



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

**Refer to NMFS No.: WCRO-2019-01847**

October 7, 2019

Thomas Montoya  
Forest Supervisor  
Wallowa-Whitman National Forest  
1550 Dewey Avenue, Suite A  
Baker City, Oregon 97814

Re: Endangered Species Act Section 7(a)(2) Biological Opinion for the Eastside Grazing Allotments and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation, Union and Baker Counties, Oregon, HUCs 17060104, 17060105, and 17050203

Dear Mr. Montoya:

Thank you for your letter dated June 26, 2019, requesting initiation of consultation with NOAA's National Marine Fisheries Service (NMFS) pursuant to section 7 of the Endangered Species Act of 1973 (ESA) (16 U.S.C. 1531 et seq.) for the Eastside Grazing Allotments. The enclosed document contains a biological opinion (Opinion) prepared by NMFS pursuant to section 7(a)(2) of the ESA on the effects of the Wallowa-Whitman National Forest (WWNF) authorizing livestock grazing on federal lands within the Eastside Grazing Allotments.

NMFS also reviewed the likely effects of the proposed action on essential fish habitat (EFH), pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1855(b)), and concluded that the action would adversely affect the EFH of coho and Chinook salmon. Therefore, we have included the results of that review in Section 3 of this document.

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

As required by section 7 of the ESA, NMFS provides an incidental take statement (ITS) with the Opinion. The ITS describes reasonable and prudent measures (RPMs) NMFS considers necessary or appropriate to minimize the impact of incidental take associated with this action.



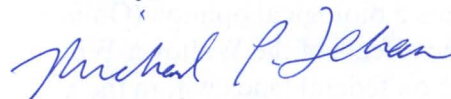
The take statement sets forth nondiscretionary terms and conditions, including reporting requirements, that the WWNF and any permittee who performs any portion of the action must comply with to carry out the RPMs. Incidental take from actions that meet these terms and conditions will be exempt from the ESA take prohibition.

This document also includes the results of our analysis of the action's effects on EFH pursuant to section 305(b) of the MSA, and includes 6 Conservation Recommendations to avoid, minimize, or otherwise offset potential adverse effects on EFH. These Conservation Recommendations are a non-identical set of the ESA Terms and Conditions. Section 305(b)(4)(B) of the MSA requires federal agencies provide a detailed written response to NMFS within 30 days after receiving these recommendations.

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

Please contact Sarah Fesenmyer, Southern Snake Branch Office, at (208) 378-5660 or [sarah.fesenmyer@noaa.gov](mailto:sarah.fesenmyer@noaa.gov) if you have any questions concerning this consultation, or if you require additional information.

Sincerely,



Michael P. Tehan  
Assistant Regional Administrator  
Interior Columbia Basin Office

Enclosure

cc: A. Huber – CTUIR  
L. Kring – WWNF

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

Eastside Grazing Allotments, Union and Baker Counties, Oregon, HUCs 17060104, 17060105, 17050203

NMFS Consultation Number: WCRO-2019-01847

Action Agency: USDA Forest Service, Wallowa-Whitman National Forest

**Affected Species and NMFS' Determinations:**

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

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

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

**Issued By:**



Michael P. Tehan  
Assistant Regional Administrator

**Date:** October 7, 2019

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## ACRONYMS

ACRONYM	DEFINITION
Allotments	Eastside Grazing Allotments
AUM	Animal Use Months
BA	Biological Assessment
CC	Clark Creek
CMC	Catherine Creek Mill Creek
CTUIR	Confederated Tribes of the Umatilla Indian Reservation
DPS	Distinct Population Segment
DQA	Data Quality Act
EFH	Essential Fish Habitat
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
HAPC	Habitat Areas of Particular Concern
ITS	Incidental Take Statement
MC	Mill Creek
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MIM	Multiple Indicator Monitoring
MPG	Major Population Group
NC	North Fork Clark Creek
NFC	North Fork Catherine Creek
NMFS	National Marine Fisheries Service
ODFW	Oregon Department of Fish and Wildlife
Opinion	Biological Opinion
PBF	Physical or Biological Features
PCE	Primary Constituent Element
PIBO	PACFISH-INFISH Biological Opinion
PFMC	Pacific Fishery Management Council
RMO	Riparian Management Objective
RPM	Reasonable and Prudent Measures
SFC	South Fork Catherine Creek
UI	Upper Indian Creek
VSP	Viable Salmonid Population
WWNF	Wallowa-Whitman National Forest

## **1. INTRODUCTION**

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

### **1.1 Background**

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

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

We completed pre-dissemination review of this document using standards for utility, integrity, and objectivity in compliance with applicable guidelines issued under the Data Quality Act (DQA) (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001, Public Law 106-554). A complete record of this consultation is on file at the Snake Basin Office in Boise, Idaho.

Updates to the regulations governing interagency consultation (50 CFR part 402) will become effective on October 28, 2019 [84 FR 44976]. Because this consultation was pending and will be completed prior to that time, we are applying the previous regulations to the consultation. However, as the preamble to the final rule adopting the new regulations noted, “[t]his final rule does not lower or raise the bar on section 7 consultations, and it does not alter what is required or analyzed during a consultation. Instead, it improves clarity and consistency, streamlines consultations, and codifies existing practice.” Thus, the updated regulations would not be expected to alter our analysis.

### **1.2 Consultation History**

The Wallowa-Whitman National Forest (WWNF) proposes to authorize livestock grazing on the Eastside Grazing Allotments (Allotments) from 2019 to 2029. Livestock grazing on these Allotments is ongoing, and NMFS previously consulted with the WWNF on these Allotments in 2010 for a 5-year timeframe (NMFS No. 2010/03694). The WWNF Level 1 Team reviewed and commented on several drafts of the biological assessment (BA) for this action between April 2018 and May 2019.

In July and August 2019, the WWNF provided additional information to NMFS on grazing management on the Allotments, through phone conversations, meetings, and emails. In an email sent to NMFS on August 22, the WWNF provided clarifications to the proposed action concerning minimization of livestock access and impact to South Fork Catherine Creek. In a phone call with NMFS on August 29, 2019, and a subsequent email on September 19, 2019, the WWNF provided clarifications to the proposed action concerning off-site water developments.

NMFS drafted an Opinion and shared the Proposed Action and Terms and Conditions sections of the Opinion with the WWNF on September 4, 2019. The WWNF subsequently shared the draft Proposed Action and Terms and Conditions with the grazing permittees, who requested and received applicant status from the WWNF. The WWNF reported no comments or concerns.

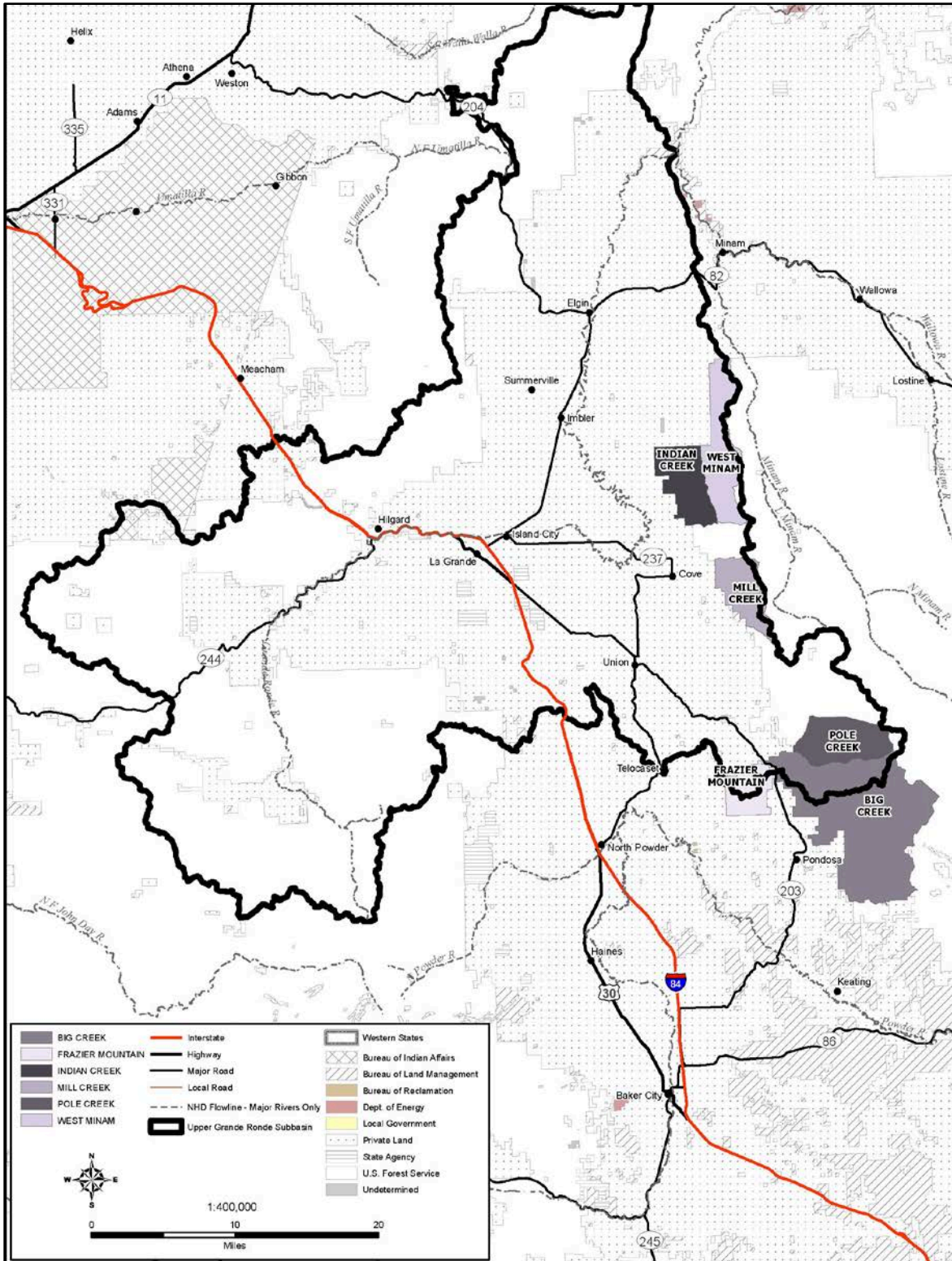
Because this action has the potential to affect tribal trust resources, NMFS provided copies of the proposed action and terms and conditions from our draft Opinion to the Confederated Tribes of the Umatilla Indian Reservation on September 5, 2019. The Confederated Tribes of the Umatilla Indian Reservation did not respond.

### **1.3 Proposed Action**

“Action” means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by federal agencies (50 CFR 402.02). The La Grande Ranger District of the WWNF proposes to authorize livestock grazing on the Eastside Grazing Allotments from 2019 until 2029. These Allotments fall in the Grande Ronde, Lower Grande Ronde, and Powder River subbasins, to the east of Union, Oregon. The Eastside Allotments include Indian Creek, West Minam, Mill Creek, Pole Creek, Frazier Mountain, and Big Creek (Figure 1). The Big Creek, Pole Creek, and Frazier Mountain Allotments are located in the headwaters of Catherine Creek. The Mill Creek, Indian Creek, and West Minam Allotments are located in the headwaters of tributaries to the Grande Ronde River. All of the Allotments have streams which provide designated critical habitat for Snake River Basin steelhead; and the Big Creek, Pole Creek, and Indian Creek Allotments also provide critical habitat for Snake River spring/summer Chinook salmon (see Appendix A, Figure A-1).

The proposed action consists of the following components: (1) Livestock numbers and season of use by pastures; (2) conservation measures aimed at minimizing the impacts of livestock on riparian areas; (3) forage utilization standards and monitoring; (4) redd surveys and redd protection; and (5) adaptive management procedures to adjust grazing practices if necessary to protect ESA-listed fish and their habitat.





**Figure 1. Map of Eastside Grazing Allotments (Indian Creek, West Minam, Mill Creek, Pole Creek, Frazier Mountain and Big Creek).**

### 1.3.1 Livestock Numbers and Periods of Use

The WWNF proposes to authorize a maximum of 5,349 animal use months (AUMs) during the period of June 1 to October 15 for up to 1,091 cow/calf pairs of cattle, spread over 12 pastures on the six allotments (Table 1). Pole Creek, Frazier Mountain, and Mill Creek Allotments consist of one summer pasture grazed for the entire season of use; whereas Big Creek, Indian Creek, and West Minam Allotments have multiple pastures through which livestock are moved during the season. Pastures are separated by fence or topography. Livestock enter and leave the Allotments via adjacent private lands through a combination of herding and stock trailers. Livestock have not been stocked on the Mill Creek Allotment since the summer of 2005, but grazing could resume on this Allotment in the future.

