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-2023-00117

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June 20, 2023

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

Re: Endangered Species Act Section 7(a)(2) Biological Opinion and Magnuson–Stevens Fishery Conservation and Management Act Essential Fish Habitat the Salmon–Challis National Forest Deer–Iron Cattle and Horse Allotment. Iron Creek-Salmon River 1706020302; Hat Creek-Salmon River 1716020301; Twelvemile-Salmon River 1716020303; and Upper Panther Creek 1716020309; Lemhi County, Idaho

Dear Mr. Mark:

Thank you for your January 26, 2023, email requesting initiation of consultation with NOAAs National Marine Fisheries Service (NMFS) pursuant to Section 7 of the Endangered Species Act of 1973 (ESA) (16 U.S.C. 1531 et seq.) for the Deer–Iron Cattle and Horse Allotment.

Thank you, also, for your request for consultation pursuant to the essential fish habitat (EFH) provisions in Section 305(b) of the Magnuson–Stevens Fishery Conservation and Management Act (MSA) (16 U.S.C. 1855(b)) for this action. However, after reviewing the proposed action, we concluded that there are no adverse effects on EFH. Therefore, we are hereby concluding EFH consultation.

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

In this biological opinion (Opinion), NMFS concludes that the action, as proposed, is not likely to jeopardize the continued existence of Snake River Basin steelhead. NMFS also concurs with the Salmon–Challis National Forest's (SCNF) determination that the proposed action may affect, but is not likely to adversely affect, designated critical habitats (DCH) for Snake River Basin steelhead and Snake River spring/summer Chinook salmon.

The SCNF determined the proposed actions would have no effect on Snake River sockeye salmon or its DCH and a no effect for Snake River spring/summer Chinook salmon. "No effect" determinations under Section 7 of the ESA are the province of action agencies, which may make such findings without seeking the agreement of NMFS. It is NMFS procedure to not provide any written concurrence with a Federal action agency's determination that its action will have "no effect" on any ESA-listed species or DCH. Therefore, effects to Snake River sockeye salmon and its DCH and Snake River spring/summer Chinook salmon will not be considered in the attached Opinion.

As required by Section 7 of the ESA, NMFS provides an incidental take statement (ITS) with the Opinion. The ITS describes reasonable and prudent measures (RPM) NMFS considers necessary or appropriate to minimize the impact of incidental take associated with this action. The take statement sets forth terms and conditions, including reporting requirements, that the SCNF, including any permittee who performs any portion of the action, must comply with in order to be exempt from the ESA take prohibition.

If you have any questions concerning this consultation, or if you require additional information, you may contact Kimberly Murphy**,** Consulting Biologist**,** at (208) 756-5180 or kimberly.murphy@noaa.gov.

Sincerely,

Nancy L Munn

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

cc: K. Gebhardt – SCNF
K. Krieger – SCNF
B. Filbert – SCNF
C. Colter – SBT
E. Traher – USFWS
J. Richards – IDFG

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

Deer–Iron Cattle and Horse Allotment

NMFS Consultation Number: WCRO-2023-00117

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 spring/summer Chinook salmon (*Oncorhynchus tshawytscha)*	Threatened	N/A	N/A	No	N/A
Snake River Basin steelhead (*O. mykiss*)	Threatened	Yes	No	No	N/A

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	No	No

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

Issued By: Nancy L Munn

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

Date: June 20, 2023

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ACRONYMS

Allotment	Deer–Iron Grazing Allotment
BA	Biological Assessment
BLM	Bureau of Land Management
DCH	Designated Critical Habitat
DMA	Designated Monitoring Area
DPS	Distinct Population Segment
DQA	Data Quality Act
EFH	Essential Fish Habitat
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
FS	Forest Service
GIS	Geographic Information System
GES	Greenline Ecological Status
HUC	Hydrologic Unit Code
ICTRT	Interior Columbia Technical Recovery Team
ITS	Incidental Take Statement
LAA	Likely to Adversely Affect
MIM	Multiple Indicator Monitoring
MPG	Major Population Group
MSA	Magnuson–Stevens Fishery Conservation and Management Act
NFS	National Forest System
NLAA	Not Likely to Adversely Affect
Opinion	Biological Opinion
PACFISH	Pacific Fish
PBF	Physical or Biological Feature
PCE	Primary Constituent Element
PNC	Potential Natural Community
RHCA	Riparian Habitat Conservation Area
RMO	Riparian Management Objectives
RPM	Reasonable and Prudent Measure
SCNF	Salmon–Challis National Forest
Services	NMFS and USFWS
SR	Snake River
SRB	Snake River Basin
USFWS	U.S. Fish and Wildlife Service
USGCRP	U.S. Global Change Research Program
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 U.S.C. 1531 et seq.), as amended, and implementing regulations at 50 CFR 402.

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 NMFS' Snake Basin Office, Boise, Idaho.

1.2. Consultation History

On January 26, 2023, NMFS received a letter from the Salmon–Challis National Forest (SCNF) requesting ESA consultation on the effects of authorizing proposed grazing activities on the Deer–Iron Cattle and Horse Allotment (Allotment). The biological assessment (BA) (USFS 2023) accompanying that letter described proposed livestock grazing activities, the environmental baseline, and the potential effects of those activities on Snake River Basin (SRB) steelhead and their designated critical habitat (DCH), and unoccupied Snake River (SR) spring/summer Chinook salmon DCH. In the BA, the SCNF determined that the proposed action "may affect," and is "likely to adversely affect" (LAA) SRB steelhead. The SCNF has also determined that the action "may affect," but is "not likely to adversely affect" (NLAA) DCH for both SRB steelhead and SR spring/summer Chinook.

NMFS first consulted on grazing of this Allotment with the issuance of a concurrence letter in 1999 (#SRB 99-020). NMFS subsequently issued biological opinions for this Allotment on September 9, 2010 (NMFS tracking number 2010/01658), and on September 24, 2013 (NMFS tracking number 2013/10252). The SCNF has modified the proposed action since the 2013 consultation. Those modifications are described in Section 1.3.4 below.

The draft BA for the Allotment was submitted to the Level 1 Team for review on January 4, 2023. NMFS provided comments to the SCNF on the draft BA on January 19, 2023, and discussed comments on the BA at the January 25, 2023, Level 1 meeting. Both agencies agreed with the approach to submit a final BA once all comments were addressed, but NMFS reserved the opportunity to request additional information, if necessary, to complete the consultation. The Allotment BA and request for consultation was received by NMFS on January 26, 2023. Consultation was initiated at that time.

NMFS shared the draft proposed action and proposed conservation measures with the SCNF on May 15, 2023. The SCNF suggested revisions to the draft Opinion on May 25, 2023.

The SCNFs 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 conservation recommendations were sent to the Shoshone–Bannock Tribes on May 16, 2023, with a request for comments. NMFS did not receive any response.

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

1.3. Proposed Federal Action

Under the ESA, "action" means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies (see 50 CFR 402.02). The Deer–Iron Creek Cattle & Horse Allotment is located on the Salmon–Cobalt Ranger District approximately 20 air miles southwest of Salmon, Idaho, on National Forest System (NFS) lands. The Allotment is approximately 47,450 acres of NFS lands with 140 acres of private in-holding. The Allotment falls within four fifth field hydrologic unit codes (HUC): Hat Creek (HUC 1706020301), Twelvemile Creek (HUC 1706020303), Iron Creek (HUC 1706020302), and Upper Panther (HUC 1706020309) in Lemhi County, Idaho (USFS 2023).

This consultation covers the proposed grazing from the completion of this signed Opinion so long as: (1) grazing activities on the Allotment are consistent with the grazing management described in this document; (2) reissuance of permits will be identical to, or more conservative than, the grazing management described in this document so as to not trigger the need to reinitiate consultation at that time; and (3) other triggers requiring reinitiation of consultation are not exceeded. This consultation covers the issuance of grazing permits following expiration or waiver as long as Conditions one and two above are met. The regulations for consultation require the action agency to reinitiate consultation if certain triggers in Condition three are met (see Section 2.11) (50 CFR 402.16).

Current Permit: Permitted grazing on this Allotment provides for grazing up to 321 cow-calf pairs (158 head-months) with a grazing season of June 16 through June 30, and 421 cow-calf pairs (1,370 head-months) with a grazing season of July 1 through October 7.

Consistent with direction provided in the Forest Service Handbook 2209.13-10, an extension of grazing may be requested outside the dates on the term grazing permit. Extensions are generally granted for no more than two weeks and can occur at the beginning or end of the permitted grazing season, or in a combination of the two time periods. When considering the request, the District Ranger will follow Regional Forester direction as outlined, including compliance with the ESA Section 7 consultation requirements. An approved extension cannot result in more take than would otherwise be allowed. Regional Forester direction also indicates that 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 be received more than 4 years in 10. Extensions may be granted in the Degan Mountain or Peel Tree Units only. Extensions will not occur in the South Fork Unit.

1.3.1. Grazing System

The Deer–Iron Creek Allotment is managed as a deferred rotation system (Table 1). This system provides for a systematic rotation of deferment among pastures, in which grazing is delayed or discontinued to provide for plant reproduction, establishment, or restoration of existing plants. This practice provides grazing for the Peel Tree and South Fork Units at some time during each year, and schedules rest for the Degan Mountain Unit every other year. As with other rotational grazing systems, move times can be seasonally adjusted if prescribed move dates and/or move-triggers have been reached. Figure 1 displays the allotment and the units within it.

The Allotment is divided into three units on NFS lands: Peel Tree, South Fork and Degan Mountain. The Peel Tree Unit is managed as two sub-units, that portion of the unit north of Sheephorn Lookout and that portion of the unit south of Sheephorn Lookout, during Year 1 of the rotation (Table 1, Figure 1). A combination of topography and rider activity allow this unit to be managed as two sub-units during Year 1. Livestock do not have access to either ESA-listed fish-occupied streams bordering the Peel Tree Unit, Hat Creek, or Iron Creek, due to steep, rugged topography. The Degan Mountain Unit is grazed every other year (Table 1). In years when the Degan Mountain Unit is grazed, livestock are removed from the unit prior to August 15. The Degan Mountain Unit contains a 140-acre private inholding that is not fenced separately from the allotment. Livestock will not enter the South Fork Unit prior to July 7 of any year, avoiding overlap with steelhead incubation. Rider activity on the allotment, including improvement maintenance, salting, livestock management, etc., averages three times per week.

Table 1. Unit Rotations

Year 1	Year 2
Peel Tree Unit (South of Sheephorn Lookout) June 16 – mid-July	Degan Mountain Unit June 16 – mid-July
South Fork Unit Mid-July – mid-September	South Fork Unit Mid-July – mid-August
Peel Tree Unit (North of Sheephorn Lookout) Mid-September – October 7	Peel Tree Unit Mid-August – October 7
Degan Mountain Unit (Rest)	

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 (Section 1.3.5.3) will drive when unit moves or the off date occurs. Permittees are responsible for moving livestock to meet annual use indicators.

1.3.1.1. Entry on/Exit off the Allotment

Livestock enter the Allotment from adjacent Bureau of Land Management (BLM) lands permitted for grazing in the Cabin Creek area during Year 1 of the rotation, and from adjacent BLM lands permitted for grazing in the Deer Creek area during Year 2 of the rotation. These routes are utilized on June 16 when the initial herd of 321 cow/calf pairs enters the Allotment, as well as on July 1 when an additional 100 cow/calf pairs enter the Allotment bringing the total to 421 cow/calf pairs. Entry onto the Allotment takes part over the course of a day or two and livestock are actively trailed with sufficient riders.

Livestock are trailed out of the Peel Tree Unit onto adjacent BLM lands in the Slide Creek area during both years of the rotation. Exit off the Allotment is similar to the move between units; supervised trailing occurs in largest bunches at first and progressively smaller groups over the following days.

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 one or two 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. No unit moves will occur before July 7, avoiding overlap with steelhead spawning and incubation. During moves after August 15, streams that may be crossed include Iron Creek, West Fork Iron Creek, and South Fork Iron Creek. This will occur in Year 1 of the rotation, when a move from the South Fork Unit to the Peel Tree Unit occurs after August 15.

