Creek (0.5 miles), and Cinnabar Creek (1.07 miles) (Figure 4). There is extensive overlap in stream reaches which are designated as critical habitat for both of these species, particularly along Squaw Creek.

The action area is used by all freshwater life history stages of threatened Snake River Basin steelhead. Streams within the action area are designated critical habitat for Snake River spring/summer Chinook salmon and Snake River Basin steelhead.

Finally, the action area, except for areas above natural barriers to fish passage, is also EFH for Chinook salmon (PFMC 1998), and is in an area where environmental effects of the proposed project may 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).

Most of the Squaw Creek Allotment action area is within the Squaw Creek PACFISH priority watershed (5^{th}-field HUC 1706020108). The rest of the Allotment is in the Slate Creek–Salmon River (HUC 1706020109) and Bayhorse Creek–Salmon River (HUC 1706020114) non-priority watersheds. The Squaw Creek watershed has ESA-listed steelhead populations and steelhead and Chinook designated critical habitat. The environmental baseline for these watersheds are

described below. Since those portions of the action area within the Bayhorse Creek–Salmon River HUC and Salmon River–Slate Creek HUC do not contain ESA-listed anadromous fish or designated critical habitat, the baseline data for these subwatersheds will not be discussed in this opinion.

2.4.1 Water Temperature

Water temperature data were collected from seven locations in the Squaw Creek watershed in 2009, 2011, and 2017. The 7-day moving maximum temperature in Squaw Creek, at the SCNF Boundary, in 2009, 2011, and 2017 was 64.2°F (17.9°C), 62.2°F (16.8°C), and 63.7°F (17.6°C), respectively. In Squaw Creek, below Martin Creek, the 7-day moving maximum temperature was 58.1°F (14.5°C) in 2009 and 56.8°F (13.8°C) in 2011. In Squaw Creek, below Cash Creek, the 7-day moving maximum was 62.6°F (17°C) in 2011 and 63.9°F (17.7°C) in 2017. In Cash Creek, above the confluence with Squaw Creek, the 7-day moving maximum was 60.9°F (16.1°C) in 2011. In Cinnabar Creek, above the confluence with Squaw Creek, the 7-day moving maximum was 59.4°F (15.2°C) in 2011. In Martin Creek, above the confluence with Squaw Creek, the 7-day moving maximum was 55.6°F (13.1°C) in 2011. In Trealor Creek, above the confluence with Squaw Creek, the 7-day moving maximum was 56.1°F (13.4°C) in 2011. Stream temperatures get warmer as you move downstream in Squaw Creek and exceed PACFISH standards below Cash and Cinnabar Creeks. Water temperature in this watershed is functioning at unacceptable risk.

2.4.2 Sediment

The SCNF has a long-term sediment monitoring site in Squaw Creek above the SCNF boundary. This site was sampled in 2008 with depth fines of 29.0%, in 2013 with depth fines at 25.3%, in 2017 with depth fines at 23.0%, and 2019 with depth fines at 25.9%. Qualitative data are not available for this indicator. However, it has likely been impacted by elevated sediment levels in some streams. High water in 2017 caused high sediment fluctuations in streams, which could have affected substrate embeddedness. Squaw Creek downstream of the SCNF boundary has ongoing disturbances related to beaver activity, mining, existing roads, and private lands adjacent to the Creek, which have likely affected substrate embeddedness. Sediment in Squaw Creek is functioning at unacceptable risk.

2.4.3 Large Woody Debris

Large woody debris (LWD) data were collected by the SCNF in accordance with PACFISH/INFISH Biological Opinion (PIBO) from two locations on Cash Creek and one on Squaw Creek. At the lower site in Cash Creek, LWD was 8.7 pieces/mile in 2003, 8.3 pieces/mile in 2008, 25.9 pieces/mile in 2013, and 0 pieces/mile in 2018. At the upper site in Cash Creek, LWD was 130.5 pieces/mile in 2013, and 109.2 pieces/mile in 2018. In Squaw Creek, LWD was 84 pieces/mile in 2003, 79 pieces/mile in 2008, 149.5 pieces/mile in 2013, and 100 pieces/mile in 2018. Low LWD numbers in 2018, specifically in Cash Creek, are likely due to high flow fluctuations in 2017 that moved LWD (Christine Stewart, professional judgement). The streams in the action area are functioning appropriately for the amount of LWD.

2.4.4 Pool Frequency and Quality

Pool frequency and quality data were conducted by the PIBO team from two locations on Cash Creek and one on Squaw Creek. The lower site in Cash Creek pool frequency was 95.6 pools/mile in 2003, 66.9 pools/mile in 2008, 95.1 pools/mile in 2013, and 67.7 pools/mile in 2018. The upper site in Cash Creek pool frequency was 90.3 pools/mile in 2008, 118.5 pools/mile in 2013, and 130.9 pools/mile in 2018. In Squaw Creek pool frequency was 45.8 pools/mile in 2003, 31.6 pools/mile in 2008, 23.5 pools/mile in 2013, and 52.5 pools/mile in 2018. Pool frequency and quality is functioning appropriately in the action area.

2.4.5 Bank Stability

Bank stability data were collected by the SCNF at seven MIM sites in the Squaw Creek watershed on SCNF lands. Bank stability at these sites ranged from 60–100%. In Trealor Creek bank stability in 2009 was 92%, in 2014 was 88%, and in 2018 was 75%. In Cinnabar Creek bank stability in 2009 was 77% and 71% in 2014. In 2010 bank stability in Martin Creek was 100%, and in 2018 bank stability was 85% in Cash Creek. In Squaw Creek bank stability was collected at three locations; within the Riparian Pasture bank stability was 75% in 2014; above the riparian pasture in Lower Squaw Creek bank stability was 71% in 2014, and 60% in 2018; and in Upper Squaw Creek bank stability was 96% in 2014. Therefore, streambank conditions are functioning at risk.

2.4.6 Riparian Vegetation

Riparian vegetation data were collected by the SCNF at seven MIM sites in the Squaw Creek watershed on national forest lands. In Trealor Creek, greenline ecological status (GES) in 2009 was 53, in 2014 was 88, and in 2018 was 92. In Cinnabar Creek, GES in 2009 was 60, and in 2014 was 83. In 2010, GES in Martin Creek was 98. In 2018, GES was 91 in Cash Creek. In Squaw Creek GES was collected at three locations; within the Riparian Pasture (59 in 2014); above the riparian pasture in Lower Squaw Creek (83 in 2014, 54 in 2018); and in Upper Squaw Creek (90 in 2014). Riparian vegetation is considered to be functioning at risk in the action area.

2.4.7 MIM Sites

The majority of the habitat parameters within the action area are functioning at risk (Table 7). However, based on the habitat data presented above, sediment and temperature are not meeting RMOs and are functioning at an unacceptable risk. One explanation for not meeting RMOs may be due to natural high flow events on Squaw Creek in 2017 that altered the riparian habitat and caused road blowouts. It is expected that the herbaceous vegetation will recover from this natural disturbance under the proposed action and following the adaptive management process. This lack of meeting RMOs for sediment and temperature are limiting factors to recovery of steelhead and Chinook; should Chinook gain access to the action area in the future. A description of each of the MIM sites is listed below.

- M284: This MIM site has been excluded from livestock grazing for the last 10 years, but will be incorporated into the grazing system. This site will be read prior to turnout in 2020, since it has not been read since 2014;

- M72: This MIM site is dominated by woody species with a minor herbaceous component;
- M71: This MIM site is dominated by woody species with a minor herbaceous component. This site is downstream of a beaver complex that washed out in the spring of 2017;
- M285: This MIM site is dominated by woody species with a minor herbaceous component. Livestock use is primarily on the adjacent bench with limited access points to water. This site will be read prior to turnout in 2020 since it has not been read since 2014.

Table 7. List of the MIM sites and the data collected within the action area streams.

Unit/Site ID	Year	Bank Stability (%)	Woody Species Regeneration		Greenline Ecological Status (GES)	Trend in GES
			Seedling/ Young (#/%)	Mature/ Dead (#/%)		
Riparian Pasture/ Squaw Creek M284	2009	86%	60/46	71/54	54/MS	Base
	2014	75%	103/37	15/12	59/MS	Static
Lower Squaw Creek/ Squaw Creek M72	2009	77%	50/48	54/52	60/MS	Base
	2014	71%	134/83	26/16	83/LS	Upward
	2018	60%	60/41	76/59	54/MS	Downward
Trealor Creek/ Squaw Creek M71	2009	92%	46/37	78/63	53/MS	Base
	2014	88%	118/76	37/24	88/PNC	Upward
	2018	75%	148/59	82/41	92/PNC	Static
Upper Squaw Creek/ Squaw Creek M285	2009	91%	22/36	39/64	49/MS	Base
	2014	96%	56/62	30/34	90/PNC	Upward

Fish habitat quality is good in many portions of the subwatershed. However, there are also many areas where fish habitat has been adversely affected by anthropogenic activities such as mining, road construction and maintenance, livestock grazing, stream diversions, and private land development. Connectivity has also been impacted over the lower part of the subwatershed by culverts, diversions, altered flow regimes, and Bruno Creek tailings disposal impoundment from the Thompson Creek Mine. This appears to have reduced the ability of the watershed to support steelhead and Chinook salmon.