**Table 1. Livestock Numbers and Season of Use for the Eastside Allotments.**

Allotment	Permitted Use (cow/calf pairs)	Authorized Use (AUMS)	General Season of Use	Allotment Acres
Big Creek	539	2,854	June 16 to Oct. 15	45,289
Frazier	30	199	June 1 to Oct. 31	2,570
Indian	140	558	July 1 to Sept. 30	10,118
Mill Creek	75	300	July 1 to Sept. 30	8,570
Pole Creek	145	580	June 15 to Sept. 15	11,310
West	162	858	June 16 to Oct. 15	13,784

### 1.3.2 Conservation Measures

The WWNF proposes to manage livestock on the Allotments in a manner that allows achievement of Blue Mountain Forest Plan standards, including meeting PACFISH standards (USFS 1995) and improving riparian conditions towards attainment of riparian management objectives (RMOs). The WWNF proposes to use the following conservation measures to minimize the impacts of livestock grazing on riparian areas, stream channels, and listed fish species:

- Permittees will herd cattle weekly (or more frequently if needed) during the grazing season to reduce cattle grazing and trailing in riparian areas. Emphasis will be placed on reaches accessible to cattle (as listed and mapped in the BA [WWNF 2019]).
- To reduce cattle impacts on riparian vegetation and stream channels, permittees will select stock driveway locations that avoid riparian areas except at needed crossings.
- To reduce cattle impacts on riparian vegetation and stream channels, permittees will not place salt for livestock use within ¼-mile of streams and springs.
- Permittees will maintain the existing off-site water sources (Table 2). As needed, permittees will develop additional off-site water sources to insure dependable sources of clean water for livestock away from riparian areas. The off-site water sources listed in Table 2 are located at small springs that are disconnected from perennial streams or seasonally connected to ephemeral streams. At these springs, water that surfaces naturally is either delivered to a stock trough or stored in a small pond/reservoir. Overflow from the tank or pond is delivered back to the natural drainage network, or an

area away from the trough to reduce mud and soil loss (personal communication, A. Johnson, WWNF, 2019b).

- Permittees and the WWNF will maintain or reconstruct as needed all existing riparian enclosure fences and riparian protection drift fences on the Allotments (shown in Appendix A, Figures A-4 and A-5). Table 3 lists existing riparian enclosures, which are located to protect the stream reaches most sensitive to livestock impacts on the Allotments. All riparian enclosure fences on the Allotments are currently operational, with the exception of the Clark Creek and Milk Creek fences. The WWNF plans to replace the riparian enclosure fence on 0.4 miles of Clark Creek in 2020 if funding is approved. In 2019, the WWNF required additional maintenance by the permittee for the Milk Creek fence; the WWNF will monitor this effort by the permittee to ensure compliance. The WWNF plans to replace the Milk Creek fence in the next 2 years if funding is approved (personal communication, A. Johnson, WWNF, 2019a).
- Before livestock grazing can resume on the Mill Creek Allotment (unused by livestock since 2005), a permittee or the WWNF will construct boundary fencing, enclosure fences for sensitive riparian areas, and two off-site water developments, in order to keep livestock away from perennial streams and control of livestock within the allotment boundaries.

**Table 2. Off-site water developments in the Eastside Allotments in subwatersheds with steelhead or Chinook salmon.**

Allotment	Existing Off-site Water
Big Creek	12
Frazier Mountain	2
Indian Creek	4
Mill Creek	0
Pole Creek	7
West Minam	6

**Table 3. Riparian Enclosures in the Eastside Allotments.**

Allotment	Stream	Miles of Stream Enclosure	Fence Status
Big Creek	Bottle Creek	0.5	Operational
	Balm Creek	0.5	Operational
	Lick Creek	0.1	Operational
Frazier Mountain	Milk Creek	0.8	Poor-needs reconstruction
	Thorn Creek	0.25	Operational
Indian Creek	Little Indian Creek	0.1	Operational
Mill Creek	NONE	N/A	NONE
Pole Creek	Corral Creek	1.1	Operational
West Minam	North Clark Creek	0.5	Operational
	Clark Creek	0.4	Replacement planned for 2020

### 1.3.3 Forage Utilization Standards and Monitoring

To limit the impact of livestock on accessible, unfenced riparian areas, the WWNF has set end-of-season riparian utilization standards for each Allotment, shown in Table 4. The riparian utilization metrics are percent shrub browse, percent streambank alteration, and greenline stubble height. The WWNF will measure shrub browse and streambank alteration at all monitoring sites. The WWNF will measure stubble height on three streams (Bottle Creek, Milk Creek, and Clark Creek). These three streams are lower-gradient streams for which stubble height is an appropriate metric for livestock use. The WWNF has determined that shrub browse is a more appropriate metric than stubble height for the other streams on the Allotments that support ESA-listed fish and are accessible to livestock. This is because most streams on the Allotments are moderate- to high- gradient streams with cascading or riffle dominated channels. Most streams on the Allotments are moderately to highly entrenched, have large substrate banks, have riparian areas of alder and currant, and do not contain soils conducive to grass and grass-like species. For these reasons, shrub browse is a more appropriate metric of livestock usage of riparian areas than stubble height. Shrub browse will be measured as the percent removed of annual leader production. Streambank alteration will be measured at the end of the grazing season using the Multiple Indicator Monitoring (MIM) method (Burton et al. 2011). The WWNF’s objective for all of the Allotments is to not exceed 20 percent streambank alteration, in order to achieve a goal of at least 90 percent streambank stability.

**Table 4. Maximum Riparian Utilization Standards for the Eastside Allotments.**

Allotment	Maximum Shrub Utilization Standard for Riparian Areas	Streambank Alteration Objective, or Meet 90% Stable Streambanks	Minimum Greenline Stubble Height for Grass & Grass-like Riparian Species*
Big Creek	30–40%	<20% alteration or 90% stable banks	6-inch - Bottle Creek
Frazier Mountain	40%	<20% alteration or 90% stable banks	6-inch - Milk Creek
Indian Creek	30–40%	<20% alteration or 90% stable banks	
Mill Creek	30–40%	<20% alteration or 90% stable banks	
Pole Creek	30–40%	<20% alteration or 90% stable banks	
West Minam	35–40%	<20% alteration or 90% stable banks	6-inch - Clark Creek

\*Stubble height will only be measured the Key Areas in the three low-gradient streams listed here (Bottle Creek, Milk Creek, and Clark Creek).

Forage utilization will be measured in Range Monitoring Key Areas within the Allotments. These reaches are mapped in Figures A-2 and A-3 of Appendix A. Key Areas are located in areas where excessive riparian forage utilization might first become evident, or in areas where forage utilization has the potential to damage riparian areas. The WWNF has designated at least one Key Area in all pastures where cows can access stream reaches with ESA-listed fish or critical habitat.

**Trigger Monitoring.** The values shown in Table 4 are for the end of the grazing season. For shrub browse and stubble height, the permittees and the WWNF will use move-trigger values to move livestock out of pastures before exceeding the end-of-season riparian forage utilization objectives. A stubble height of 7 inches will be used as a move trigger for pastures where herbaceous vegetation is a key hydric stabilizer (see Table 4). A shrub utilization of 5 percent less than the maximum allowable utilization will be used as a trigger indicator where shrubs are a key hydric stabilizer (all other pastures). Permittees will conduct trigger monitoring midway through the grazing season in each pasture and notify their WWNF range specialist when they think livestock should be moved to the next pasture or off the WWNF. Trigger monitoring can vary from numerical measurements of shrub browse, stubble height, and streambank alteration to qualitative indicators that permittees have developed to inform them of when to begin moving livestock from a pasture in order to not exceed end-of-season objectives. If end-of-season objectives are not met on an allotment (i.e., non-compliance), the WWNF will conduct the mid-season trigger monitoring the following year and collect data in lieu of permittee observations.

**End of Season Implementation Monitoring.** To determine compliance with riparian utilization standards, the WWNF range manager will measure riparian utilization during and after the grazing season, on pastures where streams are accessible to livestock and occupied by ESA-listed species or their critical habitat. The WWNF anticipates conducting implementation monitoring annually on these pastures, but will monitor at a minimum frequency of once every 5 years. If the WWNF range manager visually identifies an area of concern on one of the Allotments during the grazing season, the WWNF will take more frequent utilization measurements in that pasture. The WWNF will conduct end-of-season compliance monitoring in a pasture any year immediately following non-compliance the prior year. Monitoring will occur in Key Areas where livestock can access streams with ESA-listed species. Additionally, the WWNF established new monitoring sites within riparian exclosures in Scout Creek, Bottle Creek, and Prong Creek in 2018 after non-compliance incidents inside exclosures for those streams in 2018.

If measurements in Key Areas show that end-of-season riparian utilization standards were exceeded, then the WWNF will work with the permittee to adjust grazing management the following year to prevent future non-compliance. Adaptive management strategies may include, but are not limited to: change in season of use or numbers of livestock; fencing proposals; change in utilization standards; increased riding; or change in salt and water placements. Appropriate adaptive management measures will depend on site-specific conditions for the pasture where non-compliance occurred. The WWNF will discuss appropriate changes with the permittees and will include these changes in the next year's annual operating instructions. If grazing practices on one of the Allotments fails to meet standards in the Blue Mountains Land and Resource Management Plan (WWNF 1990) or fail to meet the requirements of this ESA consultation, and this failure is due to negligent livestock management or the permittee disregarding annual operating instructions for two consecutive years, then the WWNF will suspend the number of livestock or season of use for that Allotment.

**Effectiveness Monitoring.** The La Grande Ranger District is currently developing a comprehensive effectiveness monitoring program for all allotments in the district. Effectiveness monitoring will assess riparian vegetation and stream habitat conditions using the MIM protocols described in Burton et al. (2011). These monitoring protocols or an updated version will be used

unless a better monitoring methodology becomes available. At each effectiveness monitoring site, channel morphology and vegetation characteristics will be inventoried and tracked over time. Measurements may include channel cross-sections, vegetation composition, effective ground cover, and streambank stability. A permanent effectiveness monitoring plot will be established in each pasture. Some pastures have existing PACFISH-INFISH Biological Opinion (PIBO) monitoring sites (mapped in Figures 6a and 6b of the BA (WWNF 2019)), at which the U.S. Forest Service PIBO team collects stream habitat data every 5 years. Stream and riparian condition data derived from effectiveness monitoring will be used to identify if adaptive management changes to grazing management are required in order to attain RMOs for streams on the Allotments. For example, the WWNF’s objectives for most streams on these Allotments include: streambank stability greater than 90 percent, streambank cover of greater than 85 percent, and a width-to-depth ratio of less than 10.

Trends in riparian vegetation are also monitored through permanent photo points and vegetation plots on each pasture, designed to be re-read approximately every 5 years. These records are on file at the WWNF La Grande Ranger District office.

#### 1.3.4 Redd Monitoring

For the Allotments where livestock turn-out is scheduled for June 1 or June 16, prior to turn-out the WWNF will conduct steelhead redds surveys on all spawning habitat accessible to livestock. For pastures where livestock are not turned out until July 1 or later, or for pastures where steelhead spawning habitat is protected by riparian exclosures, the WWNF will not survey for steelhead redds. Steelhead fry generally emerge from redds before July 1 and are no longer vulnerable to trampling by cattle. Table 5 shows the accessible steelhead spawning reaches by stream and Allotment, and the schedule for surveying for the presence of steelhead redds prior to cattle turnout. For either of these two streams, if grazing does not occur prior to July 1, no spawning surveys will occur that year.

**Table 5. Accessible reaches containing steelhead spawning habitat that will be surveyed for redds prior to cattle turnout in June.**

Allotment	Stream	Accessible Reach Length (Miles)	Scheduled Redd Survey	Date of Cattle Turn Out
Big Creek	Prong Creek	0.6	Week Prior to June 16	June 16
Pole Creek	Pole Creek	0.3	Week Prior to June 16	June 16

The WWNF will document the location of any steelhead redds found during their surveys and will determine the vulnerability of each redd to trampling by cattle. If a redd is vulnerable to trampling by cattle, then the WWNF will protect the redd with a physical obstruction such as a fence or by not moving livestock into the area. Redd protection will end on July 1 when steelhead fry have emerged from the gravel.

The WWNF does not propose to conduct redd surveys on North Fork Clark Creek or South Fork Catherine Creek, although livestock could be turned out before July 1 on pastures that encompass these streams. The WWNF conducted an annual survey of the 0.4 miles North Fork Clark Creek accessible to livestock from 2010–2014 and found no steelhead redds or adult

steelhead. In January 2015 NMFS agreed with a request by the WWNF to end steelhead redd surveys on this stream reach. The WWNF does not propose to survey South Fork Catherine Creek for steelhead redds because high flows before July 1 prevent livestock from entering the water.

