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: WCR0-2019-00396

September 10, 2019

Cheryl F. Probert
Forest Supervisor
Nez Perce-Clearwater National Forest
903 Third Street
Kamiah, Idaho 83536

Lt. Col. Christian N. Dietz
U.S. Army Corps of Engineers
Walla Walla District
201 North Third Avenue
Walla Walla, Washington 98362-1836

Re: Endangered Species Act Section 7(a)(2) Biological Opinion, and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the U.S. Forest Service's Center Johnson Vegetation Management Project Nez Perce Clearwater National Forest, Idaho County, Idaho

Dear Ms. Probert and Lt. Col. Dietz:

Thank you for your letter of April 29, 2019 requesting initiation of consultation on the subject action 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.). Thank you, also, for your request for consultation pursuant to the essential fish habitat (EFH) provisions in section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA)(16 U.S.C. 1855(b)) for this action.

In the enclosed biological opinion (Opinion), NMFS concludes that the action, as proposed, is not likely to jeopardize the continued existence of Snake River Basin steelhead. Rationale for our conclusions is provided in the attached Opinion.

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

This document also includes the results of our analysis of the action's effects on EFH pursuant to section 305(b) of the MSA, and includes four Conservation Recommendations to avoid, minimize, or otherwise offset potential adverse effects on EFH. These Conservation Recommendations are similar but not identical to 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 Nez Perce Clearwater National Forests or (if regarding a Clean Water Act section 404 permit) U.S. Army Corps of Engineers must explain why the recommendations were not 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 Jennifer Gatzke, Fisheries Biologist at 208-883-8240, in the Moscow field office if you have any questions concerning this consultation, or if you require additional information.

Sincerely,

for Michael P. Tehan
Assistant Regional Administrator
Interior Columbia Basin Office

Enclosure

cc: D. Bawdon – NPCNF
J. Shinn – NPCNF
K. Fitzgerald – USFWS
M. Lopez – NPT

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

Center Johnson Vegetation
Management Project

NMFS Consultation Number: WCR0-2019-00396

Action Agencies: Nez Perce-Clearwater National Forest
U.S. Army Corps of Engineers, Walla Walla District

Affected Species and NMFS' Determinations:

ESA-Listed Species	Status	Is Action Likely to Adversely Affect Species?	Is Action Likely To Jeopardize the Species?	Is Action Likely to Adversely Affect Critical Habitat?	Is Action Likely To Destroy or Adversely Modify Critical Habitat?
Snake River steelhead (*Oncorhynchus mykiss*)	Threatened	Yes	No	NA	NA

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: September 10, 2019

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ACRONYM	DEFINITION
BA	Biological Assessment
BMP	Best Management Practice
COE	U.S. Army Corps of Engineers
CWA	Clean Water Act
DPS	Distinct Population Segment
DQA	Data Quality Act
ECA	Equivalent Clearcut Area
EFH	Essential Fish Habitat
ESA	Endangered Species Act
ESU	Evolutionarily Significant Units
FMP	Fishery Management Plan
ICTRT	Interior Columbia Technical Recovery Team
ISAB	Independent Scientific Advisory Board
ITS	Incidental Take Statement
LWD	Large Woody Debris
$MgCl_2$	Magnesium chloride
MPGs	Major Population Groups
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NMFS	National Marine Fisheries Service
NPCNF	Nez-Perce Clearwater National Forest
NTU	Nephelometric Turbidity Unit
Opinion	Biological Opinion
PBFs	Physical and Biological Features
PCEs	Primary Constituent Elements
PFMC	Pacific Fishery Management Council
RHCA	Riparian Habitat Conservation Areas
RMO	Riparian Management Objective
RPM	Reasonable and Prudent Measures
SPCC	Spill Prevention Control and Countermeasure
USFS	U.S. Forest Service
VSP	Viable Salmonid Population

1. INTRODUCTION

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

1.1 Background

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

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

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

1.2 Consultation History

The Nez Perce Clearwater National Forest (NPCNF) has requested consultation for potential effects to Snake River Basin steelhead and Pacific salmon Essential Fish Habitat (EFH) for the Center Johnson Vegetation Management Project. The NPCNF determined the project was 'No Effect' for Snake River Chinook salmon, Snake River Chinook critical habitat, and Snake River Basin steelhead critical habitat. On September 20, 2018, the NPCNF presented the Center Johnson Vegetation Management Project to NMFS and the U.S. Fish and Wildlife Service at a Level I Team meeting. On October 18, 2018, additional information on the Center Johnson Project was presented to the Level I Team; specifically, information was presented about a recently completed culvert replacement project near the mouth of Deer Creek which restored access to anadromous fish in the project area. Following edits, a second draft biological assessment (BA) was received by NMFS on March 12, 2019. Requested maps, appendices and data were received by NMFS on March 13, 2019. Level 1 closure was reached and formal consultation was initiated on April 29, 2019.

1.3 Proposed Federal Action

"Action" means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by federal agencies (50 CFR 402.02). Federal action means any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken by a federal agency (50 CFR 600.910). "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). There are no interrelated or interdependent actions for this project.

The Center-Johnson Vegetation Management Project is located on the Salmon River Ranger District, within the NPCNF in Idaho County, Idaho (see Figure 1). About 3 miles west of Slate Creek, Idaho, the project area encompasses 9,855 acres. The NPCNF proposes to conduct vegetation management through: (1) Fuel treatments to reduce hazardous and activity fuel levels on 3,760 acres; (2) timber harvest on approximately 3,045 acres (contained within the same area as the fuel treatments); (3) grassland treatment (mastication of trees) to remove encroaching ponderosa pine trees on 70 acres; and (4) road expansion and improvements on approximately 90 miles of road. Table 1 below details project activities.

Figure 1. Map of Center Johnson Vegetation Project Area, Nez-Perce Clearwater National Forest, Idaho (White Bird, Idaho pictured in top right quadrant).

Table 1. Summary of Proposed Timber Actions - Harvest and Fuel Treatments.

Treatment Type	Acres
Intermediate Harvest Total	**1,911**
Commercial Thinning	845
Pre-Commercial Thinning	22
Variable Density Thinning	1,044
Regeneration Harvest Total	**1,134**
Seed Tree	156
Shelterwood	609
Clearcut with Reserve Trees or Islands	369
Fuel Treatments Total	**3,760**
Prescribed Burning Acres in B1, B2 and B3, not including harvest units.	714
Prescribed burning activity fuels. Acres in B1 and in harvest units.	323
Prescribed burning activity fuels Acres not in B1 and in harvest units.	671
Pile and burning activity fuels in harvest units	2,030
Understory slashing	22
Grassland Treatment Total	**70**
Mastication	70
Total Harvest and Fuel Treatments	**Net Total 3,830**

Vegetation management – timber harvest

Intermediate harvest prescriptions on 1,911 acres includes commercial thinning on 845 acres, pre-commercial thinning on 22 acres, and variable density thinning on 1,044 acres. Intermediate harvest will reduce stand densities and address insect and disease infestations, thin canopy fuels and create conditions unfavorable for crown fire initiation, and reduce fuel hazards and improve elk winter range. Treatments will favor fire tolerant species such as ponderosa pine and western larch.

Commercial thinning (845 acres) would "thin from below" to increase the stand's growth and yield. The smaller, poorer-quality intermediate and suppressed trees would be taken while leaving the largest, best-quality, healthiest trees in the dominant and codominant crown classes. The residual basal area of 80–120 square feet per acre equates to a remaining canopy cover of approximately 55–75 percent.

Pre-commercial thinning (22 acres) retains approximately 250 to 300 trees per acre. The treatment is not "commercial," and does not produce products of commercial value, but may be large enough for posts and poles.

Variable density thinning (1,044 acres) removes the smaller, poorer-quality intermediate and suppressed trees. The unit can include some relatively small harvested openings (gaps), up to 5 acres in size, created in response to undesirable existing conditions such as insect and disease-affected trees or patches of trees with declining health and vigor. The thinning treatment outside the gaps will retain a residual basal area predominantly of 80–120 square feet per acre and an approximate 55–75 percent canopy cover. However, thinning can be conducted down to a residual basal area of 40–55 square feet per acre in small patches if poor stand health so dictates. There may also be some small untreated areas in the unit.

Regeneration harvest prescriptions on 1,134 acres includes seed tree on 156 acres, shelterwood on 609 acres, and clearcut with reserve trees or islands on 369 acres. Regeneration harvest maintains and/or re-establishes long-lived early seral species and reduces fuel hazard in the rural wildland urban interface**.** This treatment will manipulate patch size, age-class distribution, and species composition. Treatments will emphasize regeneration of seral species and help reduce the spread of insect and disease, by creating 12 openings ranging in size from 44 to 192 acres with a total of 992 acres.

Seed tree treatment (156 acres) will retain 8 to 15 trees per acre as residual seed trees for natural regeneration. The actual leave number would be dependent on the diameter of the residual seed trees. Only early seral species absent any insect and disease would be preferred as residual seed trees. Residual seed trees would be high-quality, high-vigor trees that are desirable for seed production.

Shelterwood treatment (609 acres) will retain 15 to 40 trees per acre as residual shelter trees. The residual leave number would be dependent on the diameter of the residual shelter trees. Early seral tree species (ponderosa pine, western larch), absent insect and disease, will be preferred as residual shelter trees. The largest, healthiest trees with the best form will be left. However, depending on habitat type and stand conditions, mid-seral species may also be left. Site preparation may be mechanical or through controlled fire activities. Both natural and artificial regeneration will be considered in meeting the regeneration objective.

Clearcut with reserve trees or reserve islands (369 acres) will remove green merchantable live trees, leaving an average of six to 10 large overstory trees per acre. Reserve trees would be selected based on wind-firmness, diameter size, and wildlife characteristics - the largest, healthiest trees with the best form. Preference would be to clump reserve trees versus scattering of individual trees. Site preparation for regeneration would occur to remove non-merchantable live trees. Site preparation may be mechanical or through controlled fire activities. Site preparation would only occur to meet fuel or regeneration objectives. Coarse woody debris would only be treated to meet post-harvest fuel objective. Regeneration would be accomplished through artificial means, specifically by planting trees.

Vegetation management – grassland treatment

Grassland treatment would include mastication of trees on 70 acres, to remove encroaching ponderosa pine trees. Mastication treatment entails shredding, chopping, or chipping trees and/or shrubs into small chunks and leaving the material on site. This treatment is similar to pre-commercial thinning as described and would retain trees over 12 inches diameter breast height. The treatment would reduce trees on areas that were historically grasslands while still providing some shade.

Vegetation management – fuel treatment

To remove vegetation and hazardous fuels, a variety of logging systems and equipment would be utilized including tractor on 1,072 acres, tractor-jammer on 883 acres, cable on 948 acres, helicopter on 121 acres, and hand treatment on 22 acres. The hand treatment includes understory slashing. This treatment includes cutting, felling and piling of trees up to 12 inches in diameter by hand. Trees over 12 inches diameter breast height would be retained. The treatment would reduce crown density and increase the distance between surface and crown fuels, to reduce the crown fire hazard.

Fuel treatments include landscape burning on 1,037 acres in three selected areas in and adjacent to harvest units. This treatment will reduce hazardous surface fuels, increase canopy height, and move the area towards Condition Class One (low departure from the natural historical fire regime). Treatment includes 685 acres of harvest units.

Burning will reduce surface and ladder fuels, break up fuel continuity, and create a patchy mosaic that could potentially reduce wildfire size and/severity. There will be no ignition in riparian areas. These burn-only areas are located primarily on dry sites where low or moderate burn intensity prescriptions will be employed. Some prescribed fires will be ignited by hand, while other areas will require aerial ignition due to dangerous terrain, size of burn area and efficiencies. Some tree mortality is expected, particularly smaller trees and shade tolerant species. A goal of less than 15 percent mortality of the large diameter overstory canopy within the burn areas is desirable. Three burn blocks proposed for prescribed burning include: B1 at 935 acres and includes 323 acres treatments of fuels in Units 22, 23, 24, 25, 26, 27, 28 and 29; Unit B2 at 79 acres; and B3 at 23 acres.