1.3.2. Total Removal from NFS Lands

Livestock will be removed from the Allotment by October 7, unless there is a District Ranger approved extension as discussed in Section 1.3 above.

1.3.3. Improvements

Existing improvements: Existing improvements, as displayed in Figure 1, 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.

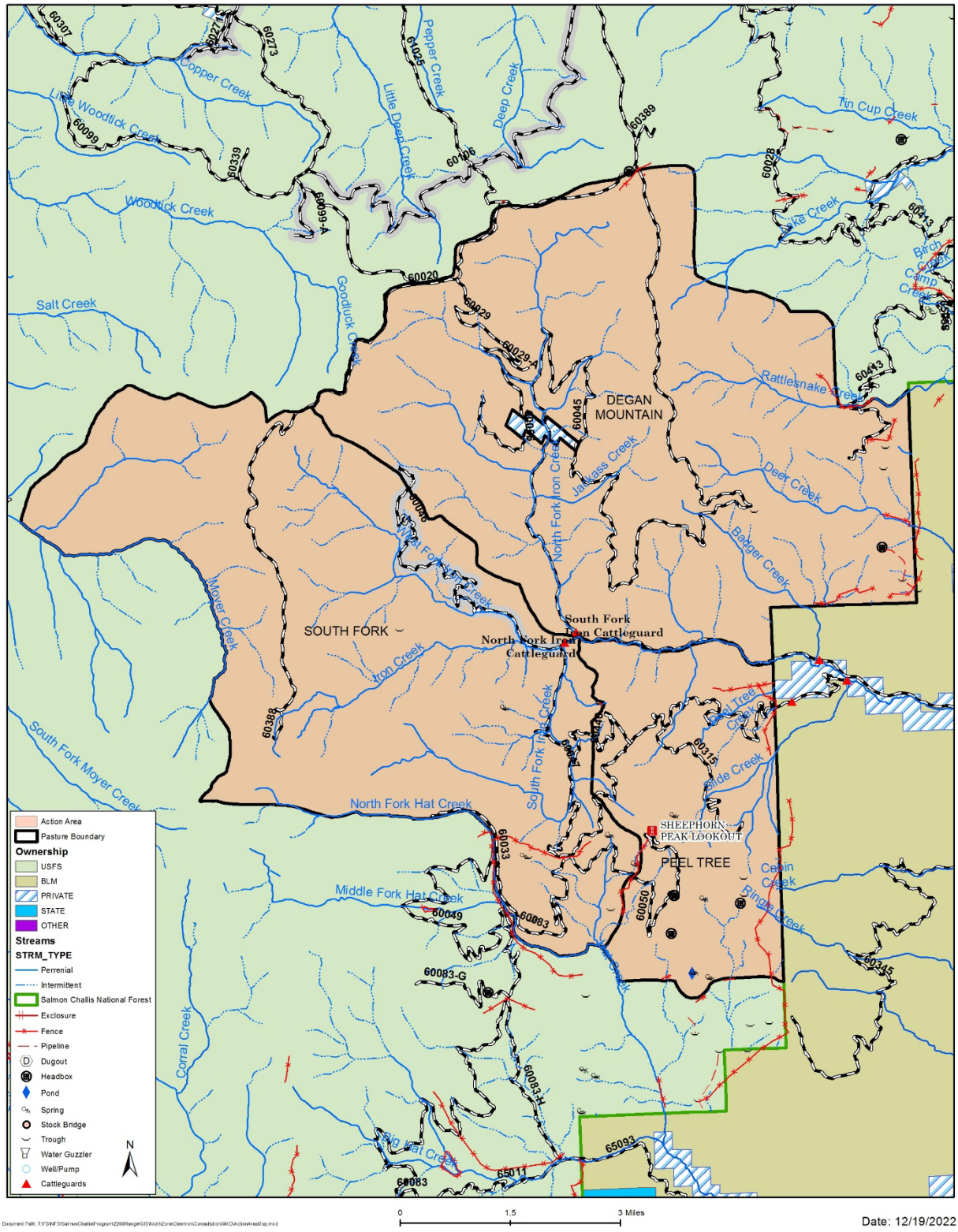

Figure 1. Deer–Iron Allotment

1.3.4. Changes from Existing Management

This proposed action includes the following changes from the management described in the May 1, 2013, BA (previous consultation). This also includes changes that have been implemented based on long-term monitoring results per the Forest's adaptive management process:

- Designated Monitoring Area (DMA) M238 – A browse use annual indicator has been added to this site and is established as 50 percent for multi-stemmed species and 30 percent for single-stemmed species, as this site appears to have sufficient woody recruitment to develop and maintain a healthy woody plant population, per the adaptive management strategy.

- DMA M243 – The browse use annual indicator for this site has been updated to include a 30 percent indicator for single-stemmed species, per the adaptive management strategy.

- DMA M215 – The woody browse annual indicator has been changed from 30 percent use of red osier dogwood to 50 percent for multi-stemmed species and 30 percent for single-stemmed species, per the adaptive management strategy.

- The northwest boundary of the Peel Tree Unit has been changed to align with natural topographic features in the area (Figure 1). This change will improve livestock management in the area as the unit boundary now follows along a natural barrier. This change also leaves the entirety of South Fork Iron Creek within the South Fork Unit, where formerly a portion of South Fork Iron Creek crossed the northwest corner of the Peel Tree Unit.

- As a conservation measure, riding will occur two times per week. The 2013 BA required riding at least once every two weeks.

1.3.5. Resource Objectives and Standards

1.3.5.1. Resource Objectives and Effectiveness Monitoring

The Allotment is being managed to support the following resource objectives; the first three are those most affected by livestock grazing. Resource objectives are the Forest's description of the desired land, plant, and water resources condition within riparian areas in the allotment. Some resource objectives are Riparian Management Objectives (RMOs) from Pacific Fish (PACFISH) and its corresponding Biological Opinions (NMFS 1995, 1998). PACFISH was developed as an interim strategy for managing anadromous fish-producing watersheds that was amended into the Salmon National Forest and Challis National Forest Plans in 1995 (USDA 1995). In 1997, the action agencies reinitiated consultation for steelhead and requested the strategy be extended indefinitely until a long-term strategy was developed (USDA 1997).

Effectiveness monitoring for resource objectives will be monitored at a minimum of every 5 years at DMAs using the Multiple Indicator Monitoring (MIM) technical reference or other best available science as it becomes available. DMAs are areas representative of grazing use specific to the riparian area being accessed and reflect what is happening in the overall riparian

area as a result of on-the-ground management actions. They should reflect typical livestock use where they enter and use vegetation in riparian areas immediately adjacent to the stream (Burton et al. 2011).

Resource Objectives

- Greenline Successional Status: A greenline successional status (GES) value of at least 61 (late seral) (Burton et al. 2011; Gamett et al. 2008; Winward 2000).

- Streambank Stability: A portion of the Deer–Iron Creek Allotment, within the Hat Creek drainage, is within a priority watershed (Figure 2, Appendix C of the BA). Within priority watersheds a bank stability is at least 90 percent or the current value, whichever is greatest (NMFS 1998). The remainder of the Deer–Iron Creek Allotment, within the Iron Creek drainage, is not within a priority watershed (Figure 2, Appendix C of the BA). Outside of priority watersheds a bank stability is at least 80 percent or the current value, whichever is greatest (NMFS 1998).

- Woody Species Regeneration: Sufficient woody recruitment to develop and maintain healthy woody plant populations (Burton et al. 2011; Gamett et al. 2008; Winward 2000).

- Sediment RMO: Less than 20 percent surface fine sediment, which is substrate less than 0.25-inch (6.4 millimeter) in diameter in spawning habitat (NMFS 1998).

- Width to Depth Ratio (W:D) (USDA 1995). Less than 10 or by channel type as follows:

    - A Channel: 21

    - B Channel: 27

    - C Channel: 28

- Water Temperature RMO: Chinook Salmon and Steelhead: No measurable increase in maximum water temperature (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) less than 64°F (17.8°C) in migration and rearing areas and 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 (NMFS 1998).

1.3.5.2. Management Standards And Guidelines

The following PACFISH Resource Standards will be applied to management of the Allotment:

- 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 the RHCAs, assure that facilities do not prevent attainment of RMOs 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.

1.3.5.3. Annual Grazing Use Indicators

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 GES; 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.

Based on the guidelines in Section 1.3.5, the available data including results from implementation and effectiveness monitoring, and the professional experience of Forest Service Forest Service (FS) personnel, the annual use indicators - for habitat either occupied by ESA-listed fish, or their DCH - have been established on this Allotment (Table 2). The annual use indicators will be used until the next effectiveness monitoring for GES, woody regeneration, and bank stability indicate adjustment is needed. Any adjustments to meet these three resource objectives directly affected by livestock grazing will be made using Adaptive Management (Section 1.3.5). The annual use indicators in Table 2 drive when unit moves, or the off-date occurs. Permittees are responsible for moving livestock to meet these annual use indicators.

Triggers. Permittees use triggers to determine when livestock need to be moved from a unit to ensure that annual use indicators are not exceeded. A trigger's numerical value varies from unit to unit, and from year to year, for any unit based on the season's growing conditions, amount of precipitation received, how long it may take to move livestock from one unit to the next, etc. As such, triggers are informally customized to the specific circumstances of each unit for the year, but may typically range from 5 to 7 inches, for example, for the stubble height indicator (see Table 2). While the FS works with the permittees to help them know how to monitor stubble height, bank alteration, and woody browse, trigger monitoring by permittees is informal (not documented) and it is not reported. The stated direction in the term grazing permit(s) is for the permittees to ensure annual use indicators are met.

Monitoring of Table 2 Annual Use Indicators will be conducted using the MIM protocol (Burton et al. 2011) or other best available science. Monitoring locations identified in Table 2 are key areas, also referred to as Designated Monitoring Areas (DMAs). Each is a representative DMA, and as such 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). DMAs identified in Table 2 are representative of units that have ESA-listed fish and or DCH. There is no DMA in the Peel Tree Unit because livestock do not have access to either stream with ESA-listed fish bordering this unit, Hat Creek or Iron Creek, due to steep, rugged topography.

Table 2. Designated Monitoring Areas and Annual Use Indicators.

Location	Unit Stream	Monitoring Attribute	Key Species	Annual Use Indicator (Multi-stemmed/Single-stemmed)	Estimated Use Trigger (Multi-stemmed/Single-stemmed)
M238*	South Fork South Fork Iron Creek	Browse use	Willow/alder	50%/30%	45%/25%
		Greenline stubble	Hydric spp.	6 in.	7 in.
		Bank Alteration	n/a	15%	10%
M243**	South Fork West Fork Iron Creek	Browse use	Willow/alder	50%/30%	45%/25%
		Greenline stubble	Hydric spp.	4 in.	5 in.
		Bank Alteration	n/a	20%	15%
M215	Degan Mountain North Fork Iron Creek	Browse use	Willow/alder	50%/30%	45%/25%
		Greenline stubble	Hydric spp.	4 in.	5 in.
		Bank Alteration	n/a	20%	15%

*Previously M226 in 2013 BA. Site location is unchanged, this is a clerical change to provide consistency with geographic information system (GIS) and data files.
**Previously M262 in 2013 BA. Site location is unchanged, this is a clerical change to provide consistency with GIS and data files.

Key species are preferred by livestock and are an important component of a plant community, serving as an indicator of change (Burton et al. 2011). Season-end annual use indicators will be monitored by FS personnel or a person authorized by the FS. For further discussion of monitoring annual use, see Monitoring Section 1.3.5.5.

1.3.5.4. Conservation Measures

The following measures will be described and implemented as part of the term grazing permit(s) on Deer–Iron Creek Allotment, to avoid and reduce potential impacts to ESA-listed fish and their habitat within the Allotment.