2.5 Effects of the Action

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

The SCNF determined the action is "May Affect, Likely to Adversely Affect" Snake River Basin steelhead. Although the SCNF determined that the proposed action would be "Not Likely to Adversely Affect" Snake River Basin steelhead and Snake River spring/summer Chinook salmon designated critical habitat, NMFS could not concur with this determination due to multiple habitat parameters being below RMOs.

Numerous symposia and publications have documented the detrimental effects of livestock grazing on stream and riparian habitats (Johnson et al. 1985; Menke 1977; Meehan and Platts 1978; Cope 1979; American Fisheries Society 1980; Platts 1981; Peek and Dalke 1982; Ohmart and Anderson 1982; Kauffman and Krueger 1984; Clary and Webster 1989; Gresswell et al. 1989; Kinch 1989; Chaney et al. 1990; Belsky et al. 1997). These publications describe a series of synergistic effects that can occur when cattle over-graze riparian areas, including: (1) woody and hydric herbaceous vegetation along a stream can be reduced or eliminated; (2) streambanks can collapse due to livestock trampling; (3) without vegetation to slow water velocities, hold the soil, and retain moisture, erosion of streambanks can result; (4) the stream can become wider and shallower, and in some cases downcut; (5) the water table can drop; and (6) hydric, deeply rooted herbaceous vegetation can die out and be replaced by upland species with shallower roots and less ability to bind the soil. The resulting instability in water volume, increased summer water temperature, loss of pools and habitat adjacent to and connected to streambanks, and increased substrate fine sediment and cobble-embeddedness can adversely affect aquatic habitats, including critical habitat.

The proposed monitoring and adaptive management approach includes an evaluation of annual livestock use, which will help the SCNF ensure that the action is being implemented as intended. It will also allow the SCNF to track resource responses to ongoing use. As such, the proposed action relies heavily on the adaptive management strategy to integrate both annual and long-term monitoring data into daily, annual, and long-term grazing management decisions. This strategy is generally consistent with the approach discussed in the MIM protocol (Burton et al. 2011) and in federal regulations (36 CFR 220.3). Should monitoring indicate that implementation is not occurring as described (i.e., annual use indicators are not met), or that RMOs are not being met, use of the adaptive management strategy should ensure that either the permit administration or the grazing plan will be adjusted as necessary to ensure upward progress toward or maintenance of properly functioning RMOs.

2.5.1 Effects of the Action on Snake River Basin Steelhead

As stated above, livestock grazing can affect ESA-listed fish in a variety of ways. When livestock trail along streams, or enter streams to cross or drink, they can affect instream habitat conditions, disturb individual fish, or trample redds (Ballard and Krueger 2005; Gregory and Gamett 2009), which can affect population abundance or destroy eggs and embryos.

2.5.1.1 Disturbance

Cattle grazing adjacent to streams, or when crossing, drinking or loafing near streams, can disturb juvenile or adult fish. However, high water conditions present during steelhead spawning increases available cover for fish and discourages livestock presence in or near streams. These

conditions provide an inherent level of protection from potential livestock disturbances to adult steelhead. Considering proposed conservation measures, interaction between cattle and spawning fish is expected to be sporadic and infrequent. Adult steelhead interactions will be minimized by proposed measures to keep cattle off stream channels such as off-channel salting and employment of riders. The proposed measures combined with environmental conditions present during steelhead spawning should ensure that cattle and adult fish interactions are minimal. Causing adult fish to periodically relocate or dart to cover to avoid cattle is not likely to result in a major disruption of normal behavioral patterns and will not rise to the level of harassment.

Similarly, cattle trailing along streambanks and/or wading into a stream also have the potential to startle juvenile salmonids rearing in action area streams. Juvenile steelhead are present in the Allotment year-round and will likely be exposed to disturbance from grazing cattle. Ballard (1999) observed that cattle spent approximately 6% of their time on an allotment in riparian areas where they rested an average of 29% of the time and foraged for 60%. However, this is contradicted by information presented by Powell et al. (2000), which suggests not only higher levels of riparian use, but also that use of riparian areas can change dramatically throughout the grazing season and can be influenced by the season of use. Because the amount of time spent in action area streams will likely vary by season and by site-specific riparian conditions, it is likely that juvenile fish will be periodically disturbed by cattle use in Squaw Creek within the Upper Squaw Creek, Trealor Creek, Lower Squaw Creek, and Riparian Pasture Units. For juvenile salmonids, disturbance causing changes in behavior can result in alteration in feeding success, increased exposure to predators, and/or displacement into less suitable habitat. Although these effects can in some circumstances result in injury or death, fish in the action area would generally be expected to be able to safely access nearby cover and avoid injury or mortality (i.e., non-lethal, behavioral response only). Although these types of responses are similar to those that would occur from wildlife as they walk along the shore or wade into streams, they occur solely because of the proposed action, and are in addition to that which would occur naturally absent grazing. However, these minor behavioral modifications are expected to be infrequent and minor because the action area habitat conditions, streambank vegetation and pool frequency, are functioning appropriately, providing suitable cover for the short and infrequent disturbances individual or small groups of cattle are likely to present to even individual fish. In addition, the SCNF has proposed a series of conservation measures designed to keep cattle away from stream channels, such as off-channel salting, and use of riders to herd cattle away from streams. Natural inaccessibility of stream channels due to topography or dense riparian vegetation further limits the potential for these effects to occur. Although no accurate figure can be generated, those most familiar with the Allotment suggest topography and vegetative conditions results in the reduction of reaches of stream accessible to cattle and vulnerable to livestock disturbance.

2.5.1.2 Disturbance Summary

Livestock are reasonably certain to disturb some adult and some juvenile steelhead while grazing the Allotment, particularly along Squaw Creek. Adult Snake River Basin steelhead will be present while cattle are on the Allotment but high water levels characteristic of this time of year greatly increases available cover for fish and discourages livestock presence in or near streams. These conditions provide an inherent level of protection from potential disturbances to adult steelhead. The proposed conservation measures combined with environmental conditions present

during steelhead spawning should ensure that cattle and adult fish interactions are minimal. Causing adult fish to periodically relocate or dart to cover to avoid cattle is not likely to result in a major disruption of normal behavioral patterns and will not rise to the level of harassment. Juvenile steelhead will experience minor and infrequent behavioral modifications. Behavioral modifications are not expected to result in harassment because natural inaccessibility of stream channels due to topography or dense riparian vegetation limits the potential for these effects to occur. In addition, measures proposed to keep cattle away from stream channels, such as off-channel salting and use of riders to herd cattle away from streams, further limits potential interactions. For these reasons, disturbances related to livestock grazing on the Allotment will be minimized to the point of not causing harassment, death, or harm.

2.5.1.3 Redd Trampling

Cattle grazing along salmonid spawning streams has the potential to result in trampling of steelhead redds and impacts to incubating eggs/embryos. There is no available information on how much mortality would be produced by cattle trampling of redds. However, Roberts and White (1992) reported that a single fisherman wading over trout redds resulted in up to 43% embryo mortality. The authors suggested that wading by cattle would result in mortality of eggs and pre-emergent fry at least equal to that demonstrated for human wading. Redd trampling is only likely to occur when livestock grazing overlaps with known spawning and incubation periods in the action area, and where topography and riparian vegetation allow cattle access to a particular stream reach.

Using the spawning and incubation periods identified in the baseline section, and the proposed pasture rotation dates, there is potential for steelhead redd trampling between June 16 and July 7. Factors which can lessen the likelihood of effects from grazing include active measures to keep cattle off stream channels such as fencing, off-channel salting, and employment of riders. Natural factors such as topography and dense riparian vegetation can also lessen the likelihood of cattle trampling steelhead redds. All these factors either exist in the action area or are being employed to reduce redd trampling potential.

There are approximately 5.3 miles of steelhead spawning in Squaw Creek within the Lower Squaw Creek, Riparian Pasture, Trealor Creek, and Upper Squaw Creek Units (Figure 4). To the best of our knowledge, livestock have access to all 5.3 miles of steelhead spawning in Squaw Creek. There is no steelhead spawning habitat in the other Units (Figure 4).

The interagency Upper Salmon Basin Watershed Project (USBWP) Technical Team determined that steelhead could potentially be spawning between Mach 15 and July 7 (USBWP 2005). Livestock will not be in the Upper Squaw Creek Unit during the March 15–July 7 steelhead spawning or incubation periods. Therefore, livestock grazing is unlikely to affect steelhead spawning or incubation in this Unit, which has 0.7 miles of spawning habitat.

