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National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
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February 20, 2025

Refer to NMFS No: WCRO-2024-02940

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Re: Endangered Species Act Section 7(a)(2) Biological Opinion for the Federal Support of the Phase 2 Implementation Plan Testing Feasibility of Salmon Reintroduction in the Upper Columbia River Basin

Dear Mr. Hoefer, Mr. Kennedy, Ms. Coffey, and Mr. MacMillan:

Thank you for your letter on November 22, 2024, requesting initiation of consultation with NOAA's National Marine Fisheries Service (NMFS) pursuant to section 7 of the Endangered Species Act of 1973 (ESA) (16 U.S.C. 1531 et seq.) for the Federal Support of the Phase 2 Implementation Plan Testing Feasibility of Salmon Reintroduction in the Upper Columbia River Basin (P2IP). We recognize the Bureau of Reclamation as the lead action agency for P2IP and the Bonneville Power Administration, the United States Army Corps of Engineers, and the United States Fish and Wildlife Service as co-lead action agencies.

In the enclosed biological opinion (opinion), NMFS concludes that the P2IP, as proposed, is likely to adversely affect, but is not likely to jeopardize the continued existence of Chinook salmon (*Oncorhynchus tshawytscha*; Upper Columbia River [UCR] spring-run, Snake River [SR] spring/summer-run, and SR fall-run Evolutionary Significant Units [ESUs]), sockeye salmon (*O. nerka*; SR ESU), or steelhead (*O. mykiss*; UCR and Snake River Basin [SRB] Distinct Population Segments [DPSs]). The action agencies determined that the P2IP, as proposed, would not affect any designated critical habitats for any of those listed entities.

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 NMFS considers necessary or appropriate to minimize the impact of incidental take associated with this action. The take statement sets forth terms and conditions, including reporting requirements, that the Bureau of Reclamation, the co-action agencies, and any permittee who performs any portion of the action, must comply with in order to be exempt from the ESA take prohibition.

In addition, we agree that the P2IP, as proposed, would not adversely affect Essential Fish Habitat (EFH) designated under the Pacific Coast Salmon Fishery Management Plan. Therefore, we are hereby concluding EFH consultation.

Please contact Trevor Conder, Fish Biologist, at trevor.conder@noaa.gov or (360) 953-3875 if you have any questions concerning this consultation, or if you require additional information.

Sincerely,

Nancy Munn, PhD
Assistant Regional Administrator for
Interior Columbia Basin Office

Enclosure

cc:

Scott Hoefer, USBR
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Endangered Species Act Section 7(a)(2) Biological Opinion

Federal Support of the Phase 2 Implementation Plan Testing Feasibility of Salmon Reintroduction in the Upper Columbia River

NMFS Consultation Number: WCRO-2024-02940

Action Agencies: Bureau of Reclamation, United States Army Corps of Engineers, Bonneville Power Administration, United States Fish and Wildlife Service

Affected Species and NMFS' Determinations:

ESA-Listed Species	Status	Is Action Likely to Adversely Affect Species?	If Likely to Adversely Affect, Is Action Likely to Jeopardize the Species?
Chinook salmon (*Oncorhynchus tshawytscha*)			
Snake River fall-run ESU	T	Yes	No
Snake River spring/summer-run ESU	T	Yes	No
Upper Columbia River spring-run ESU	E	Yes	No
Sockeye salmon (*Oncorhynchus nerka*)			
Snake River ESU	E	Yes	No
Steelhead (*Oncorhynchus mykiss*)			
Snake River Basin DPS	T	Yes	No
Upper Columbia River DPS	T	Yes	No

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

Issued By: Nancy L Munn

Nancy L. Munn, PhD.
Assistant Regional Administrator
Interior Columbia Basin Office

Date: *February 20, 2025*

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Acronyms

2020 CRS Opinion	NMFS' biological opinion for the Continued Operation and Maintenance of the 14 Federal Dams on the Columbia River System, tracking number WCRO-2020-00113, Signed July 20,2020
BA	Biological Assessment
BPA	Bonneville Power Administration
CJH	Chief Joseph Hatchery
CTCR	Confederated Tribes of the Colville Reservation
CRS	Columbia River System, formerly known as the Federal Columbia River Power System
DDT	Dichlorobiphenyl trichloroethane
DPS	Distinct Population Segment
DQA	Data Quality Act
EFH	Essential Fish Habitat
EPMs	Environmental Protection Measures
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
°F	degrees Fahrenheit
FERC	Federal Energy Regulatory Commission
ITS	Incidental Take Statement
JSATs	Juvenile Salmon Acoustic Telemetry System Tags
LCM	Life Cycle Model
MOU	Memorandum of Understanding
MPG	Major Population Group
MSA	Magnuson–Stevens Fishery Conservation and Management Act
NMFS	National Marine Fisheries Service
Opinion	Biological Opinion
P2IP	Federal Support of the Phase 2 Implementation Plan Testing Feasibility of Salmon Reintroduction in the Upper Columbia River Basin or the proposed action
P2IP Settlement Agreement	Memorandum of Understanding & Mediated Settlement Agreement, Case 3:01-cv-00640-SI Document 2442, Filed September 28, 2023
PAHs	Polycyclic aromatic hydrocarbons
PCBs	Polychlorinated biphenyls
PEA	Programmatic Environmental Assessment
PIT-tags	Passive Integrated Transponder tags
PUD	Public Utility District
RCBA	Resilient Columbia Basin Agreement
Reclamation	Bureau of Reclamation
RM&E Research, Monitoring, and Evaluation	RPMs Reasonable and Prudent Measures
SR	Snake River ESU/DPS

SRB	Snake River Basin DPS
TRMP	Tribal Resource Management Plan
UCR	Upper Columbia River ESU/DPS
UCUT	Upper Columbia United Tribes
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USG	United States Government
U.S. v. Oregon	The *U.S. v. Oregon* Harvest Management Agreement
VSP	Viable Salmonid Population
WDFW	Washington Department of Fish and Wildlife

1. INTRODUCTION

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

1.1. Background

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

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

1.2. Consultation History

The final Biological Assessment (BA [BOR 2024a]; pp. 4-6) for the Federal Support of the Phase 2 Implementation Plan Testing Feasibility of Salmon Reintroduction in the Upper Columbia River Basin (hereafter, referred to as P2IP, or the proposed action) describes in detail the coordination between the Confederated Tribes of the Colville Reservation (CTCR), Spokane Tribe of Indians, and Coeur d'Alene Tribe, with assistance from the Upper Columbia United Tribes (UCUT) (collectively referred to hereafter as the Project Proponents); and the Bureau of Reclamation (Reclamation), Bonneville Power Administration (Bonneville), United States Army Corps of Engineers (USACE), and the United States Fish and Wildlife Service (USFWS) (hereafter, referred to as the action agencies). We incorporate that detailed coordination here by reference and supplement with the following information.

From September 17-27, 2024, NMFS reviewed and provided comments on the draft BA for the P2IP. From November 14 through December 13, 2024, as a cooperating agency, NMFS reviewed and provided comments on the Draft Programmatic Environmental Assessment (PEA) for the P2IP. Reclamation forwarded the Draft Team Final PEA draft comment response matrix to NMFS for review on January 23rd, 2025.

On November 22, 2024, we received Reclamation's consultation request, the final BA (BOR 2024a), and initiation package. We initiated formal consultation that day. Reclamation and the co-action agencies determined the P2IP would not affect any designated critical habitat. Therefore, this consultation includes only Chinook salmon (*O. tshawytscha*; Snake River [SR] fall-run, SR spring/summer-run, and UCR spring-run Evolutionary Significant Units [ESUs]), sockeye salmon (*O. nerka*; SR ESU), and steelhead (*O. mykiss*; Snake River Basin [SRB] and UCR DPSs).

NMFS also reviewed the P2IP for potential effects on essential fish habitat (EFH) designated under the Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 U.S.C. 1855(b)). This review was pursuant to section 305(b) of the MSA, implementing regulations at 50 CFR 600.920, and agency guidance for use of the ESA consultation process to complete EFH consultation. We agree with Reclamation's determination that the P2IP would not adversely affect EFH designated under the Pacific Coast Salmon Fishery Management Plan (PFMC 2014). Therefore, we are hereby concluding EFH consultation.