### 1.3.5 Additional Conservation Measures for South Fork Catherine Creek

Chinook salmon spawning occurs on the Allotments in the lower two miles of South Fork Catherine Creek, but the permittee's Annual Operating Instructions state that the permittee is not allowed to graze cows along the section of South Fork Catherine Creek that supports Chinook spawning. The WWNF has determined that South Fork Catherine Creek is largely inaccessible to livestock due to a combination of fencing, steep topography, and monitoring for livestock presence by WWNF range staff (WWNF 2019). The WWNF range staff have identified three possible access points for cows to South Fork Catherine Creek, and riparian exclosures or drift fences are in place at the access points. On the other hand, biologists with the Oregon Department of Fish and Wildlife (ODFW) have anecdotally observed a small number of cows in the riparian area of South Fork Catherine Creek within the action area in August and September (personal communication, Joseph Feldhaus, ODFW, July 25, 2019). The WWNF is therefore proposing multiple conservation measures to minimize the chance that livestock will access the portion of South Fork Catherine Creek that supports Chinook salmon spawning. On August 22, 2019, the WWNF clarified by email that the proposed action includes the following conservation measures:

- To ensure livestock are detected and promptly removed from areas adjacent to South Fork Catherine Creek, the permittee's Annual Operating Instructions will include language that describes the expectation that the permittee will make inspections frequently enough to detect and remove livestock if they move to the South Fork Catherine Creek riparian area. This includes the areas of South Fork Catherine Creek currently fenced near the confluence of Pole Creek, Corral Creek, and Prong Creek, as well as the unfenced areas from Corral Creek to the WWNF boundary. The permittee will remove livestock from this area any time they are found, to avoid habituation and trailing in the areas adjacent to South Fork Catherine Creek. The permittee will conduct inspections after August 15 since Chinook begin spawning in the second half of August.
- The permittee will continue to maintain the existing fences to control livestock access to South Fork Catherine Creek.
- The permittee will utilize areas other than the South Fork Catherine Creek trail for livestock entry to the Pole Creek Allotment.
- The WWNF will periodically inspect South Fork of Catherine Creek during the month of August to ensure livestock are not in the area, or are promptly removed if detected.

- The WWNF will install a “walk-over” for recreation use at the boundary fence gate near the mouth of South Fork Catherine Creek, in order to reduce the chance that the gate will be left open by recreationists, thus potentially allowing access by livestock to the South Fork Catherine Creek riparian area.

### 1.3.5 Adaptive Management

The WWNF will use the following adaptive management steps to adjust grazing management for specific pastures, both over the long term (3–5 years) and annually, if needed to minimize the impact of livestock on streams.

- a. Monitor annual use indicators as required by the BA and Opinion.
- b. Were the annual use indicators met?
  - Yes: Continue current management and monitoring (short and long term) to continue to determine if desired condition is being achieved.
  - No: Determine why the annual use indicator was not met. Was the failure due to causes outside the permittee’s control (e.g., a grazing design problem, a changed condition outside the control of the permittee, or annual use indicator was not appropriate)? (An inappropriate annual use indicator is an indicator that is not the first attribute that might show excessive livestock impacts. In this situation, changing to a more appropriate indicator will help achieve or maintain desired conditions.)
    - Yes: Were there any effects to riparian and stream conditions? Develop a plan with permittee, fisheries biologist, and rangeland management specialist for the next year’s grazing to respond to the cause (e.g., bad design, inappropriate use indicator, etc.) and/or effects to the resource.
    - No: Determine if any effects occurred to the stream conditions. Discuss with the permittee why the annual use indicator standard was not met and develop a plan to be implemented the following year to correct grazing management in order to meet the annual use indicator standard. Change grazing management as needed if long-term effects to riparian and aquatic conditions occurred.
- c. Contact the Line officer with a recommendation for change(s) to occur for the next grazing season. Line officer will work with biologist and rangeland management specialist in making an assessment if effects to riparian and stream conditions are outside what was described and anticipated in this consultation.
- d. Line Officer contacts NMFS and the U.S. Fish and Wildlife Service.



Through adaptive management, the WWNF will modify grazing operations when progress towards achieving the desired conditions for riparian vegetation and streams is not being made. If end-of-season utilization standards are not met, adaptive management measures will ensure that standards are met in the future. Adaptive management measures could include: changes in season of use or numbers of livestock; additional fencing; changes to forage utilization standards; increased herding; and changes in placement or salt or off-site water. For example, in 2018 livestock breached enclosure fences on Bottle Creek and Prong Creek (Big Creek Allotment), and Milk Creek (Frazier Mountain Allotment); and end-of-season riparian objectives were exceeded for those streams. Starting with the 2019 grazing season, the WWNF made the following management adjustments to prevent non-compliance from reoccurring:

- **Bottle Creek and Prong Creek (Big Creek Allotment).** The enclosure fence will be maintained prior to turnout in 2019 and into the future. The pasture will not have livestock placed into it until later in the season to prevent the season-long use that occurred in 2018. The District Ranger will instruct the permittee to modify management to meet the management goals and objectives. Additional monitoring by the WWNF will occur to ensure compliance.
- **Milk Creek (Frazier Mountain Allotment).** The WWNF required additional fence maintenance in 2019 to better secure the enclosures that protect 0.8 miles of steelhead habitat on Milk Creek. Additional monitoring by the WWNF will occur in 2019 to ensure compliance.

### 1.3.6 Interrelated and Interdependent Actions

“Interrelated actions” are those that are part of a larger action and depend on the larger action for their justification. “Interdependent actions” are those that have no independent utility apart from the action under consideration (50 CFR 402.02). Permittees for the Eastside Grazing Allotments also graze livestock on adjacent private land, where grazing may cause adverse effects to ESA-listed species. However, grazing on private land adjacent to WWNF pastures would continue to occur regardless of whether or not the permittees are able to use the WWNF pastures. Therefore, adjacent private land grazing is not interrelated to or interdependent on the proposed action. NMFS does not know of any other potential interrelated or interdependent actions associated with the proposed action.

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

The ESA establishes a national program for conserving threatened and endangered species of fish, wildlife, plants, and the habitat upon which they depend. As required by section 7(a)(2) of the ESA, each federal agency must ensure that its actions are not likely to jeopardize the continued existence of endangered or threatened species, or adversely modify or destroy their designated critical habitat. Per the requirements of the ESA, federal action agencies consult with NMFS and section 7(b)(3) requires that, at the conclusion of consultation, NMFS provides an

Opinion stating how the agency's actions would affect listed species and their critical habitat. If incidental take is reasonably certain to occur, section 7(b)(4) requires NMFS to provide an ITS that specifies the impact of any incidental taking and includes non-discretionary reasonable and prudent measures (RPMs) and terms and conditions to minimize such impacts.

## **2.1 Analytical Approach**

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

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

The designations of critical habitat for ESA-listed species use the term primary constituent element (PCE) or essential features. The new critical habitat regulations (81 FR 7414) replace this term with PBFs. The shift in terminology does not change the approach used in conducting a “destruction or adverse modification” analysis, which is the same regardless of whether the original designation identified PCEs, PBFs, or essential features. In this Opinion, we use the term PBF to mean PCE or essential feature, as appropriate for the specific critical habitat. We use the following approach to determine whether a proposed action is likely to jeopardize listed species or destroy or adversely modify critical habitat:

- Identify the rangewide status of the species and critical habitat likely to be adversely affected by the proposed action.
- Describe the environmental baseline in the action area.
- Analyze the effects of the proposed action on both species and their habitat using an “exposure-response-risk” approach.
- Describe any cumulative effects in the action area.
- Integrate and synthesize the above factors by: (1) Reviewing the status of the species and critical habitat; and (2) adding the effects of the action, the environmental baseline, and cumulative effects to assess the risk that the proposed action poses to species and critical habitat.

- Reach a conclusion about whether species are jeopardized or critical habitat is adversely modified.
- If necessary, suggest a reasonable and prudent alternative to the proposed action.

## **2.2 Rangewide Status of the Species and Critical Habitat**

This Opinion considers the status of each species that would be adversely affected by the proposed action. The status is determined by the level of extinction risk that the listed species face, based on parameters considered in documents such as recovery plans, status reviews, and listing decisions. This informs the description of the species' likelihood of both survival and recovery. The species status section also helps inform the description of the species' current "reproduction, numbers, or distribution" as described in 59 CFR 402.02. The Opinion also examines the condition of critical habitat throughout the designated area, evaluates the conservation value of the various watersheds that make up the designated area, and discusses the current function of PBFs that help to form that conservation value.

The two species considered in this Opinion are the Snake River spring/summer Chinook salmon and Snake River Basin steelhead. Each of these evolutionarily significant units (ESU) or distinct population segments (DPS) is composed of multiple populations which spawn and rear in different watersheds across the Snake River basin. Having multiple viable populations makes an ESU or DPS less likely to become extinct from a single catastrophic event (ICBTRT 2007). NMFS expresses the status of an ESU or DPS in terms of the status and extinction risk of its individual populations, relying on McElhaney et al.'s (2000) description of a viable salmonid population. The four parameters of a viable salmonid population (VSP) are abundance, productivity, spatial structure, and diversity. Final recovery plans for both species (NMFS 2017) describe these four parameters in detail and the parameter values needed for persistence of individual populations and for recovery of the ESU or DPS.

We summarize the status and available information on each species based on the detailed information on the status of individual populations and the species as a whole provided by the *ESA Recovery Plan for Snake River Spring/Summer Chinook Salmon & Snake River Basin Steelhead* (NMFS 2017) and *Status review update for Pacific salmon and steelhead listed under the Endangered Species Act: Pacific Northwest* (NWFSC 2015) (Table 6). We also identify the major threats or limiting factors for the ESU/DPS. These two documents are incorporated by reference here. For both species, many individual populations are not meeting recovery plan abundance and productivity targets, such that both species remains threatened with extinction.

For Snake River spring/summer Chinook salmon, the Eastside Allotments overlap with the Catherine Creek population, in the Grande Ronde/Imnaha Major Population Group (MPG). The Catherine Creek population is currently at high risk of extinction due to population abundance and productivity values below minimum viability targets. The population is also currently supported by significant levels of direct hatchery supplementation. For the most recently calculated 10-year mean abundance estimates, Catherine Creek had only 110 natural spawners, compared to a minimum viability threshold of 1,000 spawners (NWFSC 2015). Abundance of Catherine Creek spawners in the years since 2015 has not increased (ODFW 2019). Based on

Recovery Plan viability scenarios, the Catherine Creek population must become viable for the species as a whole to recover (NMFS 2017).

**Table 6. Listing classification and date, status summary (including recovery plan reference and most recent status review), and limiting factors for species considered in this Opinion.**

Species	Listing Classification and Date	Status Summary	Limiting Factors
<b>Snake River Basin steelhead</b>	Threatened 1/5/06	<p>This DPS comprises 24 populations organized into five MPGs. Currently, five populations are tentatively rated at high risk of extinction, 17 populations are rated as maintained (moderate risk of extinction), one population is viable, and one population is highly viable. Although abundance has increased since the time of listing, four out of the five MPGs are not meeting the population viability goals laid out in the recovery plan (NMFS 2017).</p> <p>In order for the species to recover, more populations will need to reach viable status through increases in abundance and productivity. Additionally, the relative proportion of hatchery fish spawning in natural spawning areas near major hatchery release sites remains uncertain and may need to be reduced (NWFSC 2015).</p>	<ul style="list-style-type: none"> <li>• Adverse effects related to the mainstem Columbia and Snake River hydropower system and modifications to the species' migration corridor.</li> <li>• Genetic diversity effects from out-of-population hatchery releases. Potential effects from high proportion of hatchery fish on natural spawning grounds.</li> <li>• Degraded freshwater habitat.</li> <li>• Harvest-related effects, particularly for B-run steelhead</li> <li>• Predation in the migration corridor.</li> </ul>
<b>Snake River spring/summer-run Chinook salmon</b>	Threatened 6/28/05	<p>This ESU comprises 28 extant and four extirpated populations, organized into five MPGs, none of which are meeting the viability goals laid out in the recovery plan (NMFS 2017). All except one extant population (Chamberlin Creek) are at high risk of extinction (NWFSC 2015). Most populations will need to see increases in abundance and productivity in order for the ESU to recover. Several populations have a high proportion of hatchery-origin spawners—particularly in the Grande Ronde, Lower Snake, and South Fork Salmon MPGs—and diversity risk will also need to be lowered in multiple populations in order for the ESU to recover (ICBTRT 2007; ICBTRT 2010; NWFSC 2015).</p>	<ul style="list-style-type: none"> <li>• Adverse effects related to the mainstem Columbia and Snake River hydropower system and modifications to the species' migration corridor.</li> <li>• Degraded freshwater habitat, including altered streamflows and degraded water quality.</li> <li>• Harvest-related effects</li> <li>• Predation in the migration corridor.</li> <li>• Potential effects from high proportion of hatchery fish on natural spawning grounds.</li> </ul>

For Snake River Basin steelhead, the Eastside Allotments overlap with the Upper Grande Ronde River population in the Grande Ronde River Major Population Group. The NWFSC (2015) rated the Upper Grande Ronde population as viable because its 10-year abundance and productivity were above minimum viability targets. Abundance for the Upper Grande Ronde River population has remained relatively high (compared to other Snake River populations), with

an estimated 4,441 spawners in 2015 and 3,405 spawners in 2016 (Stark et al. 2017; Stark et al. 2018)—above the minimum mean abundance viability threshold for the population of 1,500 spawners. However wild steelhead returns to the Upper Grande Ronde dropped precipitously in 2018, far below the minimum abundance target (T. Sedell, ODFW, personal communication, July 30, 2019).

### 2.2.2 Status of Critical Habitat

In evaluating the condition of designated critical habitat, NMFS examines the condition and trends of PBFs that 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).