- The SCNF will follow the Communication Plan – Implementing Livestock Grazing Consultation on the Salmon–Challis National Forest (BA Appendix F). Over the duration of this proposed action, the Communication Plan could be updated to better address livestock grazing management both within the FS and between the FS 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 the BA and analyzed in this Opinion while being consistent and timely in communication when something is observed to the contrary.

- Per the Grazing System (Section 1.3.1, Table 2) the on-date may vary so livestock are placed on the Allotment at range readiness.

- Livestock moves between Units and off the Allotment are made to meet specified dates and/or annual use indicators (Section 1.3.5.3).

- Livestock will not enter the South Fork Unit prior to July 7 in any year.

- Livestock will be out of the Degan Mountain Unit before August 15.

- Permittees will continue to salt at least a quarter mile away from all streams.

- Permittees will continue to distribute livestock away from perennial streams and associated riparian areas by riding at least two times per week.

- Permittees will maintain improvements in accordance with the term grazing permit in accordance with the terms and conditions outlined in the permit.

- The Allotment will continue to be monitored using implementation and effectiveness monitoring described in Section 1.3.5.5.

1.3.5.5. Monitoring and Reporting

Implementation (Annual) Monitoring. The monitoring protocol uses the MIM method (Burton et al. 2011) or other best available published science. Implementation monitoring will be conducted at DMAs (Table 2). 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).

The purpose of monitoring annual use indicators is to identify the relationship between this allowed use (Table 2) and attainment of the three riparian resource objectives directly affected by livestock grazing. Per the MIM method, timing of annual use monitoring is based on its purpose. Alteration monitoring is typically conducted within 2 weeks of livestock having been moved from a Unit. Monitoring residual stubble height, as a protective cover for next spring's flows, is conducted by the end of the grazing season. Annual use indicators will be monitored by FS personnel or a person trained and authorized by the FS.

Effectiveness (Long-Term) Monitoring. Effectiveness monitoring for greenline ecological status, woody regeneration and bank stability uses the MIM method (Burton et al. 2011) or other best available science as it is adopted by the Forest. Effectiveness monitoring will be conducted a minimum of every five years. This monitoring also takes place at the DMAs in Table 2. DMAs are an area representative of grazing use and reflecting what is happening in the overall riparian area as a result of livestock activity (Burton et al. 2011).

The monitoring protocol for the channel geometry is revised from a wetted W:D measurement (range monitoring prior to 2010) and a bankfull W:D metric (watershed monitoring 1993–2016) to the greenline-to-greenline width measurement as described in the MIM protocol.

1.3.5.6. Fish Monitoring

Stream temperature will be monitored at established monitoring sites (T58, T64, T74, T81, T489) using water temperature data loggers (see Figure 19 in Appendix C of the BA for monitoring site locations). At a minimum, temperature will be monitored once every 5 years. ESA-listed fish population monitoring will be conducted at long-term monitoring sites within the Allotment (E94 and E283) at least every 5 years (see Figure 19 in Appendix C of the BA for monitoring site locations).

1.3.5.7. Reporting

Results of required monitoring identified above will be electronically emailed, to the respective Regulatory Agency, or their offices, by March 1 each year. Results from the annual BO Monitoring Reports will also be available at: https://www.fs.usda.gov/detail/scnf/landmanagement/resourcemanagement/?cid=STELPRDB5308989

1.3.5.8. Adaptive Management

The adaptive management strategy, described below and depicted in Appendix A, diagrams one (Long term) and two (Annual), is intended for allotments requiring consultation. The adaptive management strategy 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 Services (NMFS and the USFWS) and the FS; and (3) direction from consultation with the Services 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 that livestock directly affect (GES, streambank stability, and woody species regeneration) 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 Communication Plan, BA Appendix).

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 displayed in Table 3.

Table 3. End of Season Annual Use Indicator Value Recommendations.

Grazing Management Resource Objective	Current Status of Resource Objective	Annual Use Indicator	End of Season Annual
Greenline Successional Status	> 61%	Stubble Height	4”
	< 61%	Stubble Height	6”
Bank Stability (Priority Watershed)	90%	Bank Alteration	20%
	70-89%	Bank Alteration	10-20%
	< 70%	Bank Alteration	10%
Bank Stability (Non-Priority Watershed)	80%	Bank Alteration	20%
	60-79%	Bank Alteration	10-20%
	< 60%	Bank Alteration	10%
Woody Regeneration Single-Stemmed	Sufficient Woody Recruitment	Woody Browse	50%
	Not Sufficient Woody Recruitment	Woody Browse	30%
Woody Regeneration Aspen Multi-Stemmed	Sufficient Woody Recruitment	Woody Browse	50%
	Not Sufficient Woody Recruitment	Woody Browse	30%

Livestock grazing in the uplands and riparian areas will be limited to 50 percent use on key herbaceous species within representative use areas of the allotment during the grazing season.

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

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 DCH. Per the requirements of the ESA, Federal action agencies consult with NMFS and Section 7(b)(3) requires that, at the conclusion of consultation, NMFS provide an Opinion stating how the agency’s actions would affect listed species and their critical habitats. If incidental take is reasonably certain to occur, Section 7(b)(4) requires NMFS to provide an ITS that specifies the impact of any incidental taking and includes reasonable and prudent measures (RPMs) and terms and conditions to minimize such impacts.

The SCNF determined the proposed action is likely to adversely affect SRB steelhead. They also determined the actions are NLAA critical habitat for SRB steelhead and SR spring/summer Chinook salmon. Our concurrence with the NLAA critical habitat determinations is documented in the NLAA Determinations section (Section 2.12). Table 4, below, provides the ESA listing status for the species and habitats.

Table 4. Listing status, status of critical habitat designations, and protective regulations, and relevant Federal Register (FR) decision notices for the Endangered Species Act listed species considered in this Opinion.

Species	Listing Status[1]	Critical Habitat[2]	Protective Regulations
Chinook salmon (*Oncorhynchus tshawytscha*)			
Snake River spring/summer-run	T 4/22/92; 57 FR 14653	12/28/93; 58 FR 68543	6/28/05; 70 FR 37160
Steelhead (*O. mykiss*)			
Snake River Basin	T 8/18/97; 62 FR 43937	9/02/05; 70 FR 52630	6/28/05; 70 FR 37160

[1]The listing status for Snake River spring/summer Chinook salmon was corrected on 6/3/92 (57 FR 23458).
[2]Critical habitat for Snake River spring/summer Chinook salmon was revised on 10/25/99 (64 FR 57399).

2.1. Analytical Approach

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

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

We use the following approach to determine whether a proposed action is likely to jeopardize listed species:

- Evaluate the rangewide status of the species expected to be adversely affected by the proposed action.
- Evaluate the environmental baseline of the species.
- Evaluate the effects of the proposed action on species 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, analyze whether the proposed action is likely to 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.
- If necessary, suggest a reasonable and prudent alternative (RPA) to the proposed action.

2.2. Rangewide Status of the Species

This Opinion examines the status of the SRB steelhead distinct population segment (DPS) that is likely to be adversely affected by the proposed action. The status is determined by the level of extinction risk that the listed species face, based on parameters considered in documents such as recovery plans, status reviews, and listing decisions. This informs the description of the species' likelihood of both survival and recovery. The species status section also helps to inform the description of the species' "reproduction, numbers, or distribution" for the jeopardy analysis.

This DPS is composed of multiple populations, which spawn and rear in different watersheds across the Snake River basin. Having multiple viable populations makes a DPS less likely to become extinct from a single catastrophic event (ICTRT 2010). NMFS expresses the status of a DPS in terms of the status and extinction risk of its individual populations, relying on McElhany et al. (2000) description of a viable salmonid population (VSP). McElhany et al.'s (2000) description of a VSP defines "viable" as less than a 5 percent risk of extinction within 100 years and "highly viable" as less than a 1 percent risk of extinction within 100 years. A third category, "maintained," represents a less than 25 percent risk within 100 years (moderate risk of extinction). To be considered viable, an Evolutionarily Significant Unit (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 naturally-produced adult spawners in natural production areas); (2) productivity (number of naturally-spawning 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. NMFS recovery plan for SRB steelhead (NMFS 2017) describes these four parameters in detail and the parameter values needed for persistence of individual populations and for recovery of the DPS.

For each species, NMFS maintains an online status of the species discussion (https://www.fisheries.noaa.gov/west-coast/consultations/esa-section-7-consultations-west-coast#contacts-and-species), incorporating information from the species' recovery plans (NMFS 2017), the most recent 5-year reviews (NMFS 2022), the Biological Viability Assessment Update for Pacific Salmon and Steelhead (Ford 2022), and other best available information pertinent to the VSP parameters. NMFS updates the status of the species material annually and it is considered the best available information. For this document, we have incorporated that discussion by reference and a printed copy of the information has been retained in our project file in the event the material becomes unavailable in the future. To view the 5-year review, the reader

is directed to the following web address: SR Basin steelhead (https://doi.org/10.25923/pxax-h320).

The SRB 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, loss of habitat above the Hells Canyon Dam complex on the mainstem Snake River, 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 (Ford 2011; Good et al. 2005). NMFS completed its 5-year review for Pacific salmon and steelhead in 2022 and concluded the species should remain listed as threatened (NMFS 2022).

Life History. Adult SRB 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 & Chapman 1972). Juvenile steelhead then progressively move toward deeper water as they grow in size (Bjornn & 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 (85 FR 81822). The artificial propagation programs include the Dworshak National Fish Hatchery, Salmon River B-run, South Fork Clearwater B-run, East Fork Salmon River Natural, Tucannon River, and the Little Sheep Creek/Imnaha River 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 Review Team (ICTRT) identified 24 extant populations within this DPS, organized into five MPGs (ICTRT 2003). The ICTRT also identified a number of potential historical populations associated with watersheds above the Hells Canyon Dam complex on the mainstem Snake River, a barrier to anadromous migration. The five MPGs with extant populations are the Clearwater River, Salmon River, Grande Ronde River, Imnaha River, and Lower Snake River. In the Clearwater River, the historic North Fork population was blocked from 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 5 shows the current risk ratings for the parameters of a VSP (spatial structure, diversity, abundance, and productivity).

SRB steelhead exhibit a diversity of life-history strategies, including variations in fresh water and ocean residence times. Traditionally, fisheries managers have classified these 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. 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.

The spatial structure risk is considered to be low or very low for the vast majority of populations in this DPS. This is because juvenile steelhead (age-1 parr) were detected in 97 of the 112 spawning areas (major and minor) that are accessible by spawning adults. Diversity risk for populations in the DPS is either moderate or low. Large numbers of hatchery steelhead are released in the Snake River, and while new information about the relative abundance of natural-origin spawners is available, the relative proportion of hatchery adults in natural spawning areas near major hatchery release sites remains uncertain (Ford 2022). Reductions in hatchery-related diversity risks would increase the likelihood of these populations reaching viable status.

Table 5. Summary of Viable Salmonid Population (VSP) parameter risks and overall current status and proposed recovery goals for the Salmon River Major Population Group in the Snake River Basin steelhead distinct population segment.

Major Population Group	Population[2]	VSP Risk Rating[1]		Viability Rating	
		Abundance/ Productivity	Spatial Structure/ Diversity	2022 Assessment	Proposed Recovery Goal[3]
Salmon River (Idaho)	Little Salmon River	Very Low	Moderate	Viable	Maintained
	South Fork Salmon River	Moderate	Low	Maintained	Viable
	Secesh River	Moderate	Low	Maintained	Maintained
	Chamberlain Creek	Moderate	Low	Maintained	Viable
	Lower Middle Fork Salmon River	Moderate	Low	Maintained	Highly Viable
	Upper Middle Fork Salmon River	Moderate	Low	Maintained	Viable
	Panther Creek	Moderate	High	High Risk	Viable
	North Fork Salmon River	Moderate	Moderate	Maintained	Maintained
	Lemhi River	Moderate	Moderate	Maintained	Viable
	Pahsimeroi River	Moderate	Moderate	Maintained	Maintained
	East Fork Salmon River	Moderate	Moderate	Maintained	Maintained
	Upper Mainstem Salmon River	Moderate	Moderate	Maintained	Maintained

[1]Risk ratings are defined based on the risk of extinction within 100 years: High = greater than or equal to 25 percent; Moderate = less than 25 percent; Low = less than 5 percent; and Very Low = less than 1 percent.
[2]Populations shaded in gray are those that occupy the action area, and may be affected by the proposed action.
[3]There are several scenarios that could meet the requirements for ESU recovery (as reflected in the proposed goals for populations in Oregon and Washington). What is reflected here for populations in Idaho are the proposed status goals selected by NMFS and the State of Idaho.