On January 21, 2025, NMFS shared a copy of the draft proposed action and draft terms and conditions with the project proponents and action agencies for review. Meetings with P2IP action agencies occurred on December 11th & 18th 2024 and January 8th & 15th 2025, and NMFS reported progress on the opinion timeline. On January 27th, 2025 NMFS met in person with Bonneville Power Administration (BPA) to review the draft opinion.

On January 24, 2025, NMFS provided a copy of the draft proposed action and draft terms and conditions for this opinion to Nez Perce Tribe, Umatilla Tribe, Warm Springs Tribe, Yakima Tribe, Colville Tribe, Spokane Tribe, Coeur d'Alene Tribe, Columbia River Inter-Tribal Fish Commission, and Upper Columbia United Tribes for their review and comment by February 4, 2025.

On January 24, 2025, NMFS received a Biological Assessment Amendment from the Bureau of Reclamation. The amendment clarified proposed action language and conservation measures.

Updates to the regulations governing interagency consultation (50 CFR part 402) were effective on May 6, 2024 (89 FR 24268). We are applying the updated regulations to this consultation. The 2024 regulatory changes, like those from 2019, were intended to improve and clarify the consultation process, and, with one exception from 2024 (offsetting reasonable and prudent measures), were not intended to result in changes to the Services' existing practice in implementing section 7(a)(2) of the ESA (89 FR 24268; 84 FR 45015). We have considered the prior rules and affirm that the substantive analysis and conclusions articulated in this biological opinion and incidental take statement would not have been any different under the 2019 regulations or pre-2019 regulations.

1.3. Proposed Federal Action

Under the ESA, "action" means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by federal agencies (see 50 CFR 402.02). As described in Chapter 1 and 2 of the BA (BOR 2024a; pp. 1-16), the proposed action is the federal funding and authorizations of the action agencies to support a 20-year study to test the feasibility of reintroducing non-federally protected salmonid stocks in the blocked area upriver of Chief Joseph Dam through juvenile and adult salmon research studies. This includes the development and operation of fish-holding, fish-rearing, and acclimation facilities.

The P2IP proposed action includes:

- Providing federal funding to support P2IP activities within respective agency authorities.

- Reviewing, approving, and issuing permits for actions including, but not limited to, data collection, installation of equipment, or construction of facilities (for example, interim passage and/or rearing facilities) on federally managed lands and facilities.
- Providing eggs, juveniles, and adult salmon from existing hatcheries and non-hatchery collection actions.
- Participating in the planning, design, development, implementation, and feasibility assessments, environmental compliance processes, and operations of interim passage facilities and guidance structures, where appropriate.

The current planned sequence for fish passage design, installation, operation, and testing will be: 1) upstream passage at Chief Joseph Dam, 2) downstream passage at Grand Coulee Dam, 3) upstream passage at Grand Coulee Dam, 4) upstream passage at dams along the Spokane River, 5) downstream passage at Chief Joseph Dam, and 6) downstream passage at dams along the Spokane River. The scope of these projects needs further development and are therefore not considered in this consultation. The effects of construction and operations of these fish passage structures arising from the P2IP will be subject to separate consultation(s) pursuant to section 7 of the ESA and are not discussed herein.

In September 2023, the Project Proponents, and the United States Government (USG) signed the Memorandum of Understanding & Mediated Settlement Agreement (P2IP Settlement Agreement) to pursue implementing the P2IP.[1] The P2IP Settlement Agreement recognizes that the estimated cost of P2IP is approximately $300 million and outlines funding and implementation commitments through 2043, which include the following federal agency commitments in the P2IP:

- Bonneville will provide certain funding for implementation of the P2IP studies for reintroducing specific non-federally listed salmonid stocks above Chief Joseph and Grand Coulee dams in the Upper Columbia River Basin consistent with the Administrator's settlement authority.
- Reclamation, the USACE, the USFWS, and NMFS[2] will work with the Project Proponents and Bonneville to identify additional funding needs for implementation of the P2IP activities and seek additional funding, as necessary and appropriate, to ensure full funding of P2IP activities during the 20-year implementation period.
- The Project Proponents will utilize existing federal and non-federal facilities for activities related to P2IP implementation.
- The Co-Lead Agencies will use all appropriate legal authorities to fund, support, and implement the agreement.
- The USFWS will provide surplus fertilized eggs and juvenile salmon of non-listed stocks from federal hatchery facilities to support the study and testing of reintroduction.

The agreement also establishes a mutual understanding that the Parties do not intend for P2IP implementation to require any material changes in the operation, maintenance or configuration of

[1] Case 3:01-cv-00640-SI Document 2442 Filed 9/28/23.

[2] NOAA funds for activities that may adversely affect any ESA-listed species may require separate consultation if not covered under an existing consultation document.

any Columbia River System dams or reservoirs. The Agreement also "does not alter the Federal agencies' obligations under the court-approved management agreements or other court orders entered in United States v. Oregon, 68-cv-513-MO (D. Or.)."

Consistent with the P2IP Settlement Agreement, the federal government seeks to support efforts to study and test the feasibility of reintroducing specific non-listed Upper Columbia summer/fall-run Chinook and sockeye salmon stocks above Chief Joseph and Grand Coulee dams in the Upper Columbia River Basin. The federal government also seeks to continue to provide adequate, efficient, economical, and reliable power supply, deliver reliable water supplies, manage flood risk, and provide reliable navigation and recreational opportunities, and minimize environmental impacts.

1.3.1 Research Studies

1.3.1.1 Juvenile Survival Studies

Juvenile survival and behavioral studies will be performed for subyearling and yearling Chinook and sockeye salmon using biotelemetry, such as Passive Integrated Transponder tags (PIT-tags), Juvenile Salmon Acoustic Telemetry System Tags (JSATS), and coded-wire tags (CWT). Up to 250,000 juvenile Upper Columbia summer/fall Chinook and 250,000 juvenile Upper Columbia sockeye salmon may be released annually to accommodate the tagging studies. The current research goals are to mark all released juveniles with PIT-tag or coded-wire tags; a subset of juveniles will be marked with acoustic JSATS tags. Results from these studies will be used to evaluate migratory behavior and dam passage survival; estimate smolt-to-adult return rates; and provide returning-migrating salmon for subsequent adult behavioral and survival studies. Estimates from juvenile survival studies will be used to update life cycle model (LCM) inputs, adaptively manage research projects, and evaluate the P2IP program's success.

This JSATS-based study will examine assumptions made in the life cycle model about survival of juvenile summer/fall Chinook and sockeye salmon, behavior, dam passage routing, and travel time through action area reaches. The JSATS-based studies will provide critical information about near-dam behavior and route-specific dam passage and survival at each of the five dams in the project area. These multiyear studies are expected to begin early in the P2IP program and planned to be repeated at strategic intervals through 2043. Appendix A of the P2IP Draft PEA provides a detailed description of the P2IP research activities (BOR 2024b).

1.3.1.2 Adult Salmon Research Studies

Adult survival and behavior studies will be expanded for non-listed Upper Columbia summer/fall Chinook and Upper Columbia sockeye salmon. Project Proponents will transport up to 15,000 adult Chinook salmon and 15,000 adult sockeye from live-capture and regional hatchery operations with surplus salmon to various release locations within the blocked area. Adult Chinook and sockeye salmon will be obtained from federal and non-federal hatcheries and other collection actions available for P2IP use. Adult salmon for P2IP activities will be subject to availability of surplus fish. P2IP Proponents are responsible for coordination with appropriate parties to obtain surplus salmon. The number of adult salmon will vary annually depending on availability. The collection of summer/fall Chinook salmon will be completed by the facility

owner/operators consistent with their existing NMFS biological opinions in the Upper Columbia River basin. If a collection location does not have established collection dates for summer/fall Chinook salmon in an existing biological opinion, then the Project Proponents will only transport Chinook with known P2IP Upper Columbia River blocked area PIT tags before and after the run schedule cut-off dates established by the technical advisory committee (TAC) for the upper Columbia summer Chinook management period. Within the run schedule dates established by the TAC or existing program biological opinion, additional surplus summer/fall Chinook may be transported from corresponding collection sites to the blocked area.