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

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

Site	Physical and Biological Features (PBFs)	Species Life Stage
<b>Snake River Basin Steelhead<sup>a</sup></b>		
Freshwater spawning	Water quality, water quantity, and substrate	Spawning, incubation, and larval development
Freshwater rearing	Water quantity & floodplain connectivity to form and maintain physical habitat conditions	Juvenile growth and mobility
	Water quality and forage	Juvenile development
	Natural cover	Juvenile mobility and survival
Freshwater migration	Free of artificial obstructions, water quality and quantity, and natural cover	Juvenile and adult mobility and survival
<b>Snake River Spring/Summer Chinook</b>		
Spawning & Juvenile Rearing	Spawning gravel, water quality and quantity, cover/shelter (Chinook only), food, riparian vegetation, space (Chinook only), water temperature and access (sockeye only)	Juvenile and adult.
Migration	Substrate, water quality and quantity, water temperature, water velocity, cover/shelter, food, riparian vegetation, space, safe passage	Juvenile and adult.

<sup>a</sup> Additional PBFs pertaining to estuarine, nearshore, and offshore marine 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.

Table 7 summarizes designated critical habitat for each species, based on the detailed information on the status of critical habitat throughout the designation area provided in the recovery plans for the species (NMFS 2017), which are incorporated by reference here. Across the designation, the current ability of PBFs to support the species varies from excellent in wilderness areas to poor in areas of intensive human land use.

**Table 8. Critical habitat, designation date, Federal Register citation, and status summary for critical habitat considered in this Opinion.**

Species	Designation Date and Federal Register Citation	Critical Habitat Status Summary
<b>Snake River Basin steelhead</b>	9/02/05 70 FR 52630	Critical habitat encompasses 25 subbasins in Oregon, Washington, and Idaho. Habitat quality in tributary streams varies from excellent in wilderness and roadless areas, to poor in areas subject to heavy agricultural and urban development (NMFS 2017). Reduced summer stream flows, impaired water quality, and reduced habitat complexity are common problems.
<b>Snake River spring/summer-run Chinook salmon</b>	10/25/99 64 FR 57399	Critical habitat consists of river reaches of the Columbia, Snake, and Salmon rivers, and all tributaries of the Snake and Salmon rivers (except the Clearwater River) presently or historically accessible to this ESU (except reaches above impassable natural falls and Hells Canyon Dam). Habitat quality in tributary streams varies from excellent in wilderness and roadless areas, to poor in areas subject to heavy agricultural and urban development (NMFS 2017). Reduced summer stream flows, impaired water quality, and reduced habitat complexity are common problems.

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

- Minimizing winter drafts (for flood risk management and power generation) to increase flows during peak spring passage;
- Releasing water from storage to increase summer flows;
- Releasing water from Dworshak Dam to reduce peak summer temperatures in the lower Snake River;
- Constructing juvenile bypass systems to divert smolts, steelhead kelts, and adults that fall back over the projects away from turbine units;

- Providing spill at each of the mainstem dams for smolts, steelhead kelts, and adults that fall back over the projects;
- Constructing “surface passage” structures to improve passage for smolts, steelhead kelts, and adults falling back over the projects; and
- Maintaining and improving adult fishway facilities to improve migration passage for adult salmon and steelhead.

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

One factor affecting the status of the species and their critical habitat considered in this Opinion is climate change. Likely changes in temperature, precipitation, wind patterns, and sea-level height have implications for survival of all three species in both their freshwater and marine habitats. During the next century average temperatures in the Pacific Northwest are projected to increase 3 to 10°F, with the largest increases predicted to occur in the summer (Mote et al. 2014). Decreases in summer precipitation of as much as 30 percent by the end of the century are consistently predicted across climate models (Mote et al. 2014). Precipitation is more likely to occur during October through March, less during summer months, and more winter precipitation will be rain than snow (ISAB 2007; Mote et al. 2014). Earlier snowmelt will cause lower stream flows in late spring, summer, and fall, and water temperatures will be warmer (ISAB 2007; Mote et al. 2014). Models consistently predict increases in the frequency of severe winter precipitation events (i.e., 20-year and 50-year events) in the western United States (Dominguez et al. 2012). The largest increases in winter flood frequency and magnitude are predicted in mixed rain-snow watersheds (Mote et al. 2014). In general, these changes in air temperatures, river temperatures, and river flows are expected to cause changes in salmon and steelhead distribution, behavior, growth, and survival, although the magnitude of these changes remains unclear.

Climate change could affect Snake River spring/summer Chinook salmon and Snake River Basin steelhead in the following ways: (a) Winter flooding in transient and rainfall-dominated watersheds may scour redds, reducing egg survival, and may reduce overwintering habitat for juveniles; (b) reduced summer and fall flows may reduce the quality and quantity of juvenile rearing habitat, strand fish, or make fish more susceptible to predation and disease; (c) higher temperatures while adults are holding in tributaries and migrating to spawning grounds may lead to increased pre-spawning mortality or reduced spawning success; and (d) lethal water temperatures may occur in the mainstem migration corridor or in holding tributaries, resulting in higher mortality rates (NMFS 2017). Both freshwater and marine productivity tend to be lower in warmer years for Snake River Basin steelhead and Snake River spring/summer Chinook salmon populations. Climate factors will likely make it more challenging to increase abundance and recover the species by reducing the suitable rearing areas and leading to a more limited run-timing under the warmer future conditions. This possibility reinforces the importance of achieving survival improvements throughout each species’ entire life cycle, and across different populations since neighboring populations with different habitat may respond differently to climate change. Existing well-connected, high-elevation habitats on public lands will be important to supporting salmon survival and recovery as the climate continues to warm (Martin and Glick 2008).

## 2.3 Action Area

“Action area” means all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action (50 CFR 402.02). The action area consists of streams and riparian areas within the Allotment boundaries, which fall within the Grande Ronde, Lower Grande Ronde, and Powder River subbasins of eastern Oregon. The action area is located in range of the Catherine Creek Chinook population and the Upper Grande Ronde River steelhead population. There are 17 streams within the six Allotments that support steelhead. Three of these streams also support Chinook salmon (South Fork Catherine Creek, Buck Creek, and Indian Creek). Figure A-1 (Appendix A) shows the overlap between the six allotments and streams which support either steelhead or both steelhead and Chinook salmon.

The action area is used by all freshwater life history stages of Snake River Basin steelhead and Snake River spring/summer Chinook salmon. Critical habitat for both species is designated for stream reaches in the action area. Designated critical habitat for the Snake River spring/summer Chinook salmon includes all river reaches presently or historically accessible to the species (64 FR 57399) as well as their riparian habitat conservation areas. Designated critical habitat for Snake River Basin steelhead includes specific reaches of streams and rivers, as published in the Federal Register (70 FR 52630). The action area, except for areas above natural barriers to fish passage, is also EFH for coho (*O. kisutch*) and Chinook salmon (PFMC 1999), and is in an area where environmental effects of the proposed project may adversely affect EFH for this species.

## 2.4 Environmental Baseline

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

The action area is on the WWNF, and primary land uses on this part of the National Forest have been timber harvest and livestock grazing. Much of the area has experienced extensive timber harvest. Livestock grazing in the area has been an ongoing use since the late 1800s, with local landowners trailing livestock to the National Forest lands for summer pasture. Sheep grazing occurred at the turn of the century, but only cattle are currently grazed on the Allotments. Past grazing was at higher stocking rates than is currently permitted, and these high stocking rates and season-long grazing resulted in some areas of deteriorated range condition (WWNF 2019). These higher grazing rates likely also degraded riparian and stream habitat conditions. During the 1970s and 1980s, fences were constructed to increase management of livestock and allow for rotational grazing strategies on three of the Allotments (Big Creek, Indian Creek, and West Minam) to improve range conditions.

There are seven subwatersheds on the Allotments that support Chinook salmon or steelhead. Table 9 lists which subwatersheds overlap with each Allotment. Table 10 shows whether a habitat component is properly functioning for each subwatershed, functioning at risk, or not properly functioning. Habitat indicators most affected by past and present livestock grazing



include: Temperature, Sediment/Turbidity/Substrate Embeddedness, Off Channel Habitat, Refugia, Width/Depth Ratio, Streambank Condition, and Riparian Habitat Conservation Areas.

**Table 9. Subwatersheds which overlap with each of the Allotments and support steelhead or Chinook salmon.**

Allotment	Subwatersheds
Big Creek	South Fork Catherine Creek (SFC), Catherine Creek-Milk Creek (CMC)
Frazier Mountain	Catherine Creek-Milk Creek (CMC)
Indian Creek	Clark Creek (CC), Upper Indian Creek (UI)
Mill Creek	Mill Creek (MC), Upper Indian Creek (UI)
Pole Creek	North Fork Catherine Creek (NFC), South Fork Catherine Creek (SFC)
West Minam	Clark Creek (CC), North Fork Clark Creek (NC), Upper Indian Creek (UI)

All seven subwatersheds are functioning at risk for temperature and sediment. On the Pole Creek Allotment, Pole Creek, Sand Pass Creek, and South Fork Catherine Creek all had elevated fines in 2014 and 2016 (WWNF 2019). Streambank condition is generally in good shape, with six of seven subwatersheds functioning appropriately. However, the Catherine Creek-Milk Creek subwatershed (Frazier Mountain Allotment) is functioning at risk for streambank stability, and Clark Creek (West Minam Allotment) had a bank stability of 81 percent in 2015, below desired conditions of 90 percent. Bank stability at a monitoring site on North Fork of Clark Creek (West Minam Allotment) increased from 78 percent to 99 percent in 2015, meeting the 90 percent stability objective. Riparian areas are functioning appropriately in all but one subwatershed on the Allotments (Catherine Creek-Milk Creek on the Frazier Mountain Allotment).

To manage ongoing grazing in the action area, the WWNF has relied primarily on fencing and riparian utilization standards to protect riparian vegetation and stream habitat from livestock impacts. The compliance history for the Allotments shows mixed success for implementation of these measures. The BA presents a limited amount of past monitoring results. The Frazier Mountain Allotment has not had riparian utilization monitoring because steelhead habitat is completely fenced off in this Allotment (and no Chinook salmon are present). No recent monitoring has occurred for the Mill Creek Allotment because it has not been grazed since 2005. The BA presents no implementation monitoring results for the Pole Creek Allotment as well, since it was not grazed between 2012 and 2016.

**Table 10. Matrix for pathways and indicators showing baseline condition for the subwatersheds in the Eastside Allotments with anadromous fish (WWNF 2019).**

Diagnostic or Pathway	Properly Functioning/ Functioning Appropriately	Functioning At Risk	Not Properly Functioning/ Functioning At Unacceptable Risk
Temperature <i>Chinook, Steelhead</i>		NC, CC, CMC, SFC, NFC, MC, UI	
Sediment/Turbidity/Sub strate Embeddedness		SFC, NFC, MC, UI, NC, CC	CMC
Chem. Contamination Nutrients	CMC, SFC, NFC, MC, UI, NC, CC		
Physical Barriers	CMC, MC, UI, NC, CC	SFC, NFC	
Large Woody Material	MC, NC, CC	UI, SFC	NFC, CMC
Pool Frequency		SFC, NFC, MC, UI	CMC, NC, CC

Diagnostic or Pathway	Properly Functioning/ Functioning Appropriately	Functioning At Risk	Not Properly Functioning/ Functioning At Unacceptable Risk
Pool Quality/Large Pools		SFC, NFC, MC, UI	CMC, NC, CC
Off-channel Habitat	SFC, NFC, MC, UI	CMC, NC, CC	
Refugia	CMC, SFC, NFC, MC, UI	NC, CC	
Width/Depth Ratio	SFC, NFC	CMC, MC, UI, NC, CC	
Streambank Condition	SFC, NFC, MC, UI, NC, CC	CMC	
Floodplain Connectivity	SFC, NFC, MC, UI, NC, CC	CMC	
Road, Density, Location, Drainage		NFC, MC, NC, CC	CMC, SFC, UI
Disturbance History Peak Base Flows	CMC, SFC, NFC, MC, UI, NC, CC		
Riparian Habitat Conservation Areas	SFC, NFC, MC, UI, NC, CC	CMC	
Disturbance Regime	SFC, NFC, UI	CMC, MC, NC, CC	
Integration Species & Habitat Conditions		CMC, SFC, NFC, UI	

Upper Grande Ronde Subbasin Subwatersheds: **NFC** – North Fork Catherine Creek, **SFC** – South Fork Catherine Creek, **CMC** – Catherine Creek-Milk Creek, **MC** – Mill Creek, **UI** – Upper Indian Creek, **NC** – North Fork Clark Creek, and **CC** – Clark Creek.

Implementation monitoring results from 2014–2018 include several instances of non-compliance:

- Streambank alteration exceeded standards of less than 20 percent in Indian Creek in 2014 and 2016 on the Indian Creek Allotment.
- Clark Creek in the West Minam Allotment was measured at a streambank alteration of 28 percent in 2015, exceeding the standard of 20 percent.
- In 2018, livestock breached riparian enclosure fences in Bottle Creek and Prong Creek in the Big Creek Allotment, and at Milk Creek in the Frazier Mountain Allotment. The breach of the Milk Creek fence was due to insufficient fence maintenance. The failure of riparian enclosure fences on Bottle Creek and Prong Creek were caused in part by the permittee releasing livestock onto the Allotment sooner than planned, before WWNF had erected the enclosure fence for the season. After becoming aware of the riparian enclosure failures, the WWNF measured riparian utilization in these stream reaches, and found that stubble height, streambank alteration, and woody browse standards were all exceeded. The riparian areas within each of the enclosures have developed a healthy shrub community. The WWNF range staff observed that these dense shrubs protected a large portion of the streambanks from damage by livestock during the fence breaches; and that livestock appeared to have congregated in locations where shrubs were absent or less-dense.