After harvest, activity fuels would be mechanically piled and subsequently burned on 2,030 acres, or the fuels would be left un-piled and reduced using prescribed fire on 671 acres. In addition, as listed above, prescribed burning would be used to treat activities fuels within Unit B1 on 323 acres.

Understory slashing by hand would be used on 22 mechanically treated acres to reduce hazardous ladder fuels adjacent to private lands. In harvested units with regeneration prescriptions, and where the retained trees consist of mostly ponderosa pine, post-harvest fuels will be left unpiled and reduced using prescribed fire. Units may then be replanted with ponderosa pine, western larch, and western white pine increasing species diversity, insect and disease resistance and fire resiliency.

Fuel Storage and Transfer Helicopters

Helicopter refueling and servicing will occur in proposed helicopter landing sites located outside of riparian habitat conservation areas (RHCAs). Fuel is delivered and stored in tanks with an 8,000-gallon capacity. Refueling occurs at a frequency of every 1 to 1.5 hours during helicopter operations through a secure system with a very low risk of spill. Because the aggregate surface storage exceeds

1,320 gallons, the contractor is subject to the rules and provisions of Federal Regulation 40 CFR 112 and must submit to the Forest a Spill Prevention, Control, and Countermeasure Plan (SPCC) certified by a licensed engineer. The purpose of an SPCC Plan is to form a comprehensive Federal/State spill prevention program that minimizes the potential for discharges. The SPCC Plan must address all relevant spill prevention, control, and countermeasures necessary at the specific facility. The SPCC plan has extensive requirements. The key components are detailed below:

- The SPCC and facility design will be certified by a licensed Professional Engineer. The certification verifies the engineer has visited the site, the plan and facility are adequate for the site, and procedures for required inspections and testing have been established.

- The secondary (spill) containment system will be constructed so that any discharge from a primary containment system, such as a tank, will not escape the containment system before cleanup occurs. Dikes, containment curbs, and pits are commonly employed for this purpose.

- The SPCC will specify spill prevention measures including procedures for routine handling of products (loading, unloading, and facility transfers, etc.).

- The SPCC requires a written commitment of manpower, equipment, and materials required to expeditiously control and remove any quantity of oil discharged that may be harmful.

- Personnel will be trained in the operation and maintenance of equipment used for transfer, spill prevention, and spill cleanup.

- Prior to filling and departure of any tank car or tank truck, inspect for leaks at all outlets of such vehicles, and if necessary, ensure that they are tightened, adjusted, or replaced to prevent liquid discharge while in transit.

Refueling and Equipment Servicing (other than helicopters)

Fuel for onsite logging equipment (harvesters, yarders, skidders, excavators) will be stored primarily in slip tanks located in the back of pick-up trucks that travel in and out of the harvest area daily. These tanks typically range in size from 40 to 75 gallons without exceeding 200 gallons. Gas cans (5 gallons) used for fueling chainsaws will also be stored and transported in pick-up trucks. Though unlikely, if on-site storage of fuels occurs outside of pick-up trucks, refueling provisions of the Sanitation and Servicing portion of the contract will be followed to minimize the risk of a fuel spill. Refueling and Servicing for equipment other than helicopters include:

- Fuel storage and equipment refueling and servicing will be outside of the RHCAs.

- Contractors shall maintain all equipment operating in the contract area in good repair and free of abnormal leakage of lubricants, fuel, coolants, and hydraulic fluid.

- Fueling of logging trucks will occur in town/cities and not in the harvest area.

- If storage exceeds 1,320 gallons, the contractor and facility will be subject to the rules and provisions of Federal Regulation 40 CFR 112.

Water Pumping

Guidelines found in NMFS' Anadromous Salmonid Passage Facility Design (NMFS 2011) will be utilized for all water pumping activities associated with dust abatement and fire safety. A qualified fisheries biologist will inspect all pumping locations. In addition to the guidelines (NMFS 2011a), best management practices (BMPs) for pumping are as follows:

- Undercut banks will not be exposed, and connected flow at and below pump sites will be maintained.

- Upstream and downstream juvenile and adult passage will be maintained.

- No more than 20 percent of streamflow shall be pumped.

- Instream withdrawal sites will be constructed such that they minimize streambed alteration.

- Pump intakes will be screened with 3/32-inch plate screen or equivalent to avoid entrainment and/or intake of juvenile fish and amphibians as prescribed in NMFS (2011).

- Spill containment measures for portable pumps, such as absorbent diapers, spill kits, or physical containment, will be required on site.

Associated road actions - expansion, improvement and decommissioning

To facilitate vegetation management, approximately 90 miles of road must be functional. Proposed road work activities for the project are summarized in Table 2, below. Twenty-four miles of new temporary road will be constructed, used, and decommissioned within 3 years. To access proposed timber harvest units, the Forest must reconstruct 6 miles (Road 9337A, 9937B, and 9337C), improve 49 miles (requires more work than road maintenance to bring up to a safe standard for log haul and vehicular passage), and maintain 8 miles of road. To improve the road surface, and to reduce erosion and sediment delivery, gravel will be placed on one temporary road and on 15 miles of existing road (420, 672, 672C, 672C2, 672I (part), 672I1 (part), 672H, 9335, 9335B, 9337A, 9337B, 76044, 76061). Less than 1-mile of new permanent road construction will connect 9337C to 9902C. Roads to be decommissioned (15 miles) include the following: 672A, 672J, 672L, 76037A, 76048, 76050, 76050A, 76051,76052, 76053, 76054, 76056,76058, 76059, 76060, 76064, 76065, 9333, 9333A, 9937C, 9337C1, 9339B and 9902C. Road 76065 (less than 1 mile) will be decommissioned to a trail for vehicles less than 50 inches in width. Primary haul routes are Road 493, a portion of Road 9337, Road 420, and Road 672.

The majority of the new temporary road construction of 24 miles utilizes existing templates. Those templates may be a trail, old skid trail, or an old non-system road with existing vegetation and has not been maintained as part of the forest roads or trail system.

Road reconstruction on approximately 6 miles of roads (9337A, 9937B, and 9337C) is necessary to accommodate log haul. Roads overgrown with vegetation require work to the road template such as widening, curve widening, road realignment and repair of major sections of the existing road that has failed. Activities include clearing and grubbing, reshaping the road template by widening or realignment, replacement or installation of new culverts, repairing major slides and slumps, surface gravel placement, and surface compaction.

Road improvement on approximately 49 miles of road requires more work than road maintenance to bring up to a safe standard for log haul and vehicular passage. These roads have some drainage and slope/sluff issues that make passage difficult, and/or thicker vegetation on the shoulders or growing within the road prism. Activities may include grading and shaping of the road surface, cleaning and reshaping ditches, catch basins, and culvert inlets/outlets to achieve positive drainage; replacement or new installations of culverts, repairing soft or unstable roadbed, roadside brushing or clearing and grubbing, minor cut slope and fill slope stabilization, surface gravel placement, and surface compaction. New gravel will be placed on approximately 15 miles of existing roads (420, 672, 672C, 672C2, 672I (part), 672I1 (part), 672H, 9335, 9335B, 9337A, 9337B, 76044, 76061) and on one temporary road.

Road maintenance on approximately 8 miles of roads used for harvest activities and log haul will minimize erosion and provide proper drainage during activities. The existing templates of the road are safely navigated by vehicles and require little work for safe log haul. Road maintenance work consists of surface reshaping and blading, typically light roadside brushing, installation of drainage dips and ditch, repairing small slides and slumps and culvert maintenance.

Road decommissioning will address approximately 15 miles of road (672A (part), 672J, 672L, 76037A, 76048, 76050, 76050A, 76051,76052, 76053, 76054, 76056,76058, 76059, 76060, 76064, 76065, 9333, 9333A, 9337C, 9337C1, 9339B and 9902C). Road 76065 will be decommissioned to a trail for vehicles less than 50 inches in width. These roads are no longer needed for management and would be decommissioned through obliteration or abandonment to (1) Decrease soil erosion and instream sediment deposition; (2) help improve channel structure and function; (3) improve hillslope hydrologic processes to a more natural condition; and (4) restore soil productivity. Road obliteration would include recontouring of the road template. All perennial and intermittent stream channel crossings (culverts) will be removed. Disturbed soils would be revegetated with local native transplants and/or seed. Decommissioning roads by obliteration would directly improve soil conditions by decompacting soils and adding wood and other organic matter to the existing road surface. Slope stability and hydrologic function would improve, reducing the potential risk of mass erosion from culvert or fill failures.

If a road is currently revegetated and stable with no culverts, it may be abandoned. Roads proposed for decommissioning by abandonment are often ridgetop roads on gentle slopes with few, if any, culverts and where road surveys show minimal risk of soil erosion or mass failure. These roads generally have a narrow-disturbed width, have adequate plant and organic cover, and have cut and fill slopes of no more than two feet in height. Abandonment would leave the road in place but inaccessible to any vehicle use.

Associated road actions – culvert replacement

The NPCNF will replace or realign 13 undersized or failing culverts on the following roads: 76061, 9335 (2), 9337A (3), 9337B, and 420(5). One log culvert will be removed on Road 9335B. Along with road improvements, road decommissioning, reconstruction, reconditioning, and maintenance, replacing these culverts will improve hydrologic function and reduce adverse impacts to aquatic habitat by reducing erosion and sediment delivery to streams and/or restoring fish passage. Road surfaces at replaced culverts would be graveled for approximately 50 feet on either side of the stream crossing.

Table 2. Summary of Road Treatments delineating number of miles.

Treatment Type	Miles
Road Construction Total	**24**
New permanent road	<1
New temporary road	3
New temporary road on existing templates	21
Road Work Total	**78**
Reconstruction	6
Improvement	49
Maintenance	8
Gravel Placement	15
Improvements on Roads Total	**15 miles and 13 Culverts**
Road decommissioning	15
Road decommissioning to Trail	<1
Replace or realign undersized or failing culverts	13

Of the 24 miles of temporary road construction, only 2.6 miles will occur near stream channels and these channels are all intermittent streams. The majority of this work is for the connecting road between 9337C and 9902C which is high on the ridge and does not cross fish-bearing streams. The new beginning of Road 672A is 0.1 miles long and does not cross any stream channels.

Fish salvage

Of 13 culverts being replaced, four are on fish bearing streams. Diverting the stream during construction requires fish salvage from the work area. Fish handling conservation measures aim to capture fish using non-lethal methods, and then release or relocate them downstream with minimal handling. Conservation measures, including the use of NMFS Electrofishing Guidelines (2000), will be applied to minimize the risk of injury and mortality to listed fish to the extent possible; however, electrofishing and fish handling have potential to injure and kill fish. Also, accidentally overlooked fish may be stranded as a result of water diversion methodology.

Best Management Practices

Table 3 denotes the BMPs that will be used during this project to mitigate negative effects from actions.

Table 3. Center-Johnson Project –Design Measures and best management practices.