There is 1.6 miles of steelhead spawning and incubation habitat in the Trealor Creek Unit (Figure 4). Steelhead incubation may occur through July 7, therefore, livestock grazing will have the potential to affect steelhead spawning and incubation for up to 3 weeks in Year 1 and 2 in this Unit. In addition, livestock will trail for up to 10 days through Trealor Creek in Year 3

during steelhead spawning and incubation, which is an additional 2 weeks of cattle presence during steelhead spawning and incubation. If an early extension is granted, then there would be an additional 2 weeks of grazing during steelhead spawning and incubation in this Unit during Year 2.

There is 1.5 miles of steelhead spawning and incubation in the Lower Squaw Creek Unit, plus an additional 1.6 miles in the Riparian Pasture; these two Units will be grazed simultaneously. Therefore, livestock grazing will have the potential to affect steelhead spawning and incubation for up to 3 weeks during Years 1 and 3 in these Units. If an early extension is granted, then there would be an additional 2 weeks of grazing during steelhead spawning and incubation in this Unit during Years 1 and 3.

Adding the lengths of stream within the action area that will be subject to grazing during steelhead spawning and incubation means 4.6 miles of stream will be affected by grazing. There are no available steelhead redd density data for Squaw Creek within the action area. Therefore, steelhead spawning (redd) survey information compiled by the Idaho Department of Fish and Game (IDFG) from 1990 to 1998 for A-run steelhead in other portions of the Upper Salmon River basin was used to estimate steelhead redd densities for streams reaches within the Allotment (Table 8). Considering the redd densities compiled by the IDFG, NMFS estimated an average density of 0.65 redds per mile for streams in this Allotment with lesser quality habitat. Although Squaw Creek has high intrinsic potential for steelhead spawning habitat, NMFS has applied the lower 0.65 redds per mile estimate because of degraded habitat conditions in the watershed. However, it is important to note that these densities are likely an overestimate for Squaw Creek but are being used to ensure that NMFS does not underestimate potential effects in this analysis.

Table 8. Estimated maximum number of steelhead redds accessible to cows per Unit.

Pasture Unit Name	Stream Name	Stream Miles in Unit Accessible to Livestock	Intrinsic Steelhead Spawning Potential	Maximum Redds Per Mile	Maximum Redds Per Stream Accessible to Livestock
Lower Squaw Creek	Squaw Creek	1.48	High	0.65	0.96
Trealor Creek	Squaw Creek	1.52	High	0.65	0.99
Riparian Pasture	Squaw Creek	1.60	High	0.65	1.04
Upper Squaw Creek	Squaw Creek	0.00	High	0.65	0.00
Grand Total		**4.60**			**1 or 2 per year**

NMFS does not expect all exposed redds will be trampled simply because they may be accessible to livestock. Gregory and Gamett (2009) reported that cattle trampled 12–78% of simulated bull trout (*Salvelinus fontinalis*) redds while on federal grazing allotments during their study. They also noted that stocking intensity [(number pairs/suitable grazing acres) grazing days)] significantly influenced redd trampling rates; with the highest stocking intensity generating the highest observed trampling levels, and vice versa. This Allotment has a moderate to very low stocking intensity, which translates to a trampling rate less than 33%. This estimate may still be high as bull trout are fall spawners, and cattle use of riparian areas is higher in late summer than early spring when steelhead spawning (Parsons et al. 2003; McInnis and McIver 2009) overlaps with grazing. In addition, cattle are less likely to concentrate in riparian areas during spring months because of flooding, and because water and palatable vegetation are readily

available in upland areas away from streams (Leonard et al. 1997; Ehrhart and Hanson 1997; Kinch 1989; Parsons et al. 2003; Wyman et al. 2006; and McInnis and McIver 2009). McInnis and McIver (2009) reported cattle presence (hoof prints) along the greenline was 59% higher in late summer pastures (90%) than in early summer pastures (53%).

As previously stated, cattle tend not to concentrate use in riparian areas in spring and early summer when riparian areas are colder, wetter, and have lower forage palatability than uplands. High water levels and the dense riparian vegetation further limit streamside cattle activity during steelhead incubation period. Therefore, cattle use during the steelhead redd incubation period is largely expected to be limited to watering at streambanks and the occasional crossing of streams, typically repeated at the same sites. Applying these rates to the steelhead spawning streams within the Allotment, NMFS estimated the maximum number of steelhead redds potentially vulnerable to livestock trampling by Unit and Year within the Allotment. NMFS estimates up to one redd will potentially be trampled in Year 2, and up to two redds could be trampled in Years 1 and 3 under the proposed action (Table 9).

Table 9. Estimated maximum number of Snake River Basin steelhead redds potentially trampled by livestock by Unit.

Pasture Unit Name	Stream Name	Maximum Redds Vulnerable Per Stream	Est. Redds Trampled Per Unit (%*)	Est. # Trampled by Year		
				1	2	3
Lower Squaw Creek.	Squaw Creek	0.96	0.32	0–0.32	0	0–0.32
Trealor Creek	Squaw Creek	0.99	0.33	0 -0.33	0–0.33	0
Riparian Pasture	Squaw Creek	1.04	0.34	0–0.34	0	0–0.34
Upper Squaw	Squaw Creek	0	0	0	0	0
Grand Totals		**2.99**	**0.99**	**0.99**	**0.33**	**0.66**

*****Based on Gregory and Gamett (2009) range of 12% to 78%.

[a] Unit will not be grazed, but supervised trailing of up to 10 days will occur during steelhead spawning and incubation.

Table 9 demonstrates that the risk of steelhead redd trampling is relatively low in any given year, leading to an estimated trampling of up to 1 redd annually as a result of the proposed action. Trampling is more likely to occur in Years 1 and 3 of the rotation, where redds are potentially exposed in 3 and 2 Units respectfully. However, these numbers likely significantly overestimate likely redd trampling for several reasons. First, the stream miles accessible to cattle are based on miles open to grazing areas without steep slopes or thick vegetation to prevent access to streams. Second, the redd density estimate was applied equally across all miles of stream within the Allotment, despite redds typically being concentrated in only the highest quality habitat. Third, the redd densities calculated include a scenario of a blanket 33% trampling rate despite reports of reduced trampling where cover and riparian vegetation is heavy (Gregory and Gamett 2009). Therefore, these numbers should be used to gauge the relative size of the potential impact and should not be viewed as absolute numbers that are likely to occur.

To put the numbers into a population perspective, NMFS applied the maximum number of redds that might be potentially trampled annually by livestock (one per year) and converted these numbers to adult equivalents to determine the potential population level effects. For this analysis, NMFS assumes that each steelhead redd contains roughly 5,000 eggs, and steelhead egg-fry

survival is estimated to be approximately 29.3% under natural conditions (Quinn 2005). If trampling were to kill 19% of the pre-emergent fry in a redd (Roberts and White 1992), each trampled redd could result in approximately 278 fewer fry. Assuming fry-to-smolt survival approximates 13.5% (Quinn 2005), approximately 38 fewer steelhead smolts would be produced per trampled redd. Applying a conservative smolt-to-adult survival rate of 0.8% (USFWS 1998) results in less than one fewer adult equivalent (0.3) per trampled redd. Therefore, with one steelhead redd likely being trampled each year, we estimate that this will result in about one fewer returning adult steelhead for every 3 years the Allotment is grazed.

In addition to random trampling events while grazing, livestock could also have the potential to trample redds when being intentionally trailed from one Unit to another. The SCNF has indicated that livestock will be trailed from Unit to Unit under rider supervision, using established roads, trails and uplands to the extent feasible (SCNF 2020). Moves are typically of short duration (1 to 10 days), each time with one or more riders. Therefore, trailing of cattle is unlikely to result in the trampling of steelhead redds, due to the short duration per move, and trailing routes selected to avoid steelhead spawning habitat.

Trampling Summary. The proposed action both temporally and spatially overlaps spawning and incubation periods of Snake River Basin steelhead. Proposed grazing rotations, mineral placements, use of riders, drift and exclosure fences, cattle guards, and active trailing on roads combine to make the likelihood of cattle trampling of steelhead redds extremely remote but not completely unlikely. NMFS estimated that up to one Snake River Basin steelhead redd could be trampled annually within the Allotment. To complete our jeopardy analysis, NMFS converted the number of redds potentially trampled to adult equivalents using reasonable life stage survival estimates. Results of those calculations indicate the action could result in approximately one fewer adult steelhead returning to the action area every 3 years of grazing the Allotment.

The Upper Mainstem Salmon steelhead population is at Moderate abundance/productivity risk, with a generic 10-year mean below the minimum threshold of 1,000 natural-origin spawners, which is required for low risk. NMFS believes the maximum calculated loss of up to one adult fish annually is likely an overestimate for several reasons, including: (1) stream miles accessible to livestock were not modified to account for steep slopes or thick vegetation, which are known to prevent access to streams; (2) redd density estimates were calculated as though redd distribution occurs equally across all stream miles, despite redds typically being concentrated in only the highest quality habitat; (3) calculated redd trampling rates includes a 33% trampling rate, despite reports of lower trampling rates where cover and riparian vegetation is heavy (Gregory and Gamett 2009).