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 geometric mean abundance for natural-origin steelhead passing Lower Granite Dam, which includes all but one population in the DPS, was 11,462 adults (Ford 2011). Abundance began to increase in the early 2000s, with the single year count and the 5-year geometric mean both peaking in 2015 at 45,789 and 34,179, respectively (ODFW & WDFW 2022). Since 2015, the 5-year geometric means have declined steadily with only 11,557 natural-origin adult returns for the most recent 5-year geometric mean (ODFW & WDFW 2022). Based on 20-year geometric means, productivity for all populations remains above replacement. But cyclical spawner-to-spawner ratios, which reflect the combined impacts of habitat, climate change, and density dependence, have been strongly below replacement since 2010. Productivity is also expected to decline in the coming years due to recent declines in abundance (NMFS 2022).

Recovery. NMFS completed a recovery plan for SRB steelhead in 2017 (NMFS 2017). The proposed recovery targets for each population are summarized in Table 1. The greatest opportunities for advancing recovery include: (1) prioritizing actions that improve habitat resilience to climate change; (2) reconnecting stream channels with floodplains; (3) developing local- to basin-scale frameworks that prioritize restoration actions and integrate a landscape perspective; (4) implementing restoration actions at watershed scales; and (5) connect tributaries to mainstem migration corridors (NMFS 2022).

For SRB steelhead, the life stage that appears to be the most vulnerable to climate change is juvenile rearing (Crozier et al. 2019). Summer habitats may have reduced flow, or loss of tributary access, from irrigation withdrawals. High summer water temperatures are also prevalent. Climate change has and will cause earlier snowmelt timing, reduced summer flows, and higher air temperatures; all of which will exacerbate the low flows and high-water temperatures for juvenile SRB steelhead. This DPS is also considered to have only moderate capacity to adapt to climate change impacts. Given the extrinsic factors currently increasing the vulnerability of many populations to climate change impacts, it is unclear whether their adaptability would be sufficient to mitigate the risk climate change poses to the persistence of this DPS.

Summary. Based on information available for the 2022 viability assessment, none of the five MPGs are meeting their recovery plan objectives and the viability of many populations remains uncertain. The recent, sharp declines in abundance are of concern and are expected to negatively affect productivity in the coming years. Overall, available information suggests that SRB

steelhead continue to be at a moderate risk of extinction within the next 100 years. This DPS continues to face threats from tributary and mainstem habitat loss, degradation, or modification; predation; harvest; hatcheries; and climate change (NMFS 2022).

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

One factor affecting the rangewide status of SR salmon and steelhead, and aquatic habitat at large is climate change. As observed by Siegel and Crozier in 2019, long-term trends in warming have continued at global, national, and regional scales. The five warmest years in the 1880 to 2019 record have all occurred since 2015, while 9 of the 10 warmest years have occurred since 2005 (Lindsey & Dahlman 2020). The year 2020 was another hot year in national and global temperatures; it was the second hottest year in the 141-year record of global land and sea measurements and capped off the warmest decade on record.

Events such as the 2014–2016 marine heatwave (Jacox et al. 2018) are likely exacerbated by anthropogenic warming, as noted in the annual special issue of Bulletin of the American Meteorological Society on extreme events (Herring et al. 2018). The U.S. Global Change Research Program (USGCRP) reports average warming in the Pacific Northwest of about 1.3ºF from 1895 to 2011, and projects an increase in average annual temperature of 3.3ºF to 9.7ºF by 2070 to 2099 (compared to the period 1970 to 1999), depending largely on total global emissions of heat-trapping gases (predictions based on a variety of emission scenarios including B1, RCP4.5, A1B, A2, A1FI, and RCP8.5 scenarios). The increases are projected to be largest in summer (USGCRP 2018).

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

Climate change is already evident. It will continue to affect air temperatures, precipitation, and wind patterns in the Pacific Northwest (ISAB 2007; Philip et al. 2021), resulting in increased droughts and wildfires and variation in river flow patterns. These conditions differ from those, under which native anadromous and resident fishes evolved and will likely increase risks posed by invasive species and altered food webs. The frequency, magnitude, and duration of elevated water temperature events have increased with climate change and are exacerbated by the Columbia River hydrosystem (EPA 2020a, 2020b; Scott 2020). Thermal gradients (i.e., rapid change to elevated water temperatures) encountered while passing dams via fish ladders can slow, reduce, or altogether stop the upstream movements of migrating salmon and steelhead (Caudill et al. 2013). Additional thermal loading occurs when mainstem reservoirs act as a heat trap due to upstream inputs and solar irradiation over their increased water surface area (EPA 2020a, 2020b, 2021). Consider the example of adult sockeye salmon in 2015, when high summer

water temperatures contributed to extremely high losses of Columbia River and Snake River stocks during passage through the mainstem Columbia and Snake River (Crozier et al. 2020), and through tributaries such as the Salmon and Okanogan Rivers, below their spawning areas. Some stocks are already experiencing lethal thermal barriers during a portion of their adult migration. The effects of longer or more severe thermal barriers in the future could be catastrophic. For example, Bowerman et al. (2021) concluded that climate change will likely increase the factors contributing to prespawn mortality of Chinook salmon across the entire Columbia River basin.

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

All habitats used by Pacific salmon and steelhead will be affected by climate dynamics. However, the impacts and certainty of the changes will likely vary by habitat type. Some changes affect salmon at all life stages in all habitats (e.g., increasing temperature), while others are habitat-specific (e.g., stream-flow variation in freshwater, sea-level rise in estuaries, upwelling in the ocean). How climate change will affect each individual salmon or steelhead stock also varies widely, depending on the extent and rate of change and the unique life-history characteristics of different natural populations (Crozier et al. 2008). The continued persistence of salmon and steelhead in the Columbia basin relies on restoration actions that enhance climate resilience (Jorgensen et al. 2021) in freshwater spawning, rearing, and migratory habitats, including access to high elevation, high quality cold-water habitats, and the reconnection of floodplain habitats across the interior Columbia River basin. However, due to management techniques proposed for the action, livestock grazing in the action area is not expected to significantly contribute to the broader adverse effects of climate change to steelhead.

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). For purposes of this

consultation, the action area is defined as the Allotment boundary and trailing routes from adjacent BLM lands (Figure 1).

The Allotment is partially within a priority watershed. Priority watersheds are those watersheds that have been identified per direction in the 1995 PACFISH Biological Opinion that require a different management strategy because of their importance to ESA-listed fish (NMFS 1995). Portions of the South Fork Unit within the Hat Creek drainage lie within a priority watershed for Chinook salmon and steelhead. The remainder of the South Fork Unit, and the Degan Mountain and Peel Tree Units, are not within a priority watershed. Management direction for priority watersheds are identified in Section 1.3.5.8.

The Allotment is located within the Hat Creek (1706020301), Twelvemile Creek (1706020303), Iron Creek (170602302), and Upper Panther (1706020309) 5th field HUCs on the Salmon-Cobalt Ranger District. This location is approximately 20 air miles southwest of Salmon, Idaho on NFS lands. The Allotment is approximately 47,450 acres of NFS lands with 140 acres of private in-holding.

This Allotment contains several streams that have ESA-listed SRB steelhead and SRB steelhead critical habitat present: Iron Creek, South Fork Iron Creek, West Fork Iron Creek, North Fork Iron Creek, an unnamed tributary to North Fork Iron Creek, Moyer Creek, Hat Creek, and North Fork Hat Creek (Table 6). Iron Creek has approximately 3.71 miles of unoccupied Snake River spring/summer Chinook salmon DCH (USFS 2023).

Table 6. Miles of Snake River Basin steelhead occupied habitat and miles of designated critical habitat by stream and Unit within the Deer–Iron Allotment. Adapted from the final Biological Assessment.

Unit	Species	Stream	Use Type	Miles	
				Present	Designated Critical Habitat
South Fork	Steelhead	Iron Creek	Spawning and Rearing	1.33	0.81
		South Fork Iron Creek	Spawning and Rearing	2.16	No
		West Fork Iron Creek	Spawning and Rearing	0.78	No
		Hat Creek	Spawning and Rearing	0.37	No
		North Fork Hat Creek	Spawning and Rearing	No	No
		Moyer Creek	Spawning and Rearing	3.38	0.14
	Total Steelhead Miles			8.02	0.95
Peel Tree	Steelhead	Iron Creek	Spawning and Rearing	0.09	No
		Hat Creek	Rearing	0.33	No
	Total Steelhead Miles			0.42	No
Degan Mountain	Steelhead	Iron Creek	Spawning and Rearing	1.83	1.83
		North Fork Iron Creek	Spawning and Rearing	1.68	No
		Unnamed tributary to North Fork Iron Creek	Spawning and Rearing	No	No

Unit	Species	Stream	Use Type	Miles	
				Present	Designated Critical Habitat
		Lake Creek (headwaters)	Spawning and Rearing	No	No
	Total Steelhead Miles			3.51	1.83

2.4. Environmental Baseline

The "environmental baseline" refers to the condition of the listed species or it's DCH in the action area, without the consequences to the listed species or DCH 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 DCH from ongoing agency activities or existing agency facilities that are not within the agency's discretion to modify are part of the environmental baseline (50 CFR 402.02).

The action area is used by all freshwater life history stages of threatened SRB steelhead. Habitat conditions have been influenced by several activities occurring within the action area, including but not necessarily limited to: road development, mining, livestock grazing, and recreation (e.g., hunting, fishing, hiking, trail riding, etc.) Environmental baseline conditions in the action area are described further below.

2.4.1. Water Temperature

Water temperature influences many aspects of salmonid fish life history, including reproduction, growth, and migration (Bjornn & Reiser 1991). PACFISH/INFISH identifies a rearing temperature criterion of less than 64˚F and a spawning temperature criterion of less than 60˚F as components of its suite of RMOs (NMFS 1998). Water temperature conditions in Iron Creek, North Fork Iron Creek, and West Fork Iron Creek have not exceeded the PACFISH spawning criteria (60°F) (USFS 2023). South Fork Iron Creek is the warmest tributary to Iron Creek and has had short term exceedances of the PACFISH spawning criteria (60°F). Daytime temperatures in South Fork Iron Creek typically remain above 50˚F until October. These temperatures are a probable mechanism for observed fish distribution patterns, with high steelhead densities in Iron and South Fork Iron Creeks. Overall, observed water temperature regimes within the Allotment have generally fallen within PACFISH water temperature criteria, but individual streams and stream reaches have periodically displayed periods of elevated temperatures beyond optimum ranges for both spawning and rearing. The PACFISH RMO for stream temperature in migration and rearing areas is being met in monitoring sites across the Allotment (USFS 2023). The PACFISH RMO for temperature in spawning areas is being met in steelhead spawning streams within the Allotment during steelhead spawning/incubation.

2.4.2. Sediment

Stream sediment conditions can influence fish incubation success as well as rearing habitat quantity and quality and fish food base productivity (Bjornn & Reiser 1991). The SCNFs Watershed Program has collected stream sediment data, using the core sampling methodology, since 1993.

Analysis of core sampling data correlates measured levels of depth fines in spawning habitats to predicted egg incubation success values determined by Stowell et al. (1983). Results of all assessments are expressed as percent fines less than a quarter-inch in diameter. Analysis of depth fines additionally considers drainage geology. Most of the soils in the Iron Creek drainage are derived mainly from quartzite parent material (approximately 52 percent, USFS 2023). The following are the evaluation criteria for stream sediment based primarily in quartzite geology:

- Less than 20 percent depth fines (less than 1/4" diameter): Properly Functioning.
- 21–25 percent depth fines (less than 1/4" diameter): Functioning at Risk.
- Greater than 25 percent depth fines (less than 1/4" diameter): Not Properly Functioning.