Number	Mitigation Measure	Applies to
Aquatic Resources and Water Quality		
1	Apply the State of Idaho Best Management Practices found in Rules Pertaining to the Idaho Forest Practices Act Title 38, Chapter 13, Idaho Code; Forest Service Soil and Water Conservation Practices (Forest Service Handbook 2509.22).	All activities
2	If storing more than 1,320 gallons of fuel (helicopter), contractors will provide a SPCC plan and have associated containment materials (see section above for details). 120% containment for fuel storage over 200 gallons (the size of a slip tank for a truck). Do not store fuel or other toxicants in RHCAs. Avoid refueling in RHCAs unless there are no other alternatives. Exception for fuel cans associated with pumps drafting water.	All activities
3	Apply PACFISH interim direction to project activities, including default RHCAs - 300 feet of fish-bearing streams, 150 feet of perennial non-fish bearing water, wetlands >1-acre; or 100 feet of intermittent streams, wetlands <1-acre, landslides or landslide prone areas. No timber harvest is proposed within these areas. No mechanical treatment within field verified landslide prone areas (Forest Plan Amendment #20). Verification of landslides and landslide prone areas would be completed during layout and implementation.	Harvest, Fuel and Instream activities
4	No new or restored landings in RHCAs. Locate and design landings to have minimal effects to soil and aquatic resources.	Harvest activities
5	Incidental trees within RHCA's may be felled to facilitate anchoring for cable yarding systems, so long as no machinery enters the RHCA to set up the anchor, and these trees are not removed.	Harvest and fuels activities
6	Slash and water bars will be added to bare soil areas in skyline yarding corridors to prevent channelized flow.	Harvest activities
7	Avoid direct ignition of fuels within RHCA's. Allow prescribed fires to back into these areas.	Fuels activities
8	All temporary roads would be decommissioned within 3 years of use. If a temporary road has to overwinter, it would be blocked to public use and put into a stable condition consisting of water barring and seeding, as specified in the contract.	Harvest activities Road actions
9	Temporary road locations would predominantly be on slopes less than 35%, over existing templates where possible, and in areas where excavation would be minimized. Out-sloped drainage is preferred where feasible.	Road actions Temporary road construction and decommissioning
10	Dust abatement will be used on major haul routes to minimize sediment input to streams from log hauling activities (both water and magnesium chloride).	Harvest and hauling activities
11	Upon completion of hauling operations, the road surface shall be bladed, as required by the contract. No sidecasting of materials where: • It may be introduced into a stream, or where the placement of these materials will contribute to destabilization of the slope;	Harvest and hauling activities

Number	Mitigation Measure	Applies to
	• into ditch; and • in the RHCA, as much as possible.	
12	Culverts and ditches shall be kept functional and repaired, if needed. Clean ditches only when necessary to remove blockage. Roadside cut slopes or berms shall not be undercut. Cleaned materials from culverts and open tops will not be flushed or deposited in stream.	Harvest and hauling activities
13	Road decommissioning: • Remove all culverts and ditches when dry; • restore natural gradient on all live stream crossings; • apply available slash to the recontour surface (slash is considered available where the equipment is able to reach it from the working area where the decommissioning is occurring); • place available downed logs or branches and boulders on the site to discourage use by off-highway vehicles but allow for non-motorized access. Place woody debris on the downhill side of the decommissioned road; and • road decommissioning through abandonment will include stabilizing and seeding sources of erosion but will leave the road prism intact. All temporary roads will be scarified and recontoured (decommissioned). On temporary roads: reshape cut/fill slopes and crossings to natural contours.	Road decommissioning
14	For Removal or Replacement of Culverts, or Improve Stream Crossings, apply the following actions: • Minimize the use of machinery and limit the number of stream crossings by machinery in the stream channel during implementation. • Allow instream activities in fish bearing streams between July 1 and August 15 to avoid sediment deposition on emerging steelhead redds, unless site-specifically adjusted through coordination with Central Idaho Level 1 team review and approval. • For all instream activities, stream dewatering and diversion, erosion control measures will be employed. • For all replaced culverts, new structures will be designed to handle a 100 year flow event including debris. Ensure channel width, flow velocities, substrate condition, and stream gradients approximate the natural channel and accommodate passage of expected streamflow, debris, fish, and other aquatic organisms (PACFISH). • For all replaced culverts, apply aggregate on native surface roads (Roads 420, 76061, 9335, 9335B, 9337A, 9337B) and/or ditches, etc. • During culvert replacements, in fish-bearing streams, provide fish passage at all times. • Suspend instream operations if state turbidity standards are exceeded. This will be a one-time increase of 50 nephelometric turbidity units (NTUs) above background levels or 10 days of increase of 25 NTUs above background levels. Operations can be resumed when State standards are met again.	Culvert removal or replacement, or stream crossing improvement activities
Invasive Plants		

Number	Mitigation Measure	Applies to
1	Remove all mud, soil, and plant parts from off-road equipment before moving into project area to limit the spread of noxious weeds. Conduct cleaning off National Forest lands.	All equipment used on National Forest for all ground disturbing activities
2	Use Forest Service approved native plant species or non-native annual species to meet erosion control needs and other management objectives. Follow regional plant and seed transfer guidelines. Require contractors to use certified seed laboratories to test seed against the all state noxious weed list, and provide documentation of the seed inspection test to the contract administrator. Apply only certified weed-free seed and mulch.	Revegetation with native plants
3	Use Forest Service approved rock sources.	All activities
Rare Plants		
1	Protect Threatened and Endangered Species plant species and/or potential habitat identified at any point during implementation and notify the unit botanist.	All activities
Range		
1	Prior to harvest, fuel treatments and other activities, contact the Rangeland Management Specialist to notify permittees and facilitate movement of livestock, as needed.	All project activities
2	Protect range improvements from damage during implementation (e.g. livestock, cabins, corrals, barns, and fences). If any pasture fence is removed or breached to facilitate timber harvest, re-install/repair allotment fence in the same season.	All project activities
3	Install and maintain cattle barriers at allotment boundaries if roads and/or skid trails (permanent or temporary) cross allotment boundaries.	Harvest and fuel activities
4	Protect or return to the same condition, any specified existing non-system trails used to facilitate movement of livestock. Trails shall not to exceed 46 inches in width and be free of slash material from post- timber harvest, fuel treatment, and/or other activities. Coordinate with Rangeland Management Specialist.	Harvest and fuel activities
Soil Resources		
1	Restrict activities when soils are wet to prevent excessive rutting, soil displacement, and erosion.	All project activities
2	Reuse existing landings and skid trails and locate temporary roads over existing templates, wherever possible	All harvest activities
3	Limit ground based skidding to slopes 45% or less.	Harvest activities
4	Locate and design skid trails, landings and yarding corridors to minimize the area of detrimental soil effects. Space tractor skid trails no less than 80 feet apart (edge to edge), except where converging on landings. This does not preclude the use of feller bunchers.	Harvest activities (skid trails, landings, yarding corridors)
5	In units harvested with ground based equipment, pile slash in up to 50% of the unit area.	Harvest and fuels activities
6	Ensure suspension of one end of the log when utilizing skyline yarding systems.	Harvest activities (skyline yarding)
7	Retain an average of 7 to 15 tons per acre of coarse woody debris (greater than 3 inches in diameter), following completion of activities.	Harvest activities
8	Construct drainage controls (waterbars, drain ditches) and apply available slash in log yarding corridors (cable or skyline) upon completion of harvest activities where bare mineral soil is exposed and water flow may be confined.	Harvest Activities
9	Scarify and recontour excavated skid trails to restore slope hydrology and soil productivity.	Harvest activities Skid trails

Number	Mitigation Measure	Applies to
	Scarify non-excavated skid trails and landings that are compacted or entrenched 3 inches or more. Scarify to a depth of 6 to 14 inches. Scatter 7 to 15 tons per acre of coarse woody debris (greater than 3 inches in diameter) over recontoured and decompacted areas on skid trails and landings to cover; or if material is not available, seed the disturbed areas.	
10	Allow winter logging only during frozen conditions. Frozen conditions are defined as 4 inches of frozen ground or a barrier of unpacked snow greater than two feet in depth and packed snow 1-foot in depth.	Harvest activities
11	Within units, keep slash piles (excavator piles) small (4–10 feet in height).	Fuels activities
12	Broadcast burning of activity slash will be designed to emulate a low-severity mosaic burn. Retain and/or return green tops and allow green foliage to over-winter 1-year prior to burning, within the ground based harvest portions of the following units: 1, 2, 4, 7, 8, 9, 12, 28, 32, 36, 37, 38, 39, and 40.	Harvest and Fuels activities
13	Prescribed burning will be conducted in the spring and fall when fuel moisture in the 1-, 10-, and 1000-hour fuels is high. The majority of the prescribed burn treatment area is expected to receive a low intensity ground fire with some areas of moderate intensity including occasional torching of single trees or larger clumps of trees and consumption of some patches of regeneration.	Fuels activities
14	Use mastication equipment in a pattern that minimizes turning and under conditions to minimize detrimental soil disturbance.	Grassland Treatment
Vegetation		
1	Revegetate harvest units within in 5 years of harvest, using combination of artificial regeneration with desirable species (western larch and ponderosa pine) from site-adapted seed sources in combination with natural regeneration. Reduce fuels and shrub competition sufficiently to establish desired vegetation through prescribed burning, mechanical treatments, hand piling or a combination of both, depending on post-cutting conditions.	Harvest and fuel activities
Wildlife		
1	Retain trees (green or snags) with obvious cavities or large stick nests.	Harvest activities
2	Retain snags greater than or equal to 15 inches at diameter breast height within all harvest units to the maximum extent possible, or largest size available if snags are less than 15 inches at diameter breast height.	Harvest activities
3	In intermediate harvest treatments, except for variability density thinning gaps, retain at least 15 healthy trees per acre in the largest tree size class. In these late-seral dry forest communities, retain fire tolerant/dependent tree species such as ponderosa pine, Douglas-fir and western larch, wherever possible.	Harvest activities
4	Maintain a minimum 40-acre yearlong no-treatment buffer (no ground disturbing activities) around recently occupied goshawk nest trees. See map in project record.	All ground disturbing project activities
5	No ground disturbing activities shall be allowed inside known occupied post-fledgling areas from April 15 to August 15. See map in project record.	All ground disturbing project activities
6	Limit spring broadcast burning to those units that cannot be burned in summer/fall due to safety and risk concerns and still meet management objectives; to minimize impacts on wildlife, especially during breeding, nesting, calving/fawning, and denning periods; to improve forage	Prescribe Burn Units Fuels activities

Number	Mitigation Measure	Applies to
	response. Coordinate implementation of spring broadcast burn operations with a wildlife biologist.	

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

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

2.1 Analytical Approach

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

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

The designations of critical habitat for steelhead and salmon use the term primary constituent element (PCE) or essential features. The new critical habitat regulations (81 FR 7414) replace this term with physical or biological features (PBFs). The shift in terminology does not change the approach used in conducting a ''destruction or adverse modification'' analysis, which is the same regardless of whether the original designation identified 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 expected to be adversely affected by the proposed action.

- Describe the environmental baseline in the action area.

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

- Describe any cumulative effects in the action area.

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

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

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

2.2 Rangewide Status of the Species

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

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

Table 4. Listing status, status of critical habitat designations and protective regulations, and relevant Federal Register decision notices for ESA-listed species considered in this Opinion.

Species	Listing Status	Critical Habitat	Protective Regulations
Steelhead (*O. mykiss*)			
Snake River Basin	T 1/05/06; 71 FR 834	9/02/05; 70 FR 52630	6/28/05; 70 FR 37160

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

2.2.1 Status of the Species

This section describes the present condition of the Snake River Basin steelhead distinct population segment (DPS). NMFS expresses the status of a salmonid evolutionarily significant units (ESU) or DPS in terms of likelihood of persistence over 100 years (or risk of extinction over 100 years). NMFS uses McElhaney et al.'s (2000) description of a viable salmonid population (VSP) that defines "viable" as less than a 5 percent risk of extinction within 100 years and "highly viable" as less than a 1 percent risk of extinction within 100 years. A third category, "maintained," represents a less than 25 percent risk within 100 years (moderate risk of extinction). To be considered viable an ESU or DPS should have multiple viable populations so that a single catastrophic event is less likely to cause the ESU/DPS to become extinct, and so that the ESU/DPS may function as a metapopulation that can sustain population-level extinction and recolonization processes (ICTRT 2007). The risk level of the ESU/DPS is built up from the aggregate risk levels of the individual populations and major population groups (MPGs) that make up the ESU/DPS.

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

Snake River Basin Steelhead

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

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

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

The Interior Columbia Technical Recovery Team (ICTRT) identified 24 extant populations within this DPS, organized into five MPGs (ICTRT 2003). The ICTRT also identified a number of potential historical populations associated with watersheds above the Hells Canyon Dam complex on the mainstem Snake River, a barrier to anadromous fish migration. The five MPGs with extant populations are the Clearwater River, Salmon River, Grande Ronde River, Imnaha River, and Lower Snake River. In the Clearwater River, the historic North Fork population was blocked from accessing spawning and rearing habitat by Dworshak Dam. Current steelhead distribution extends throughout the DPS, such that spatial structure risk is generally low. For each population in the DPS, Table 5 shows the current risk ratings for the parameters of a viable salmonid population (spatial structure, diversity, abundance, and productivity).