The collection facilities are identified in Table A-1 of Appendix A of the draft P2IP PEA, and include Chief Joseph Hatchery, Entiat National Fish Hatchery, Chelan Falls Hatchery, Rocky Reach Juvenile Fish Bypass, Priest Rapids Dam and Hatchery, Ringold Springs Hatchery, Wells Dam and Hatchery, Tumwater Dam, and the Wenatchee River Hatcheries (BOR 2024b). Morphometrics will be used to select against possible spring Chinook to reduce the probability of transporting a spring Chinook into the blocked area. Additionally, post hoc genetic analysis will be utilized to evaluate spring Chinook salmon's presence, prevalence, and origin in the trap and transport program and determine if additional coordination is needed with NMFS to adjust the P2IP trap and transport program.

Salmon research studies will examine factors that influence adult return rates to the blocked area and inform planning and development of interim adult passage facilities at all five dams. A subset of adults will be tagged and detected using existing acoustic tag receivers deployed for concurrent resident fish monitoring programs already in operation. Telemetry receivers will be installed near the dam tailraces and within blocked area tributaries to assess near-dam behavior and spawning escapement. Tagged and transported adult salmon will be transported via truck from existing facilities, and released in various locations including dam tailraces and forebays, mid-reservoir reaches, tributaries, and the transboundary reach. Salmon research studies will be repeated through 2043.

1.3.2 Fish-Rearing and Acclimation Facilities

The proposed action will require a source of both summer/fall Chinook and sockeye salmon for research studies. In Phase 1, Chief Joseph Hatchery (CJH) summer/fall Chinook and Okanogan sockeye salmon stocks were ranked highest for use in the reintroduction program and are the preferred stocks for use in P2IP efforts. Several other summer/fall Chinook salmon sources (i.e., Entiat National Fish Hatchery and Wells Fish Hatchery) were also identified as potential donor stocks. Appendix B of the P2IP PEA provides a detailed description of the P2IP fish-rearing activities, and the interim fish-rearing and acclimation facilities are summarized below.

If hatchery juvenile fish availability becomes limited, juveniles will be sourced from ongoing activities associated with TRMP Research, Monitoring, and Evaluation (RM&E) actions. For example, juvenile sockeye salmon trapped during beach seining activities, in the mainstem Columbia River below Chief Joseph Dam, or at the mouth of the Okanogan River, will be tagged and transported for release into the blocked area. Similarly, juvenile salmon trapped in the smolt trap operated for RM&E on the Okanogan River will also be tagged and transported to the blocked area as a back-up source of juvenile fish for the P2IP action. These back-up sources of

juvenile fish may only occur in limited instances and without compromising ongoing TRMP RM&E programs in the Okanogan.

Artificial production of summer/fall Chinook and sockeye salmon needed for the Proposed Action will rely on either existing local land-based hatchery facilities or updated versions of these facilities, and new acclimation facilities. Additionally, the Project Proponents will work with the owner/operators of anadromous fish hatcheries downstream of Chief Joseph Dam to determine whether surplus fish production or rearing space is available. Subyearling production will not require acclimation sites, as these fish will be released directly from hatcheries to various locations within the blocked area. Subyearlings may be released in the spring (March–May) or in the fall (September–November).

Egg incubation and early rearing will be done using existing hatchery facilities or through an expansion or upgrade of existing facilities, or development of new acclimation facilities in the Sanpoil and Spokane River watersheds. New, expanded, or upgraded acclimation sites will occur in the Sanpoil and Spokane River watersheds. Siting of the acclimation facilities will be based on studies, existing infrastructure, and site conditions. Data collection may include geotechnical studies, surveying, and well drilling to characterize site conditions to inform the design process. These actions could occur at each potential site over a 20-year period.

1.3.3 Interim Fish Passage

Interim passage actions will focus on the study, design, installation, testing, and operation of fish passage systems. Data collection could include geotechnical studies and surveys, along with existing operational data, to characterize site conditions, inform hydrologic modeling, and aid in the design process. These actions could occur at each dam within the blocked area over the next 20 years. The existing trap-and-transport program will be expanded early in the P2IP project. Fish could be collected from Priest Rapids Dam, Wells Hatchery and Dam, and below Chief Joseph Dam, and from hatcheries with available surplus salmon.

Adult traps at existing facilities will not change configurations or operational periods to supply the P2IP program. Adult trapping will continue at those sites, per the terms of prior agreements, reviews, and ESA consultations specific to the respective hatchery programs and the TRMP. Only the handling, tagging, transport, and release of adults from these facilities is proposed as part of the P2IP action. Adult salmon release sites could include Rufus Woods Reservoir, Lake Roosevelt, the Columbia River transboundary reach, Hangman Creek, the Sanpoil River, the Spokane River, the Little Spokane River, and other spawning and rearing areas.

1.3.4 Other Activities Caused by the Proposed Action

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

1.3.5 Conservation Measures

The Environmental Protection Measures (EPMs) are incorporated by reference and found in Section 2.1.5 of the BA (BOR 2024a). The list of conservation measures summarizes the EPM's that are intended to reduce impacts to ESA-listed fish during activities including: hatchery operations, capture, handling, release locations, trapping protocol, disease control, temperature, tagging, seining, netting, transporting, PIT-tag scanning, reporting, and habitat restoration. These extensive activities are described in detail in Appendix A of the BA and in the PEA (BOR 2024a, BOR 2024b).

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

2.1. Analytical Approach

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

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

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

- Evaluate the rangewide status of the species expected to be adversely affected by the proposed action.
- Evaluate the environmental baseline of the species.
- Evaluate the effects of the proposed action on species using an exposure–response approach.

- Evaluate cumulative effects.
- In the integration and synthesis, add the effects of the action and cumulative effects to the environmental baseline, and, in light of the status of the species, analyze whether the proposed action is likely to directly or indirectly reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species.
- If necessary, suggest a reasonable and prudent alternative to the proposed action.

2.2. Rangewide Status of the Species

This opinion examines the status of each species that is likely to be adversely affected by the proposed action. The status is determined by the level of extinction risk that the listed species face, based on parameters considered in documents such as recovery plans, status reviews, and listing decisions. This informs the description of the species' likelihood of both survival and recovery. The species status section also helps to inform the description of the species' "reproduction, numbers, or distribution" for the jeopardy analysis. Table 1 includes by reference the Federal Register decision notices, recovery plans, and most-recent 5-year status reviews for the species considered in this opinion.

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

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

2.2.1 Year Reviews and Recovery Plans

We incorporate by reference the following 5-year reviews and references cited therein.

Chinook salmon:

- 2022 5-Year Review: Summary & Evaluation of Upper Columbia River Spring-run Chinook Salmon and Upper Columbia River Steelhead
- 2022 5-Year Review: Summary & Evaluation of Snake River Spring/Summer-run Chinook Salmon
- 2022 5-Year Review: Summary & Evaluation of Snake River Fall-run Chinook Salmon

Sockeye salmon:

- 2022 5-Year Review: Summary & Evaluation of Snake River Sockeye Salmon

Steelhead:

- 2022 5-Year Review: Summary & Evaluation of Upper Columbia River Spring-run Chinook Salmon and Upper Columbia River Steelhead
- 2022 5-Year Review: Summary & Evaluation of Snake River Basin Steelhead

We also incorporate by reference the following species recovery plans and references cited therein:

- 2017 Recovery Plan for Snake River Fall-run Chinook Salmon
- 2017 Recovery Plan for Snake River Spring/Summer-run Chinook Salmon and Snake River Basin Steelhead
- 2015 Recovery Plan for Snake River Sockeye Salmon
- 2007 Upper Columbia Spring-run Chinook Salmon and Steelhead Recovery Plan

2.2.2 Additional Information

Additional information that has become available since the most-recent 5-year reviews and the recovery plans were published, is summarized below, and contributes to the best scientific and commercial data available for the species considered in this opinion.

A summary of the current status of the SR fall-run Chinook salmon ESU can be found on NMFS' publicly available internet site at: https://www.fisheries.noaa.gov/s3/2024-08/status-species-snake-river-fall-chinook-salmon-jul-2024.pdf, and is incorporated by reference here. While the ESU is currently considered viable, it is not meeting its recovery goals.

A summary of the current status of the SR spring/summer-run Chinook salmon ESU can be found on NMFS' publicly available internet site at https://www.fisheries.noaa.gov/s3/2024-08/status-species-snake-river-spring-summer-chinook-salmon-july-2024.pdf, and is incorporated by reference here. Rangewide, the species is at a moderate-to-high risk of extinction.