Core sampling is used in trend monitoring to determine the amount of percent fines within the stream's substrate. Anadromous streams receive a 6-inch dig and resident fish streams receive a 4-inch dig. The amount of percent fines is used in determining the stream's biotic potential (Stowell et al. 1983). Biotic potential is the condition of spawning substrate quality, which maximizes survival and emergence of fish embryos.

Iron Creek 1A, North Fork Iron Creek 1A, South Fork Iron Creek, and West Fork Iron Creek 1A in the Allotment are monitored for sediment by the SCNFs Watershed Program. Most of the sites have a relatively continuous dataset, with the exception of South Fork Iron Creek 1A. The BA indicates that the South Fork Iron Creek 1A was sampled 10 times (1993 through 2009). The site was visited in 2015, but was unable to be sampled due to a beaver dam at the site. Monitoring at this site has been discontinued, but sampling could resume if site conditions change. All sites show a declining or static trend in depth fines and are currently meeting objectives for sediment (except for South Fork Iron Creek 1A that has not been monitored since 2010). Data show no apparent increases in fines after the 2011 Salt Fire, as depth fines have been consistently below 20 percent fines.

2.4.3. Width to Depth Ratio

Based on information provided in the BA streams within the Allotment are considered to display W:Ds reflective of mean natural condition database values for their respective geologies and channel morphology types (USFS 2023). In addition, streambanks in the Allotment are densely vegetated with woody species and have high bank stability.

2.4.4. Streambank Condition

Streambank condition can influence the overall stability and resilience of stream channels. Eroding streambanks increase turbidity and can contribute large amounts of fine sediment deposition, which degrade fish habitat and cause additional stream channel adjustment. The Allotment is partially within a PACFISH Priority Watershed. PACFISH identifies an RMO of 80 percent or greater bank stability for streams outside of priority watersheds and 90 percent or greater bank stability for those streams inside of priority watersheds. Those portions of this Allotment that contain SR Basin steelhead and DCH are outside a PACFISH priority watershed.

MIM protocol measures bank stability at all of the MIM sites. The most recent MIM readings of bank stability were: on South Fork Iron Creek (M238) - 94 percent in 2018; West Fork Iron Creek (M243) - 100 percent in 2018; and North Fork Iron Creek (M215) - 91 percent in 2022. Based on information provided in the BA, all MIM monitored streams within the Allotment are meeting the priority watershed PACFISH RMO of 90 percent or greater streambank stability.

Within the action area, long-term streambank stability monitoring (non-grazing related) had been conducted on mainstem Iron, North Fork Iron, South Fork Iron, and West Fork Iron Creeks by SCNF hydrology monitoring crews until 2015. All sites monitored were meeting the 80 percent back stability objective for streams outside of the priority watershed except for one site on Iron Creek 1A that did not meet the 80 percent bank stability in 2015. The cause of the decrease in bank stability in 2015 is unknown, but this site is inaccessible to livestock (USFS 2023).

2.4.5. Riparian Habitat Conservation Areas

The condition of riparian vegetation can strongly influence aquatic habitat quality and fish productivity. Removal of riparian vegetation can result in negative impacts to fish populations (Platts & Nelson 1989). The analysis of RHCAs focuses on GES and woody species recruitment. The SCNF Plan forest-wide GES objective is 61 or greater. An ecological status rating greater than 86 is indicative of a potential natural community (PNC) (Winward 2000).

Riparian monitoring sites were established on the Allotment in 2010. The most recent survey data are as follows:

South Fork Iron Creek (M238): GES was identified at mid-seral (43) with a 94 percent bank stability during its most recent baseline reading in 2018. This site is below the resource management objective for GES and, per the Adaptive Management strategy (Section 1.3.5.8), the end of season average greenline stubble height annual use indicator will remain at 6 inches and the bank alteration annual indicator will remain at 15 percent. M238 is scheduled to be read again in 2023 and adjustments may be made to the annual indicators at this site to help meet or move toward desired condition of late seral.

West Fork Iron Creek (M243): GES was identified at late-seral (68) with a 100 percent bank stability during its most recent baseline reading in 2018. When this site was read in 2013, bank stability rating was 100 and GES rating was 85.

North Fork Iron Creek (M215): GES was identified at late-seral (67) with a 91 percent bank stability during its most recent baseline reading in 2022. This reading was down from a late seral status of 77 in 2017, but still within a late seral successional status (Winward 2000). The range specialist who participated in the 2017 and 2022 long term monitoring at that site indicated that improved plant identification in 2022 factored into the resulting GES number change and that successional status has not changed at the site (USFS 2023).

2.4.6. Major Limiting Factors

Major limiting factors affecting fisheries production within the action area include mining impacts and water quality problems, passage barriers, roads, introgression between native populations and hatchery stocks, and climate change. Fish passage to the headwaters of Moyer Creek is currently limited by a two-culvert crossing. A culvert on the private inholding on North Fork Iron Creek (outside of the action area) is also a fish passage barrier.

Historic and active drilling has occurred in the Iron Creek drainage. The North Fork Iron Creek was recently 303(d) listed for copper impairment, based on water samples that were collected directly below the patented claim in 2019 (USFS 2023). All seven samples exceeded both acute and chronic criteria for copper (USFS 2023). After the Idaho Department of Environmental Quality submitted the consent order to the mine to eliminate surface water discharge, the mine has started developing a discharge infiltration system, which will remove surface water outfalls (USFS 2023).

Cold-Water Aquatic Life use in North Fork Iron Creek is impaired by copper; salmonid spawning is a subcategory of Cold-Water Aquatic Life and Salmonid Spawning is not supported if Cold Water Aquatic Life is not supported (USFS 2023). Exposure to above-normal copper levels can cause wide-ranging effects to fish, from sublethal to lethal. Sublethal effects can include behavioral, (e.g., lethargy, incoordination, reduced feeding), morphological (e.g., skin and gill damage, swelling), and physiological changes (e.g., internal organ damage, blood thickening) (USFS 2023). The patented claim (outside of the action area) has waste rock piled within the RHCA, which artificially confines the channel and has not been tested.

The BA states that off-channel habitat is relatively limited within the action area, except for the beaver-influenced reaches near the confluence of South Fork and West Fork Iron Creeks. There are several near-stream roads within the action area. The Iron Creek watershed has approximately 27.9 miles of motorized roads within an RHCA, which limits floodplain connectivity. Significant lengths of mainstem Iron Creek as well as its North Fork, are paralleled by roads, which have impacted large woody debris loading, pool frequency and quality, off-channel habitat and floodplain connectivity at locations within the action area. Near-stream roads are less of a concern in Hat Creek, where the road is generally located well away from the stream aside from a few points.

Very low numbers of adult steelhead have returned to Iron Creek in recent years, and these returns have been dominated by hatchery-origin fish (USFS 2023). These hatchery fish originate from juvenile steelhead release programs that occur off-site (outside of the action area) and are designed to spread out the fishery effort and harvest in the upper Salmon River.

Climate change is an escalating conservation problem. Warming trends in mountain headwater streams have been especially pronounced, driven by earlier and more rapid snowmelt in the spring and increased winter precipitation and flooding. These changes contribute to warmer summer water temperatures that reduce the amount of thermally suitable habitat (USFS 2023).

2.4.7. Snake River Basin Steelhead Presence in Action Area

The Pahsimeroi River steelhead population, which is part of the Salmon River DPS, uses the action area for spawning, rearing and migration. Using information presented in the SCNFs BA (USFS 2023), which was based on observed species distribution in the action area, it is possible that steelhead spawn in up to 4.39 total miles in Iron Creek, 3.31 miles in North Fork Iron Creek, 1.80 miles in South Fork Iron Creek, 0.78 miles in West Fork Iron Creek, and 4.70 miles in Moyer Creek, within the action area. These lengths reflect continuous mapping reaches and are likely significant overestimates of actual spawnable areas within the streams due to occurrence of high gradient reaches and the discontinuous occurrence of suitable combination of water depth, water velocity, and stream substrate composition within lower gradient reaches (USFS 2023). Much of the potential steelhead spawning habitat in the Allotment is inaccessible to livestock, as outlined further in Table 9 of the BA (USFS 2023). The only location on the Allotment that has steelhead present and is potentially accessible to livestock is North Fork Iron Creek (approximately 1.1 miles of stream access) in the Degan Mountain Unit.

2.5. Effects of the Action

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

2.5.1. Effects to Steelhead Juveniles and Adults

Livestock grazing in the Degan Mountain unit has the potential to affect SRB steelhead by disturbing adults and rearing juveniles, and also by trampling incubating redds as cows wade through or cross instream habitats, in 1.1 miles of North Fork Iron Creek. Adult steelhead are likely to have completed spawning and will have moved out of the action area or died prior to livestock presence on the Allotment. However, there could be years where steelhead adults could be present for brief periods during the proposed grazing period if they arrive late. Juvenile steelhead are likely to be present during the grazing season.

For adult and juvenile steelhead, disturbance can lead to behavioral changes that can result in indirect effects through alteration in feeding success, increased exposure to predators, or displacement into less suitable habitat. Although these effects can result in injury or death, we expect that adults and juveniles affected by this action to be able to access nearby cover and avoid injury or death (behavioral effect only). Within the action area bank stability is high, indicating that sufficient escape cover to protect fish in the short term is likely available from

overhanging banks. NMFS expects behavioral modifications will be infrequent and minor because habitat conditions in the action area should provide suitable escape cover and because of livestock management.

The SCNF and permittees will employ the following measures to reduce the amount of time cows spend in riparian areas: maintaining off-stream water sources; placing salt at least a quarter mile from streams; weekly herding of cows out of riparian areas; using designated crossings in most cases to move livestock across streams when changing pastures; maintaining fencing, and adhering to riparian utilization standards. The natural inaccessibility of many of action area streams, due to topography and dense riparian vegetation or beaver dams, further limits the potential for these effects to occur. For these reasons disturbances to adult and juvenile steelhead related to livestock grazing on the Allotment will be infrequent and minor, and will not result in harm or harassment.

2.5.2. Effects to Redds

There is potential for SRB steelhead redds to be exposed to grazing cattle in the following situations and locations:

- Locations where trampling is likely to occur is North Fork Iron Creek (approximately 1.1 miles of stream access) in the Degan Mountain Unit.

- Trampling is not likely to occur in other locations because of unsuitable spawning habitat; inaccessible reaches due to beaver dams, topography or fencing; or timing of redds and cow presence do not overlap.

The only unit that has both temporal overlap with steelhead spawning/incubation and spatial overlap where livestock can access the stream is the North Fork Iron Creek in the Degan Mountain Unit. North Fork Iron Creek is not DCH for steelhead. This overlap occurs for up to 3 weeks every other year (Year 2 of rotation), or up to 5 weeks if an early season extension were granted (USFS 2023).

If steelhead redds are present, and eggs are still incubating when crossings occurred, steelhead embryos are likely to be killed. This could occur anytime livestock are wading or crossing streams from arrival on the Allotment up until July 7 (estimated time for completion of incubation). No unit moves will occur before July 7, avoiding overlap with steelhead spawning and incubation.

NMFS used the only known redd density estimate available from the Iron Creek watershed to represent the likely redd densities within North Fork Iron Creek (USFS 2023). Applying the known spawning area density (0.73 redds per mile) to livestock accessible reaches of North Fork Iron Creek (1.1 miles) grazed during steelhead incubation results in up to 1 (0.80) redd potentially being exposed to livestock trampling in years the Degan Unit is grazed. Potential trampling rates and effects of livestock trampling on the redds, potentially exposed, are discussed below.