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

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

Abundance and Productivity. Historical estimates of steelhead production for the entire Snake River basin are not available, but the basin is believed to have supported more than half the total steelhead production from the Columbia River basin (Mallet 1974, as cited in Good et al. 2005). Historical estimates of steelhead passing Lewiston Dam (removed in 1973) on the lower

Clearwater River were 40,000 to 60,000 adults (Ecovista et al. 2003), and the Salmon River basin likely supported substantial production as well (Good et al. 2005). In contrast, at the time of listing in 1997, the 5-year mean abundance for natural-origin steelhead passing Lower Granite Dam, which includes all but one population in the DPS, was 11,462 adults (Ford 2011). Counts have increased since then, with between roughly 23,000 and 44,000 adult wild steelhead passing Lower Granite Dam in the most recent 5-year period assessed in NMFS' status review (2011–2015) (NWFSC 2015).

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

Table 5. Summary of viable salmonid population parameter risks and overall current status for each population in the Snake River Basin steelhead DPS (NWFSC 2015). Risk ratings with "?" are based on limited or provisional data series.

MPG	Population	VSP Risk Parameter		Overall Viability Rating
		Abundance/ Productivity	Spatial Structure/ Diversity	
Salmon River (Idaho)	Little Salmon River	Moderate?	Moderate	Maintained?
	South Fork Salmon River	Moderate?	Low	Maintained?
	Secesh River	Moderate?	Low	Maintained?
	Chamberlain Creek	Moderate?	Low	Maintained?
	Lower Middle Fork Salmon R.	Moderate?	Low	Maintained?
	Upper Middle Fork Salmon R.	Moderate?	Low	Maintained?
	Panther Creek	Moderate?	High	High Risk?
	North Fork Salmon River	Moderate?	Moderate	Maintained?
	Lemhi River	Moderate?	Moderate	Maintained?
	Pahsimeroi River	Moderate?	Moderate	Maintained?
	East Fork Salmon River	Moderate?	Moderate	Maintained?
	Upper Mainstem Salmon R.	Moderate?	Moderate	Maintained?

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

Steelhead in the project area are included in the Little Salmon River steelhead population, one of 12 populations in the Salmon River MPG (Table 5) (NOAA, 2006). Within this population, NOAA (2006) identified one major and four minor spawning areas. The major spawning area is the Little Salmon River, and the minor spawning areas are Slate Creek, Rock Creek, White Bird Creek, and Skookumchuck Creek. Watersheds in the project area include Deer Creek, Christie Creek, Joe Creek, and Sherwin Creek. E-DNA samples in 2016 documented *O. mykiss* presence in Deer Creek, Christie Creek, and Sherwin Creek. Christie, Joe, and Sherwin Creeks are considered by some to be inaccessible for anadromous fish due to high gradient channels and seasonal lack of water from water withdrawal. From the eDNA information, it appears that

Christie and Sherwin Creeks support at least resident *O. mykiss*. Although not specifically studied in those watersheds, in some cases resident *O. mykiss* above barriers or partial barriers produce significant numbers of progeny that become anadromous (Thrower and Joyce 2004). In Christie and Sherwin Creeks, resident redband trout (*Oncorhynchus mykiss gairdneri*) occupy upstream habitat, but in small numbers.

In Deer Creek, in collaboration with the state of Idaho in 2017, local residents initiated and completed a culvert replacement project to provide anadromous fish access. Adult steelhead can now access portions of Deer Creek, helping restore an increment of spatial structure for this Little Salmon River steelhead population. There is no steelhead critical habitat in the action area.

Figure 2. Map of Fish Bearing Tributaries to the Lower Salmon River, Nez-Perce Clearwater National Forest, Idaho. Deer Creek, Joe Creek, Christie Creek, and Sherwin Creek (top to bottom).

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

Climate change is affecting aquatic habitat and the rangewide status of Snake River spring/summer Chinook salmon and Snake River Basin steelhead. The U. S. Global Change Research Program reports average warming of about 1.3°F from 1895 to 2011, and projects an increase in average annual temperature of 3.3°F to 9.7°F by 2070 to 2099 (CCSP 2014). Climate change has negative implications for ESA listed anadromous fishes and their habitats in the Pacific Northwest (CIG 2004; Scheuerell and Williams 2005; Zabel et al. 2006; ISAB 2007). According to the Independent Science Advisory Board (ISAB), these effects will cause the following:

- Warmer air temperatures will result in diminished snowpack and a shift to more winter/spring rain and runoff, rather than snow that is stored until the spring/summer melt season;

- With a smaller snowpack, watersheds will see their runoff diminished earlier in the season, resulting in lower flows in the June through September period, while more precipitation falling as rain rather than snow will cause higher flows in winter, and possibly higher peak flows; and,

- Water temperatures are expected to rise, especially during the summer months when lower flows co-occur with warmer air temperatures.

These changes will not be spatially homogeneous across the entire Pacific Northwest. Low-lying areas are likely to be more affected. Climate change may have long-term effects that include, but are not limited to, depletion of important cold-water habitat, variation in quality and quantity of tributary rearing habitat, alterations to migration patterns, accelerated embryo development, premature emergence of fry, and increased competition among species.

Climate change is predicted to cause a variety of impacts to Pacific salmon (including steelhead) and their ecosystems (Mote et al. 2003; Crozier et al. 2008a; Martins et al. 2012; Wainwright and Weitkamp 2013). The complex life cycles of anadromous fishes, including salmon, rely on productive freshwater, estuarine, and marine habitats for growth and survival, making them particularly vulnerable to environmental variation. Ultimately, the effects of climate change on salmon and steelhead across the Pacific Northwest will be determined by the specific nature, level, and rate of change and the synergy between interconnected terrestrial/freshwater, estuarine, nearshore, and ocean environments.

The primary effects of climate change on Pacific Northwest salmon and steelhead include:

- Direct effects of increased water temperatures on fish physiology;

- Temperature-induced changes to streamflow patterns;

- Alterations to freshwater, estuarine, and marine food webs; and,

- Changes in estuarine and ocean productivity.

While all habitats used by Pacific salmon will be affected, the impacts and certainty of the change vary by habitat type. Some effects (e.g., increasing temperature) affect salmon at all life stages in all habitats, while others are habitat-specific, such as streamflow variation in freshwater, sea-level rise in estuaries, and upwelling in the ocean. How climate change will affect each stock or population of salmon also varies widely depending on the level or extent of change, the rate of change, and the unique life-history characteristics of different natural populations (Crozier et al. 2008b). For example, a few weeks' difference in migration timing can have large differences in the thermal regime experienced by migrating fish (Martins et al. 2011).

Temperature Effects. Like most fishes, salmon are poikilotherms (cold-blooded animals); therefore, increasing temperatures in all habitats can have pronounced effects on their physiology, growth, and development rates (see review by Whitney et al. 2016). Increases in water temperatures beyond their thermal optima will likely be detrimental through a variety of processes, including increased metabolic rates (and therefore food demand), decreased disease resistance, increased physiological stress, and reduced reproductive success. All of these processes are likely to reduce survival (Beechie et al. 2013; Wainwright and Weitkamp 2013; Whitney et al. 2016).

By contrast, increased temperatures at ranges well below thermal optima (i.e., when the water is cold) can increase growth and development rates. Examples of this include accelerated emergence timing during egg incubation stages, or increased growth rates during fry stages (Crozier et al. 2008a; Martins et al. 2011). Temperature is also an important behavioral cue for migration (Sykes et al. 2009), and elevated temperatures may result in earlier-than-normal migration timing. While there are situations or stocks where this acceleration in processes or behaviors is beneficial, there are also others where it is detrimental (Martins et al. 2012; Whitney et al. 2016).

Freshwater Effects. Climate change is predicted to increase the intensity of storms, reduce winter snow pack at low and middle elevations, and increase snowpack at high elevations in northern areas. Middle and lower-elevation streams will have larger fall/winter flood events and lower late-summer flows, while higher elevations may have higher minimum flows. How these changes will affect freshwater ecosystems largely depends on their specific characteristics and location, which vary at fine spatial scales (Crozier et al. 2008b; Martins et al. 2012). For example, within a relatively small geographic area (the Salmon River basin in Idaho), survival of some Chinook salmon populations was shown to be determined largely by temperature, while in others it was determined by flow (Crozier and Zabel 2006). Certain salmon populations inhabiting regions that are already near or exceeding thermal maxima will be most affected by further increases in temperature and, perhaps, the rate of the increases. The effects of altered flow are less clear and likely to be basin-specific (Crozier et al. 2008b; Beechie et al. 2013). However, flow is already becoming more variable in many rivers, and this increased variability is believed to negatively affect anadromous fish survival more than other environmental parameters (Ward et al. 2015). It is likely this increasingly variable flow is detrimental to multiple salmon and steelhead populations, and also to other freshwater fish species in the Columbia River basin.

Stream ecosystems will likely change in response to climate change in ways that are difficult to predict (Lynch et al. 2016). Changes in stream temperature and flow regimes will likely lead to shifts in the distributions of native species and provide "invasion opportunities" for exotic species. This will result in novel species interactions, including predator-prey dynamics, where juvenile native species may be either predators or prey (Lynch et al. 2016; Rehage and Blanchard 2016). How juvenile native species will fare as part of "hybrid food webs," which are constructed from natives, native invaders, and exotic species, is difficult to predict (Naiman et al. 2012).

Estuarine Effects. In estuarine environments, the two big concerns associated with climate change are rates of sea level rise and water temperature warming (Wainwright and Weitkamp 2013; Limburg et al. 2016). Estuaries will be affected directly by sea-level rise: as sea level rises, terrestrial habitats will be flooded and tidal wetlands will be submerged (Kirwan et al. 2010; Wainwright and Weitkamp 2013; Limburg et al. 2016). The net effect on wetland habitats depends on whether rates of sea-level rise are sufficiently slow that the rates of marsh plant growth and sedimentation can compensate (Kirwan et al. 2010).

Due to subsidence, sea-level rise will affect some areas more than others, with the largest effects expected for the lowlands, like southern Vancouver Island and central Washington coastal areas (Verdonck 2006; Lemmen et al. 2016). The widespread presence of dikes in Pacific Northwest estuaries will restrict upward estuary expansion as sea levels rise, likely resulting in a near-term loss of wetland habitats (Wainwright and Weitkamp 2013). Sea-level rise will also result in greater intrusion of marine water into estuaries, resulting in an overall increase in salinity, which will also contribute to changes in estuarine floral and faunal communities (Kennedy 1990). While not all anadromous fish species are highly reliant on estuaries for rearing, extended estuarine use may be important in some populations (Jones et al. 2014), especially if stream habitats are degraded and become less productive. Preliminary data indicate that some Snake River Basin steelhead smolts actively feed and grow as they migrate between Bonneville Dam and the ocean (Beckman 2018), suggesting that estuarine habitat is important for this DPS.

Marine Effects. In marine waters, increasing temperatures are associated with observed and predicted poleward range expansions of fish and invertebrates in both the Atlantic and Pacific Oceans (Lucey and Nye 2010; Asch 2015; Cheung et al. 2015). Rapid poleward species shifts in distribution in response to anomalously warm ocean temperatures have been well documented in recent years, confirming this expectation at short time scales. Range extensions were documented in many species from southern California to Alaska during unusually warm water associated with "the blob" in 2014 and 2015 (Bond et al. 2015; Di Lorenzo and Mantua 2016) and past strong El Niño events (Pearcy 2002; Fisher et al. 2015). For example, recruitment of the introduced European green crab (*Carcinus maenas*) increased in Washington and Oregon waters during winters with warm surface waters, including 2014 (Yamada et al. 2015). Similarly, the Humboldt squid (*Dosidicus gigas*) dramatically expanded its range northward during warm years of 2004–09 (Litz et al. 2011). The frequency of extreme conditions, such as those associated with El Niño events or "blobs" is predicted to increase in the future (Di Lorenzo and Mantua 2016), further altering food webs and ecosystems.

Expected changes to marine ecosystems due to increased temperature, altered productivity, or acidification will have large ecological implications through mismatches of co-evolved species and unpredictable trophic effects (Cheung et al. 2015; Rehage and Blanchard 2016). These effects will certainly occur, but predicting the composition or outcomes of future trophic interactions is not possible with current models.