However, the annual loss of up to one adult equivalent every 3 years the Allotment is grazed from the Upper Mainstem Salmon steelhead population is smaller than the annual adult return variability and is too minor to influence population abundance. Therefore, the proposed action will not reduce the viability or recovery potential of the Upper Mainstem Salmon steelhead population.

2.5.2 Habitat-Related Effects

Habitat-related impacts can result in harm to individuals as habitat becomes less suitable for occupancy or the performance of essential behaviors. ESA-listed fish could be affected by the action if it degrades the available habitat in the action area. Effects of grazing on habitat relate to physical effects on the environment that further inhibit the completion of a specific life stage of the listed species. In the following analysis, NMFS determines that the effects of the action on instream habitat conditions will generally be minor, and successfully meeting the established move triggers/annual indicators is anticipated to trend habitat indicators upward from their current conditions. Because habitat-related effects are expected to be minor, effects to ESA-listed species from those effects are also expected to be minor and $A = \pi r^2 A = \pi r^2$ not expected to reach levels resulting in reduced production and/or mortality. A summary of how these habitat-related effects may affect ESA-listed fish in the action area follows.

Habitat conditions most likely to be affected by the proposed action include water quality, spawning substrate, and riparian vegetation. Affecting these habitat conditions has the potential to reduce habitat complexity and the ability of the action area to support freshwater spawning, rearing, or migration of Snake River Basin steelhead (and Chinook salmon, should they become present in the future). Habitat-related effects to fish from livestock are directly tied to the amount of time they spend in riparian areas, with effects increasing with the amount of time spent there. Despite the adaptive management plan the SCNF has in place, continued grazing in existing degraded conditions is likely to lead to a slower rate of recovery with the action than without it. Because riparian vegetation will continue to be affected, the rate of recovery will be slowed for water temperatures, instream sediment levels, and streambank conditions. As stated above, numerous symposia and publications have documented the detrimental effects of livestock grazing on stream and riparian habitats. The resulting instability in water volume, increased summer water temperature, loss of pools and habitat adjacent to and connected to streambanks, and increased substrate fine sediment and cobble-embeddedness can adversely affect salmon and steelhead, and their habitat. However, when grazing activities are well-managed, effects to fish can be minimized, stream and riparian impacts can be greatly reduced, and recovery can occur over time.

The proposed action, including established pasture rotations, range improvements, in-season move triggers, annual utilization standards, and adaptive management strategy have been established specifically for the Allotment with the intent that PACFISH standards and objectives will be met and the above-described potential adverse effects to ESA-listed fish and their habitat will be avoided. A summary of the in-season/end-of-season grazing use indicators that have been designed to avoid habitat-related effects is provided in Table 2. The SCNF will monitor the stubble height of grasses, sedges, and rushes, along with streambank alteration levels to determine when cattle should be moved from individual Units or when use of sensitive areas should be eliminated. Literature summarized here indicates that the proposed use levels can reasonably be expected to prevent major resource damage while still allowing for recovery of annual grazing disturbances prior to the next year's grazing. This can reduce consequences to fish and can promote achievement of "properly functioning" conditions over time. Ehrhart and Hansen (1997) found mixed success when only one use standard/management objective was applied on an allotment. However, by concurrently monitoring multiple annual indicators, the

SCNF will be able to work with the permittees to move cattle or eliminate access to sensitive areas based on the most sensitive indicator for a given year. This is important as annual variability in precipitation and air temperature, which may be influenced by climate change, can cause wide discrepancies in forage availability and thus annual livestock foraging habits. This process is expected to minimize negative riparian-related impacts from occurring, maintaining properly functioning conditions where they currently occur, and ensuring an upward trend in habitat indicators elsewhere on the Allotment.

Stubble height has a direct relationship to the health of herbaceous riparian plants and the ability of the vegetation to provide streambank protection; to filter out and trap sediment from overbank flows; and in small streams to provide overhead cover (University of Idaho Stubble Height Review Team 2004; Roper 2016; Saunders and Fausch 2009). On monitoring sites across 17 National Forest and four Bureau of Land Management Units in the Interior Columbia River basin, Goss (2013) found a linear relationship between increasing stubble height and multiple components of high-quality salmonid habitat: increasing residual pool depth, increasing streambank stability, increasing percent undercut banks, and decreasing streambank angle. This suggests that across stream and riparian conditions evaluated within the Interior Columbia River basin, the higher the stubble height the greater the likelihood stream conditions favored by salmonids will be present (Goss 2013).

Multiple studies have evaluated minimum stubble heights necessary to protect stream habitat from the impacts of livestock grazing. Most studies have reported stubble height of the entire greenline graminoid and herbaceous community—as opposed to a subset of key plant species—because it is simpler to evaluate, avoids controversy over which species to monitor, and is likely more informative of actual streambank conditions than knowing the height of a subset of plant species (Roper 2016). Using PIBO data from federal lands in the Columbia basin, Goss (2013) found that stubble height was related to streambank disturbance, and streambank disturbance began to increase substantially when stubble heights fell below 10 inches. Bengeyfield (2006) found that a 4-inch stubble height did not initiate an upward trend in stream channel morphology at sites on the Beaverhead–Deerlodge National Forest in Montana, based on 7 to 9 years of monitoring. Clary (1999) found that while 5-inch stubble height at the end of the growing season resulted in improvements in most measured aquatic and riparian conditions in an Idaho meadow after 10 years, 6.5-inch stubble height was needed to improve all measured habitat metrics. Pelster et al. (2004) found that during summer and fall grazing, greater than 40% of cattle diets were willow when stubble heights were less than 8 inches; they suggested that stubble heights greater than 8 inches were needed to reduce willow consumption during these critical periods. Willows enhance salmonid habitat by providing fish with cover, modulating stream temperatures, and contributing leaf detritus and terrestrial insects that expand food sources (Bryant et al. 2006; Clary and Leininger 2000; Murphy and Meehan 1991). This reinforces the idea that higher stubble heights lead to improved fish habitat.

After reviewing the available scientific literature, including all of the studies mentioned above, Roper (2016) strongly recommended 6 inches as a starting point for a stubble height objective, measured at the end of the growing season, for small- to medium-sized cold water streams inhabited by salmon and trout. This is consistent with Clary and Webster (1989), who suggested a 6-inch starting point for stubble height objectives in the presence of ESA-listed or sensitive

fish. Roper (2016) acknowledges that 4 inches or 8 inches could be appropriate stubble height objectives for some stream sites, but that site-specific data would be necessary to support these more liberal or conservative objectives. The scientific literature therefore suggests that the SCNF's proposed stubble height objective of 4 to 6 inches will likely be effective in minimizing livestock damage to streambanks on the Allotments if permittee compliance rates remain high.

The SCNF proposes that a residual stubble height of 6-inches on hydric species be applied within the Lower Squaw Creek and Riparian Pasture Units to improve the condition of riparian vegetation (USDA Forest Service 2020) (Table 2). The SCNF proposes a residual stubble height of 4 inches be applied to Trealor Creek and the Upper Squaw Creek Units (Table 2). Considering baseline conditions in the Allotment, NMFS believes the residual stubble height limits upon livestock grazing will be sufficient to limit sediment delivery associated with overland flow, and will allow continued recovery and maintenance of stream conditions within the Allotment.

Streambank disturbance can affect riparian vegetation and eventually result in increased erosion and subsequent sediment delivery to action area streams. To address this, the SCNF has proposed to monitor streambank alteration as another annual use indicator for managing livestock use on the Allotment. Streambank alteration is used to evaluate the amount of annual bank disturbance caused by livestock grazing, the levels of which can then be related to streambank stability and riparian vegetation conditions within the greenline (Cowley and Burton 2005). Bank trampling can lead to increased channel widths, decreased depths, and slower water velocity. These channel changes can cause sediment deposition mid-channel, which can further erode and reduce water storage in streambanks, resulting in changes to vegetation composition from willows and sedges to drier species. Although unlikely to reach a scale that will result in fish mortality, these types of impacts all have the potential to affect ESA-listed fish species present in action area streams by reducing the quality of overall fish habitat.

Bengeyfield (2006) reported that bank alteration levels were the most sensitive annual indicator they employed. On streams over-widened by historical overgrazing, they noted that between forage utilization, stubble height, and streambank alteration, streams managed for streambank alteration were the only streams consistently showing significant improvement after a 4- to 6-year period. They concluded that streambank alteration was the only annual use indicator that initiated the upward trend in stream channel shape that they believed was necessary to achieve riparian function. Their study streams were predominantly meadow systems. While the Allotment contains reaches of streams meandering through meadow complexes, the majority of streams are in moderately steep canyons with confined valley bottoms and willow and alder vegetation. Therefore, the use of a combination of in-season/end-of-season grazing use indicators appears most appropriate for this Allotment. Because channel conditions, which influence fish productivity, are affected by cattle and influenced by riparian vegetation, it is important to monitor both streambank alteration and vegetation utilization on this Allotment. The proposed multi-indicator monitoring and adaptive management strategy should avoid instances where an improper or insensitive standard is continually met and yet still leads to a downward trend in one of the RMOs and, ultimately, degraded habitat conditions.