Gregory and Gamett (2009) reported that cattle trampled 12 percent to 78 percent of simulated bull trout redds while grazing the Federal pastures they evaluated. It is not known if the evaluated pastures were grazed to the same annual use indicators proposed for this Allotment. They did note that stocking intensity (number pairs/capable[1] grazing area [acres]/grazing days) significantly influenced redd trampling rates with the highest stocking intensity generating the highest observed trampling levels and vice versa. The Degan Mountain Unit has a low stocking intensity, which translates to trampling rates on the lower end of the spectrum (or 12 percent).

Cattle typically use the high forage areas located in hillside meadows and ridge tops well above the streams during steelhead incubation. Because permittees and the SCNF intend to reduce livestock use of riparian areas as much as possible via frequent riding and other management techniques, NMFS assumed a potential trampling rate of 12 percent for the lowest stocking intensity index of pastures evaluated (0.04) based on Gregory and Gamett's (2009) study. For steelhead, this estimate may still be high, as bull trout are fall spawners, and cattle use of riparian areas is higher in late summer/fall than early spring (McInnis & McIver 2009; Parsons et al. 2003) when steelhead eggs are incubating. Additionally, a rate reduction was warranted given the assumed effectiveness of upland water and prescribed herd management efforts to minimize livestock use of riparian zones (Ehrhart & Hanson 1997; Kinch 1989; Leonard et al. 1997; McInnis & McIver 2009; Parsons et al. 2003; Wyman et al. 2006).

Applying the 12 percent redd trampling rate to the maximum number of steelhead redds that could be present in North Fork Iron Creek (0.80 redds) results in up to one redd potentially being trampled by livestock every other year ($0.80 \times 0.12 = .09$) when the Degan Mountain Unit is grazed. This approach likely overestimates potential redd trampling for the following reasons: (1) Trampling rate reductions likely do not fully account for the reduced riparian use during steelhead incubation periods (i.e., spring grazing); and (2) stream discharge during spring grazing is often high and discourages livestock from entering streams beyond the margins.

NMFS converted the number of potential redd trampling events to adult equivalents that may be lost from the Pahsimeroi population. NMFS has estimated that between zero and one Snake River Basin steelhead redd could be trampled on alternate years when the Degan Mountain Unit is grazed. To complete an SRB steelhead jeopardy analysis, NMFS converted the number of redds potentially trampled to adult equivalents using reasonable life stage survival estimates. Results of these calculations indicate the action could result in approximately zero to one fewer adult Snake River Basin steelhead, from the Pahsimeroi River population, returning 4 years after the Degan Mountain Unit is grazed. The Pahsimeroi River steelhead population is part of the Salmon River DPS. As described above, the number of redds trampled and the resultant loss of one adult steelhead every-other-year are likely conservative estimates for several reasons: (1) stream miles accessible to cattle are based on total miles within the Allotment and were modified only where fences, steep slopes, or thick vegetation 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 only in the highest quality habitat; (3) trampling rates observed for fall spawning species were used to estimate the potential for redd

[1] Gregory and Gamett (2009) used the term "suitable area" but as defined in their paper (i.e., areas less than 30 percent slope, less than 1,600 meters from water, and producing at least 225 kg/ha of useable forage) the current and correct term if "capable area" (Personal Communication, Mike Helm, SCNF GIS Specialist, September 9, 2014).

trampling of a spring spawning species, at a time when livestock are not expected to concentrate time in riparian areas. Redd trampling could be near zero on most years, which could result in essentially zero impact to returning adult Snake River Basin steelhead in the action area. For these reasons, this value is more likely to represent the actual impacts of the action.

2.6. Cumulative Effects

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

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

No State lands occur in the action area. Known future private activities within the action area include a replacement of a culvert on the private inholding on North Fork Iron Creek and ongoing exploratory minerals operations on this patented claim. The existing culvert is expected to be replaced with a 100-ft. long embedded culvert. The impacts of this culvert replacement on fish passage are not known at this time but given that the existing culvert represents a complete passage barrier, the replacement is expected to represent no change in passage or possibly an improvement (USFS 2023).

Recreational activities such as hunting, fishing, camping, and off-road vehicle use are likely to continue at levels similar to the past and will have some minor impacts to streams and riparian habitat in the action area. These impacts were included in the current baseline condition where information was available.

Since the action area consists primarily of Federal land, NMFS is not aware of any additional future private activities within the action area that would cause additional effects to a listed species or a DCH than presently described. Thus, NMFS assumes that future private and State actions will continue within the action area, at roughly the same level as identified. As such, NMFS is not aware of any additional cumulative effects at this time. A future consultation will be conducted for proposed exploratory minerals operations on Federal lands.

2.7. Integration and Synthesis

The Integration and Synthesis section is the final step assessing the risk that the proposed action poses to species and critical habitat. In this section, we add the effects of the action (Section 2.5) to the environmental baseline (Section 2.4) and the cumulative effects (Section 2.6), taking into account the status of the species (Section 2.2), to formulate the agency's biological Opinion as to whether the proposed action is likely to: (1) reduce appreciably the likelihood of both the

survival and recovery of a listed species in the wild by reducing its numbers, reproduction, or distribution.

SRB steelhead from the Pahsimeroi population inhabit the action area and depend on it to support critical life functions of spawning, rearing, and migration. SR Basin steelhead abundance experienced population increases, relative to the time of ESA listing, through the mid-2000s. During the past 7 years, abundance has dropped, with many populations nearing levels observed when the species was listed. Observed declines have been similar for all populations in the DPS and declines are believed to be tied to recent ocean conditions (Ford 2022). Action area conditions have not materially changed during this time and have likely had little influence on recent trends. In addition to abundance and productivity concerns for this species, climate factors will likely make it more challenging to increase abundance and recover the species (Crozier et. al. 2019; NMFS 2017). All individual populations, including the Pahsimeroi population that is affected by this proposed action, are still at high risk of extinction and remain far below recovery plan abundance and productivity targets. As a result, SRB steelhead remain threatened with extinction.

Furthermore, climate factors will likely make it more challenging to increase abundance and recover the species (NMFS 2017). Climate change is expected to alter aquatic habitat by impacting streamflow and temperature regimes. These effects, in combination with other baseline conditions within the action area, may lower juvenile salmonid survival rates by impacting spawning, rearing, and migration for steelhead. However, due to management techniques proposed for the action, livestock grazing in the action area is not expected to significantly contribute to the broader adverse effects of climate change to steelhead.

SRB steelhead adults spawn within the action area and juveniles use the action area for rearing and migration. NMFS expect steelhead in the action area could potentially experience adverse effects associated with redd trampling, and disturbance from livestock wading and crossing North Fork Iron Creek.

However, the effects of disturbance at the reach scale are expected to be infrequent and minor because of the proposed conservation measures, limited livestock accessibility to the stream, low stocking density, and ability of fish to find cover within the stream reach if disturbed. The effects of habitat-related impacts are also expected to be minor and/or very unlikely to occur at the reach scale to RMOs currently being met in the areas proposed to be grazed, as well as application of conservative annual use indicators and move triggers that have proven effective at maintaining habitat conditions, and implementation of an adaptive management process when and where necessary. The baseline conditions of habitat in the action area are expected to be maintained or to improve.

The main effect to SRB steelhead will be from the potential trampling of redds. Grazing will overlap with spawning and incubation in North Fork Iron Creek. NMFS expects the following adverse effects to SRB steelhead from redd trampling:

- Up to one Snake River Basin steelhead redd could be trampled every other year in North Fork Iron Creek in the Degan Mountain Unit.

- The estimated trampling of up to one SRB steelhead redd (0.83) could result in approximately one fewer adult returning to the action area for each year grazing occurs in the Degan Mountain Unit under the proposed action.

Effects to individual fish include effects to the VSP (i.e., abundance, productivity, spatial structure, and genetic diversity that support the species' ability to maintain itself naturally at a level to survive environmental stochasticity). However, the anticipated level of effects to individuals are not anticipated to result in any change to abundance or productivity at the population scale. Similarly, the effect at the scale of the MPG (Salmon River MPG) will not change. This is due to the low number of steelhead redds present within the action area and low numbers of livestock being able to access areas of suitable spawning habitat given the wide annual variability in adult and juvenile returns and seasonal variations in habitat use. The proposed action also supports recovery of these populations (and consequently the MPG) because of efforts to improve riparian and instream function over time, which will support increased productivity. The action area occurs primarily on Federal land, and all future activities in the action area will likely be implemented, permitted, or funded by the SCNF and will require separate consultation pursuant to Section 7 of the ESA. Therefore, there will be no cumulative effects for the proposed action.

When considering the status of the species, environmental baseline, and cumulative effects, it is NMFS opinion that implementation of the proposed action will not appreciably alter the abundance, productivity, spatial structure, or diversity of the Pahsimeroi population. Because the VSP criteria for the Pahsimeroi populations will not be negatively influenced, the proposed action is not expected to affect the survival or the recovery potential of the Salmon River MPG and the Snake River DPS.

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 SRB steelhead.

2.9. Incidental Take Statement

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

incidental to an otherwise lawful agency action is not considered to be prohibited taking under the ESA if that action is performed in compliance with the terms and conditions of this ITS.

2.9.1. Amount or Extent of Take

The proposed action is reasonably certain to result in incidental take of ESA-listed SRB steelhead. NMFS is reasonably certain the incidental take described here will occur because livestock will graze alongside streams during the redd incubation periods for steelhead. In the Opinion, NMFS determined that incidental take is reasonably certain to occur from redd trampling.

2.9.1.1. Steelhead Redd Trampling

Through implementation of the proposed action, grazing is expected to occur in the same time and place as SRB steelhead egg/embryo incubation for approximately three weeks every other year. The proposed off-channel salt placements, preferred upland grazing and water usage in the early season, riding, and conservative move-triggers/annual use standards, as well as inaccessible reaches of the stream for livestock, all help make the likelihood of SRB steelhead redd trampling extremely low, but the potential for redds to be trampled by livestock still exists.

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 steelhead in 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, access to these streams by SCNF personnel is difficult at this time of year due to snow and ice. Peak flows occur approximately during the middle of the spawning period. Ice shelves along stream margins, high flows, and turbid water may potentially 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 following 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, NMFS will not identify the amount of take, but will identify a surrogate for incidental take, consistent with 50 CFR 402.14(i).

For the reasons stated above, it is difficult for NMFS to quantify the extent of take for steelhead. There is no known forage utilization or channel measurement indicator that directly correlates to redd trampling rates. However, 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 livestock present and with the time spent by those livestock in riparian areas. Similarly, the likelihood of redd trampling increases with both the number of livestock present and with the time spent by those livestock 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 green lines within the Unit DMAs and

elsewhere in the Allotment. Therefore, NMFS will use percent streambank alteration as the surrogate for take for steelhead in this Opinion.

The SCNF proposed bank alteration limits of 20 percent or less. The proposed action indicates that the permittee should begin moving cattle at identified move-trigger points, which will be set at levels 5 percent below the limit to ensure the end of season values meet maximum allowed use levels (Table 2). 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 SRB steelhead redd every other year of the grazing rotation.

Therefore, NMFS has established the extent of incidental take limit as:

- In the Degan Mountain Unit, during periods of spawning and incubation (June 16 to July 7, or potentially, two weeks before the June 16 on date when an early season extension has been granted), bank alteration shall not exceed: (1) 10 percent where bank stability is less than 60 percent; (2) 15 percent where bank stability is 60 percent to 79 percent; or (3) 20 percent where the bank stability RMO is being met for non- priority watersheds (i.e., greater than or equal to 80 %).

Bank alteration monitoring is typically conducted within two weeks of livestock having been moved from a Unit, which means regular monitoring for bank alteration occurs at the end of a Unit's grazing, which could take place several weeks or months after the completion of steelhead spawning and incubation. This incidental take limit requires that real-time, early season bank alteration levels be monitored where grazing overlaps the steelhead spawning and incubation period to ensure exceedances do not occur. Therefore, bank alteration monitoring should occur no later than the July 7 conclusion of steelhead redd incubation. This monitoring is in addition to bank alteration monitoring typically conducted within two weeks of livestock being removed from a Unit.