A summary of the current status of the UCR spring-run Chinook salmon ESU can be found on NMFS' publicly available internet site at: https://www.fisheries.noaa.gov/s3/2024-08/status-species-upper-columbia-river-spring-chinook-july-2024.pdf, and is incorporated by reference here. Rangewide, the species is at a high risk of extinction.

A summary of the current status of the SR sockeye salmon ESU can be found on NMFS' publicly available internet site at: https://www.fisheries.noaa.gov/s3/2024-08/status-species-snake-river-sockeye-salmon-july-2024.pdf, and is incorporated by reference here. The species remains at high risk across all four VSP parameters and is at a high risk of extinction within 100 years.

A summary of the current status of the SRB steelhead DPS can be found on NMFS' publicly available internet site at: https://www.fisheries.noaa.gov/s3/2024-08/status-species-snake-river-basin-steelhead-july-2024.pdf, and is incorporated by reference here. Rangewide, available information suggests that SRB steelhead continue to be at a moderate risk of extinction within the next 100 years.

A summary of the current status of the UCR steelhead DPS can be found on NMFS' publicly available internet site at: https://www.fisheries.noaa.gov/s3/2024-08/status-species-upper-columbia-river-spring-chinook-july-2024.pdf, and is incorporated by reference here. Rangewide, the species is at a high risk of extinction.

2.2.3 Climate Change

There is a large and growing body of literature on past, present, and future impacts of global climate change, exacerbated and accelerated by human activities. Some of the likely effects commonly mentioned are sea level rise, increased frequency of severe weather events, and change in air and water temperatures. NOAA's climate information portal provides basic background information on these and other measured or anticipated effects (see http://www.climate.gov). As observed by Siegel and Crozier (2019), long-term trends in warming have continued at global, national, and regional scales. The 10 warmest years in the historical record (1890-2023) have all occurred in the past decade, with 2023 recorded as the warmest year on record by a wide margin (Lindsey and Dahlman 2024).

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

Climate change will continue to affect air temperatures, precipitation, and wind patterns in the Pacific Northwest (ISAB 2007, Philip et al. 2021), resulting in increased droughts and wildfires

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

Columbia River basin salmon and steelhead spend a significant portion of their life-cycle in the ocean, and as such the ocean is a critically important habitat influencing their abundance and productivity. Climate change is also altering marine environments used by Columbia River basin salmon and steelhead. This includes increased frequency and magnitude of marine heatwaves, changes to the intensity and timing of coastal upwelling, increased frequency of hypoxia (low oxygen) events, and ocean acidification. These factors are already reducing, and are expected to continue reducing, ocean productivity for salmon and steelhead. This does not mean the ocean is getting worse every year, or that there will not be periods of good ocean conditions for salmon and steelhead. For example, near-shore conditions off the Oregon and Washington coasts were considered “good” in 2011-2012, “poor” 2015-2017, “good” in 2021, and “fair” in 2022- 2024 (NOAA 2024).

Unfortunately, the magnitude, frequency, and duration of downturns in marine conditions are expected to increase over time due to climate change and any long-term effects of the stressors that fish experience during freshwater stages that do not manifest until the marine environment will be amplified by the less-hospitable conditions that are due to climate change. Together with increased variation in freshwater conditions, downturns will further impair the abundance, productivity, spatial structure, and diversity of the region’s native salmon and steelhead stocks (ISAB 2007, Isaak et al. 2018). As such, these climate dynamics will likely reduce fish survival through direct and indirect impacts at all life stages.

All habitats used by Pacific salmon and steelhead will be affected by climate dynamics. However, the impacts and certainty of the changes will likely vary by habitat type. Some changes affect salmon at all life stages in all habitats (e.g., increasing temperature), while others are habitat-specific (e.g., stream-flow variation in freshwater, sea-level rise in estuaries, upwelling in the ocean). How climate change will affect each individual salmon or steelhead stock also varies widely, depending on the extent and rate of change and the unique life-history characteristics of different natural populations (Crozier et al. 2008). The continued persistence of salmon and steelhead in the Columbia basin relies on restoration action that enhance climate

resilience (Jorgensen et al. 2021) in freshwater spawning, rearing, and migratory habitats, including access to high elevation, high quality cold-water habitats, and the reconnection of floodplain habitats across the interior Columbia River basin.

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).

As described in the BA (BOR 2024a; Section 1.4, p.6), the action area (Figure 1 in the BA and incorporated here by reference) includes the Upper Columbia River from Beebe Bridge (about 12 miles downstream of Wells Dam), the lower Okanogan River, and all major tributaries upstream of Chief Joseph Dam in the United States, and the Penticton Hatchery in Penticton, British Columbia, Canada. These aquatic environments include a connected network of streams and reservoirs where fish passage, trap and transport activities, and research activities would occur. The existing facilities downstream of Chief Joseph Dam where trap and transport of P2IP study fish may occur are described in detail in Appendix D of the P2IP BA (BOR 2024a). Of these, Priest Rapids Dam is the most downstream potential collection facility. The federal action will not directly or indirectly affect the Snake River; therefore, the Snake River is not considered part of the action area. The action area also includes areas adjacent to the aquatic environments (i.e., up to 1.5 miles from stream and reservoir centerlines). This 1.5-mile buffer accounts for the effects of activities that would occur during the project, including transportation routes, fish-rearing facilities, off-channel acclimation sites, geotechnical investigations, and job-box operation and maintenance for telemetry and antenna arrays.

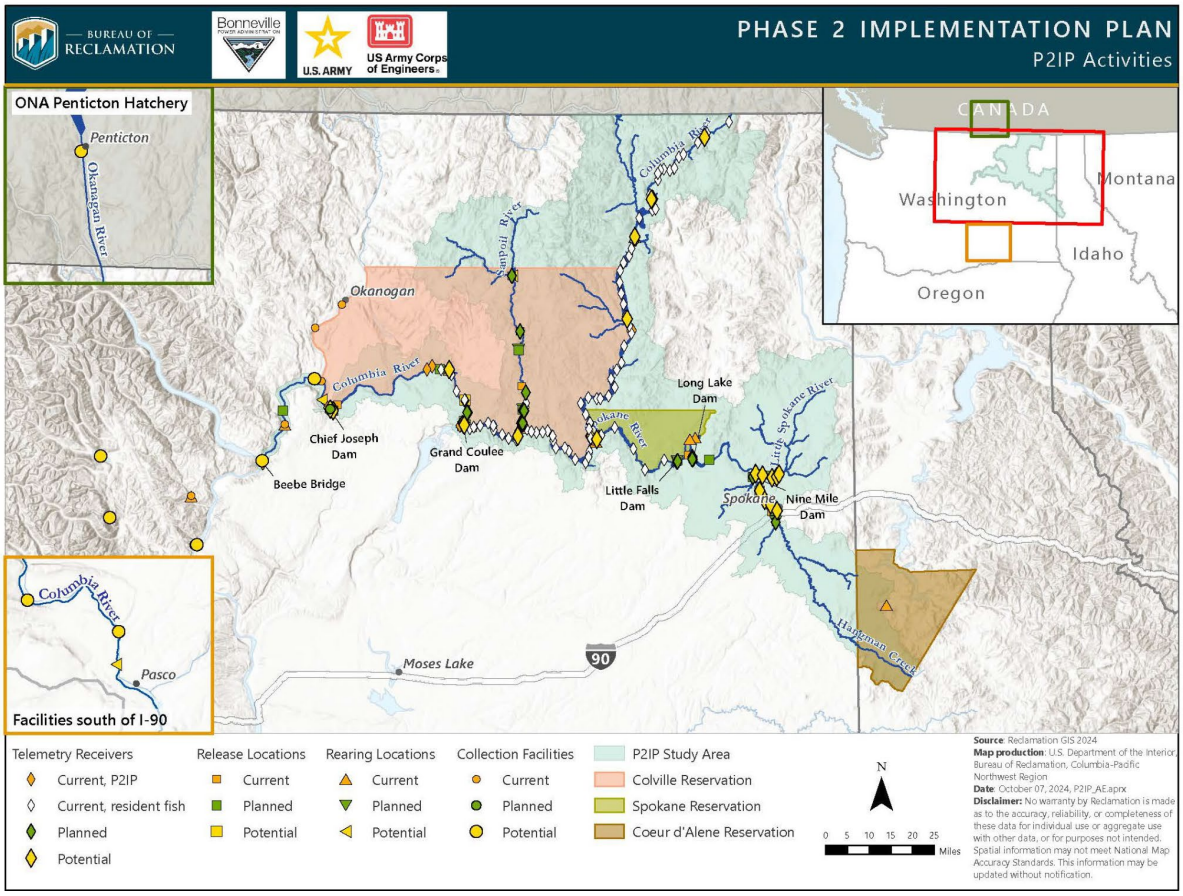

Figure 1. Map of capture and research locations within the P2IP action area.