Cowley (2002) suggested the maximum allowable streambank alteration that maintained streambank stability was 30%. It was further suggested that if 30% streambank alteration was the

minimum necessary to maintain streambank conditions, that applying a 20% streambank alteration standard should allow for making significant progress in areas not meeting desired conditions. However, Cowley (2002) cited other studies to support his recommendation that "10% or less alteration would seem to allow for near optimal recovery and should not retard or prevent attainment of RMOs". The SCNF will use their adaptive management strategy on bank alteration also. The Riparian Pasture will have an end-of-season bank alteration of 10–15%, Lower Squaw Creek Unit will have a 10% bank alteration indicator, Trealor Creek Unit will have a 15% bank alteration indicator, and Upper Squaw Creek will have a 20% bank alteration indicator (Table 2). Streams are not currently meeting RMOs on this Allotment, and although achievement of properly functioning conditions will take longer than they would absent grazing, applying bank alteration annual indicators of 20% or less within all grazing Units will ensure that habitat-related effects to fish species are minor and conditions should continue to improve at near natural rates.

Proposed monitoring, including adoption of appropriate in-season/end-of-season grazing use indicators, will enable the SCNF to move cattle off the Allotment or eliminate access to sensitive sites before excessive cattle use could initiate bank instabilities or lead to other potential adverse habitat effects. If an exceedance occurs, the SCNF will first determine why the indicator was not met, and secondly determine if any effects not previously considered occurred as a result of the exceedance. If such an exceedance occurs, the SCNF proposes to modify allotment administration. Allotment modifications will be designed to reduce the likelihood of additional impacts both within the current year (e.g., move livestock to another pasture or off the Allotment, fencing, increased riding, etc.) and during future years (e.g., fencing, increased riding, changes in number of livestock, rotation, or season of use, etc.) Should an exceedance result in effects not considered in this consultation, NMFS expects the SCNF will pursue reinitiation of consultation. Although specific changes to Allotment administration are impossible to identify before a problem occurs, typical changes can include modifying stocking rates, changing seasons of use, mineral site adjustments, or increased riding or fencing of site-specific problem areas during subsequent season(s). Successful implementation of adaptive management can reasonably be anticipated to modify grazing practices such that the magnitude of adverse effects to ESA-listed fishes and their habitat are sufficiently minimized.

2.5.3 Critical Habitat

In the action area, Snake River Basin steelhead designated critical habitat is found in Squaw, Cash, and Cinnabar Creeks, and Snake River spring/summer Chinook salmon critical habitat is found in Squaw, Martin, and Cinnabar Creeks. The proposed action has the potential to affect the following PBFs: (1) water quality; (2) substrate; (3) forage/food; (4) natural cover; and (5) riparian vegetation. Any modification of these PBFs may affect freshwater spawning or rearing in the action area. Proper function of these PBFs is necessary to support successful adult and juvenile migration, adult holding, spawning, rearing, and the growth and development of juvenile fish.

The following discussion on PBFs applies to freshwater spawning, rearing, and migration sites of Chinook and steelhead within the action area.

2.5.3.1 Water Quality

Habitat impacts associated with this Allotment are likely to include small areas of denuded and/or collapsed streambank where cattle repeatedly access streams to drink or cross while foraging. Denuded areas associated with watering and crossing sites are likely to result in a slight increase in turbidity for a short distance downstream during rainstorms or runoff events. Although a return of livestock grazing to Lower Squaw Creek Unit (which had a bank stability of less than the 90% RMO at the monitoring site) could cause increased sediment delivery to downstream reaches, given background levels of turbidity during runoff events, it will be difficult to distinguish between turbidity resulting from these minor grazing impacts and background turbidity. Ramifications of this potential increase in sediment delivery are addressed below (see Section 2.5.3.2 Spawning Substrate). Cattle waste is likely to lead to a slight increase in nutrients; however, impacts will be localized and immeasurable as a result of proposed measures designed to limit cattle use in riparian areas.

Shade provided by vegetation can be important in keeping stream temperatures cool for salmonids (Zoellick 2004). Li et al. (1994) and Zoellick (2004) found that trout abundance decreased as solar input and water temperature increased. Water temperature is primarily affected by stream shade and channel geometry. Livestock grazing can increase water temperature if riparian vegetation removal results in increased solar exposure. Effects could occur if livestock remove large quantities of vegetation, either through foraging or trampling. Reduced riparian vegetation can result in increased streambank instability, which in turn leads to over-widened streams. Over-widened streams expose a greater surface area of shallower water to the sun. This can further increase water temperatures.

Stream temperatures can have important effects on fish distribution and abundance. Livestock grazing can impact aquatic and riparian habitats by reducing streamside vegetation or reducing stability of streambanks, both of which can result in channel widening and increased solar exposure, leading to elevated stream temperatures (Platts 1991). Livestock grazing can impact stream temperatures both in areas that are grazed by livestock and in areas downstream from where grazing occurs.

Historic livestock grazing on this Allotment has modified stream channels and riparian vegetation along several streams in a manner that has resulted in small increases in temperatures of some streams. The Lower Squaw Creek, Riparian Pasture, Upper Squaw Creek, and Trealor Units will be rested every third year to reduce potential streambank and riparian vegetation impacts that are caused by over-use and early or late season use.

The proposed rest-rotation and deferred rotation grazing system, stubble height, and woody browse utilization standard are expected to maintain a vegetated canopy cover along Squaw Creek and Martin Creek in the Upper Squaw Creek, Trealor Creek, and Lower Squaw Creek Units. NMFS expects the grazing rotation and the woody browse utilization standard to improve the canopy cover in these Units.

The proposed action includes measures, including new bank alteration standards, salting, and early season use to minimize livestock use along stream reaches. This should result in livestock

having less potential to impact stream temperatures. Proposed annual use standards serve to reduce potential livestock impacts on water temperatures by minimizing riparian vegetation use and livestock impacts to streambanks within the Allotment. Further, successful use of the described adaptive management program is expected to minimize site-specific impacts and prevent a onetime exceedance of annual utilization level from leading to long-term habitat degradation. This should result in an upward trend of indicators toward desired conditions. Application of the adaptive management strategy to modify riparian annual use indicator standards for stubble height, woody browse, and/or bank alteration are expected to result in upward trends in riparian condition and streambank stability which would serve to effect an improvement in water temperature regimes. For these reasons, the proposed action is expected to have minor adverse effects on water quality in the action area. Nonetheless, vegetative recovery is expected to be slower than with no grazing, especially where the 20% bank alteration and 4-inch stubble height indicators will be applied.

In summary, past livestock grazing activities have been identified as contributing factors influencing water quality. The proposed action is not expected to decrease water quality beyond currently observed levels. Application of the adaptive management strategy will implement modifications to annual use indicators in impacted areas of the Allotment in response to observed habitat conditions below desired levels. Implementation of the adaptive management strategy is expected to result in improvement of focus indicators, which can influence water quality and cause an upward trend in habitat conditions that effect water quality. Therefore, the proposed action is expected to maintain and, over time, improve the condition of the water quality PBF within the action area. Proposed ongoing MIM monitoring will continue to identify future status and trends of riparian vegetative condition within the action area. These monitoring operations will be effective in continuing to identify both the occurrence and causal mechanisms of any changing conditions which would continue to direct responsive modification of grazing management strategies for the Allotment under the adaptive management strategy.

2.5.3.2 Spawning Substrate

Historic livestock grazing prior has likely resulted in measurable increases in sediment levels and reduced the ability of Squaw Creek watershed to support steelhead and Chinook salmon critical habitat PBFs. Bank erosion is a potentially large source of sediment delivery. Increased sediment in spawning gravel can lead to reduced spawning success and reduced growth of juvenile salmonids. Chinook salmon do not occupy portions of Squaw Creek within the Allotment and therefore will not experience these habitat-related effects at this time. However, Snake River Basin steelhead do occupy approximately 5.3 miles of Squaw Creek within the Allotment and may currently experience effects to this PBF. The baseline conditions for Squaw Creek indicates that sediment is “functioning at unacceptable risk” under current grazing practices. Although overall bank stability may still continue to improve over time as predicted by the SCNF, thereby reducing sediment inputs, the rate of improvement under the proposed grazing levels will be slower than would occur without continued grazing or under more conservative use prescriptions.