## 2.5 Effects of the Action

Under the ESA, “effects of the action” means the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline (50 CFR 402.02). Indirect effects are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur. This section will evaluate the effects of the action starting from the time of the issuance of this Opinion through the term of the permit.

### 2.5.1 Effects on Critical Habitat

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

The WWNF proposes to use several conservation measures and grazing management techniques to minimize the impacts of livestock grazing on steelhead critical habitat in the Eastside Allotments. The WWNF will reduce the time that cows spend in or near streams through: off-site watering facilities and salt placement; herding of cows out of riparian areas; fencing; and riparian utilization standards. Monitoring riparian utilization will allow WWNF and the permittees to move cows to a new pasture or off the Allotments if the animals are negatively impacting streams or riparian areas. The adaptive management procedures which are part of the Proposed Action will help the WWNF to adjust grazing management as needed to minimize the impact of livestock on streams.

The WWNF will use a combination of stubble height, streambank alteration, and shrub browse to monitor the mid-season and annual impacts of livestock on riparian areas. Of the three indicators, Goss (2013) found that stubble height and stream alteration were most effective at measuring grazing intensity. However, many of the streams on the Eastside Allotments are moderate- to high-gradient streams with riparian areas dominated by shrubs and not grass. Woody browse is a more appropriate indicator of livestock use than grass stubble height for these streams. The WWNF protocols for monitoring the three indicators include:

- For stubble height along the streambank, grass and grass-like vegetation must be 6 inches at the end of the season, for the streams where stubble height is an appropriate metric of use (Table 4). A stubble height of 7 inches will be used as a move trigger for these pastures where herbaceous vegetation is the key hydric stabilizer.
- The WWNF will assess shrub browse by measuring percent removed of annual leader production for riparian shrubs. Maximum shrub use is 30–40 percent, depending on the stream (Table 4). A shrub utilization of 5 percent less than the maximum allowable utilization will be used as a move trigger.
- The WWNF will measure streambank alteration at the end of the grazing season. The endpoint objective for the allotments is for streambank alteration to remain below 20 percent.

Permittees will conduct trigger monitoring midway through the grazing season in each pasture to see if riparian utilization is nearing the endpoint objectives in Table 4, and will move livestock to the next pasture or off the Allotments based on move-trigger values. If end-of-season objectives are not met on an Allotment (i.e., non-compliance), WWNF staff will conduct the mid-season trigger monitoring the following year. The WWNF will conduct end-of-season monitoring. If end-of-season measurements of any of the three indicators exceed the endpoint objectives, then WWNF range staff will work with the permittees to adjust grazing management practices for that particular pasture for the following year to ensure that there is no long-term damage to riparian conditions. Adjustments to livestock management could include: change in season of use or numbers of livestock, fencing proposals, change in utilization standards, increased riding, or change in salt and water placements.

***Stubble Height.*** Stubble height has a direct relationship to the health of herbaceous riparian plants and the ability of the vegetation to provide streambank protection; to filter out and trap sediment from overbank flows; and in small streams to provide overhead cover (University of Idaho Stubble Height Review Team 2004; Roper 2016; Saunders and Fausch 2007). On monitoring sites across 17 National Forest and four Bureau of Land Management units in the Interior Columbia River basin, Goss (2013) found a linear relationship between increasing stubble height and multiple components of high quality salmonid habitat, including: increasing residual pool depth; increasing streambank stability; increasing percent undercut banks; and decreasing streambank angle. This suggests that across stream and riparian conditions evaluated within the Interior Columbia River basin, the higher the stubble height the greater the likelihood that stream conditions favored by salmonids will be present (Goss 2013).

Multiple studies have evaluated minimum stubble heights necessary to protect stream habitat from the impacts of livestock grazing. Using the PIBO monitoring data from federal lands in the Columbia basin, Goss (2013) found that stubble height was related to streambank disturbance, and streambank disturbance began to increase substantially when stubble heights fell below 10 inches. Bengueyfield (2006) found that a 4-inch stubble height did not initiate an upward trend in stream channel morphology at sites on the Beaverhead-Deerlodge National Forest in Montana, based on 7 to 9 years of monitoring. Clary (1999) found that while 5-inch stubble height at the end of the growing season resulted in improvements in most measured aquatic and riparian

conditions in an Idaho meadow after 10 years, 6.5-inch stubble height was needed to improve all measured habitat metrics. Pelster et al. (2004) found that during summer and fall grazing, more than 40 percent of cattle diets were willow when stubble heights were less than 8 inches; and consequently suggested that stubble heights greater than 8 inches were needed to reduce willow consumption during these critical periods. Willows enhance salmonid habitat by providing fish with cover, modulating stream temperatures, and contributing leaf detritus and terrestrial insects that expand food sources (Bryant et al. 2006; Clary and Leininger 2000; Murphy and Meehan 1991). These studies reinforce the observation that higher stubble heights are positively correlated with improving stream conditions for fish habitat.

After reviewing the available scientific literature, including all of the studies mentioned above, Roper (2016) strongly recommended 6 inches as a starting point for a stubble height objective, measured at the end of the growing season, for small to medium sized cold water streams inhabited by salmon and trout. This is consistent with Clary and Webster (1990), who suggested a 6-inch starting point for stubble height objectives in the presence of ESA-listed or sensitive fish. Roper (2016) acknowledges that 4 inches or 8 inches could be appropriate stubble height objectives for some stream sites, but that site-specific data would be necessary to support these more liberal or conservative objectives. Furthermore, a 4-inch stubble height could suffice as a move trigger on spring pastures if there is sufficient time for the graminoid and herbaceous vegetation to grow to meet end-of-growing-season objectives (Roper 2016). The scientific literature therefore suggests that WWNF's proposed stubble height endpoint objective of 6 inches will protect most streams from livestock damage.

***Streambank Alteration.*** Streambank alteration provides an indicator of the amount of livestock activity in riparian zones, increasing with both the number of cows present and the time spent by those cows in riparian areas. The streambank alteration standard measures the amount of annual bank disturbance caused by livestock grazing, the levels of which can then be related to streambank stability and riparian vegetation conditions within the greenline (Cowley and Burton 2005). Excessive bank trampling can lead to increased channel widths, decreased depths, and slower water velocity. These channel changes can cause mid-channel sediment deposition, which can further erode and reduce water storage in streambanks, resulting in vegetation transitioning from willows and sedges to species preferring drier habitats. These impacts all reduce the quality of fish habitat. Of indicators evaluated by Bengeyfield (2006), bank alteration level was the most sensitive.

Cowley (2002) suggested that the maximum allowable streambank alteration that maintains streambank stability is 30 percent, and that applying a 20 percent streambank alteration standard should allow streambanks to recover. Cowley (2002) cited additional studies to support a recommendation that "Ten percent or less alteration would seem to allow for near optimal recovery and should not retard or prevent attainment of resource management objectives." WWNF proposes a 20 percent maximum streambank alteration standard. Based on Cowley (2002), we expect this standard to: (1) Prevent negative impacts to streambanks from grazing; (2) maintain properly functioning conditions where they currently occur on the Allotments; and (3) allow for stream habitat recovery and an upward trend where habitat indicators are not currently properly functioning. However, where habitat indicators are not properly functioning, continued grazing has the potential to retard the rate of habitat recovery compared to no grazing.

A more protracted recovery period could result in greater sediment delivery, wider stream channels, reduced vegetative vigor, and higher water temperatures in the action area for a longer period of time than would occur absent grazing.

***Shrub Browse.*** Burton et al. (2011) consider 40 percent shrub utilization to be light use. Research has shown that heavy to extreme use by grazing animals every year is detrimental to plant health, while light to moderate use maintains overall plant health (Thorne et al. 2005). In general, there is a reduction in seed production when livestock shrub browse is above 55 percent (Winward 2000). There can be a reduction in the overall health of plants, including size and root strength, when heavy and severe utilization levels are sustained over time. Because WWNF is requiring 30–40 percent maximum shrub use for riparian areas on these Allotments, this endpoint objective should protect most streams from livestock damage.

#### *2.5.1.1 Impacts to Critical Habitat Physical and Biological Features*

As described above, continued grazing with a maximum of 20 percent streambank alteration would allow the streambanks to recover; however, it could slow the recovery of the stream habitat components that are functioning at risk in some subwatersheds on the Allotments. These habitat components include temperature, fine sediment, and streambank condition (Catherine Creek–Milk Creek subwatershed only). Slowing the recovery of stream temperatures, amounts of fine sediment, and streambank stability would have small adverse effects on some of the essential PBFs in the action area. The PBFs that could be affected are water quality, forage, natural cover, riparian vegetation, substrate, and floodplain connectivity. We expect that grazing with a maximum of 20 percent streambank alteration would allow for an improving trend in PBFs, but at a slower rate than without grazing. Because impacts to riparian areas on the Allotments would be localized and dispersed, we only expect localized delays in improving trends for PBFs. When scaled up to the critical habitat designation scale, these localized impacts will not preclude or more than minimally delay development of PBFs.

***Water Quality and Forage.*** Continued grazing could affect water quality through impacts to temperature. Summer stream temperatures on the Allotments are high in some stream reaches, with temperatures functioning at risk for all seven subwatersheds on the Allotments. Shade provided by vegetation can be important in keeping stream temperatures cool for salmonids (Zoellick 2004). Shade from vegetation will continue to be important in the future, as stream temperatures rise across the Pacific Northwest. Slight changes in environmental conditions during the 10-year permit term, due to climate change, could therefore amplify the proposed action's effects on water quality. Livestock grazing can directly increase water temperature if riparian vegetation removal results in increased solar exposure. Additionally, reduced riparian vegetation and bank trampling can result in increased streambank instability, which in turn can lead to over-widened streams. Over-widened streams with high width-to-depth ratios expose a greater surface area of shallower water to the sun, which can further increase water temperatures. Based on the scientific literature, we expect that grazing with a minimum 6-inch greenline stubble height, a maximum of 20 percent streambank alteration, and a maximum of 30–40 percent shrub browse will protect existing riparian vegetation and streambank stability and therefore not cause increases in stream temperature. For the stream reaches that are accessible to livestock, continued grazing with a maximum of 20 percent streambank alteration

could be one factor slowing the recovery of shade-producing riparian vegetation, thereby prolonging the time to recovery of the stream temperature RMO. However, the impacts will be localized and are not likely to cause an actual degradation in this PBF; rather it is likely that there will possibly be a slowing of recovery toward properly function conditions.

Salmonids rely on terrestrial and aquatic invertebrates as a food source. Terrestrial invertebrates fall into stream from riparian vegetation and aquatic invertebrates feed on dead leaves from riparian vegetation (Saunders and Fausch 2009). Livestock grazing could therefore affect forage for salmonids by altering riparian vegetation. However, Saunders and Fausch (2009) observed no difference in invertebrate biomass entering streams between sites managed for rotation grazing and ungrazed sites. Based on the cited literature, we therefore anticipate only very small impacts to the forage PBF.

**Substrate.** Grazing can negatively impact substrate by increasing substrate fine sediment and cobble-embeddedness when livestock trample streambanks. All seven watersheds on the Allotments with Chinook salmon or steelhead habitat are functioning at risk for sediment. However, streambank condition is generally in good shape, with six of seven subwatersheds functioning appropriately. Because streambank stability is meeting a properly functioning condition in most cases, continued grazing with a maximum of 20 percent streambank alteration will have only a small effect on critical habitat by slowing the recovery of substrate conditions in localized and dispersed stream reaches. The proposed action will not likely result in a degradation in this PBF, just a slowing of recovery toward properly functioning conditions.

**Natural Cover and Riparian Vegetation.** Riparian vegetation provides cover for salmonids in the form of overhanging vegetation and undercut banks. Salmonids appear to prefer spawning in close proximity of overhead cover (Bjornn and Reiser 1991), and overhead cover protects juvenile salmonids from predation. Riparian vegetation also stabilizes streambanks, and thick riparian vegetation can reduce livestock access to streams, reducing trampling (Gregory and Gamett 2009). Grazing can negatively impact natural cover by consuming or trampling riparian vegetation. Riparian areas are functioning appropriately in all but one subwatershed on the Allotments (Catherine Creek-Milk Creek on the Frazier Mountain Allotment). The scientific literature suggests that the combination of WWNF's stubble height, shrub browse, and streambank alteration endpoint objectives (i.e., 6-inch stubble height minimum, 30–40 percent woody browse, and 20 percent maximum streambank alteration) will likely protect most riparian areas from livestock damage and thus should facilitate continued recovery. However, it will not eliminate the risk of livestock damage and NMFS expects some adverse impacts to riparian vegetation and natural cover PBFs. Due to the anticipated effectiveness of proposed utilization standards and the proposed monitoring, these effects should be localized and should not persist for multiple grazing seasons.