2.4. Environmental Baseline

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

2.4.1 Mainstem Hydroelectric Dams

Conditions for ESA-listed salmon and steelhead have been fundamentally altered by the construction and operation of mainstem dams for power generation, navigation, and flood control. ESA-listed salmon and steelhead in the action area are adversely affected by hydrosystem-related flow and water quality effects, obstructed and/or delayed passage, and ecological changes caused by impoundments.

The federal and non-federal dams on the Columbia River have transformed the action area from a free-flowing river into a series of reservoirs with slower-moving water, an altered thermal regime, and an abundance of native and non-native predators of juvenile salmonids. Elevated water temperatures impact migration, survival, and spawning success of migrating ESA-listed salmon and steelhead and may contribute to an increase in stray rates. During July and August, when a portion of adult SR salmon and steelhead migrate, solar radiation heats reservoir surface waters, which can lead to high temperatures and differentials between the bottom and top sections in a fish ladder. Ladder temperatures exceeding 68 degrees Fahrenheit (°F) and differentials greater than 1.8°F have been demonstrated to delay passage for Chinook salmon and steelhead at the Columbia River System (CRS) dams in the lower Snake River (Caudill et al. 2013). The accumulation of temperature exposure during migration may reduce fitness and increase the likelihood of prespawning mortality (Crozier et al. 2017, Hinch et al. 2021). ESA-listed fish migrating into the action area during the summer and early fall months are vulnerable to temperature-related impacts of the federal and non-federal dams.

2.4.1.1 Continued Operation and Maintenance of the Columbia River System

Reclamation and USACE have implemented measures in previous ESA section 7 Columbia River System hydropower consultations to improve conditions in the juvenile and adult migration corridor including 24-hour volitional spill, surface passage routes, upgrades to juvenile bypass systems, and predator management measures. In 2020, NMFS issued its most-recent opinion for the Continued Operation and Maintenance of the Columbia River System (2020 CRS opinion).[3] In the 2020 CRS opinion, NMFS determined that the continued operations of the Columbia River System (CRS) dams[4] would adversely affect, but that it was not likely to jeopardize the continued existence of, ESA-listed salmon and steelhead included in this opinion.

Beginning in 2024, the USACE began operating its CRS dams on the mainstem Columbia and Snake rivers consistent with the Resilient Columbia Basin Agreement (RCBA) and associated Memorandum of Understanding (MOU).[5] The current hydro system operation includes increased spring spill volume and extended surface spill operations, which is intended to improve survival for ESA-listed fish; however, no operational changes at CRS dams within the P2IP action area were included. The RCBA also included funding commitments for habitat and infrastructure improvements. While habitat restoration is likely to improve baseline conditions for listed salmon and steelhead species across the Columbia River Basin, we will not know the precise impacts of any specific habitat improvements and interim hydro system operations for many years to come.

Under the 2020 CRS opinion, Dworshak Dam is managed so that summer temperatures at the tailrace of Lower Granite Dam do not exceed 68°F. This action reduces temperatures in the

[3]The most recent Biological Opinion for the Continued Operation and Maintenance of the Columbia River System, NMFS tracking number WCRO-2020-00113, signed July 24, 2020, and available at: https://www.fisheries.noaa.gov/resource/document/biological-opinion-operation-and-maintenance-fourteen-multiple-use-dam-and

[4] The hydro system consists of the 14 federal dam and reservoir projects addressed in the 2020 CRS Opinion: Libby, Hungry Horse, Albeni Falls, Grand Coulee, Chief Joseph, Dworshak, Lower Granite, Little Goose, Lower Monumental, Ice Harbor, McNary, John Day, The Dalles, and Bonneville dams.

[5] Case 3:01-cv-00640-SI Document 2450-1 Filed 12/14/23

lower Snake River. However, due to limited cooling water availability, river temperatures may exceed 70°F below Ice Harbor Dam during the early summer and early fall migration period. These warmer river temperatures may increase the number of Snake River ESA-listed fish that enter the action area as they seek cooler migration conditions or experience difficulty accurately homing to natal streams. It is currently unknown what influence that lower Snake River temperatures have on this behavior. Factors that could influence the variability of this stray rate may include reservoir temperature management, juvenile transportation, and potential interactions with returning Upper Columbia salmon and steelhead adults.

2.4.1.2 Non-Federal Columbia River Hydroelectric Projects

In 2003, NMFS issued biological opinions and Section 10 Incidental Take Permits authorizing Habitat Conservation Plans covering the operation and maintenance of three Federal Energy Regulatory Commission (FERC) licensed projects on the mainstem Columbia River downstream of Chief Joseph Dam - including related hatchery and tributary habitat mitigation programs: Wells Dam (FERC No. 2149) owned by Public Utility District (PUD) No. 1 of Douglas County, Rocky Reach Dam (FERC No. 2145) and Rock Island Dam (FERC No. 943) owned by PUD No. 1 of Chelan County (NMFS 2003a, 2003b, and 2003c).

A consultation on interim operations and then on the issuance of a new FERC license for the Priest Rapids Project (FERC No. 2114) owned by PUD No. 2 of Grant County and comprising the Wanapum and Priest Rapids dams in the Columbia River downstream of Rock Island Dam, including associated hatchery and tributary habitat mitigation programs, was completed in 2004, and 2008, respectively (NMFS 2004, NMFS 2008).

Together, the owners of these five dams, collectively referred to as the mid-Columbia PUD projects, have implemented both structural and operational improvements to substantially increase juvenile and adult survival rates through the dams and reservoirs, especially for juvenile salmon and steelhead. Additionally, the related tributary habitat mitigation programs targeting the Methow, Entiat, and Wenatchee rivers are expected to provide continuing benefits to UCR spring-run Chinook salmon and steelhead populations in those tributaries. These measures are ongoing and their benefits with respect to improved functioning of the mainstem habitat will continue into the future.

2.4.2 Harvest

Historical harvest rates have been reduced from their peak as a result of international treaties, fisheries conservation acts, the advent of weak-stock management, regional conservation goals, and the ESA listing of many salmon ESUs and steelhead DPSs. While fisheries do not target weak stocks of listed salmon or steelhead, listed fish are incidentally caught in fisheries directed at hatchery and unlisted natural-origin stocks. Within the action area, these fisheries are managed under the U.S. v. Oregon Harvest Management Agreement (*U.S. v. Oregon*), and the CTCR TRMP.

2.4.2.1 The 2018-2027 U.S. v. Oregon Harvest Management Agreement

U.S. v. Oregon is the on-going Federal court proceeding first brought in 1968 to enforce the reserved fishing rights of the Confederated Tribes of the Warm Springs Reservation of Oregon, the Confederated Tribes of the Umatilla Indian Reservation, the Nez Perce Tribe, and the Confederated Tribes and Bands of the Yakama Nation. The 2008-2017 *U.S. v. Oregon* Management Agreement expired on December 31, 2017. The 2018-2027 Management Agreement extends the expired Management Agreement, but for some updates and minor modifications, until 2027. Within the action area, there are tribal and recreational fisheries occurring under this Management Agreement.

NMFS signed the 2018-2027 *U.S. v. Oregon* Management Agreement for the Columbia River Basin on February 26, 2018.[6] The 2018-2027 Management Agreement accomplishes two primary objectives. First, it implements harvest policies that the parties have agreed should govern the amount of harvest. Second, it incorporates hatchery programs and associated production levels in the Columbia Basin that support harvest and are also important to the conservation of salmon and steelhead populations above Bonneville Dam.

Shortly before signing the 2018-2027 Management Agreement, NMFS issued an opinion,[7] which assessed the impacts of our decision to sign a new Management Agreement with *U.S. v Oregon* parties. In the 2018 opinion, NMFS determined that the new Management Agreement would adversely affect listed species as a result of proposed fisheries managed pursuant to the New Agreement, but that the New Agreement was not likely to jeopardize the continued existence of ESA-listed salmon or steelhead included in this opinion.