Wind-driven upwelling is responsible for the extremely high productivity in the California Current ecosystem (Bograd et al. 2009; Peterson et al. 2014). Minor changes to the timing, intensity, or duration of upwelling, or the depth of water-column stratification, can have dramatic effects on the productivity of the ecosystem (Black et al. 2015; Peterson et al. 2014). Current projections for changes to upwelling are mixed: some climate models show upwelling unchanged, but others predict that upwelling will be delayed in spring, and more intense during summer (Rykaczewski et al. 2015). Should the timing and intensity of upwelling change in the future, it may result in a mismatch between the onset of spring ecosystem productivity and the timing of salmon entering the ocean, and a shift toward food webs with a strong sub-tropical component (Bakun et al. 2015).

Columbia River anadromous fishes also use coastal areas of British Columbia and Alaska and midocean marine habitats in the Gulf of Alaska, although their fine-scale distribution and marine ecology during this period are poorly understood (Morris et al. 2007; Pearcy and McKinnell 2007). Increases in temperature in Alaskan marine waters have generally been associated with increases in productivity and salmon survival (Mantua et al. 1997; Martins et al. 2012), thought to result from temperatures that are normally below thermal optima (Gargett 1997). Warm ocean temperatures in the Gulf of Alaska are also associated with intensified downwelling and increased coastal stratification, which may result in increased food availability to juvenile salmon along the coast (Hollowed et al. 2009; Martins et al. 2012). Predicted increases in freshwater discharge in British Columbia and Alaska may influence coastal current patterns (Foreman et al. 2014), but the effects on coastal ecosystems are poorly understood.

In addition to becoming warmer, the world's oceans are becoming more acidic as increased atmospheric carbon dioxide is absorbed by water. The North Pacific is already acidic compared to other oceans, making it particularly susceptible to further increases in acidification (Lemmen et al. 2016). Laboratory and field studies of ocean acidification show that it has the greatest effects on invertebrates with calcium-carbonate shells, and has relatively little direct influence on finfish; see reviews by Haigh et al. (2015) and Mathis et al. (2015). Consequently, the largest impact of ocean acidification on salmon will likely be the influence on marine food webs, especially the effects on lower trophic levels (Haigh et al. 2015; Mathis et al. 2015). Marine invertebrates fill a critical gap between freshwater prey and larval and juvenile marine fishes, supporting juvenile salmon growth during the important early-ocean residence period (Daly et al. 2009, 2014).

Uncertainty in Climate Predictions. There is considerable uncertainty in the predicted effects of climate change on the globe as a whole, and on the Pacific Northwest in particular. Many of the effects of climate change (e.g., increased temperature, altered flow, coastal productivity, etc.) will have direct impacts on the food webs that species rely on in freshwater, estuarine, and marine habitats to grow and survive. Such ecological effects are extremely difficult to predict even in fairly simple systems, and minor differences in life-history characteristics among stocks of salmon may lead to large differences in their response (e.g. Crozier et al. 2008b; Martins et al. 2011, 2012). This means it is likely that there will be "winners and losers," meaning some salmon populations may enjoy different degrees or levels of benefit from climate change while others will suffer varying levels of harm. Climate change is expected to impact anadromous fishes during all stages of their complex life cycle. In addition to the direct effects of rising temperatures, indirect effects include alterations in flow patterns in freshwater and changes to food webs in freshwater, estuarine, and marine habitats. There is high certainty that predicted physical and chemical changes will occur; however, the ability to predict bio-ecological changes to fish or food webs in response to these physical/chemical changes is extremely limited, leading to considerable uncertainty. In additional to physical and biological effects, there is also the question of indirect effects of climate change and whether human "climate refugees" will move into the range of salmon and steelhead, increasing stresses on their respective habitats (Dalton et al. 2013; Poesch et al. 2016).

Summary. Climate change is expected to impact Pacific Northwest anadromous fishes during all stages of their complex life cycle. In addition to the direct effects of rising temperatures, indirect effects include alterations in stream-flow patterns in freshwater and changes to food webs in freshwater, estuarine, and marine habitats. There is high certainty that predicted physical and chemical changes will occur; however, the ability to predict bio-ecological changes to fish or food webs in response to these physical/chemical changes is extremely limited, leading to considerable uncertainty. As we continue to deal with a changing climate, management actions may help alleviate some of the potential adverse effects (e.g., hatcheries serving as a genetic reserve and source of abundance for natural populations, increased riparian vegetation to control water temperatures, etc.).

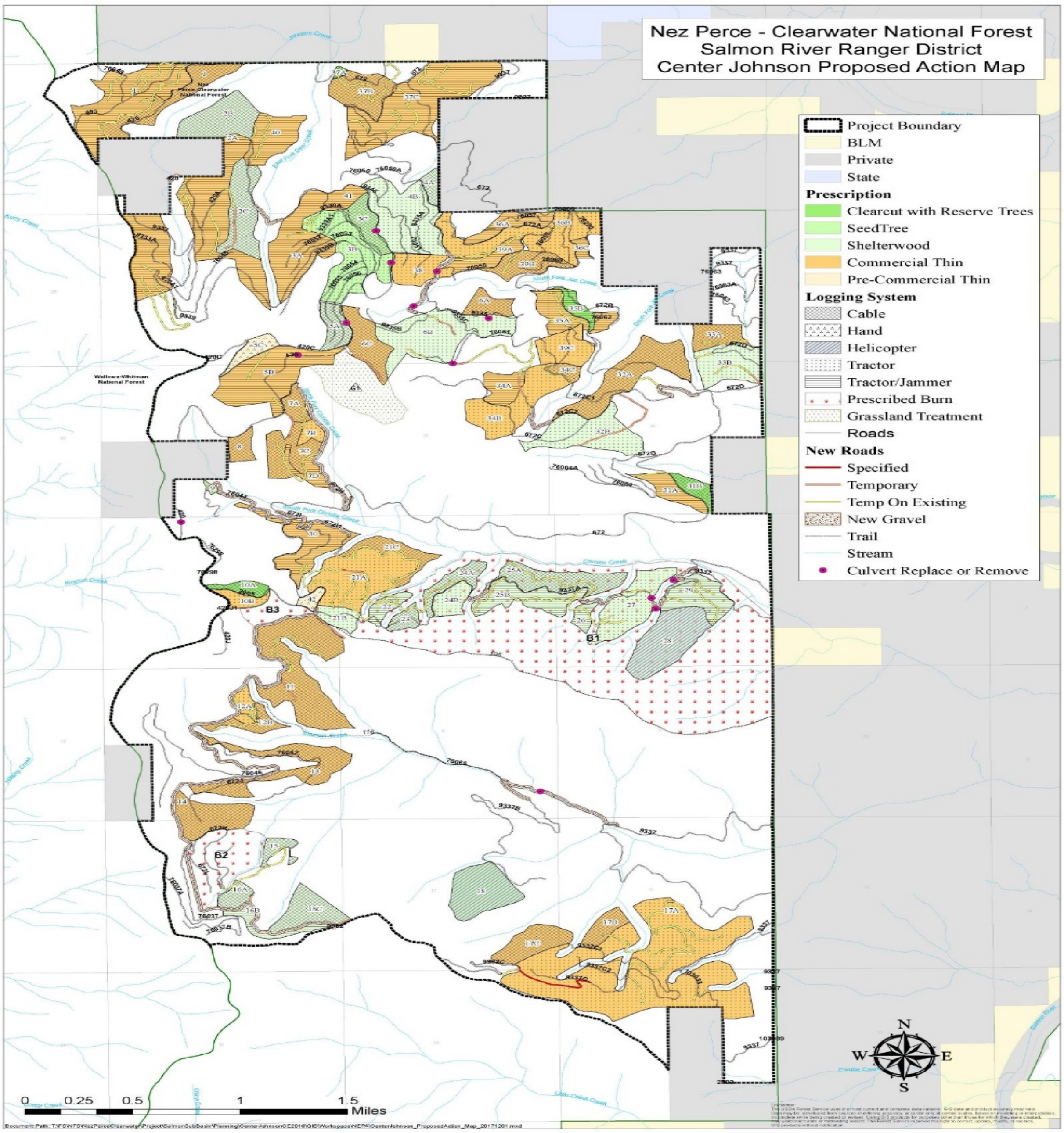
Climate change is expected to make recovery targets for Chinook salmon and steelhead populations more difficult to achieve. Climate change is expected to alter critical habitat by generally increasing temperature and peak flows and decreasing base flows. Although changes will not be spatially homogenous,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

2.3 Action Area

"Action area" means all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action (50 CFR 402.02). The Center Johnson Project is located on the Salmon River Ranger District, NPCNF, approximately 3 miles west of Slate Creek, Idaho. Named streams in the action area are tributaries to the lower Salmon River and include Johnson Creek, Deer Creek, Lyon Creek, Joe Creek, Rhett Creek, Christie Creek, and Sherwin Creek. The action area consists of the fuel treatment/timber harvest units, haul roads, riparian areas, and tributary streams that may be directly or indirectly affected by project activities, including harvest, haul, project-related road work, prescribed burning, water pumping, refueling, and equipment servicing and staging. Suspended and deposited sediment from project disturbance may eventually travel into lower sections of the tributary streams and into the Salmon River; however, the location of project activities and the application of the project BMPs make it very unlikely project effects would be detectable in those areas.

A portion of the action area is used by all freshwater life history stages of threatened Snake River Basin steelhead. Although the mainstem Salmon River is designated critical habitat for Snake River basin steelhead, there is not designated critical habitat for steelhead within the action area.

Figure 3. Map of Center Johnson Vegetation Management Project Area, Nez-Perce Clearwater National Forest, Idaho. Culverts marked with red dots and primary U.S. Forest Service (USFS) haul roads identified.



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).

Streams in this basalt landform generally flow through valleys that are V-shaped and confined with slopes of 10 percent or more. However, there are specific areas, particularly in Deer Creek, where gradient and confinement are less. Landforms in these watersheds include steep mountain slopes, dissected stream break lands, and mass wasted moderate slopes. Channel gradients in the analysis area generally fall within the range of 20–40 percent. Streams transport high sediment loads and are subject to occasional debris torrents in response to heavy rain or rain-on-snow events. Alluvial fans are common at the confluence of these streams at the Salmon River, limiting upstream aquatic organism passage. Water withdrawals frequently cause streams below the forest boundary to have no surface flow during summer months.

The Snake River Basin steelhead Recovery Plan (NMFS 2017) categorizes the Little Salmon River population as facing moderate risk. Sediment loading, passage limitations, reduced water levels, and increased temperatures, are recognized limiting factors in this action area. Recovery strategies include the following actions: (1) reduce and prevent sediment delivery to steams by rehabilitating roads; (2) eliminate passage barriers to improve connectivity to historical habitat; (3) protect pristine tributary habitat; (4) reestablish riparian areas and floodplains in order to restore and preserve natural habitat-forming processes in areas of high intrinsic potential; and (5) upgrade irrigation diversions to provide instream flow and fish passage.

An upward trend analysis was conducted by the NPCNF because the Christie, Joe, Sherwin and Deer Creek watersheds were not meeting their fishery water quality objectives. A watershed survey was conducted in 2016 and showed that the riparian management objectives (RMOs) were not met for all stream reaches. All reaches are above RMO for quantity of large woody debris per stream mile, and below the RMO for percent surface fines. Most stream reaches are above the RMO for width-to-depth ratio, with the exception of four reaches: one in Christie Creek and another in Sherwin Creek prescription watersheds, and two stream reaches in Joe Creek prescription watershed.

According to the Pfancuck stream stability ratings, all stream reaches in Christie Creek and Deer Creek prescription watersheds are fair, while stream reaches in Joe Creek and Sherwin Creek prescription watersheds are fair to good. Width to depth ratios and Pfankuch stream stability ratings indicate North Fork Joe Creek and Sherwin Creek stream reaches are stable, and Christie Creek and Joe Creek stream reaches are potentially unstable.

In summary, baseline conditions in the action area indicate that the affected watersheds are currently not meeting all of their fishery water quality objectives. However, the ratings were mixed for individual stream reaches with many exceeding objectives for some criteria.

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. There are no indirect effects from this action.