**Water Quantity and Floodplain Connectivity.** In some cases, riparian grazing and associated removal of riparian vegetation and bank instability can lead to stream down-cutting and a drop in the water table. This could lead to a reduction in floodplain connectivity. Because we expect only minor impacts to riparian vegetation and bank stability from the proposed action, we expect that continued grazing on the Allotments would contribute only minimally to any decreases in floodplain connectivity. Off-site water developments across the Allotments divert flow from

small springs into stock troughs. The springs are not connected to streams or surface flow but likely contribute to streamflow in streams that support Chinook or steelhead through ground water contributions. A small quantity of the diverted water may evaporate from the stock troughs and therefore not contribute to streamflow via groundwater subsurface flow. However, based on the small size of the troughs and limited number of troughs, any impact to ground water is likely to be very small. Therefore any increase in critical habitat water quantity is also likely to be extremely small.

#### *2.5.1.2 Impacts to Critical Habitat from Permittee Non-compliance*

When endpoint indicators are not met, the severity of the effects described above (e.g., minor impacts to riparian vegetation, reduction of shade, etc.) will increase. Between 2014 and 2018 there was a total of six instances of permittees exceeding riparian utilization standards in the Eastside Allotments; and exceedances per year in this time-frame ranged from zero to three. We therefore assume that exceedances will continue to occur on the Allotments during the 10-year timeframe of the action. However, we expect that WWNF's proposed adaptive management strategy will reduce the number of exceedances that occur in the future (such as to two or less per year), and will minimize the long-term impacts of any exceedances that occur.

#### 2.5.2 Effects on ESA-listed Species

Cattle grazing has the potential to affect ESA-listed fishes by disturbing rearing, holding, or spawning salmonids; by trampling incubating redds as cows wade through or cross instream habitats; and through impacts to habitat (described above in Section 2.5.1 and summarized below in Section 2.5.2.3). All freshwater life stages of both species are likely to be present on the Eastside Allotments during the grazing season.

##### *2.5.2.1 Disturbance*

Cattle grazing adjacent to streams, or when crossing, drinking or loafing near streams, are reasonably certain to startle or disturb juvenile or adult steelhead or Chinook salmon present in the action area. The WWNF will employ the following measures to reduce the amount of time cows spend in riparian areas: maintaining off-stream water sources and salt; herding of cows out of riparian areas; and maintaining riparian exclosures. Despite these measures, cows are likely to spend time adjacent to unfenced, accessible streams reaches on the Allotments, particularly in late summers.

Adult steelhead will not be present in the action area in summer, when livestock are likely to spend time adjacent to streams. Holding adult Chinook may be present in the action during summer in South Fork Catherine Creek, but the WWNF has determined that South Fork Catherine Creek is largely inaccessible to livestock due to a combination of fencing, steep topography, and monitoring for livestock presence by WWNF range staff (WWNF 2019).

For juvenile steelhead and Chinook salmon, 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 the 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 generally 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.

#### *2.5.2.2 Steelhead Redd Trampling*

Livestock grazing along salmonid spawning streams can result in trampling of steelhead redds and impacts to incubating eggs/embryos. The WWNF has determined that there are two stream reaches on the Allotments where livestock could access steelhead spawning habitat before steelhead fry have emerged from spawning gravels. These stream reaches are 0.6 miles of Prong Creek, on the Big Creek Allotment, and 0.3 miles of Pole Creek, on the Pole Creek Allotment. Cattle turn-out could be allowed as early June 16 for both of these pastures, so any steelhead redds in these stream reaches would be vulnerable for approximately two weeks, before steelhead fry emerge from the gravel around July 1. The WWNF (2019) determined that all other steelhead spawning reaches on the Allotments, located on pastures where livestock are turned out before July 1, are inaccessible to livestock due to a combination of fencing and topography.

A week prior to the June 16 livestock turn-out, WWNF will survey the accessible reaches of Prong Creek and Pole Creek for steelhead redds. The WWNF will document the location of any steelhead redds found during their surveys and will determine the vulnerability of each redd to trampling by cattle. If a redd is vulnerable to trampling by cattle, then the WWNF will protect the redd with a physical obstruction such as a fence or by not moving livestock into the area. A WWNF fisheries biologist surveyed Prong Creek in 2010, 2012, 2013, 2014, and 2015, and found one redd in 2013. For Pole Creek, a WWNF fisheries biologist found no redds or adult steelhead in 2011. Since that year, the Pole Creek Allotment has either been not grazed, or turn-out has been after July 1, thus not requiring a redd survey.

We do not expect any steelhead redds to be trampled on the Allotments because:

- The WWNF will survey for and protect any steelhead redds in reaches where livestock could access the stream before July 1;
- Past WWNF surveys have found only one redd in reaches accessible to livestock on these Allotments;
- We expect cows to spend most of their time in the uplands in the 2 weeks between turn-out of July 1. Telemetry research on the WWNF (on the Starkey Experimental Forest) suggests that cows spend most of their time in the uplands in the early season (June 15 through July 1). Of a total of 20,371 cattle locations logged over 3 years during this 2-week period, only 36 locations included the stream channel (0.2 percent) (WWNF 2017); and

- Since at least 2012, livestock turn-out for the pastures with Prong Creek and Pole Creek has occurred after July 1 if at all (S. Brandy, WWNF, personal communication, August 21, 2019).

### 2.5.2.3 Chinook Redd Trampling

There are 2 miles of spawning habitat for Chinook salmon in the action area, on South Fork Catherine Creek. On the 2.0 miles of lower South Fork Catherine Creek managed by WWNF, ODFW has identified between zero and 49 Chinook redds in the last 10 years, averaging 14.4 redds per year (ODFW 2019). Livestock are authorized to be on the Big Creek Allotment and Pole Creek Allotment during Chinook salmon spawning and incubation from late August through mid-October, both of which border South Fork Catherine Creek. The permittee's Annual Operating Instructions state that the permittee is not allowed to graze cows along the section of South Fork Catherine Creek which supports Chinook spawning.

The WWNF has determined that the two miles of South Fork Catherine Creek that support Chinook spawning on National Forest land are largely inaccessible to livestock due to a combination of fencing, topography, down timber, rock bluffs, and dense shrubs (WWNF 2019). The WWNF range staff have identified three possible access points for cows to South Fork Catherine Creek, and riparian enclosures or drift fences are in place at these locations. On the other hand, anecdotal reports from the ODFW suggest that a small number of livestock sometimes graze in the South Fork Catherine Creek riparian area (personal communication, Joseph Feldhaus, ODFW, July 25, 2019). The WWNF has therefore proposed additional conservation measures to minimize the chance that livestock will access the portion of South Fork Catherine Creek that supports Chinook salmon spawning:

- To ensure livestock are detected and promptly removed from areas adjacent to South Fork Catherine Creek, the permittee's Annual Operating Instructions will include language that describes the expectation that the permittee will make inspections frequently enough to detect and remove livestock if they move to the South Fork Catherine Creek riparian area. This includes the areas of South Fork Catherine Creek currently fenced near the confluence of Pole Creek, Corral Creek, and Prong Creek, as well as the unfenced areas from Corral Creek to the WWNF boundary. The permittee will remove livestock from this area any time they are found, to avoid habituation and trailing in the areas adjacent to South Fork Catherine Creek. The permittee will conduct inspections after August 15 since Chinook begin spawning in the second half of August.
- The permittee will continue to maintain the existing fences to control livestock access to South Fork Catherine Creek.
- The permittee will utilize areas other than the South Fork Catherine Creek trail for livestock entry to the Pole Creek Allotment.
- The WWNF will periodically inspect the South Fork of Catherine Creek during the month of August to ensure livestock are not in the area, or are promptly removed if detected.

- The WWNF will install a “walk-over” for recreation use at the boundary fence gate near the mouth of South Fork Catherine Creek, in order to reduce the chance that the gate will be left open by recreationists, thus potentially allowing access by livestock to the South Fork Catherine Creek riparian area.

Based on these new conservation measures proposed by the WWNF, we do not anticipate trampling of Chinook redds from the proposed action.

#### *2.5.2.4 Habitat-related Effects*

Livestock grazing will adversely affect steelhead and Chinook through the impacts to spawning, rearing, and migration habitat described in Section 2.5.1. The habitat effects which will impact the species include increased summer water temperature, loss of pools and habitat adjacent to and connected to streambanks, increased substrate fine sediment and cobble-embeddedness, and reductions in riparian vegetation and natural cover. These types of impacts to habitat could have the following effects on individual fish: reductions in natural cover increases exposure of juveniles to predators; reductions in pools and habitat connected to streambanks decreases the availability of habitat to rest from the current, which can lead to increased energy demands on fish; increased water temperature leads to increased metabolic demands for fish (Myrold and Kennedy 2015); and increased sediment deposition can reduce forage (i.e., aquatic invertebrates) (Gleason et al. 2003). All of these effects can lead to harm, harassment, or mortality of rearing salmon and steelhead.

The WWNF proposes to use several conservation measures and grazing management techniques to reduce the time livestock spend in riparian areas and thereby reduce the impacts of livestock grazing on stream habitat. These measures include: off-site watering facilities and salt placement; herding of cows out of riparian areas; fencing; and riparian utilization standards. Although cattle will consume and trample some riparian vegetation, the proposed conservation measures and annual utilization standards should limit potential riparian and stream habitat impacts to a few dispersed locations across the Allotments. The scientific literature suggests that the combination of WWNF’s stubble height, streambank alteration, and shrub browse endpoint objectives (6-inch stubble height minimum, 20 percent maximum streambank alteration, 30–40 percent shrub browse) will protect many streams from livestock damage, but will not eliminate livestock damage. As described in Section 2.5.1, we expect localized, dispersed areas of adverse impacts to temperature, riparian vegetation, natural cover, fine sediment, substrate, water quantity, and floodplain connectivity. Although it is not possible to estimate how many, we expect that a small number of juvenile salmon and steelhead will experience harm or harassment in these dispersed locations of adverse impacts to habitat on the Allotments over the course of the 10-year permit.

## **2.6 Cumulative Effects**

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

section 7 of the ESA. Ongoing livestock grazing occurs on private land directly adjacent to pastures on the Allotments and within the action area. Livestock grazing on private land in the action area is likely to continue at its current rate, continuing the effects to stream habitat described in Section 2.4. NMFS is not aware of any other specific private, state, local, or tribal actions that are reasonably certain to occur in the future that will affect the action area.

## **2.7 Integration and Synthesis**

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

***Critical Habitat.*** Critical habitat is present in the action area for Snake River Basin steelhead and for Snake River spring/summer Chinook salmon. The condition of spawning and rearing habitat across the range of each of these species varies from excellent in wilderness and roadless areas to poor in areas subject to intensive human land uses. Within the action area, some PBFs are degraded, such as water quality. Streambanks are generally stable but summer stream temperatures are high in some streams and fine sediment levels are elevated. Stream temperatures across the Pacific Northwest are likely to rise in the future due to climate change, such that slight changes in environmental conditions during the 10-year permit term due to climate change could amplify the proposed action's effects on water quality.

The WWNF has incorporated several conservation measures (e.g., fencing, off-stream water sources and salt placement, herding, and riparian utilization standards and monitoring) into grazing management on the Allotments in order to limit the impacts of livestock on designated critical habitat. Based on available scientific literature, NMFS expects that the proposed 20 percent maximum streambank alteration standard, 6-inch minimum stubble height, and 30–40 percent shrub browse will allow for stream habitat recovery and an upward trend for degraded PBFs. However, we expect that continued grazing could slow the rate of habitat recovery compared to no grazing in localized areas on the allotments. The PBFs that could be affected are water quality, forage, natural cover, riparian vegetation, substrate, water quantity, and floodplain connectivity. Nevertheless, those impacts will not preclude or significantly delay development of the critical habitat features in the watersheds affected by the proposed action because: (1) Impacts to riparian areas on these Allotments would be localized and dispersed; and (2) we expect the proposed adaptive management strategy for the Allotments to identify trends in stream habitat conditions over the term of the permit, and for the WWNF to adjust grazing practices where habitat conditions and trends are not meeting resource objectives. The proposed action will therefore not appreciably diminish the conservation value of designated critical habitat in the watersheds affected by grazing on these Allotments. Because the conservation value of critical habitat will not be appreciably diminished in these watersheds, the conservation value of critical habitat at the designation scale will not be appreciably diminished.

**Species.** Snake River Basin steelhead and Snake River spring/summer Chinook salmon, which are both present in the action area, are threatened with extinction. The Upper Grande Ronde steelhead population, which occupies the action area, is currently rated as viable. The Catherine Creek Chinook population is considered at high risk of extinction. For both species, future deterioration of water quality, water quantity, or physical habitat due to climate change is expected to cause a reduction in the number of naturally-produced adults returning to populations across the DPS and ESU (NMFS 2017).

The proposed action has the potential to affect ESA-listed fish by disturbing juveniles and by impacts to stream habitat from riparian grazing. Conservation measures to reduce the time livestock spend in riparian areas will reduce the amount of potential disturbance to individual fish as will the proposed adaptive management strategy, as described in Section 1.3.3. We expect that behavioral modifications of individual fish disturbed by livestock will be minor because habitat conditions in the action area should provide suitable escape cover.

We expect that a small number of juvenile salmon and steelhead will experience harm or harassment in dispersed locations of adverse impacts to habitat on the Allotments over the course of the 10-year permit, as described in Section 2.5.1. Because only a small number of individual juveniles would experience harm, harassment, or mortality over the course of 10 years, the loss would not be great enough to impact the population abundance of the Upper Grande Ronde steelhead population or the Catherine Creek Chinook salmon population. Because the proposed action would only minimally affect the attributes of a VSP for these two populations, the proposed action will not reduce appreciably the likelihood of the survival and recovery of either species.