Livestock will cross, water, and graze along some stream reaches in the Allotment and there will undoubtedly be minor instances of sediment introduction at crossings, watering sites, or where

foraging activities result in low levels of bank alteration. These sediment introductions are likely to cause minor and temporary increases in substrate fine sediment in low velocity areas immediately downstream. In addition, the use of riders, salting, and the described annual use indicators are expected to prevent measurable degradation of bank conditions, which would otherwise lead to elevated sediment levels. These measures should ensure that the existing sediment conditions are maintained where "Functioning Appropriately," and trend toward recovery where "Functioning At Risk" or "Unacceptable Risk." NMFS also anticipates a long-term reduction in sedimentation as riparian conditions as well as streambank stability continue improving over time.

The proposed action is therefore expected to maintain the current condition of the substrate PBF in the short term, and result in an improvement to sediment levels over time (although at a slower rate than would occur absent grazing). Ongoing sediment monitoring will be employed to continue to identify trends of stream substrate conditions within the Allotment. These monitoring operations, supplemented by ongoing MIM monitoring, should be effective in identifying both the occurrence and causal mechanisms of any change in substrate conditions which would initiate responsive modification of grazing management strategies for the Allotment under the adaptive management strategy. Therefore, the proposed action is expected to maintain and, over time, allow for improvement of the condition of this PBF within the action area.

2.5.3.3 Natural Cover

Salmonids appear to prefer spawning in close proximity of overhead cover (Bjornn and Reiser 1991), and overhead cover protects juvenile salmonids from predation. Cover can also influence livestock access to streams reducing trampling where cover is high or riparian vegetation is thick (Gregory and Gamett 2009). There will be a slight, short-term (1 to 6 months) reduction in overhead vegetative cover at each access point and in individual riparian areas receiving actual grazing use. However, these effects are expected to be localized and not at a scale that would influence cover on a stream reach scale. Also, considering the prescribed riparian vegetation utilization standards, grazed riparian vegetation is expected to grow back prior to the start of the following grazing season. Available literature indicates the proposed utilization levels will allow maintenance of vegetation where currently meeting RMOs. Where riparian areas are not meeting RMOs, the SCNF proposes a more restrictive utilization standard be applied, which should result in continued improvement of riparian conditions in these areas. Because riparian conditions have shown demonstrable improvements or maintenance of appropriately functioning conditions in the action area under past grazing, it is reasonable to assume these patterns will continue and the action will have only minor effects on cover.

No information currently exists documenting the amount or locations of undercut banks available to fish as cover in the action area. However, as previously discussed, current bank stability ratings are "Functioning at Risk" in areas accessible to livestock use. This suggests that past grazing activities may have at least locally reduced the available quantity of undercut banks providing cover for ESA-listed fish in the action area. Under the proposed action, NMFS anticipates this condition to persist for the short term while riparian and streambank conditions improve over time in response to the proposed grazing strategy. Therefore, as proposed, the

action should not result in further degradation of streambank conditions and should result in a long-term improvement at both stream reach and watershed scales.

2.5.3.4 Forage

More than half of some fish's food originates from terrestrial sources (Baxter et. al. 2005; Saunders and Fausch 2007). The remaining food is aquatic, with many of these prey species feeding on terrestrial leaf litter. Aquatic invertebrates, another major fish food source, also depend heavily on terrestrial vegetation inputs. Therefore, riparian vegetation is very important to fish growth and survival in natal streams. Saunders and Fausch (2007) reported grazing management can influence terrestrial invertebrate inputs and demonstrated that short duration, high-intensity grazing management resulted in large growth and abundance increases of fish when compared to season-long grazing management. Saunders and Fausch (2009) observed no difference in invertebrate biomass entering streams between sites managed for rotation grazing and ungrazed sites. The proposed action utilizes a rotational grazing scheme with low to moderate intensities. As a result, the action is expected to have effects consistent with the cited literature and thus minimal impacts to forage inputs are anticipated.

2.5.3.5 Riparian Vegetation

Similar to those PBFs described above, riparian vegetation impacts from the proposed livestock grazing are expected to be minor. Although cattle will consume and trample some riparian vegetation, the proposed conservation measures and annual utilization standards should greatly limit potential disturbance. All Units in the Allotment will have a 30–50% woody riparian browse utilization standard to limit livestock impacts to woody riparian species. This level of use has been consistently demonstrated to allow for a stable trend where the trend is currently at potential natural community (PNC), or, where not at PNC, a trend towards late seral status (Holechek 2004). The grazing season flexibility will also prevent overgrazing of seedlings and saplings which limits age class diversity and regeneration. To prevent a downward trend in riparian condition, the SCNF will rely on the woody browse criteria in the willow, boulder, and cobble dominated reaches to trigger movement of livestock and limit potential grazing impacts. As such, there is a low likelihood of reducing riparian vegetation under the proposed action.

The SCNF's other conservation measures are also expected to help maintain or achieve late seral status or PNC. A deferred rotation grazing system should ensure no one site is consistently grazed early or late in the season. This will allow for benefits of early and late grazing season to occur regularly, and ensure any detrimental impacts due to early or late season grazing are minimized. For example, when a Unit is grazed first, browse on willows will be less (Hall and Bryant 1995; Kovalchik and Elmore 1991) and, when the Unit is deferred to the following season, upland and riparian herbaceous plants will be allowed to achieve maximum growth before grazing. Waiting for appropriate range conditions to turn livestock out (range readiness) will result in less potential impacts to soils and better distribution of livestock. For example, soil moistures will have decreased when range conditions are adequate, thus resulting in less soil disturbance. At the same time, herbaceous plants in the uplands should still be fairly palatable resulting in livestock spending less time in riparian areas. Salting at least one-quarter mile away from creeks and riding for improved distribution of livestock will also help minimize cattle

presence and potential impacts along streams and in riparian areas. Salt placed away from creeks will tend to encourage cattle to utilize other areas of the Allotment besides riparian areas. Riding would also serve the same purpose. These measures are expected to lead to a management scenario under which only minimal impacts on riparian vegetation will occur.

As conditions in riparian areas improve, fish habitat is expected to become more complex, both in the critical habitat reaches and upstream reaches. Improvements will be largely due to increases in overhanging vegetation and increased bank stability as vegetation vigor improves. As vegetation increases, roots will stabilize streambanks, and stems and foliage will slow water velocities, trap fine sediment, provide overhead cover for fish, provide shade that may aid in keeping stream temperatures cool, and provide surfaces for macroinvertebrates to inhabit.

Multiple habitat parameters are not meeting PACFISH standards. The lack of meeting these standards mean that ESA-listed fish are subject to the degraded habitat conditions until the point when habitat conditions recover. Continued grazing in the degraded habitat will result in a slower recovery rate than without grazing. Information obtained from annual indicator monitoring will provide data and information to determine whether the current season's livestock grazing is meeting the intended criteria for livestock use in riparian areas. These data will provide the information needed to allow land managers to use the adaptive management plan to make annual changes to livestock grazing management practices necessary to continue to meet, or improve, RMOs in the action area.

2.6 Cumulative Effects

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

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

The Squaw Creek Allotment is completely managed by the SCNF; there are no state or private lands within the Allotment. The Squaw Creek watershed as a whole, including the Allotment and downstream of the Allotment to the confluence with the Salmon River, is made up of 80% SCNF lands, 19% BLM managed lands, and 1% privately owned lands. All BLM and privately owned lands are downstream of the Allotment. Cattle grazing and recreation are the primary uses within the BLM and private lands. There is a limited amount of mining that may still be occurring downstream of the Allotment. There are no known or proposed changes that will occur to the current use of BLM or private lands. The effects and use downstream of the Allotment will likely continue at the same rate as is currently being utilized.

The entire Allotment is managed by the SCNF. The BLM and private lands downstream of the Allotment are utilized primarily by grazing and recreational use. The current effects will likely remain constant throughout the life of the grazing permit. The cumulative effects will be very minimal given that the entire action area is owned and managed by the SCNF.

2.7 Integration and Synthesis

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

There are 5.3 miles of steelhead spawning habitat within the action area, 4.7 of which will be grazed during spawning and incubation periods. Within the Units that will be grazed during spawning and incubation periods, all 4.7 miles of spawning habitat is accessible to cattle. Cattle have the potential to trample redds for up to 3 weeks each year. During Years 1 and 3, Lower Squaw Creek and the Riparian Pasture Units will be grazed during steelhead spawning and incubation periods for 3 weeks. During Year 2, the Trealor Creek Unit will be grazed for 3 weeks during steelhead spawning and incubation periods. In addition, during Year 3 cattle will be trailed through the Trealor Creek Unit to reach the Upper Squaw Creek. If an early season extension is granted, cattle could be present for an additional 2 weeks in the Unit being grazed first in the rotation. Cattle also have the potential of disrupting juvenile steelhead behavior, which will be present in the action area year-round. The protective measures implemented with the action, such as riding and salting, will help minimize the time cattle spend in the riparian areas. Further, the in-season/end-of-season indicators will protect the habitat that is required for steelhead, and steelhead spawning. Given the measures to protect steelhead and spawning habitat, it is expected that no more than one steelhead redd will be trampled in any given year for this proposed action.