2.4.2.2 Confederated Tribes of the Colville Reservation's Tribal Research Management Plan

The Confederated Tribes of the Colville Reservation completed their TRMP that included their tribal fisheries and the CJH programs in early 2017. The TRMP specified artificial propagation for UCR spring-run Chinook salmon, summer/fall Chinook salmon, and steelhead, harvest, predator control, kelt reconditioning, and monitoring and evaluation activities in the Okanogan River basin and portions of the Upper Columbia River.

On October 27, 2014, NMFS issued an ESA Section 10 permit (permit number 18928) authorizing the take of adult and juvenile UCR spring-run Chinook salmon through brood stock collection activities, hatchery operations, juvenile fish releases, and monitoring and evaluation activities associated with the CJH Okanogan spring-run Chinook Program. On February 27, 2017, the CTCR submitted their TRMP. On April 20, 2017, we issued a Tribal 4(d) Rule Determination for the TRMP and associated activities (NMFS 2017b, 82 FR 18614).

[6]https://www.fisheries.noaa.gov/west-coast/sustainable-fisheries/salmon-and-steelhead-fisheries-west-coast-united-states-v-oregon

[7]Biological Opinion on the Effects of the 2018-2027 *U.S. v. Oregon* Management Agreement, NMFS tracking number WCR-2017-7164, signed February 23, 2018 and available at: https://www.fisheries.noaa.gov/resource/document/consultation-effects-2018-2027-us-v-oregon-management-agreement

On February 24th, 2017, NMFS issued an opinion for the authorization/funding actions of NMFS and Bonneville and the activities undertaken by the CTCR under its TRMP.[8] ESA coverage for activities covered under Section 10 Permit 18928 were superseded by the 2017 TRMP opinion. In the 2017 TRMP opinion, NMFS determined that the CTCR TRMP would adversely affect listed species as a result of proposed tribal fisheries and CJH programs, but that it was not likely to jeopardize the continued existence of ESA-listed salmon and steelhead included in this opinion (NMFS 2017b).

2.4.3 Hatchery Operations

In the upper Columbia River region, hatcheries producing salmon and steelhead are operated to mitigate the impacts of habitat loss resulting from the construction of Grand Coulee Dam and passage and habitat impacts of the mid-Columbia PUD projects. While these hatcheries provide valuable mitigation and/or conservation benefits, they can also cause adverse impacts, including genetic effects that reduce fitness and survival, ecological effects such as competition and predation, facility effects on passage and water quality, incidental handling, and mortality due to harvest, and masking of the true status of natural-origin populations.

Within the action area, there are 18 salmon and steelhead hatchery programs, including the TRMP programs described above in Section 2.4.2.2. Table 1, below, summarizes the hatchery programs. All of the biological opinions listed in Table A analyzed both the positive and negative impacts of each hatchery program (see Appendix A of NMFS [2017b] for details about the factors considered when analyzing hatchery effects). The negative effects analyzed included population productivity, genetic diversity, disease risk, spawning distribution, and age and size at maturity. All of the opinions listed in Table A determined that the impacts from these hatcheries were not likely to jeopardize the continued existence or destroy or adversely modify designated critical habitat of the ESA-listed salmon and steelhead included in this opinion. These biological opinions have specific collection protocols and timing (e.g., NMFS 2017a, 2017b) to avoid the run timing and associated effects to ESA-listed species. The P2IP proposed action will follow the collection protocols consistent with ESA consultations (BOR 2024a).

Table 1. List of hatchery programs and associated biological opinions and ESA authorization pathways within the action area.

Program Name	Funder/Operator/ Other Action Agency	Biological Opinion NMFS Tracking Number (Citation)	ESA Authorization Pathway(s)
Methow Hatchery Spring Chinook Salmon Program	Washington Department of Fish & Wildlife (WDFW); Chelan PUD; Douglas PUD; Grant PUD; Yakama Nation	WCR-2015-3845 (NMFS 2016c)	Section 10(a)(1)(A) Permit 18925 Permit 20462 Permit 20533

[8]Biological Opinion on Issuance of a Tribal 4(d) Rule Determination for a Tribal Resource Management Plan (TRMP) submitted by the Confederated Tribes of the Colville Reservation. NMFS Consultation Number: WCR-2014-388, signed February 24, 2017.

Program Name	Funder/Operator/ Other Action Agency	Biological Opinion NMFS Tracking Number (Citation)	ESA Authorization Pathway(s)
Winthrop National Fish Hatchery spring Chinook salmon program	USFWS; Reclamation	WCR-2015-3845 (NMFS 2016c)	Section 10(a)(1)(A) Permit 18927
Wells Complex steelhead program	WDFW; Douglas PUD	WCR-2017-6986 (NMFS 2017d)	Section 10(a)(1)(A) Permit 23163
Winthrop National Fish Hatchery steelhead program	USFWS; Reclamation	WCR-2017-6986 (NMFS 2017d)	Section 4(d) Limit 5
Entiat National Fish Hatchery summer Chinook salmon program	USFWS; Reclamation	NWR-2012-00841 (NMFS 2013A)	Section 7
Chiwawa (Wenatchee) spring Chinook salmon program	WDFW; Chelan PUD; Yakama Nation	WCR-2017-7365 (NMFS 2015a)	Section 10(a)(1)(A) Permit 18121
Nason Creek (Wenatchee) spring Chinook salmon program	WDFW; Grant PUD; Yakama Nation	WCR-2017-7365 (NMFS 2015a)	Section 10(a)(1)(A) Permit 18118
Wenatchee steelhead program	WDFW; Chelan PUD; Yakama Nation	WCR-2017-7367 (NMFS 2017e)	Section 10(a)(1)(A) Permit 18583
Leavenworth National Fish Hatchery spring Chinook salmon program	USFWS; Reclamation; Environmental Protection Agency	WCR-2017-7345 (NMFS 2017c)	Section 7
Chelan Falls Summer/Fall Chinook Salmon	WDFW; Chelan PUD	(NMFS 2017a) WCR-2015-3607	Section 10(a)(1)(B) Permit 23191
Wenatchee Summer/Fall Chinook Salmon	WDFW; Chelan PUD; Grant PUD	(NMFS 2017a) WCR-2015-3607	Section 10(a)(1)(B) Permit 23191
Methow Summer/Fall Chinook Salmon	WDFW; Grant PUD	(NMFS 2017a) WCR-2015-3607	Section 10(a)(1)(B) Permit 23191

Program Name	Funder/Operator/ Other Action Agency	Biological Opinion NMFS Tracking Number (Citation)	ESA Authorization Pathway(s)
Wells Hatchery Summer/Fall Chinook Salmon	WDFW; Douglas PUD	(NMFS 2017a) WCR-2015-3607; (NMFS 2020) WCR-2020-00825	Section 10(a)(1)(B) Permit 23193/ Section 4(d) Limit 5
Priest Rapids Fall Chinook Salmon	Grant PUD; USACE	(NMFS 2017a) WCR-2015-3607	Section 10(a)(1)(B) Permit 23194/ Section 7
Ringold Springs Hatchery Fall Chinook Salmon	USACE	(NMFS 2017a) WCR-2015-3607	Section 7

2.4.4 Research and Monitoring

The ESA allows the issuance of permits to take listed species for the purposes of scientific research and enhancement (Section 10(a)(1)(A)). In addition, the ESA allows for NMFS to enter into cooperative agreements with states, developed under Section 6 of the ESA, to assist in recovery actions of listed species. Prior to issuance of these authorizations, the proposal must be reviewed for compliance with section 7 of the ESA. The collection and handling of fish for the purposes of research can cause harm through stress, injury, migration delay, and mortality.

Per a search of the NMFS online application system for Authorizations and Permits for Protected Species (APPS) database, by the consulting biologist on December 10, 2024, there were five active Section 10(a)(1)(A) scientific research permits in the action area applicable to juvenile and adult Chinook salmon, sockeye salmon, and steelhead, in addition to the permits identified in Section 2.4.5. These permits allow the capture (including broodstock collection), handling, tagging, sampling, and release of these species, using a range of methods. Collectively, their purposes are to gain scientific knowledge on the status and productivity of the species to better inform management decisions, implement recovery actions, and restore habitat.