2.5.1 Effects on ESA-listed Species

Due to limited presence of steelhead in the action area, the proposed action has only limited potential to negatively affect them. As mentioned above, most streams in the action area are very high gradient and not suitable habitat for steelhead. The primary activities that might harm steelhead are certain culvert replacements and timber haul on roads that are adjacent to fish-bearing streams, and harvest/yarding activities in those areas. There are only four culverts where replacement work could potentially harm steelhead. The primary haul routes only have limited crossing of perennial streams occupied by steelhead. Finally, monitoring by the NPCNF has shown that RHCA buffers are effective at preventing sediment delivery to streams; and skidding/yarding BMPs minimize risk of channelized flow and sediment delivery from harvest units into action area streams.

The potential effects of the proposed action are sediment delivery to streams, fine sediment depositing on spawning gravel, passage disruption, chemical contamination of streams, cover removal, increasing water temperatures, and impacts to riparian functions and watershed hydrology. These potential effects are discussed below.

2.5.1.1 Sediment – suspended and deposited

Sediment can become suspended and impact fish as a result of activities such as road work and log haul, culvert repair, ditch cleaning, and forestry practices. The effects of increased suspended sediment on salmonids generally increase with exposure time, concentration, and particle size (Newcombe and Jensen 1996). These effects were reviewed by Newcombe and Jensen (1996) and range from avoidance response, to minor physiological stress from increased rate of coughing, to death. Additional effects include gill abrasion or behavioral changes (Servizi and Martens 1992), and interference with chemosensory ability (Wenger and McCormick 2013). Salmonids are relatively tolerant of low to moderate levels of suspended sediment and may increase feeding rates during moderate levels of suspended sediment (Gregory and Northcote 1993). Salmon and steelhead tend to avoid suspended sediment above certain concentrations (Servizi and Martens 1992; McLeay et al. 1987). Avoidance behavior can mitigate adverse effects when fish are capable of moving to an area with lower concentrations of suspended sediment. Researchers have reported thresholds for salmonid avoidance behavior at turbidities ranging from 30 to 70 NTUs (Lloyd 1987; Servizi and Martens 1992; Berg and Northcote 1985).

During precipitation events or wet periods, disturbed soils may mobilize into streams, become suspended, and be deposited into downstream substrates. Deposition occurs in a graded pattern with larger particles settling out first and smaller particles settling out farther downstream (Foltz et al. 2008). When suspended sediment settles onto the streambed, fine sediment ($\leq$2 millimeter diameter) can cause detrimental sedimentation effects on spawning and rearing habitats by filling interstitial spaces between gravel particles (Anderson et al. 1996; Suttle et al. 2004). Sedimentation can: (1) Bury salmonid eggs or smother embryos; (2) destroy, alter or displace prey habitat; and (3) destroy, alter or displace spawning and rearing habitat (Spence et al. 1996). Excessive sedimentation can reduce the flow of water and oxygen to eggs and alevins in redds. This can decrease egg survival, delay development of alevins (Everest et al. 1987), reduce growth and cause premature hatching and emergence (Birtwell 1999), decrease fry emergence rates (Bash et al. 2001; Cederholm and Reid 1987; Chapman 1988), and cause a loss of summer rearing and overwintering cover for juveniles (Bjornn et al. 1977; Griffith and Smith 1993; Hillman et al. 1987).

Through the implementation of forest management BMPs, (e.g., applying slash on disturbed soils and locating yarding corridors, swing trails, and landings in locations disconnected from the stream network), there is little potential for sediment delivery to streams from timber harvest and prescribed burning; however, there is a greater potential for delivery from road work and road use near streams (Brown et al. 2013). The following activities have the potential to disturb soil, increase surface erosion, and deliver fine sediment to action area streams: culvert work, timber harvest, prescribed burning, construction of permanent and temporary roads, haul road maintenance and use, and road decommissioning.

Culvert Work

Based on monitoring of culvert replacements in small streams, similar to those in the action area, activity-generated fine sediment transported to and suspended in the water column is expected to settle out into the stream substrate within a few hundred feet. Prior USFS studies indicate that, on similarly small streams with the same site-dewatering and sediment intercepting BMPs used in this action, suspended sediment becomes indistinguishable from background levels no more than 600 feet downstream from culvert work (Connor 2014).

Analysis from 20 culvert, diversion, and road replacement or removal projects from the NPCNF (A. Connor, NPCNF hydrologist, unpublished data 2014) shows that there were spikes in turbidity at the onset of dewatering and rewatering at each monitoring site. Results can be generalized and show that these spikes extended between 100 and 600 feet downstream, 50 percent of the spikes exceeded 50 NTU, with a maximum of 250 NTU, for less than 2 hours. Based on the intensity and duration of turbidity exposure for those projects, and effects thresholds summarized in Newcombe and Jensen (1996), it is likely that juvenile steelhead would have experienced non-lethal physiological harmful effects in the areas directly below the culvert work sites. Expected temporary (up to 2 hours) effects would have included behavioral effects such as volitional movement and/or reduced or increased feeding, and physiological effects including coughing. Because the proposed culvert replacements will occur on similar sized streams and at a similar time of year, in the locations where steelhead occur the effects to steelhead are expected to be similar to those indicated by the NPCNF's prior assessment of culvert work and defined by Newcombe and Jensen (1996).

As suspended sediments settle out within 600 feet of the culvert work sites, there may be a small amount of increased sediment deposition in these areas. Four of the culverts that are scheduled for work likely have steelhead within 600 feet downstream. Three of these culverts are on the 9337A Road where the road crosses a tributary to Christie Creek and one is on the 9337B Road where it crosses Sherwin Creek. Fine sediments within 600 feet of sources have the potential to deposit in sufficient quantities to alter substrates detectably. Generally, increased sediment in stream substrates can result in reduced diversity and abundance of invertebrate species that juvenile salmon and steelhead eat, and thus can result in reduced growth in juvenile salmon and steelhead (Suttle et al. 2004). Fine sediment can also fill interstitial spaces in gravel smothering eggs or pre-emergent fry (Spence et al. 1996), and reduce substrate habitat for summer or winter rearing juvenile salmonids (Bjornn et al. 1977).

The project-associated localized sediment deposits in these areas will likely be transported downstream in the next high water event, when effects on turbidity will likely be indistinguishable from background conditions. Also, any eventual substrate effects greater than 600 feet downstream (i.e., when high flows move the material farther downstream) will be greatly attenuated and likely either undetectable or so small as to not adversely affect steelhead in those areas. With implementation of the proposed BMPs to minimize sediment delivery and the limited overlap of the project with steelhead, adverse effects to steelhead from sediment will be limited to short-term exposures to turbidity and deposited sediment in four locations within 600 feet below culvert work.

Timber Harvest

Timber harvest activities, particularly skidding and yarding of logs, have the potential to deliver sediment to streams. Overland soil movement and the potential for forming channelized flow and sediment delivery from harvest and log handling areas will be minimized by implementing RHCA buffers, limiting harvest in wet conditions, retaining slash, and other measures to reduce erosion. The NPCNF has demonstrated that RHCA buffers are over 97 percent effective at capturing sediment and avoiding sediment delivery to streams (USFS 2003). As described in the Proposed Action section, no harvest will occur within 300 feet of fish-bearing streams, 150 feet of perennial non-fish-bearing streams, 100 feet of intermittent streams (stream channels that are dry for part of the year), and 100-foot slope distance from the edge of wetlands larger than 1-acre or landslide prone areas. Riparian buffers provide high obstruction density in the form of trees, understory vegetation, and downed wood, which will dissipate energy and capture sediment in the riparian area before it reaches streams. Growth of vegetation on portions of harvest units and road prisms will be enhanced by soil decompaction, fuels treatments, live transplants, duff placement woody debris application or seeding. Field review of landslide-prone areas and excluding harvest and yarding from those areas is expected to avoid increasing landslide risk from harvest activities.

Because of those BMPs and considering the above-referenced results on RHCA buffer effectiveness, NMFS expects the amount of sediment delivered from harvest activities to streams and deposited in stream substrates will be very small. In addition, it is unlikely that landslides will be caused by harvest activities due to the implementation of landslide prone area identification and buffers.

Prescribed Burning

Burning removes vegetative ground cover which can expose soils to erosion and possible sediment delivery. There may be some low intensity burning that occurs in RHCAs from prescribed fire being allowed to back into those areas. However, few if any trees are expected to be killed in RHCAs, based on results of prior burning of similar type conducted by the NPCNF. Slopes with low burn severity have retained live vegetation and root systems, both of which stabilize soils and resist erosion. A low intensity backburn in a relatively higher riparian humidity will not likely burn into the root zone, allowing for the soil matrix to remain intact. NMFS expects the amount of sediment delivered to streams will be very small because burning will not be initiated in RHCAs and even if fire backs into RHCAs, the partial loss of vegetation is expected to have at most minor, localized effects on the sediment interception/filtering functions of the RHCA. Also areas cleared by burning will be replanted. Given that the amount of sediment from burning reaching streams will be very small, NMFS expects the effects to steelhead from this sediment will be minimal.

Addition of Permanent Roads

The only new permanent roads that would be constructed would be to connect Roads 9337C to 9902C and to add a short segment that would create a new beginning of Road 672A. The total for new permanent roads will be less than 1-mile in length. The majority of this work is for the connecting road between 9337C and 9902C which is high on the ridge and does not cross fish-bearing streams. The new beginning of Road 672A is 0.1 miles long and does not cross any stream channels. Due to the lack of connectivity of the new permanent roads to the stream network, it is unlikely that sediment will be delivered to action area streams from these roads.

Construction of Temporary Roads

All temporary roads will be constructed on existing road templates or on ridgetops. They will be obliterated within 3 years of project completion. Obliteration includes recontouring, where needed, decompaction, and the application of slash. Any roads to be overwintered will be water-barred and placed in a hydrologically stable condition to reduce the potential for surface erosion.

Of the 24 miles of temporary road construction, only 2.6 miles will occur near stream channels and these channels are all intermittent streams. Road construction BMPs include: installing crossdrains prior to other road reconstruction and reconditioning, cleaning ditches and catch basins when needed with no undercutting at the toe of cut slopes, avoiding road widening, removing vegetation in a manner that will not interfere with stream shade, and avoiding disposing of excess material in streams. All road work, including drainage improvements, will be performed during dry periods to avoid causing erosion and soil compaction.

Because of the small exposure to only intermittent streams, the near or on ridge top locations of new temporary roads, and the short 3-year duration before obliteration, temporary roads are not expected to create measurable short-term pulses or long-term chronic inputs of sediment to streams. With the lack of exposure in intermittent streams and small sediment additions to these streams and substrate, direct effects to steelhead from temporary road construction are not expected. Later, indirect effects are expected to be very small, as the small amounts of sediment disperse and become very diffuse or undetectable in the areas steelhead occupy, well downstream of the construction sites.

Road Maintenance

A key BMP for minimizing sediment delivery from road work is to avoid cleaning or blading functioning vegetated road drainage ditches. Cleaning roadside ditches during reconditioning or maintenance can loosen sediments which can be transported to streams at stream crossings during precipitation events. Sediment produced from unnecessary ditch cleaning can be greater than that produced from wet weather haul (Luce and Black 2001). Avoiding unnecessary ditch cleaning is expected to keep sediment delivery during road work to low levels with consequent low levels of effects to substrate and steelhead where steelhead occur.

The proposed action also includes roadwork that includes brushing, grading and shaping the road surface, gravel placement, and minor maintenance of cut and fill slopes. All of these except for the brushing have the potential to disturb the ground and make sediment available for delivery to the stream system. Project design features include provisions that there will be no sidecasting of material into ditches or other locations where it might be introduced into a stream, or where the placement of materials might destabilize slopes. Gravel placement will serve to help minimize the movement of sediment and will reduce the potential for sediment delivery. With implementation of these project design features, sediment delivery from road maintenance, and consequent effects to substrate and steelhead, are expected to be kept to low levels.

Haul

To keep sediment delivery from log hauling activity to low levels, cross drains will be in place on either side of crossings which will minimize road area draining to stream crossings. Also, restrictions of use in wet conditions, sale administration to verify roads are not damaged and not delivering sediment to streams, and installation and maintenance of sediment filtering devices is expected to effectively limit sediment delivery to streams.