## **2.8 Conclusion**

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

## **2.9 Incidental Take Statement**

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

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

### 2.9.1 Amount or Extent of Take

The proposed action is reasonably certain to result in incidental take of ESA-listed steelhead and Chinook salmon. NMFS is reasonably certain the incidental take described here will occur because livestock will graze alongside streams occupied by steelhead and Chinook salmon. In the Opinion, NMFS determined that incidental take is reasonably certain to occur from habitat-related impacts on rearing juveniles of both species. NMFS expects that behavioral modifications of juvenile or adult steelhead and Chinook salmon, due to cows grazing alongside streams, will be minor because habitat conditions in the action area should provide adequate escape cover to mitigate for localized disturbance. Effects due to disturbance of individual juvenile or adult steelhead or Chinook salmon are therefore not reasonably certain to rise to the level of take.

***Habitat-related Take.*** It is not possible to observe the number of fish subjected to habitat-related impacts from grazing because we cannot precisely predict where and when habitat impacts will occur across the Allotments and over the course of the 10-year permit term. NMFS will therefore use the extent of streambank alteration as a surrogate for habitat-related take, pursuant to 50 CFR 402.14(i)(1)(i). Percent streambank alteration is the best extent of take indicator for the habitat pathways of incidental take. This is because: (1) The habitat effects of cattle grazing increase with the amount of time cattle spend in close proximity to streams; (2) all habitat pathways of take will vary in proportion to streambank alteration including shade, riparian conditions and natural cover, and fine sediment and substrate; (3) measured streambank alteration is a function of within-season grazing as opposed to other indicators that might require long-term monitoring; and (4) streambank alteration is measured by a standardized and repeatable methodology. It is important to point out here that NMFS is not saying that streambank alteration is, in itself, take. Nor does streambank alteration necessarily and directly cause take of steelhead or Chinook salmon in every case. Rather, NMFS is reasonably certain that the overall habitat effects of grazing cattle on the Allotments will cause take, and that measured streambank alteration is the best currently available single indicator that is proportional to all of those effects.

***Extent of Take.*** We estimate that two exceedances of percent streambank alteration could occur during any year of the 10-year permit term based on the past non-compliance history on the Allotments and the proposed monitoring program. NMFS anticipated such exceedances in our analysis of effects. The extent of take will be exceeded if streambank alteration in more than two pastures occupied by ESA-listed fish exceeds 20 percent at the end of the grazing season in any year during the permit term. Such an exceedance would be detected by the WWNF's proposed monitoring program, and reinitiation would be triggered after two instances.

### 2.9.2 Effect of the Take

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

### 2.9.3 Reasonable and Prudent Measures

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

The WWNF and its permittees shall:

1. Minimize incidental take from livestock grazing on the Eastside Allotments.
2. Ensure completion of a monitoring and reporting program to confirm that the terms and conditions in this ITS were effective in avoiding and minimizing incidental take from permitted activities and that the extent of take was not exceeded.

### 2.9.4 Terms and Conditions

The terms and conditions described below are non-discretionary, and WWNF and its permittees must comply with them in order to implement the RPMs (50 CFR 402.14). WWNF and its permittees have 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 (minimize take from livestock grazing):
  - a. For all pastures with ESA-listed fish for which stubble height is an effective metric of riparian use by livestock (those streams listed in Table 3 and all other lower-gradient streams on the Allotments), the WWNF will measure stubble height during implementation monitoring and the minimum end-of-season greenline stubble height will be 6 inches.
  - b. All pastures with ESA-listed fish will have a maximum end-of-season streambank alteration of <20 percent, regardless of streambank stability measurements for the stream or watershed.
  - c. The WWNF shall monitor end-of-season riparian utilization every year in pastures in which livestock grazing overlaps with accessible spawning reaches for ESA-listed species.

- d. The WWNF and its permittees shall ensure that pastures are monitored mid-season and end-of-season at the frequency described in the Proposed Action. Mid-season monitoring will be conducted by the WWNF in all pastures in which an end-of-season indicator was exceeded during the previous season.
  - e. The WWNF shall ensure that appropriately trained WWNF staff monitor streambank alteration levels for each pasture with end-of-season objectives. If the take surrogate of 20 percent streambank alteration is exceeded for more than two pastures in 1-year, the WWNF shall contact the NMFS Snake Basin Office immediately.
  - f. The WWNF shall ensure all exclosures, fences, and water developments that reduce cattle use adjacent to streams are properly maintained and functioning as intended (particularly the exclosures on the Frazier Mountain and Big Creek Allotments that were breached by cows in 2018).
2. The following terms and conditions implement RPM 2 (monitoring and reporting). The WWNF shall:
- a. Develop an effectiveness monitoring plan for the Eastside Allotments, as described in the Proposed Action. Effectiveness monitoring will assess riparian vegetation and stream habitat conditions using the MIM protocols. The WWNF shall include effectiveness monitoring results in the annual monitoring report submitted to NMFS.
  - b. Submit an annual monitoring report to NMFS by February 1 each year with the following:
    - i. Overview of proposed action and actual management (e.g., livestock numbers, on-off dates for each pasture, etc.).
    - ii. Results from all implementation and effectiveness monitoring identified as part of the proposed action, including required move-trigger and end-of-season monitoring (i.e., stubble height, riparian shrub utilization, streambank alteration), seral condition, bank stability, water temperature, sediment, and width-to-depth ratio.
    - iii. Discussion of any unauthorized use and/or any maintenance issues related to fences or water developments.
    - iv. Discussion of any incidences of riparian utilization non-compliance, including the WWNF response. Give a detailed description of any adaptive management responses taken by WWNF as part of the adaptive management program described in the Proposed Action.



- v. Any relevant information that becomes available regarding Snake River Basin steelhead or Snake River Chinook salmon habitat trends and/or spawning locations that would modify the assumptions made in this Opinion or result in effects not considered.
  - vi. Any management recommendations for subsequent years.
- c. Submit the report to the WWNF Level 1 Team.

## **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 is consistent with this obligation and therefore should be carried out by WWNF:

1. 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, mainstem, and estuarine habitat measures; as well as protective hydropower mitigation measures. In particular, implement measures to protect or restore riparian buffers, wetlands, and floodplains; remove stream barriers; and to ensure late summer and fall tributary streamflows.

## **2.11 Reinitiation of Consultation**

This concludes formal consultation for the permitting of grazing activities on the Eastside Allotments.

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

### **3. MAGNUSON-STEVENSON FISHERY CONSERVATION AND MANAGEMENT ACT ESSENTIAL FISH HABITAT CONSULTATION**

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

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

#### **3.1 Essential Fish Habitat Affected by the Project**

The PFMC designated EFH for Chinook salmon, coho salmon, and Puget Sound pink salmon (PFMC 2014). The proposed action and action area for this consultation are described in the Introduction to this document. The action area is designated as EFH for Chinook salmon and coho salmon. The proposed action will affect EFH for spawning, rearing, and migration life-history stages of Chinook salmon and coho salmon.

The PFMC has identified five habitat areas of particular concern (HAPC), which warrant additional focus for conservation efforts due to their high ecological importance. Three of the five HAPC are applicable to freshwater and include: (1) Complex channels and floodplain habitats; (2) thermal refugia; and (3) spawning habitat. All of these could be affected in streams on the Allotments.

#### **3.2 Adverse Effects on Essential Fish Habitat**

Adverse effects to EFH in the action area are identified in the Opinion. Where habitat indicators are not properly functioning, continued grazing has the potential to retard the rate of habitat recovery compared to no grazing. Continued grazing under the proposed action could slow the recovery of the riparian vegetation somewhat from what might occur absent grazing. This could produce small adverse effects on stream temperature (thermal refugia HAPC) and small adverse effects on streambank conditions (complex channel and floodplain HAPC). These effects to stream temperature and streambank condition would be small because we expect grazing with a maximum of 20 percent streambank alteration would allow for an improving trend in habitat conditions but at a slower rate than without grazing.

### **3.3 Essential Fish Habitat Conservation Recommendations**

NMFS believes that the following conservation measures are necessary to avoid, mitigate, or offset the impact of the proposed action on EFH. These conservation recommendations are a subset of the ESA terms and conditions in the Opinion. NMFS believes that the implementation of the terms and conditions provided in the ESA consultation above are adequate to ensure conservation of EFH within the action area.

1. For all pastures with ESA-listed fish for which stubble height is an effective metric of riparian use by livestock (those streams listed in Table 3 and all other lower-gradient streams on the allotments), the WWNF should measure stubble height during implementation monitoring and should designate the minimum end-of-season greenline stubble height at 6 inches.
2. All pastures with ESA-listed fish should have a maximum end-of-season streambank alteration of <20 percent, regardless of streambank stability measurements for the stream or watershed.
3. The WWNF should monitor end-of-season riparian utilization every year in pastures in which livestock grazing overlaps with accessible spawning reaches for ESA-listed species.
4. The WWNF and its permittees should ensure that pastures are monitored mid-season and end-of-season at the frequency described in the Proposed Action. Mid-season monitoring should be conducted by the WWNF in all pastures in which an end-of-season indicator was exceeded during the previous season.
5. The WWNF should ensure that appropriately trained WWNF staff monitor streambank alteration levels for each pasture with end-of-season objectives.
6. The WWNF should ensure all exclosures, fences, and water developments that reduce cattle use adjacent to streams are properly maintained and functioning as intended (particularly the exclosures on the Frazier Mountain and Big Creek Allotments that were breached by cows in 2018).

### **3.4 Statutory Response Requirement**

As required by section 305(b)(4)(B) of the MSA, the WWNF must provide a detailed response in writing to NMFS within 30 days after receiving an EFH Conservation Recommendation from NMFS. Such a response must be provided at least 10 days prior to final approval of the action if the response is inconsistent with any of NMFS' EFH Conservation Recommendations, unless NMFS and the federal agency have agreed to use alternative timeframes for the federal agency response. The response must include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with NMFS Conservation Recommendations, the federal agency must explain its reasons for not following the recommendations, including the scientific justification for any

disagreements with NMFS over the anticipated effects of the action and the measures needed to avoid, minimize, mitigate, or offset such effects [50 CFR 600.920(k)(1)].

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

### **3.5 Supplemental Consultation**

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

## **4. DATA QUALITY ACT DOCUMENTATION AND PRE-DISSEMINATION REVIEW**

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

### **4.1 Utility**

Utility principally refers to ensuring that the information contained in this consultation is helpful, serviceable, and beneficial to the intended users. The intended users of this Opinion are the WWNF and its permittees. Individual copies of this Opinion were provided to the WWNF. The format and naming adheres to conventional standards for style.

### **4.2 Integrity**

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

### **4.3 Objectivity**

**Information Product Category:** Natural Resource Plan

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

***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 implementation, and reviewed in accordance with West Coast Region ESA quality control and assurance processes.

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**APPENDIX A**  
**MAPS**

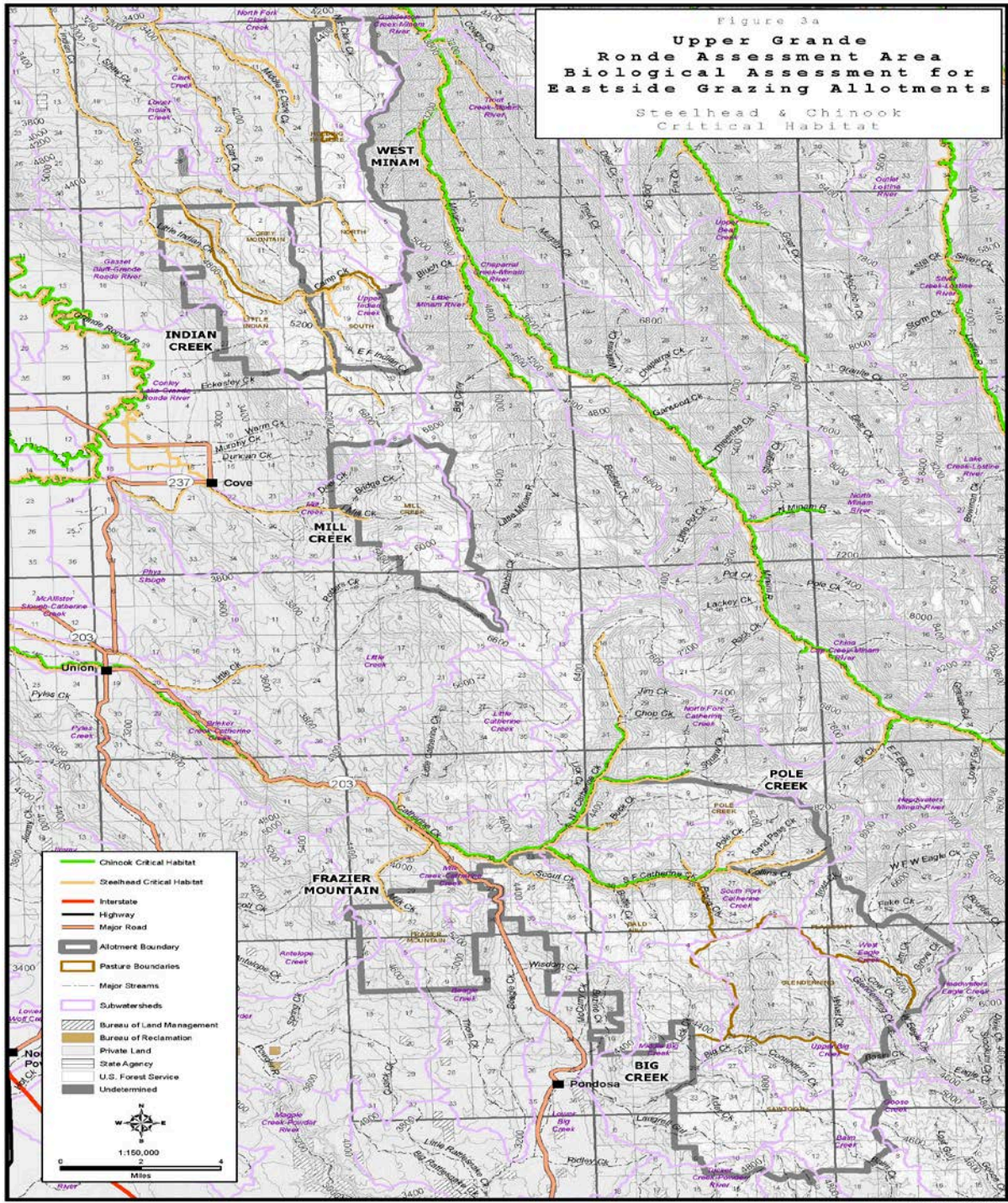


Figure A-1. Overlap between steelhead and Chinook salmon habitat and the Allotments.