2.4.5 Condition of the Habitat

Human activities have altered and/or curtailed habitat-forming processes and limited the habitat suitable for ESA-listed salmon and steelhead in the action area. Storage dams, diversions, roads and railways, agriculture, residential development, and forest management continue to cause changes in water flow, water temperature, sedimentation, floodplain dynamics, riparian function, and other aspects of the ecosystem.

Water quality in the action area is impaired. Common toxic contaminants include polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), polybrominated diphenyl ethers (i.e., flame retardants), dichlorodiphenyltrichloroethane (DDT) and other legacy pesticides, current use pesticides, pharmaceuticals and personal care products, and trace elements

(LCREP 2007). The LCREP (2007) report noted widespread presence of PCBs, PAHs, DDT, and copper both geographically and in the food web, especially in the lower river.

Growing population centers throughout the Columbia River basin and numerous smaller communities contribute municipal and industrial waste discharges. Common water-quality issues with urban development and residential septic systems include warmer water temperatures, lowered dissolved oxygen, increased nutrient loading, increased fecal coliform bacteria, and increased chemicals associated with pesticides and urban runoff (LCREP 2007). Developed agricultural areas of the basin also deliver fertilizer, herbicide, and pesticide residues to the river.

2.4.6 Status of ESA-Listed Species in the Action Area

The status of the ESA-listed salmon and steelhead subject to this opinion remains unchanged from the most recent 5-Year Reviews completed in 2022. UCR spring-run Chinook salmon and SR sockeye salmon remain endangered under the ESA. Snake River spring/summer-run and fall-run Chinook salmon and UCR and SRB steelhead remain threatened under the ESA (NMFS 2016b, NMFS 2022). This is largely due to a combination of effects in their natal systems (e.g., water diversions, riparian habitat loss, loss of flood plain connectivity, high stream temperatures, embedded gravels, hatchery programs, and tribal and recreational fisheries) and of the existence and operation of the federal and non-federal dams on Columbia River impairing habitat throughout the Columbia River Basin.

Based on the available information, the action area may be occupied by SR fall-run, SR spring/summer-run, and UCR spring-run Chinook salmon, SR sockeye salmon, and SRB and UCR steelhead. There is evidence using PIT-tag detections that a relatively small proportion of adult SR salmon and steelhead adults typically stray into the action area (NMFS 2025). This stray rate is usually low (1-3%) and consistent with natural salmonid stray rates; however, in a few more recent migration years, a higher proportion have strayed into the action area (NMFS 2025). Substantial numbers of returning adult UCR spring-run Chinook salmon and UCR steelhead migrate through several of the collection facilities listed in the proposed action. The probability of encountering individual fish from these ESUs/DPSs can be derived by PIT-tag detections (Table 2) and estimated tag/count ratios (NMFS 2025). Snake River Chinook and sockeye salmon ESU's entering into the action area are unlikely to spawn successfully in their natal streams (NMFS 2025, BOR 2024a.). SRB steelhead utilize the action area for over-wintering and may successfully spawn in the Snake River Basin after entering and exiting the action area.

Table 2. Total number of individual PIT-tag detections by collection location in the action area over a 12-year period, 2013-2024.

Facility	SR Sockeye	SR Sp/Su Chinook	SR Fall Chinook	SRB Steelhead	UCR Spring Chinook	UCR Steelhead
Priest Rapids Dam	87	44	144	208	3272	8920
Priest Rapids Hatchery	0	4	21	2	2	7
Wells Dam	58	20	58	62	1923	5817

Facility	SR Sockeye	SR Sp/Su Chinook	SR Fall Chinook	SRB Steelhead	UCR Spring Chinook	UCR Steelhead
Wells Hatchery	2	5	13	3	288	211
Rocky Reach Bypass	0	1	0	8	9	1391
Chief Joe Hatchery	2	7	0	0	0	0
Okanogan Instream	1	0	26	7	79	942
Ringold Hatchery	0	5	3	2	0	66
Tumwater Dam	0	1	0	1	1073	2225
Wenatchee upper	2	2	0	4	201	1611
Entiat Hatchery	0	0	0	0	8	58

Adult SR sockeye salmon are not known to use the action area for spawning, but a fraction of returning adults have been detected at collection facilities within the action area. The percent of these adults in the action area is usually low (1-3%), but in recent years a higher proportion (7-19%) of SR sockeye salmon have strayed above Wells Dam and into the action area (NMFS 2025). The SR sockeye salmon is at a high risk of extinction as a result of habitat degradation, impaired passage, fisheries, historical chemical treatment, and poor ocean conditions. The decline in abundances has now become the major limiting factor and leaves the species vulnerable to catastrophic loss; it also creates risks to genetic diversity (BOR 2024a). No adult SR sockeye salmon have been detected returning to natal spawning areas after passing Wells Dam into the action area, and there are no SR sockeye juveniles known to exist in the action area.

Adult SR fall-run Chinook salmon typically migrate between late August and early December, with the peak occurring in early September to mid-October. The number of individual SR fall-run Chinook salmon straying into the action area is low and consistent with natural stray rates for Chinook salmon with an average of 5 PIT-tag detections per year, which represents 0.4% of the ESU passing McNary Dam (NMFS 2025). Primary threats to SR fall-run Chinook salmon include hydropower development, water withdrawal and diversions, water storage, relatively high harvest rates, high levels of hatchery origin spawners, and habitat availability. Despite climate challenges, the total returns of adult SR fall-run Chinook salmon to natal spawning areas increased steadily from the mid-1990s to the 2010s. From 2010 to 2019, 10-year geometric mean of natural origin spawners was 9,034, which is well above the minimum abundance threshold of 3,000 natural origin spawners set forth in the recovery plan (NMFS 2017f, Ford 2022). While the ESU, as a whole, rates as "viable," it was rated at moderate risk for spatial structure and diversity reflecting concerns with the high levels of hatchery-origin spawners in natural spawning areas (Ford 2022). No adult SR fall-run Chinook salmon have been detected returning to natal spawning areas after entering the action area, and there are no juvenile SR fall-run Chinook salmon in the action area.

Adult SR spring/summer-run Chinook salmon destined for the Snake River return to the Columbia River from the ocean in early spring and pass-through Bonneville Dam from early March to late July. Snake River spring/summer-run Chinook salmon hold in deep pools within the main stem Columbia and Snake rivers and the lower ends of spawning tributaries until late summer and spawn from September through October. The current primary threats to this ESU include degraded tributary habitat, the influence of hatchery fish, hydropower systems, toxic contamination, increased predation by nonnative species, and effects due to climate change. The number of individual SR spring/summer-run Chinook straying into the action area is very low with only an average of 1.6 PIT-tagged fish detected at Wells Dam annually. This represents less than 0.1 % of the ESU migrating through McNary Dam, and none of these PIT-tag-detected fish have been detected subsequently entering the Snake River to spawn (NMFS 2025). There are no SR spring/summer run Chinook juveniles known to exist in the action area.

The UCR spring-run Chinook salmon ESU includes naturally spawned spring-run Chinook salmon originating from Columbia River tributaries downstream of Chief Joseph Dam, excluding the Okanogan River subbasin. The UCR spring-run Chinook salmon from the Chief Joseph Spring Chinook Hatchery Program (Okanogan release) and artificial propagation programs from the Methow Program (NMFS 2022) also comprise the ESU. Adults begin returning from the ocean in the early spring, with the run continuing into the Columbia River mouth through mid-May. The UCR spring-run Chinook salmon enter the UCR tributaries from April through July, holding until spawning in late August through September. Juveniles have a stream-type life history strategy and typically spend a year in fresh water before migrating to the Pacific Ocean in April-June. The UCR spring-run Chinook salmon continue to face pressures in the action area from degraded habitat, increasing temperatures, predation, and harvest. Degraded habitat conditions include simplified stream channels, disconnected floodplains, impaired instream flows, loss of cold-water refugia, and the operation of federal and non-federal dams. Existing dams and other barriers continue to impede access to habitat for rearing and spawning, including in the blocked area.

The UCR spring-run Chinook utilize the mainstem portions of the action area below Chief Joseph Dam primarily for migration during juvenile and adult life stages. The capturing, handling, and releasing of UCR spring-run Chinook salmon for research purposes and hatchery related activities leads to stress, injury, and occasional mortality. The majority of adult UCR spring-run Chinook salmon will migrate through the collection facilities within the action area prior to collection for P2IP occurring (NMFS 2025). Current management and associated consultations such as TRMP and the summer/fall Chinook hatchery programs are intentionally designed to reduce encounters and cover take associated with the capture and handling of adult UCR spring-run Chinook salmon by adjusting collection timing to further avoid impacts (NMFS 2017a; NMFS 2017b).