Main haul routes have limited crossings of perennial streams occupied by steelhead and the crossings are well distributed throughout the action area. Considering sections of road that are along streams with steelhead, less than one mile of haul will be adjacent to Deer Creek where it is occupied by steelhead. Where main haul routes cross occupied perennial streams, streams have gradients of over 10 percent. With these high gradients, steelhead occupancy, suitable spawning gravels, and fine sediment deposition would be limited to small patches of low stream velocity near stream banks or behind larger rocks. Fine sediment introduced from haul would also likely accumulate in a limited number of small patches before being transported downstream in the next high water.

The less than 1-mile of haul on the Deer Creek Road adjacent to Deer Creek is unlikely to introduce large amounts of sediment into Deer Creek. Deer Creek in this mile ranges from 15 to 50 feet from Deer Creek Road, and there is significant irrigation diversion from Deer Creek in this mile. Although spawning steelhead are known to occur in this reach of Deer Creek, stream gradient for this mile averages 9 percent. As explained above, with this steep gradient, suitable spawning habitat would be limited to a few small patches within the reach. Fine sediment introduction from road drainage and dust would be kept to low levels by cross drains, graveling, dust abatement, and other BMPs. The small additions of sediment to Deer Creek along this section of road would likely be transported out of Deer Creek during seasonal high water events. Because of BMPs such as crossdrains and graveling limiting sediment delivery at stream crossings, limited exposure of steelhead to effects from main haul routes, and limited suitable habitat in the areas of exposure, effects to steelhead from haul are expected to be minimal.

Road Decommissioning

Road decommissioning is a ground disturbing activity that results in a short-term increase in sediment delivery but reduces long-term chronic sediment delivery and landslide risk (Switalski et al. 2004). Road bed ripping and recontouring alleviates most of the risks resulting from concentrated flow including gullying, mass wasting, and increases in peak flows (Luce et al. 2001). However, the unconsolidated material retains some risk of failure, especially on lower slope locations (Madej 2001). In addition, channel adjustment (erosion) may occur following crossing removals, with erosion risk increasing with drainage area, stream gradient, and the volume of fill removed (Madej 2001). As with all ground disturbing decommissioning activities, rapid regrowth of vegetation (Foltz 2008), and in particular tall trees for recontoured slopes, is essential for the success of the decommissioning (Luce et al. 2001). Significant regrowth and soil stabilization occurs within 1 to 2 years (Luce et al. 2001). Where soil organic matter is lacking following decommissioning, soil amendments and/or plantings are recommended (Luce et al. 2001).

Proposed road decommissioning includes activities that result in the stabilization and restoration of unneeded roads to a more natural state. Most roads proposed for decommissioning would be fully recontoured with only a small amount decommissioned using abandonment. Decommissioned roads are near ridgetops and at mid-slope locations. Small local short-term increases in sediment delivery and deposition in downstream substrates are expected from soil disturbance and stream crossing removals for up to 5 years. However, substantial regrowth, soil stabilization, and reduced potential for sediment delivery would occur within 1 to 2 years. The decommissioning would reduce chronic sediment delivery in the long term.

Prescriptions for decommissioning may include:

- Removing any metal culverts and other drainage structures and associated fills.

- Pulling up fill material where there are existing or potential failures, or where the fill is determined to be unstable. Treatments along stream crossings require a complete recontour of all fill material and with stream channels restored to natural grade and dimensions.

- Laying entire or selected portions of the road to original contours or the angle of repose of the fill material.

- Out-sloping the road surface.

- Diverting streams via temporary culvert or non-eroding, water-tight diversion. Settling basins or other methods will be used to ensure that muddy water does not return to the streams. Diversions will be installed, operated, and removed such that erosion and sedimentation are minimized.

- Removing gates after applying wood and rock debris across the de-compacted road surface to prevent vehicle usage.

Steelhead are known to occur in the Deer Creek subwatershed with resident *O. mykiss* occurring in Sherwin and Christie Creek subwatersheds, and no *O. mykiss* occurring in the Joe Creek subwatershed. However, all proposed decommissioned crossings occur on non-fish bearing streams. With the small additions of sediment to substrates and the steelhead spawning and rearing limited to the Deer Creek subwatershed, effects from fine sediment to substrates may have small effects to steelhead.

2.5.2 Fish Salvage

Culvert placement and repair on flowing streams requires fish salvage and passage. Handling fish may cause short-term stress and is likely to cause harm or death to some individuals, particularly those exposed to electrofishing (McMichael et al. 1998; Nielson 1998). Electrofishing can cause spinal injury or death to individual fish (Dalbey et al. 1996). Following the NMFS (2000) electrofishing guidelines should minimize the stress and mortality related to electrofishing. McMichael et al. (1998) found a 5.1 percent injury rate for juvenile middle Columbia River steelhead captured by electrofishing in the Yakima River subbasin.

Deer Creek is approximately 6.5 feet wide and the dewatered areas would likely be at most 200 feet in length. Deer Creek is rated as having 'fair' habitat and the Smolt Density Model notes that one could expect 0.005 steelhead per square foot in 'fair habitat' (Hall-Griswold et al. 1996). Based on this, there could potentially be 6.5 juvenile steelhead that could be captured or killed by salvage operations at each of the four culvert locations. However, the proposed action will take place over a number of years and steelhead have only recently gained access into the action area. It is therefore possible that steelhead densities could increase before project completion. For this reason, NMFS will conservatively assume that there might be up to 20 juvenile steelhead captured and handled at each location.

The NPCNF has proposed using NMFS electrofishing guidelines which will help minimize the impact of salvage operations. Using McMichael et al. (1988) estimates, and assuming up to 20 fish could be present in each dewatered section, approximately one fish could be injured or killed from electrofishing at each of the four culvert locations.

The proposed action incorporates conservation measures designed to prevent sediment from entering the project area during construction, and thus minimizing potential increases in turbidity. Turbidity plumes extending downstream from the construction site may occur when the diversion barriers are set in place, and when they are removed and the channel is rewatered.

From monitoring of similar projects, the NPCNF has found that turbidity spikes usually exist for 2 hours or less and under 250 NTU, which normally subside quickly to levels below 50 NTU (Connor 2014). Exposure to this intensity of turbidity for this amount of time should not cause lethal effects for juvenile salmonids (Newcombe and Jensen 1996). Juvenile steelhead will likely respond to such short-term turbidity plumes by trying to avoid the plume and temporarily seeking refuge nearby. Nearby habitat is suitable for salmonids. Juvenile steelhead that do not avoid the sediment plumes will be exposed to the sub-lethal impacts described above. Road 76065 will be decommissioned to a trail for vehicles less than 50 inches in width. Since this road runs beside Sherwin Creek and has several crossings, it will be decommissioned while the stream is dry to avoid any impacts on fish.

2.5.3 Contaminants (fuel and lubricants)

Equipment used in vegetation management practices requires fuel and lubricants to maintain operational efficiency. Petroleum-based products (e.g., fuel, oil, and some hydraulic fluids) contain polycyclic aromatic hydrocarbons, which can cause lethal or chronic sublethal effects to aquatic organisms. Petroleum products can adhere to gills and interfere with respiration or suffocate fish. The toxicity of petroleum products to fish is based on concentration and time of exposure.

Typically, magnesium chloride is used for dust abatement on graveled haul routes where harvest volumes exceed one million board feet. When applied to the road surface, a 1-foot no-spray buffer is left on the edges of the road, if road width allows, to minimize overspray into ditches which could contaminate streams. Because the application of magnesium chloride is expensive and water is effective for dust abatement for short durations, haul routes that will be used for short durations with less traffic may receive water for dust abatement.

The exposure of ESA-listed fish to magnesium chloride ($MgCl_2$) will be kept to a low level with BMPs and specifications found in the Standard Contract for all timber sales. For example, one BMP requires a 1-foot no-spray buffer be left on the edges of the road, if road width allows, to minimize overspray into ditches. The Standard Contract specifies preparation of the road surface prior to application, the rate of application, and that water be applied after the $MgCl_2$. This BMP and three contract specifications are designed to maximize penetration of chemical into road surface, minimize the amount of $MgCl_2$ used, and to minimize the amount of chemical running off the road surface. Those measures, the road reconstruction upgrades to reduce the hydrologic connection of road surfaces to streams, and the position of primary haul routes upstream of fish-bearing waters will reduce the likelihood to a low level of $MgCl_2$ being introduced into streams and is unlikely to cause harm to steelhead.

The proposed action has potential to expose fish to petroleum-based contaminants through leakage of fuel, oil, or hydraulic fluids. Landings will likely have greater amounts of petroleum products; however, the landings will not be located in RHCAs. Fuel storage and transfer is also prohibited from RHCAs. Machinery used for harvest, haul, or road maintenance would be present near streams only where roads intersect RHCAs. Leakage or spill of fuels and oils on roads, near streams, or during instream culvert work, could result in contaminants leaching or running off into streams. However, all contractors are required to follow the provisions in the sale contract, which include, but are not limited to, maintaining all machinery free of abnormal leakage, maintaining a clean-up kit on site, and operating to avoid fuel or other toxic chemical spills. Any spill or leaks that do occur will likely be small due to the lack of fuel or fueling activities in proximity to the stream network.

Additionally, roadside signs will be posted warning the public and truck drivers of the driving hazards, and speed limits will be reduced to 25 miles per hour. With use of these standard safety practices, there have been only two accidents during haul in the last 15 years on the NPCNF. With implementation of BMPs and the limited intersection of project roads with fish-bearing streams, the risk of adverse effects to steelhead from fuel spills is extremely unlikely.

2.5.4 Hydrology and Riparian Function

Crook (2017) addresses the potential for vegetation treatments and road work to increase equivalent clearcut area (ECA), an indicator of change in water yield or peak flows resulting from reductions in forest canopy. A loss of canopy can reduce transpiration and precipitation interception, thereby making more water available for runoff. Increased runoff can increase peak flow; and detectable increases in peak flow can occur with 15–30 percent increases in ECA (Grant et al. 2008). Increases in peak flow may cause channels to erode as channels adjust to the higher flow. Large changes in water yield can also decrease streambank stability, thereby increasing fine sediment input to streams and potentially affecting water temperature.

According to the literature, ECA-related peak flow effects on channel morphology tend to be in stream reaches where gradients are less than 2 percent and stream banks and bed substrate are gravel sized particles and smaller (Grant et. al. 2008). The larger sized streambed substrate in the project area and greater than 2 percent gradient indicate that project-related ECA increases will not appreciably increase channel scour and sediment movement/deposition.

The ECA in the Christie Creek, Deer Creek and Sherwin Creek watersheds would increase as a result of proposed federal activities. The removal of trees (canopy), through logging, road building, and the creation of landings, may increase water yields. However, in Christie and Deer Creek, the modeled increase is not enough to change the hydrologic function of those streams. And for all subwatersheds in the action area, stream gradients average 14 percent which is much higher than the 2 percent threshold for geomorphic change cited above. In addition, PACFISH buffers and BMPs including application of slash for erosion control in harvest units are expected to filter sediment and contaminants, and moderate channelized flow from skid trails and skyline yarding practices, and mitigate supplemental water yield. Therefore, effects from small increases in water yield are not expected to be measurable beyond the action area portions of the streams. Within the action area, effects to fish habitat conditions associated with changes in water yield are expected to be very small and will be insignificant for steelhead.

Water Temperature and Large Woody Debris

A loss of canopy shade in riparian areas can cause water temperatures to rise. Canopy surrounding streams reduces solar heating of streams and helps maintain water temperatures suitable for salmonids. Water temperatures above optimal ranges for salmonids can have a wide range of adverse effects at the individual and population scales. These include reduced growth rates and survival for rearing juveniles, or reductions in suitable spawning and rearing habitat. Removing riparian trees can also reduce recruitment of large woody debris (LWD) which, in turn, would reduce the quality of salmonid habitat.

The PACFISH RHCAs fully encompass the area that provides shade to the streams, as well as those areas providing LWD delivery. Because this project avoids timber harvest in RHCAs (including landslide prone areas), involves only small and temporary effects on riparian vegetation associated with culvert work, and applies proven techniques that ensure the effects of prescribed fire on riparian vegetation are small, the effects of the action on shade/temperature and LWD/habitat complexity, and the associated effects on steelhead, will also be very small.