The number of fish affected is expected to be too small (i.e., approximately one adult equivalent every 3 years for steelhead) and the type of habitat-related effects too minor to produce any observable effect on the VSP parameters of the ESA-listed species. This is true given wide annual variability in adult and juvenile returns and seasonal variations in habitat use. Additionally, impacts to the steelhead population will be spread amongst multiple year classes. This further reduces the likelihood of any appreciable population level impacts on the VSP parameters. The action will not greatly modify the VSP parameters for the affected population of Snake River Basin steelhead. Since VSP parameters for the population will not be greatly affected, it is even less likely that VSP parameters will be affected at the MPG or DPS levels. For this reason, the action will not appreciably reduce the likelihood of survival and recovery of the Snake River Basin steelhead DPS.

The effects of grazing on proposed critical habitat PBFs will be limited to small, localized, short-term turbidity increases when cattle cross or water from action area streams, low water quality, forage, and natural cover impacts as a result of minor riparian vegetation utilization and bank alterations. The substrate PBF for steelhead will be temporarily affected by redd trampling. However, this will only affect a very small area in any given season (no more than one redd within designated critical habitat per year). Proposed Unit rotations, strict adherence to the annual move-triggers and long-term RMOs, successful adaptive management, and use of minerals, riders, exclosure fences, and active trailing all contribute to limiting the potential effects of the action on critical habitat PBFs. In the long term (years to decades), all critical habitat PBFs are expected to continue to improve since grazing is being implemented with closely monitored move-trigger and subsequent adaptive management decisions that will continue allowing riparian vegetation and stream channels to recover to appropriate conditions. Thus, the proposed action will allow for a gradual increase in the conservation value of critical habitat.

Information obtained from annual indicator monitoring will provide data and information to determine whether the current season's livestock grazing is meeting the intended criteria for livestock use in riparian areas. These data will provide the information needed to allow land managers to use the adaptive management plan to make annual changes to livestock grazing management practices necessary to continue to meet, or improve, RMOs in the action area.

The entire Allotment is managed by the SCNF. Therefore, the cumulative effects should be minimal.

The grazing permit for this Allotment will run through the end of 2034. Climate change predicts warmer drier climates in much of the Northwest. Two of the limiting factors in action area streams are water temperature and deposited sediment. Restricting cattle use of riparian areas will help minimize the effects cattle have on the riparian vegetation, which will minimize bank alteration and shade cover of streams. This will in turn minimize the effects on sediment input and water temperature. However, it is assumed that streams will continue to increase in temperature with climate change in the future, which will hinder the recovery of anadromous fish in the action area streams.

2.8 Conclusion

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

2.9 Incidental Take Statement

Section 9 of the ESA and federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without a special exemption. "Take" is

defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. "Harm" is further defined by regulation to include significant habitat modification or degradation that actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering (50 CFR 222.102). On an interim basis, NMFS interprets "harass" to mean "Create the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering." "Incidental take" is defined by regulation as takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the federal agency or applicant (50 CFR 402.02). Section 7(b)(4) and section 7(o)(2) provide that taking that is incidental to an otherwise lawful agency action is not considered to be prohibited taking under the ESA if that action is performed in compliance with the terms and conditions of this ITS.

2.9.1 Amount or Extent of Take

In this opinion, NMFS determined that incidental take is reasonably certain to occur as follows: Livestock grazing will occur in the same vicinity and during the same period as Snake River Basin steelhead spawning and incubation in Squaw Creek within the Lower Squaw Creek, Riparian Pasture, and Trealor Creek Units. Although several protective measures are included in the proposed action to limit the potential for livestock trampling of steelhead redds during steelhead spawning/incubation, the proposed rotation and timing of grazing make it possible that up to one steelhead redd could be trampled annually.

Despite NMFS estimating the number of redds that could be trampled in the preceding opinion, the number of trampled redds will not be used to establish the amount of take for this opinion, as it cannot be readily monitored by field personnel within this Allotment. Steelhead redds are constructed in the early spring, and while some redds may be visible early in the season, peak flows occur approximately during the middle of the spawning period. Ice shelves along stream margins, high flows, and turbid water make redd inventory in the action area inaccurate and impractical to complete. In addition, substrate around and in any redds identified before peak flows are likely to be reorganized or covered by substrate deposits during runoff, making redds essentially invisible after flows drop. Thus, it would be impractical to determine how many redds are present in the action area, let alone accurately determine how many of those redds are subsequently trampled by cattle each grazing season. Because circumstances causing take are likely to arise, but cannot be quantitatively measured in the field, the extent of incidental take is described, pursuant to 50 CFR 402.14(i).

Similarly, it is difficult for NMFS to quantify the extent of take for the action as proposed. There is no known forage utilization or channel measurement indicators that directly correlate to steelhead redd trampling rates. However, steelhead redd trampling is most likely to occur when cattle concentrate in riparian areas, with trampling occurring when cows cross or enter streams to water. Streambank alteration provides an indication of the amount of time cattle spend in riparian zones, increasing with both the number of cows present and with the time spent by those cows in riparian areas. Streambank alteration is already proposed as both a move-trigger and annual use indicator. As such, alteration levels will be measured during routine Allotment monitoring along

greenlines within individual Unit DMAs and elsewhere in individual Units. Therefore, NMFS will use percent streambank alteration as the extent of take for this opinion.

The SCNF proposed a bank alteration limit of less than 10% be applied to the Lower Squaw Creek Unit, a bank alternation limit of 15% in the Trealor Creek and Riparian Pasture Units, and a 20% bank alteration on the Upper Squaw Creek Unit. The proposed action indicates that the permittee should begin moving cattle at identified move-trigger points, which will be set at levels 5% below the limit to ensure the end-of-season value meets maximum allowed use levels. In this opinion, NMFS determined that the proposed move-triggers and annual use standards would help reduce cattle presence in streamside areas such that trampling would be limited to no more than one Snake River Basin steelhead redd per year which would not jeopardize the species. Therefore, NMFS has established the extent of incidental take limit authorized by this opinion as streambank alteration levels: (1) less than 10% in Units where bank stability is less than 60%; (2) less than 15% in Units where bank stability is 60–79% in non-priority watersheds, or 60–89% in priority watersheds; or (3) less than 20% in Units where the bank stability RMO is being met. This extent of take is not coextensive with the proposed action, because grazing is not intended or expected to reach the specified extent of streambank alteration.

Allotment monitoring will be critical to ensure: (1) all assumptions used to develop this take statement are accurate; (2) the SCNF does not exceed the amount of take authorized; and (3) implementation of the action results in the intended effects and allows for rapid change in grazing management when effects differ from what was anticipated. If at any time the level or method of take exempted from take prohibitions in this opinion is exceeded, reinitiation of consultation is required. Reinitiation of consultation is also required if any of the proposed or required monitoring of this ITS are not completed, or if reinitiation is requested by NMFS.

2.9.2 Effect of the Take

In this 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 Snake River Basin steelhead or destruction or adverse modification of Snake River Basin steelhead or Snake River spring/summer Chinook salmon critical habitat.

2.9.3 Reasonable and Prudent Measures

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

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

The SCNF shall:

1) Minimize the potential for incidental take resulting from trampling of Snake River Basin steelhead redds.

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

2.9.4 Terms and Conditions

The terms and conditions described below are non-discretionary, and the SCNF or any applicant must comply with them in order to implement the RPMs (50 CFR 402.14). The SCNF 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. To implement RPM #1, the SCNF shall ensure that:

   a. The proposed action, including all described conservation measures, monitoring, and adaptive management processes are implemented as described in the BA and proposed action section of this opinion.

   b. The extent of incidental take is not exceeded, by ensuring streambank alteration levels along Squaw Creek where Snake River Basin steelhead redd trampling is expected to occur (within Lower Squaw Creek, Riparian Pasture, and Trealor Creek Units) do not exceed the following levels at any time during the identified Snake River Basin steelhead incubation period for the action area (May 15 to July 7):

      (1) 10% in Units where streambank stability conditions are less than 70%;

      (2) 15% in Units where bank stability conditions are 70–89% for that Unit;

      (3) 20% in Units where the bank stability RMO is being met (i.e., at least 90%).

   c. To further reduce steelhead redd trampling potential in Squaw Creek (in Lower Squaw Creek, Riparian Pasture, and Trealor Creek Units), where redd trampling risk is highest, the proposed adaptive management process should be immediately triggered if streambank alteration at the end of the Snake River Basin steelhead incubation period (July 7) exceeds levels identified in Term and Condition 1.b.