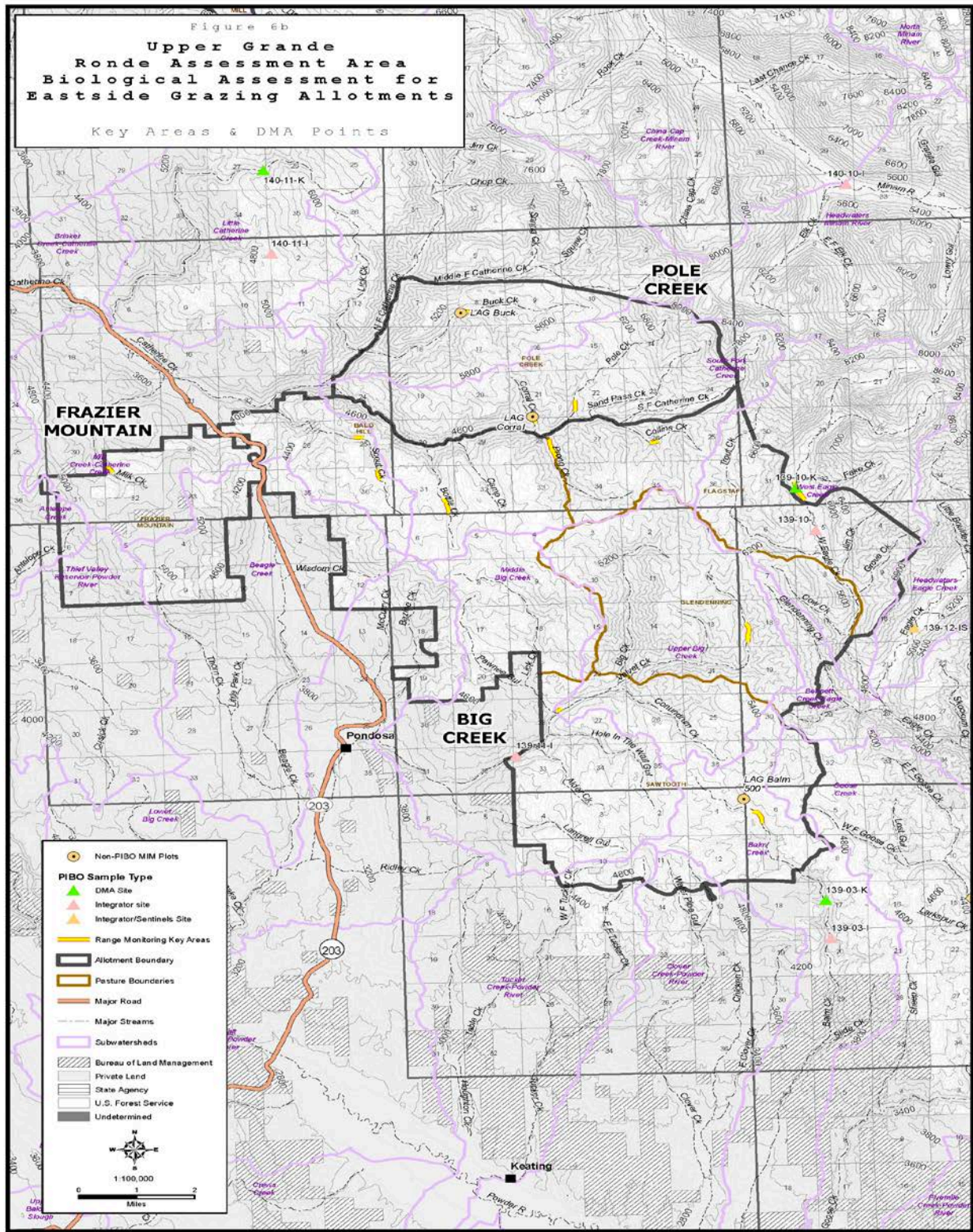


Figure A-3. Range Monitoring Key Areas on the southern three Allotments.

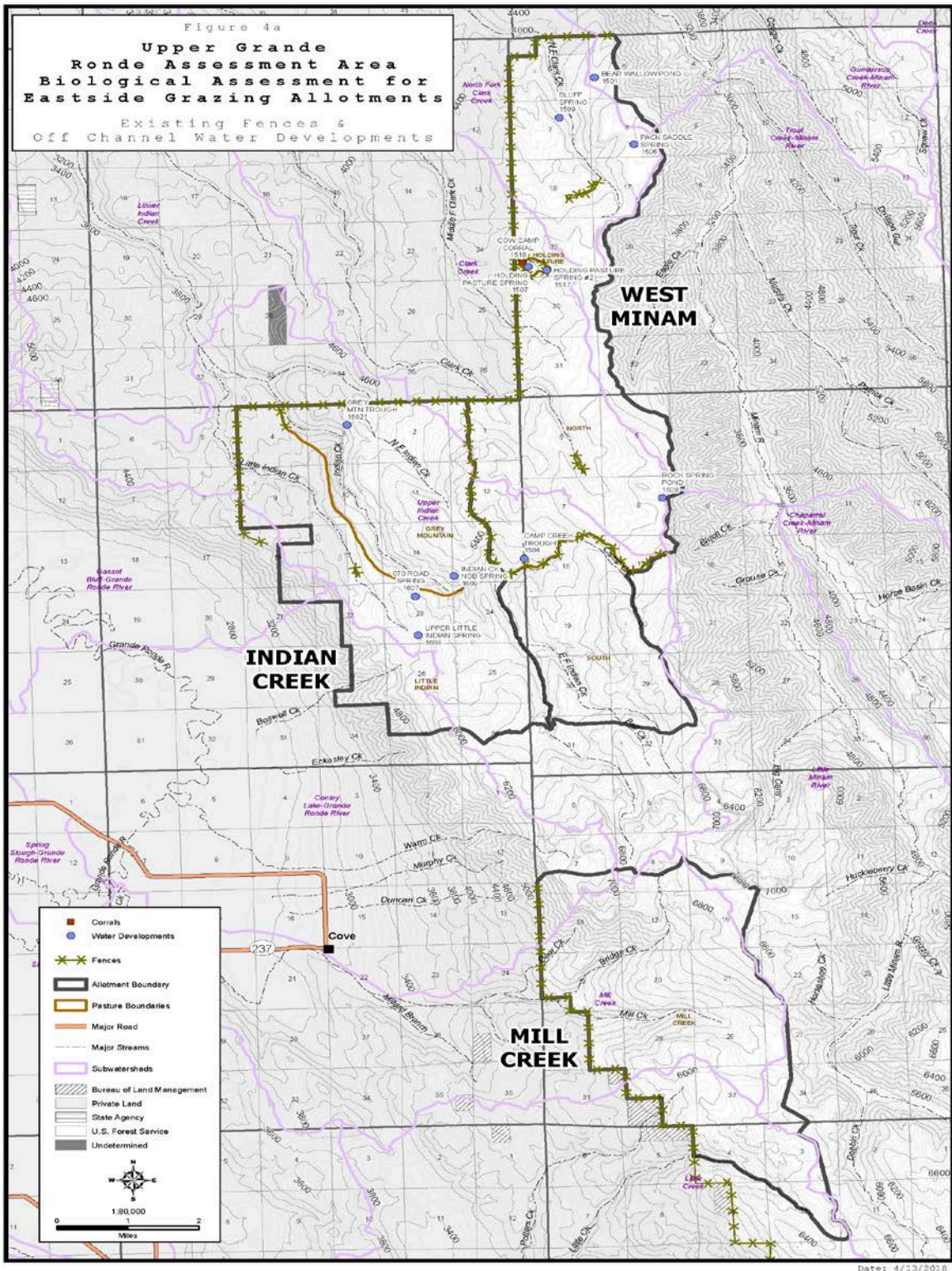


Figure A-4. Existing fences and off-channel water developments on the northern three Allotments.



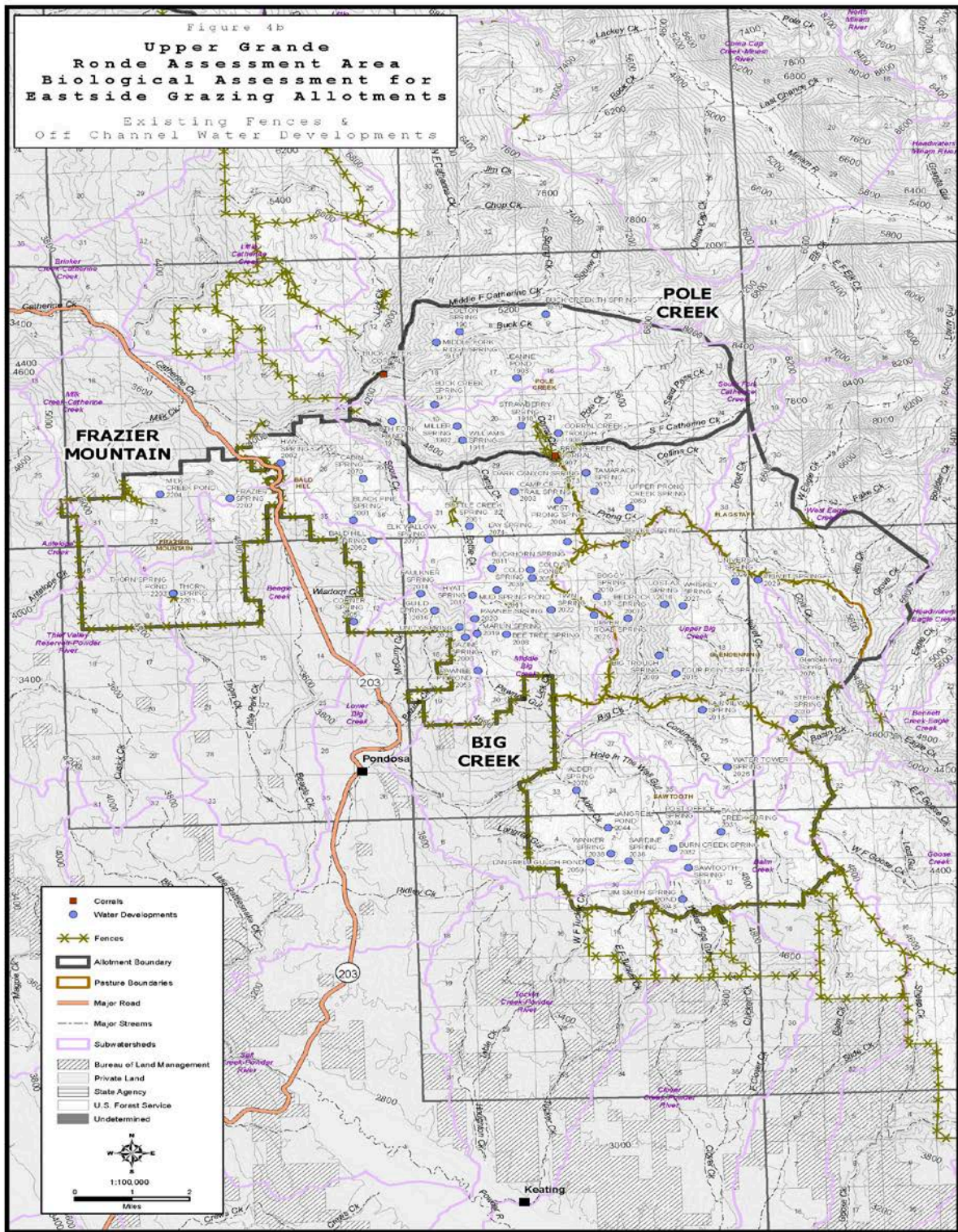


Figure A-5. Existing fences and off-channel water developments on the southern three Allotments.