Water Pumping

Pumping water from streams to tanker trucks may be necessary for dust abatement or fire control associated with burning. Pumping will follow PACFISH Standard RA-5 and NMFS' pumping criteria (NMFS 2011) to isolate the area and prevent entrainment into and impingement on the pumping apparatus and screen. With the implementation of NMFS' screening and pumping criteria for this project, and isolation of the pump intake from fish, the effects on fish will be minimal.

2.6 Cumulative Effects

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

Some continuing non-federal activities are reasonably certain to contribute to climate effects within the action area. However, it is difficult if not impossible to distinguish between the action area's future environmental conditions caused by global climate change that are properly part of the environmental baseline *vs.* cumulative effects. Therefore, all relevant future climate-related environmental conditions in the action area are described in the environmental baseline (Section 2.3). Aside from this, the action area is made up of exclusively federal land and so there are no cumulative effects associated with this action.

2.7 Integration and Synthesis

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

Due to limited presence of steelhead in the action area, the proposed action has only limited potential to negatively affect them. As mentioned above, most streams in the action area are very high gradient and not suitable habitat for steelhead. In collaboration with the state of Idaho in 2017, local residents initiated and completed a culvert replacement project in Deer Creek to provide anadromous fish access. Steelhead are either already known to occur or likely will be found to occur above each of those improved culverts during implementation of the proposed action. Because the action takes place over a number of years, it is possible that greater numbers of steelhead may be present in the action area, and the effects analysis was conducted accordingly. There is no steelhead critical habitat in the action area.

Baseline conditions in the action area indicate that the affected watersheds are currently not meeting all of their fishery water quality objectives. However, the ratings were mixed for individual stream reaches with many exceeding objectives for some criteria.

The affected steelhead population is the Little Salmon River population which is included in the Salmon River MPG. The population is rated as being at Moderate Risk for both Abundance/Productivity and Spatial Structure/Diversity. The overall viability rating is tentatively rated as being “maintained”. The population is necessary for the recovery of both the MPG and the DPS.

The primary activities that might harm steelhead are culvert replacement projects. The above effects analysis shows that the proposed action will likely only cause small, short-term effects on steelhead. Deposited sediment and turbidity from project activities will be short-term, localized, and will likely adversely affect only a small number of steelhead. Adverse effects from short term exposure to turbidity, or from capture/handling or stranding will occur from culvert replacement actions on four culverts; but the total number of fish that might be impacted, lethally or sub-lethally, will likely be limited to no more than 80 juvenile steelhead over the course of the action. The Little Salmon River steelhead population is estimated to be currently only at Moderate Risk for abundance/productivity, and so 80 juvenile steelhead is too small a number to cause more than a minimal impact on the population. Because the population will be only minimally impacted, the effects on the MPG and DPS will be even less. Overall, the action will not likely reduce the likelihood of the survival and recovery of the Snake River Basin steelhead.

2.8 Conclusion

After reviewing and analyzing the current status of the listed species, 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 Steelhead.

2.9 Incidental Take Statement

Section 9 of the ESA and federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without a special exemption. “Take” is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. “Harm” is further defined by regulation to include significant habitat modification or degradation that actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering (50 CFR 222.102). On an interim basis, NMFS interprets “harass” to mean “Create the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering.” “Incidental take” is defined by regulation as takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the federal agency or applicant (50 CFR 402.02). Section 7(b)(4) and section 7(o)(2) provide that taking that is incidental to an otherwise lawful agency action is not considered to be prohibited taking under the ESA if that action is performed in compliance with the terms and conditions of this ITS.

2.9.1 Amount or Extent of Take

The proposed action is reasonably certain to result in incidental take of ESA-listed species. NMFS is reasonably certain the incidental take described here will occur because: (1) Recent surveys indicate it is possible that ESA-listed species occur in the action area; (2) the proposed action includes culvert replacements that could result in sediment delivery to streams; and (3) the proposed action includes instream work activities that could harm or kill juvenile steelhead (e.g., dewatering, rewatering/turbidity, electrofishing). In the Opinion, NMFS determined that incidental take would occur as follows:

(1) Mortality of juvenile steelhead during channel dewatering/salvage operations for culvert replacements;

(2) Harm of juvenile steelhead as a result of temporary turbidity plumes associated with construction activities for culvert replacements;

(3) Harm of juvenile steelhead from sedimentation of substrate below stream crossings associated with culvert removals and replacements.

Incidental Take from Culvert Replacement Dewatering

As described in the species effects analysis, NMFS was able to quantify the take associated with the four culvert replacements that are most likely to have steelhead present (i.e., take from channel dewatering). NMFS estimated that up to 20 juvenile steelhead might be captured or stranded at each of the four culvert replacement sites. Therefore, NMFS will consider the extent of take exceeded if more than 20 juvenile steelhead are captured at any of the culvert replacements.

Incidental Take from Culvert Replacement Turbidity Plume

NMFS noted that juvenile steelhead could be temporarily displaced due to elevated turbidity levels resulting from instream work at four culvert replacements. Because it is not feasible to observe fish fleeing the area, NMFS will use the extent and duration of the turbidity plumes as a surrogate for take. Because turbidity is the direct cause of take of steelhead, and it is known what levels of turbidity cause adverse effects to steelhead, monitoring turbidity is an excellent surrogate for this take pathway. NMFS will consider the extent of take exceeded if turbidity plumes at any of the four monitored culvert replacements extends 600 feet downstream at greater than 50 NTU for more than 60 consecutive minutes.

Incidental Take from Sedimentation of Substrate

Because the most likely areas of appreciable sediment deposition where steelhead occur would be within 600 feet below the four culvert replacement locations, the extent of take for sediment deposition will be the same as for turbidity.

2.9.2 Effect of the Take

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

2.9.3 Reasonable and Prudent Measures

The NPCNF and U.S. Army Corps of Engineers (COE) (for those measures relevant to the Clean Water Act [CWA] section 404 permit) shall comply with the following RPMs:

1. Minimize the potential for incidental take from culvert replacements.

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 ensuring amount/extent of incidental take defined herein is not exceeded.

2.9.4 Terms and Conditions

The terms and conditions described below are non-discretionary, and the NPCNF and (where applicable to any CWA section 404 permitting) COE must comply with them in order to implement the RPMs (50 CFR 402.14). The NPCNF and COE 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 incidental take statement (50 CFR 402.14). If the NPCNF and COE do not comply with the following terms and conditions, protective coverage for the proposed action would likely lapse.

1) To implement RPM 1, the NPCNF and COE (for those measures relevant to the CWA section 404 permit) shall ensure that:

a) The proposed action, including all described conservation measures and BMPs, will be implemented as described in the BA and Proposed Federal Action section of this Opinion.

b) The creation of channelized flow from harvest activities (i.e. skid trails, yarding activities, land construction and design) into and in RHCAs is avoided.

c) The NPCNF or COE shall require onsite contractors to have spill prevention and containment materials on site during in-water work to minimize the risk of an accidental spill of petroleum products resulting adverse effects to water courses and aquatic biota in the event of a spill.

d) NMFS is contacted within 48 hours of any project log truck accident that occurs within 50 feet of moving water or is leaking fuels or other toxic chemicals into streams.

2) To implement RPM 2 (monitoring and reporting), the NPCNF and COE (as relevant to the CWA section 404 permit) shall ensure that:

a) All steelhead injured or killed during dewatering and fish handling shall be identified, counted, and recorded. These data will be reported in the annual project report.

b) If project take of steelhead (total of 20 fish) from capture/handling is exceeded at the any of the four culvert sites, work will be suspended and NMFS will be called to discuss reinitiation of consultation.

c) Turbidity monitoring shall be conducted for the four stream crossings proposed for turbidity monitoring. Turbidity readings shall be collected at the following locations: (1) greater than 50 feet upstream of the action area; and (2) 600 feet or less downstream of the action area. Turbidity at the downstream sample location shall be recorded every 30 minutes until the plume is no longer visible at 600 feet or less downstream. Monitoring of NTUs, time and distance of measurements, and maximum extent of turbidity will be reported in the project annual report.

d) Post-project reports summarizing the results of all monitoring shall be submitted to NMFS by December 31 annually. The annual project reports shall also include a statement on whether all the terms and conditions of this Opinion were successfully implemented.

e) The post-project reports shall be submitted electronically to: nmfswcr.srbo@noaa.gov. Hard copy submittals may be sent to the following address:

National Marine Fisheries Service
Attn: Ken Troyer
800 East Park Boulevard
Plaza IV, Suite 220
Boise, Idaho 83712-7743

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

2.10 Conservation Recommendations

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

1. To mitigate the effects of climate change on ESA-listed salmonids, the NPCNF and COE should follow recommendations by the ISAB (2007) to plan now for future climate conditions by implementing protective tributary, mainstem, and estuarine habitat measures; as well as protective hydropower mitigation measures. In particular, implement measures to protect or restore riparian buffers, wetlands, and floodplains; remove stream barriers; and to ensure late summer and fall tributary streamflows.

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

2.11 Reinitiation of Consultation

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

3. MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT ESSENTIAL FISH HABITAT 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 effect means any impact that reduces quality or quantity of EFH, and may include direct or indirect physical, chemical, or biological alteration of the waters or substrate and loss of (or injury to) benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality or quantity of EFH. Adverse effects on EFH may result from actions occurring within EFH or outside of it and may include site-specific or EFH-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810). Section 305(b) also requires NMFS to recommend measures that can be taken by the action agency to conserve EFH.

On September 12, 2014, NMFS approved Amendment 18 to the Pacific Coast Salmon Fishery Management Plan for Commercial and Recreational Salmon Fisheries off the Coasts of Washington, Oregon, and California (FMP). Amendment 18 revises the description and identification of EFH for Pacific salmon managed under the FMP, designates habitat areas of particular concern, updates information on fishing activities, and updates the list of non-fishing related activities that may adversely affect EFH and potential conservation and enhancement measures to minimize those effects.

This analysis is based, in part, on the EFH assessment provided by the NPCNF and descriptions of EFH for Pacific coast salmon contained in the fishery management plans developed by the Pacific Fishery Management Council (PFMC) (PFMC 2014), including Amendment 18 (79 FR 75449) and approved by the Secretary of Commerce.

3.1 Essential Fish Habitat Affected by the Project

The PFMC designated EFH in the action area for Chinook salmon (PFMC 1999) and for coho salmon (Amendment 18). The action and action area for this consultation are described in the Introduction to this document. The action area includes areas designated as EFH for various life-history stages of Chinook salmon. The Tribe has undertaken the reintroduction of both Chinook salmon, and both species are successfully returning to the watershed.

3.2 Adverse Effects on Essential Fish Habitat

Based on the information provided in the BA and the analysis of effects presented in the ESA portion of this document, NMFS concludes that the proposed action will have the following adverse effects on EFH designated for Chinook salmon: (1) Increased sediment temporarily affecting water quality and substrate temporarily in some areas.

3.3 Essential Fish Habitat Conservation Recommendations

The NPCNF and COE should ensure that:

1) The proposed action, including all described conservation measures and BMPs, will be implemented as described in the BA and Proposed Federal Action section of this Opinion.

   Spill prevention and containment materials will be kept on site to minimize the risk of an accidental spill of petroleum products, as well as to protect water courses and aquatic biota from adverse effects in the event of a spill.

2) NMFS is contacted within 48 hours of any project log truck accident that occurs within 50 feet of moving water or is leaking fuels or other toxic chemicals into streams.

3) The creation of channelized flow through harvest activities (i.e. skid trails, yarding activities, land construction and design) is avoided.

3.4 Statutory Response Requirement

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

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

3.5 Supplemental Consultation

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

4. DATA QUALITY ACT DOCUMENTATION AND PRE-DISSEMINATION REVIEW

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

4.1 Utility

Utility principally refers to ensuring that the information contained in this consultation is helpful, serviceable, and beneficial to the intended users. The intended users of this document are the NPCNF, its representatives, its contractors, and the COE. The format and naming adheres to conventional standards for style.

4.2 Integrity

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

4.3 Objectivity

Information Product Category: Timber Harvest, and Road Construction, Maintenance, and Repair.

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

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

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

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

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