2.9.2. Effect of the Take

In the Opinion, NMFS determined that the amount or extent of anticipated take, coupled with other effects of the proposed action, is not likely to result in jeopardy to SRB steelhead.

2.9.3. Reasonable and Prudent Measures

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

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 implementation of the proposed action.

The SCNF shall:

1. Minimize the potential for incidental take resulting from trampling of redds due to livestock grazing on the Allotment.

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 that the extent of take was not exceeded.

2.9.4. Terms and Conditions

In order to be exempt from the prohibitions of Section 9 of the ESA, the Federal action agency must comply (or must ensure that any applicant complies) with the following terms and conditions. The 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. The following terms and conditions implement RPM 1:

    a. Appropriately trained SCNF staff will monitor streambank alteration levels, using the same protocols identified in the proposed action, at the Degan Mountain Unit North Fork Iron Creek DMA. The monitoring shall occur within three weeks of moving cattle off this Unit.

    b. The Allotment permittee or their employees shall receive training to appropriately implement the move triggers identified in the proposed action.

    c. Annual meetings shall be conducted with the permittee to discuss specific actions necessary to protect spawning areas in stream reaches with the potential for cattle interaction with SRB steelhead spawning fish and/or redds.

    d. The SCNF and their permittees shall ensure that all water developments that reduce cattle use adjacent to streams with ESA-listed fish species are properly maintained and functioning as intended.

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

    a. Each Unit's DMA or key area is annually monitored to determine compliance with all identified annual use indicators 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:

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

ii. Date and location of any specific SCNF implementation monitoring data collected, including monitoring required under terms and conditions 1 above.

iii. 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, and streambank alteration), photo point monitoring, seral condition, streambank stability, water temperature, sediment, and greenline-to-greenline width.

iv. Discussion of any unauthorized use and/or any maintenance issues related to fences or water developments as it pertains to Units with ESA-listed fish species or DCH.

v. Brief review of Allotment management and compliance successes and failures as it pertains to Units with ESA-listed fish species or DCH.

vi. Any relevant information that becomes available regarding SRB steelhead or SR 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.

vii. A clear description of compliance with the terms and conditions and any exceedances of the extent of take contained in this ITS.

viii. Any management recommendations for subsequent years.

c. The SCNF shall submit post-project report to: nmfswcr.srbo@noaa.gov

2.10. Conservation Recommendations

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

The following recommendations are discretionary measures that NMFS believes are consistent with this obligation and therefore should be carried out by the SCNF:

- To mitigate the effects of climate change on ESA-listed salmonids, follow recommendations by the Independent Scientific Advisory Board (2007) to plan now for future climate conditions by implementing protective tributary habitat measures.

Implement measures to protect or restore riparian buffers, wetlands, and floodplains; remove stream barriers; and ensure late summer and fall tributary stream flows.

- Continue to work with the permittees to adjust the timing and/or rotation of Allotment Units to better protect accessible stream reaches during periods of steelhead spawning/incubation periods. Where feasible, give preference to grazing Units with inaccessible stream reaches (i.e., fenced, or less accessible because of steep topography or dense riparian vegetation) during these critical timeframes.

- 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.

- Water quality is a limiting factor for anadromous fish in the Iron Creek Watershed. 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 water quality. Changes in water quality 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 Iron Creek Watershed to support species recovery.

- The SCNF should consider addressing fish passage limitations at the headwaters of Moyer Creek where passage is currently limited by a two-culvert crossing.

- The SCNF should consider not using an early season extension in year two of the rotation when the Degan Mountain Unit is scheduled for use to further reduce potential grazing overlap with SRB steelhead spawning and incubation.

Please notify NMFS if the SCNF, or another entity, carries out 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 DCHs.

2.11. Reinitiation of Consultation

This concludes formal consultation for the Deer–Iron Grazing Allotment. Under 50 CFR 402.16(a): "Reinitiation of consultation is required and shall be requested by the Federal agency or by the Service where discretionary Federal agency involvement or control over the action has been retained or is authorized by law and: (1) if the amount or extent of taking specified in the incidental take statement is exceeded; (2) if new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (3) if the identified action is subsequently modified in a manner that causes an effect

to the listed species or critical habitat that was not considered in the biological opinion or written concurrence; or (4) if a new species is listed or critical habitat designated that may be affected by the identified action."

2.12. "Not Likely to Adversely Affect" Determinations

NMFS received the SCNFs request for written concurrence that the proposed action is not likely to adversely affect critical habitat for SRB steelhead or SR spring/summer Chinook salmon on January 26, 2023. NMFS prepared this response to the SCNFs request pursuant to Section 7(a)(2) of the ESA, implementing regulations at 50 CFR 402, and agency guidance for the preparation of letters of concurrence.

2.12.1. Effects on Designated Critical Habitat for Snake River Basin Steelhead and Snake River Spring/summer Chinook

The SCNF determined that the proposed action was NLAA SRB steelhead DCH or unoccupied SR spring/summer Chinook salmon DCH within the action area. The designations of critical habitat for SRB steelhead and SR spring/summer Chinook salmon use the term primary constituent elements (PCE) or essential features. The 2016 final rule (81 FR 7414; February 11, 2016) replaced this term with physical or biological feature (PBF). 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 section, we use the term PBF to mean PCE or essential feature, as appropriate for the specific critical habitat.

To determine whether a proposed action is likely to adversely modify 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 7). Potential effects to DCHs and PBFs will be discussed in more detail below.

PBFs: Freshwater Spawning, Rearing, and Migration Sites

Water Quality. Habitat impacts associated with this Allotment are likely to include a few areas of denuded streambank on each Unit up to a few feet wide where cattle access streams to drink or cross. Early in the season, cattle do not typically loiter in riparian areas and they are expected to access streams to drink or cross in the same areas to avoid breaking new trail. 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. However, given background levels of turbidity during runoff events, it would be very difficult to distinguish between turbidity resulting from these minor grazing impacts and background turbidity. Cattle grazing 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 and the wide distribution of cattle across the Allotment over each year. In addition, riparian vegetation will function to trap and utilize nutrients deposited in riparian areas preventing the majority of waste from entering the water column.

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 directly increase water temperature if riparian vegetation removal results in increased solar exposure. Indirect effects could occur if livestock remove significant 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, or high W:D, expose a greater surface area of shallower water to the sun. This can further increase water temperatures.

Within the Allotment, riparian conditions have remained static or improved since the 2010 BA, and W:D are within the natural range of variability. The BA states that observed water temperature regimes within the Deer–Iron Allotment have generally fallen within PACFISH water temperature criteria, but individual streams and stream reaches have periodically displayed periods of elevated temperatures beyond optimum ranges for both spawning and rearing as described earlier in Section 2.4.1. Temperature data at the sites are scheduled to be collected at least every 5 years. These data suggest recent livestock grazing within the Allotment has not resulted in detectable effects to water temperatures within the action area.

The proposed action includes measures, including salting and use of riders to keep livestock away from critical stream reaches, which should result in livestock having even less potential to impact stream temperatures than has occurred in the past. Proposed annual use standards serve to reduce potential livestock impact on water temperatures by minimizing riparian vegetation use and livestock impact to streambanks to insignificant levels within the Allotment. Further, successful use of the described adaptive management program is expected to prevent site-specific impacts or a onetime annual use standard from leading to long-term habitat degradation. For these reasons, the proposed action is expected to have only insignificant effects on water quality in the action area.

Table 7. Types of sites, essential physical and biological features, and the species life stage each physical and biological feature supports.

Site	Essential Physical and Biological Features	Species Life Stage
Snake River Basin steelhead[a]		
Freshwater spawning	Water quality, water quantity, and substrate	Spawning, incubation, and larval development
Freshwater rearing	Water quantity and floodplain connectivity to form and maintain physical habitat conditions	Juvenile growth and mobility
	Water quality and forage[b]	Juvenile development
	Natural cover[c]	Juvenile mobility and survival
Freshwater migration	Free of artificial obstructions, water quality and quantity, and natural cover[c]	Juvenile and adult mobility and survival

Site	Essential Physical and Biological Features	Species Life Stage
Snake River spring/summer Chinook salmon		
Spawning and 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 physical and biological features (PBFs) pertaining to estuarine areas have also been described for Snake River steelhead. These PBFs will not be affected by the proposed action and have therefore not been described in this Opinion.
[b] Forage includes aquatic invertebrate and fish species that support growth and maturation.
[c] Natural cover includes shade, large wood, log jams, beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks.
[d] Food applies to juvenile migration only.

Forage. More than half of some fish's food originates from terrestrial sources (Baxter et. al. 2005; Saunders & Fausch 2007). Their other food source is aquatic with many prey species feeding on terrestrial leaf litter. Aquatic invertebrates 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 moderate intensities over short durations. As a result, the action is expected to have effects consistent with the cited literature and thus impacts to this PBF will be insignificant.

Substrate. Available data from grazed areas within the action area indicates sediment levels in gravels are generally meeting SCNF standards for sedimentary geology within the Allotment (mean percent fines less than a quarter inch at depth). Because the proposed action is similar to the grazing that has occurred during the recent past it is reasonable to anticipate similar effects in the future.

Within the action area, stream sediment levels have been monitored at long-term sites on mainstem West Fork Iron Creek, North Fork Iron Creek, South Fork Iron Creek, and Iron Creek. Functionality criteria for instream sediment reflect goal levels identified in the Salmon National Forest Plan, as modified by geologic setting. Most recent surveys (sediment - mean percent fines less than a quarter inch at depth) include: West Fork Iron Creek 1A (2019) -10.4 percent; North Fork Iron Creek 1A (2019) - 17.7 percent; South Fork Iron Creek 1A (2009) - 21.9 percent; and Iron Creek 1A (2018) - 14.3 percent. The South Fork Iron site was visited in 2015, but was able to be monitored due to a beaver dam at the site and no adequate monitoring site available.

Review of the data associated with the resource objectives that are the most affected by livestock grazing (greenline successional status, woody species regeneration, and bank stability) taken at the three Allotment DMAs show these indicators are at the RMO or higher except at M238 (South Fork Iron Creek Unit), which has a GES of 43 with a static trend between the 2013 and

2018 readings. The bank stability rating in 2018 was 94 percent. The annual use indicator at this site is a 6-inch stubble height and 15 percent bank alteration until the GES objective is met. A browse use annual indicator has also been added to this site and is established as 50 percent for multi-stemmed species and 30 percent for single-stemmed species. This site appears to have sufficient woody recruitment to develop and maintain a healthy woody plant population. Cattle will water, cross, 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 streambank alteration. These introductions are likely to cause minor and temporary increases in substrate fine sediment in low velocity areas immediately downstream. As the available monitoring data suggest, these increases are not expected to be measurable. In addition, the use of riders, mineral deployment, and the described annual use indicators are expected to prevent measurable degradation of streambank conditions, which would otherwise lead to elevated sediment levels. These measures should ensure that the existing functioning appropriate sediment conditions within grazed areas of the Allotment are retained. NMFS also anticipates a long-term reduction in sedimentation as riparian conditions and streambank stability continue improving over time. Any short-term effects would be insignificant.

Natural Cover. Salmonids appear to prefer spawning in close proximity of overhead cover (Bjornn & 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 & 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 very 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. Should riparian areas develop that are not meeting RMOs, the SCNF proposes to use adaptive management to prescribe more restrictive utilization standards, which should result in improvement of riparian conditions at near natural rates 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 insignificant 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, current bank stability ratings are meeting RMOs in all areas accessible to livestock use. This suggests that recent grazing activities have not reduced the available quantity of undercut banks providing cover for ESA-listed fish in the action area. NMFS anticipates this condition to persist for the term of the proposed action and any reduction of undercut banks that does occur would be minor and insignificant at the stream reach or watershed scales.