      Once, triggered, the adaptive management strategy shall be used to further reduce the potential for cattle/steelhead redd interactions including, but not limited to, adjusting in-season move-triggers, rotation/season of use, cattle numbers, and/or implementation of additional minimization/avoidance measures.

   d. Each Unit with potential Snake River Basin steelhead redd trampling (i.e., Lower Squaw Creek, Riparian Pasture, and Trealor Creek Units) will contain at least one DMA that is also located in an area where the risk of cattle trampling of redds is highest. If unable to

establish suitable DMAs in these locations, coordinate location(s) of suitable DMAs with the SCNF Interagency Level 1 Streamlining Team (NMFS Level 1 Team).

(1) Definitions for DMA shall be as described in the SCNF's February 21, 2020, Squaw Creek BA.

(2) Appropriately trained SCNF or contract staff will monitor streambank alteration levels, using the same protocols identified in the proposed action, at each Unit's DMA. The monitoring shall occur within 2 weeks of moving cattle off each Unit, or by July 7, whichever comes first.

e. The Allotment permittee or their employees receive training to appropriately implement the alteration triggers identified in the proposed action.

f. Annual meetings are conducted with the permittee to discuss specific actions necessary to protect vulnerable spawning areas in stream reaches with the highest potential for cattle interaction with Snake River Basin steelhead spawning fish and/or redds (Lower Squaw Creek, Riparian Pasture, and Trealor Creek Units).

g. Frequent riding (at least twice per week) is implemented in the Lower Squaw Creek, Riparian Pasture, and Trealor Creek Units during the Snake River Basin steelhead incubation period (May 15 to July 7), with the intent to reduce cattle use within and adjacent to potential Snake River Basin steelhead spawning habitats in these Units.

h. On Units where trampling of steelhead redds may occur (i.e., Lower Squaw, Riparian Pasture, and Trealor Units), permittees inspect and repair fence lines intended to keep livestock within intended Unit boundaries before turnout onto those Units.

i. All fences, and water developments that reduce cattle use adjacent to streams with ESA-listed fish species are properly maintained and functioning as intended.

j. Turnout dates, move triggers, and end-point indicators, as well as responsible parties, are outlined in the grazing permit's annual operating instructions (AOI) to the permittee.

To implement RPM #2 (monitoring and reporting), the SCNF shall ensure that:

a. Each Allotment Unit's DMA or MIM is annually monitored to determine compliance with all identified annual use indicators identified in the proposed action. The report shall also identify any modifications to move-triggers or annual indicators that result from implementing the adaptive management strategy.

b. An end-of-year report is available to NMFS by March 1 of each year. The following shall be included in the report:

(1) Overview of proposed action and actual management (livestock numbers, on-off dates for each Unit, etc.);

(2) Date and location of any specific SCNF implementation monitoring data collected, including monitoring required under term and condition 1 above;

(3) Results from all implementation and effectiveness monitoring identified as part of the proposed action and this opinion, including required annual use indicator monitoring (e.g., stubble height, riparian shrub utilization, streambank alteration;

(4) Discussion of any unauthorized use and/or any maintenance issues related to fences or water developments;

(5) Brief review of Allotment management and compliance successes and failures, as it relates to the proposed action and this opinion;

(6) Any relevant information that becomes available regarding Snake River Basin steelhead or spring/summer Chinook salmon habitat trends and/or spawning locations that would modify the assumptions made in this opinion or result in effects not considered;

(7) A clear description of compliance with the terms and conditions contained in this ITS.

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

2.10 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 develop ment of information (50 CFR 402.02).

1. To mitigate the effects of climate change on ESA-listed salmonids, follow recommendations by the ISAB (2007) to plan now for future climate conditions by implementing protective tributary and mainstem habitat measures; 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 streamflows.

2. Water quantity is a limiting factor for anadromous fish in the Upper Salmon River drainage. Both the overall production and productivity of ESA-listed fish and their habitat are affected by the number and length of streams, volume and quality of flow among stream reaches, and volume of the underlying aquifer. Changes in the consumptive use of water can affect ESA-listed salmonids and their habitat in downstream reaches. The SCNF should continue to utilize their authorities to conserve and recover aquatic habitats throughout the Upper Salmon River drainage to support species recovery.
3. Require permittee to routinely evaluate and document resource conditions (bank alteration, stubble height, shrub utilization) in each Unit and begin moving livestock at the appropriate move trigger such that annual use indicator exceedance is avoided.
4. To further avoid/minimize potential for trampling of Snake River Basin steelhead redds, the SCNF should consider adjusting the grazing rotations to better avoid steelhead spawning, focusing early grazing efforts before July 7 to Units that are not known to have spawning steelhead. Alternatively, the SCNF should consider constructing additional exclosure fencing along potential spawning areas along Squaw and Trealor Creeks to protect them from livestock entry.

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

2.11 Reinitiation of Consultation

This concludes formal consultation for Squaw Creek Grazing Allotment.

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

If the SCNF does not complete the monitoring described in the proposed action, NMFS will consider that a failure to carry out the proposed action as described in this opinion and the take exemption provided by the ITS will lapse, and NMFS will request that the SCNF reinitiate consultation at that time. In accordance with the proposed action, this opinion does not cover any grazing activities after December 31, 2034. It will be necessary to reinitiate consultation for SCNF grazing activities implemented after December 31, 2034. To reinitiate consultation, contact NMFS' Idaho State Habitat Office and refer to consultation number: WCRO-2020-00629.

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

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

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

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

The PFMC has identified five habitat areas of particular concern (HAPC), which warrant additional focus for conservation efforts due to their high ecological importance. Three of the five HAPC are applicable to freshwater within the action area and include: (1) complex channels and floodplain habitats; (2) thermal refugia; and (3) spawning habitat.

3.2 Adverse Effects on Essential Fish Habitat

The proposed action's adverse effects on EFH are the same as the effects to designated critical habitat described above. These impacts are largely related to sustaining altered habitat conditions not meeting RMOs within the Allotment for a longer period of time than would occur without the action. Although areas of poor bank conditions and RHCAs "functioning at risk" are

expected to improve during the permit term, grazing at the proposed utilization levels is expected to retard recovery rates compared to no grazing.

3.3 Essential Fish Habitat Conservation Recommendations

NMFS believes that the following six conservation measures are necessary to avoid, mitigate, or offset the impact of the proposed action on EFH. These conservation recommendations are a non-identical set of the ESA terms and conditions.

1. The proposed action, including all described conservation measures, should be implemented as described in the BA and proposed action section of this opinion.

2. Streambank alteration levels in Squaw Creek (within Lower Squaw Creek, Riparian Pasture, and Trealor Creek Units) should not exceed the following levels at any time during the identified Snake River Basin steelhead incubation period for the action area (June 16 to July 7):

    a. 10% in Units where streambank stability is less than 70%;

    b. 15% in Units where bank stability conditions are 70–89% for that Unit;

    c. 20% in Units where the bank stability RMO is being met (i.e., at least 90%).

3. Each Unit with potential Snake River Basin steelhead redd trampling (i.e., Lower Squaw Creek and Trealor Creek Units) should contain at least one DMA that is also located in an area where the risk of cattle trampling of redds is highest. If unable to establish suitable DMAs in these locations, coordinate location(s) of suitable DMAs with the NMFS Level 1 Team.

    a. Definitions for DMA should be the same as described in the SCNF's June 15, 2011, Squaw Creek BA.

    b. Appropriately trained SCNF or contract staff should monitor streambank alteration levels, using the same protocols identified in the proposed action, at each Unit's DMA. The monitoring should occur within 2 weeks of moving cattle off each Unit, or by July 7, whichever comes first.

4. The Allotment permittee or their employees should receive training to appropriately implement the alteration triggers identified in the proposed action.

5. All fences and water developments that reduce cattle use adjacent to streams with ESA-listed fish species should be properly maintained and functioning as intended.

6. Turnout dates, move triggers, and end-point indicators, as well as responsible parties, should be outlined in the grazing permit's AOI to the permittee.

3.4 Statutory Response Requirement

As required by section 305(b)(4)(B) of the MSA, the SCNF 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 measures proposed by the agency for avoiding, minimizing, mitigating, or otherwise offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with the Conservation Recommendations, the federal agency must explain its reasons for not following the recommendations, including the scientific justification for any disagreements with NMFS over the anticipated effects of the action and the measures needed to avoid, minimize, mitigate, or offset such effects [50 CFR 600.920(k)(1)].

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

3.5 Supplemental Consultation

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

4. Data Quality Act Documentation and Pre-Dissemination Review

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

4.1 Utility

Utility principally refers to ensuring that the information contained in this consultation is helpful, serviceable, and beneficial to the intended users. The intended users of this opinion are the SCNF. Other interested users could include U.S Fish and Wildlife Services and the grazing permittees. Individual copies of this opinion were provided to the SCNF. The document will be available within 2 weeks at the NOAA Library Institutional Repository [https://repository.library.noaa.gov/welcome]. The format and naming adheres to conventional standards for style.

4.2 Integrity

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

4.3 Objectivity

Information Product Category: Natural Resource Plan.

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

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

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

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

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