Riparian Vegetation. Similar to those PBFs described above, riparian vegetation impacts from the proposed livestock grazing are expected to be insignificant. Although cattle will consume and trample some riparian vegetation, the proposed conservation measures and annual utilization

standards should greatly limit potential disturbance. Cattle use of riparian vegetation will be limited to 50 percent browse on multi-stemmed and 30 percent on single-stemmed species when the RMO for woody species is being met. A more restrictive 30 percent browse on multi-stemmed and 20 percent browse on single-stemmed species will be applied to Units when the RMO is not being met. Almost all DMAs are currently meeting RMOs for riparian vegetation and will utilize the higher utilization standards. This level of use has been consistently demonstrated to allowing for a stable trend where currently at PNC, or a trend toward late seral status where not at PNC.

The SCNF has incorporated several conservation measures (e.g., fencing, off-stream water sources and salt placement, established pasture rotations, herding, and forage utilization standards and monitoring) into grazing management on the Allotment in order to limit the impacts of livestock on DCH. Based on available scientific literature, NMFS expects that the proposed 20 percent maximum streambank alteration standard and 4-inch minimum stubble height will maintain stream habitat conditions that are currently functioning appropriately.

The SCNFs other conservation measures are also expected to help maintain or achieve late seral status or PNC. Turn-out in the spring is delayed by two weeks every other year to avoid grazing plants at the same time every year. For example, when a Unit is grazed first, browse on willows will be less (Hall & Bryant 1995; Kovalchik & Elmore 1991), and when the Unit is deferred 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 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 reduce negative impacts on riparian vegetation to insignificant levels while continuing to improve their seral status.

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 information needed to refine and make annual changes to livestock grazing management practices necessary to continue to meet RMOs (through adaptive management) should they become degraded.

The impact of grazing on riparian habitat within the action area has the potential to accelerate stream temperature increases caused by climate change. Overgrazing of riparian vegetation and stream widening due to bank alteration from livestock could result in less shading and shallow stream reaches, therefore causing an increase in water temperature. Additionally, the proposed action will occur while climate change-related effects are expected to become more evident within the range of the SRB steelhead DPS. However, management techniques for the proposed action will either maintain or improve riparian habitat within the action area. Therefore, the

proposed action is not expected to significantly contribute to the broader adverse effects of climate change to steelhead and Chinook.

NMFS anticipates that only insignificant effects to critical habitat are likely to occur under the proposed action. Primary reasons for this conclusion include: (1) habitat and riparian conditions are functioning at or near potential in almost all SCNF-managed reaches, which have been under less restrictive grazing practices in the recent past; (2) stream channels most sensitive to livestock grazing are generally excluded from grazing or occur in Units where late season grazing is not proposed; (3) the SCNF has demonstrated their ability to effectively apply the proposed monitoring and adaptive management strategy to identify potential livestock overutilization and prescribe effective management responses; and (4) there is limited livestock access to sensitive stream reaches designated as critical habitat due to topography and existing fences. Limiting the action's impacts to the minor levels described will maintain habitat conditions where they currently meet objectives and allow continued improvement in the limited sites that are below objectives. As a result of successfully implementing the proposed action, including conservation measures and monitoring, as described in the BA and this Opinion and based on the best available information, NMFS concurs with the SCNFs findings that the subject action is NLAA DCHs for SRB steelhead and SR spring/summer Chinook salmon.

3. 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.

3.1. Utility

Utility principally refers to ensuring that the information contained in this consultation is helpful, serviceable, and beneficial to the intended users. The intended users of this Opinion are the SCNF and their permittees. A copy of this Opinion was provided to the SCNF. The format and naming adhere to conventional standards for style. This consultation will be posted in the NOAA Library Institutional Repository at https://repository.library.noaa.gov/welcome.

3.2. 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.

3.3. 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 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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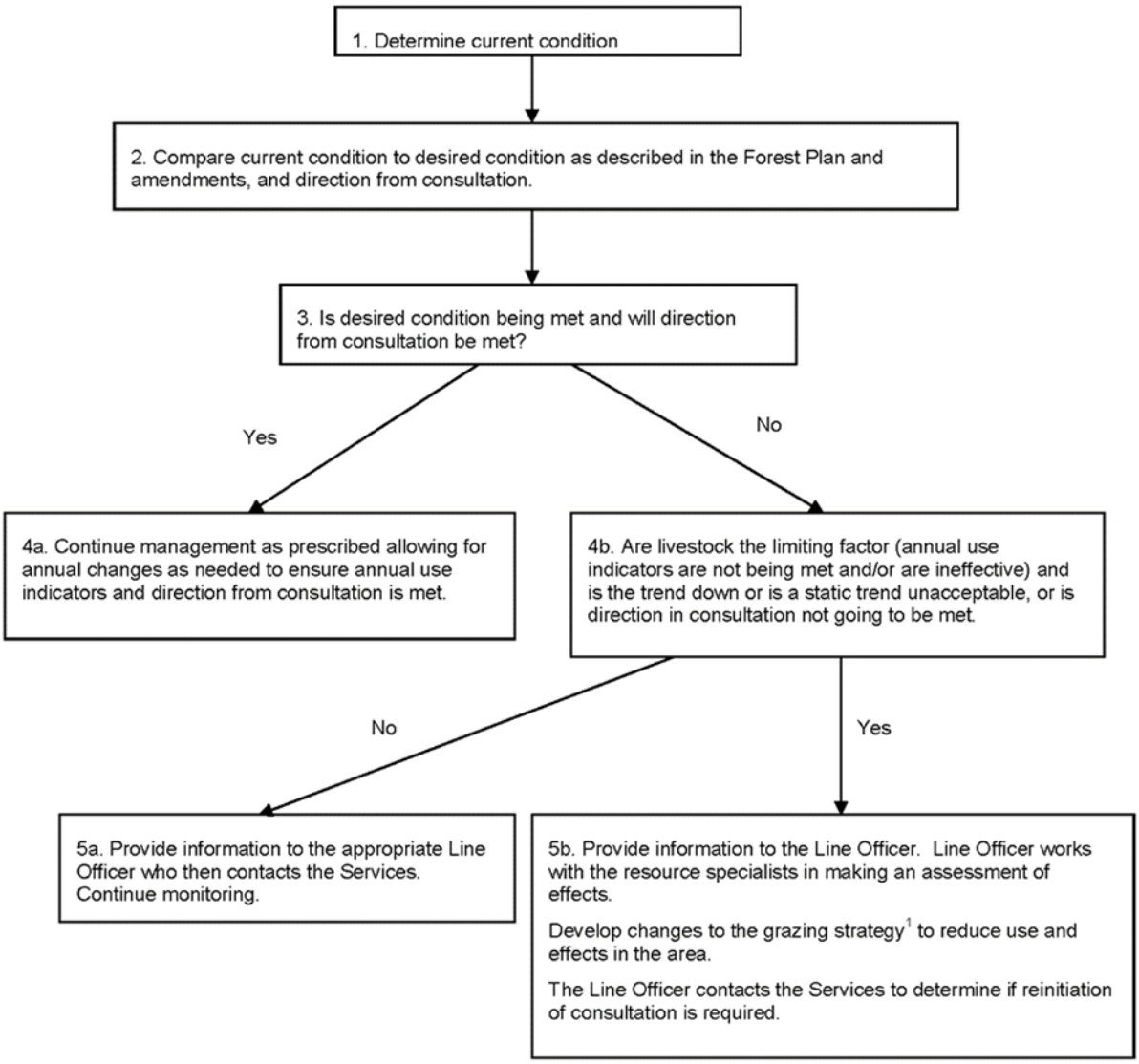
5. APPENDIX

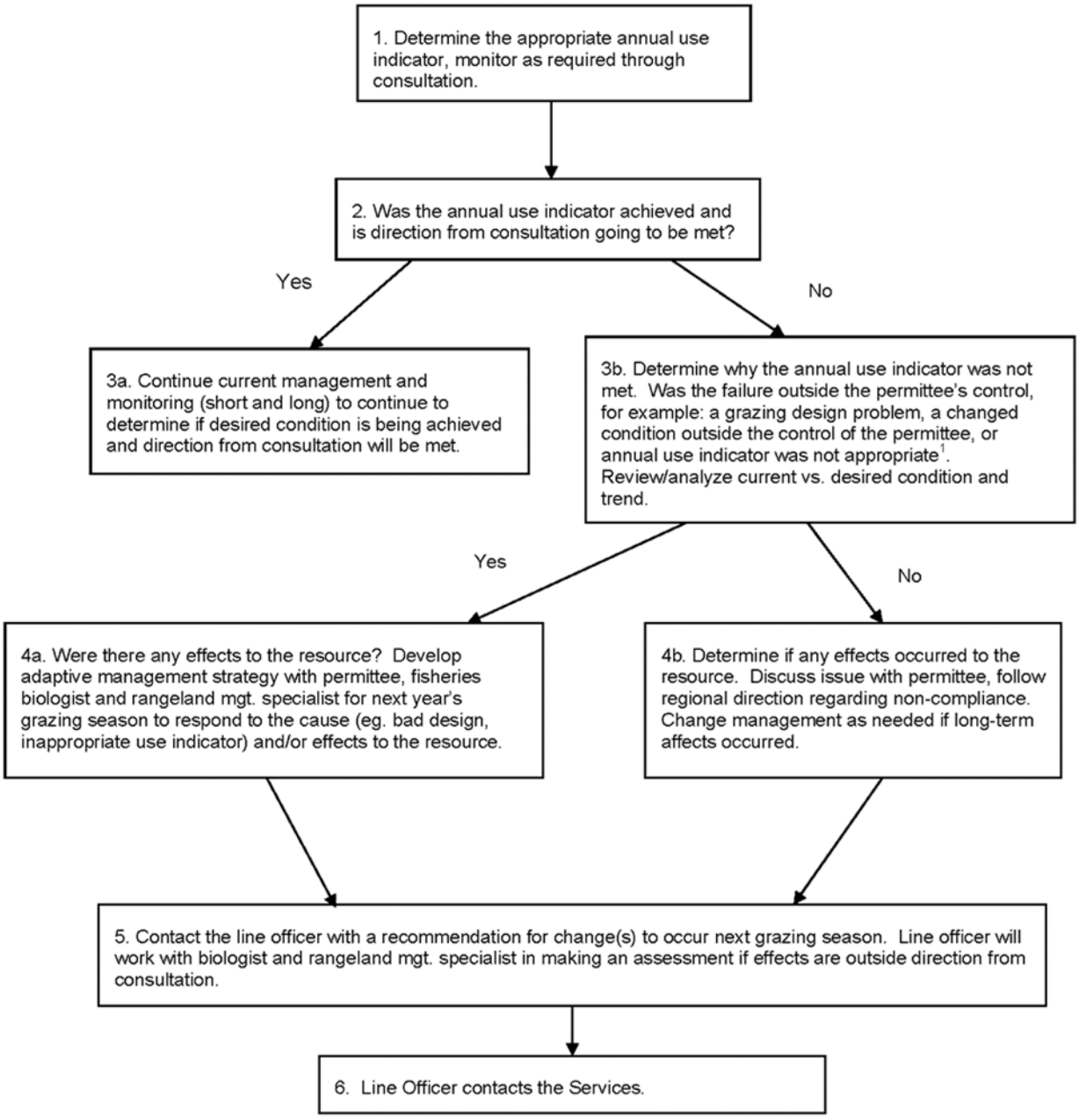
Salmon–Challis National Forest
Adaptive Management Strategy for Grazing Allotments

Diagram 1.0 – Implementation of Long-Term Adaptive Management Strategy for Allotments Requiring Consultation.



[1]Management actions will initially reduce use in the area. It is expected this may occur in any number of ways including but not limited to changing the season of use, reducing numbers, changing amount of use on annual indicator, changing herding practices, changing salting practices and/or reconstructing/constructing range improvements. If use can't be reduced and livestock continue to be the limiting factor total removal of livestock from the area may be necessary. Effectiveness of changed management will be monitored through adjusted annual use indicators and effectiveness monitoring.

Diagram 2.0 - Implementation of Annual Adaptive Management Strategy for Allotments Requiring Consultation.



[1]An inappropriate annual use indicator is an indicator that does not most accurately identify the weak link or first attribute that would indicate excessive livestock impacts. In this situation, changing to a more appropriate indicator will help achieve or maintain desired conditions.