Adult SRB steelhead use the action area for overwintering. Adult SRB steelhead generally spend 1-3 years in the ocean and return to the Columbia River between May and September to spawn. This species is capable of returning to the ocean and spawning more than once. Some individual adult SRB steelhead overshoot the Snake River and overwinter in reservoirs within the action area prior to reaching reproductive maturity and continuing to natal streams to spawn. Overwintering outside of natal spawning areas is typical for steelhead, and PIT-tagged SRB

steelhead have been detected returning to the Snake River after overwintering in the upper Columbia River. An average of six PIT-tagged SRB steelhead have been detected within the action area at Wells Dam annually, which represents approximately 0.7% of the DPS. The threats to the SRB steelhead in the action area are primarily due to harvest, hydrosystem impacts, and capture and handling effects. There are no Snake River steelhead juveniles known to exist in the action area.

The UCR steelhead includes naturally spawned steelhead that originate below impassible barriers in the upper Columbia River. The DPS also includes steelhead from five artificial propagation programs. UCR steelhead return to the Columbia River beginning in May, with primary passage occurring in the summer months from July through September. The action area overlaps with UCR steelhead critical habitat, and UCR steelhead are present within the action area continuously. Adult UCR steelhead utilize the mainstem habitat within the action area below Chief Joseph Dam primarily for migration, overwintering, and rearing. A portion of the returning adults overwinter in mainstem Columbia River reservoirs, moving to tributaries to spawn through the late spring. Juvenile UCR steelhead generally spend 1 to 3 years rearing in fresh water before migrating to the ocean April through July. Most adult UCR steelhead return to the Upper Columbia after 1 or 2 years at sea. UCR steelhead may exhibit multiple spawning cycles. Factors contributing to the decline of the UCR steelhead in the action area include predation and competition, blocked access to historical habitat, habitat degradation, hatchery practices, and urbanization. Threats broadly include overfishing, loss of freshwater and estuarine habitat, hydropower development, and climate change. UCR steelhead face barriers from hydropower dams throughout the Columbia River Basin and may benefit substantially from increased passage.

2.5 Effects of the Action to ESA-listed Species

Under the ESA, "effects of the action" are all consequences to listed species that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action but that are not part of the action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (see 50 CFR 402.02). An assessment of the effects of the proposed action to ESA-listed species are included in the BA. NMFS has evaluated these sections, agrees with their content, and adopts these sections here (50 CFR 402.14(h)(3)).

2.5.1 Effects to ESA-listed Species from Telemetry Studies

Telemetry equipment would be installed, operated, and maintained throughout the action area, primarily within the blocked area. An active tag array will likely be installed directly below Chief Joseph Dam. ESA-listed salmon and steelhead may be present below Chief Joseph Dam when the array is installed, operated, and maintained; however, no spawning is known to occur for ESA-listed fish in the immediate placement area. The array will be anchored with cables and will cover a cross section of the river. The installation and maintenance of a telemetry array has the potential to cause some initial disturbance and stress to fish from boat noise, vibration, and the potential introduction of contaminants. Installation of anchored submersible receivers is likely to cause temporary increases in suspended sediment and turbidity in the immediate area of

the anchor. However, we expect effects from the installation and maintenance of telemetry equipment to be temporary and minimal as the installation and maintenance will occur for a brief period over a relatively small area of the river, when very few individual ESA-listed salmon and steelhead are present in the immediate vicinity.

2.5.2 Effects to ESA-listed Species from Fish-Rearing and Acclimation Facilities

The proposed action would use existing artificial production facilities and net pens, upgrades to existing facilities, development of new net pen locations, and two new acclimation facilities. There is the potential that some ESA-listed Chinook and sockeye salmon could, inadvertently, be transported to an artificial production facility and endure injury and potential mortality from artificial rearing activities. Collection timing will remain consistent with current consultations (e.g., NMFS 2017a; 2017b) that intend to avoid or minimize interactions with ESA-listed salmon that might enter the hatchery ladder and adult holding facilities where they would be sorted, tallied, and promptly released.

Juvenile fishes released in the blocked area may interact with juvenile UCR spring-run Chinook salmon and UCR steelhead below Chief Joseph Dam. There would be a potential effect for competition and the spread of disease and pathogens to both juvenile and adult life stages. The spread of disease and pathogens would be reduced by spreading the rearing and release locations throughout the action area. Facility operators will frequently monitor and inspect fish and water quality to prevent disease transmission. Project Proponents would continue to implement the Salmonid Disease Control Policy of the Fisheries Co-managers of Washington State and Pacific Northwest Fish Health Protection Committee Guidelines (PNFHPC 2007) to minimize the risk of fish disease amplification or transfer and to ensure that artificially propagated fish are released in good health (BOR 2024a). Given the current large number of hatchery produced juveniles released into the Columbia River, with minimal competition and disease related effects on naturally produced fishes, the potential risk posed by competition or disease stemming from P2IP facilities are likely to be extremely small. This risk is further reduced because any diseased fishes released upstream of Chief Joseph Dam are likely to be consumed by predators before they reach the Chief Joseph Dam tailrace. Based on these considerations, we expect any effects to juvenile UCR spring-run Chinook salmon or steelhead in the action area downstream of Chief Joseph Dam are highly unlikely to occur as a result of P2IP fish hatcheries and acclimation facilities.

2.5.3 Effects to ESA-listed Species from Interim Fish Passage

Research activities for the purpose of P2IP will require non-listed adult Upper Columbia summer/fall Chinook and sockeye salmon to be captured and transported to the blocked area annually. As described in the BA (BOR 2024a), existing consultations (e.g., NMFS 2017a; 2017b) consider impacts to ESA-listed salmon and steelhead associated with the capture and handling of surplus fish at these facilities. P2IP activities include a continuation of capture activities including: trapping at existing fish facilities, seining, fyke netting, and hook and line. The existing facilities where handling and transport of P2IP fish may occur include: Chief Joseph Hatchery, Entiat National Fish Hatchery, Chelan Falls Hatchery, Rocky Reach Juvenile Fish Bypass, Priest Rapids Hatchery, Ringold Springs Hatchery, Wells Dam Hatchery, Tumwater Dam, and the Wenatchee River Hatcheries. Section 1.3.5 of this opinion and Appendix A of the

BA contain EPM's proposed to further reduce impacts to ESA-listed fishes, such as immediate removal, sorting, protective gear, and transport protocols.

The initial interim upstream passage strategy would be a trap-and-transport program from existing facilities below Chief Joseph Dam. There is the potential for adult ESA-listed salmon and steelhead to be encountered during interim adult trapping efforts that occur downstream of Chief Joseph Dam. Fish may endure handling activities, including the collection of adults, and sorting according to their juvenile release location determined by the PIT-tag or other mark. Some fish would endure increased stress, injury, and potential mortality from handling, sorting, and tagging activities for the purpose of P2IP. Action agencies and project proponents would continue to follow existing protocols and environmental compliance from projects used in the current program. Additionally, a disposition plan would be developed with NMFS to determine the specific fate of the fish captured, including the potential capture of adult ESA-listed salmon and steelhead. We discuss the effects to each ESA-listed species from interim fish passage separately.

The proposed action intends to capture a maximum of 15,000 UCR summer/fall Chinook salmon annually, assuming full capability is met. An average of 125,119 UCR summer/fall Chinook salmon are available annually based on average Priest Rapids Dam counts in the last twelve years (range 58,000-335,000). Based on this, an average of 12% of UCR summer/fall Chinook salmon may be transported annually for P2IP ((15,000/125,000) x 100 = 12%). This 12% collection and transport rate is used in our analysis to quantify the unintentional collection of ESA-listed Chinook salmon and steelhead species in sections below.

An average of 303,000 sockeye salmon have been counted annually at Priest Rapids Dam in the last twelve years (range 67,000-700,000). The proposed action intends to capture a maximum of 15,000 sockeye salmon, assuming full capability is met. Annually, this number would equate to an average capture rate of 5% of the total run of UCR sockeye salmon ((15,000/303,000) x 100 = 5%). This 5% collection and transport rate is used in our analysis to conservatively quantify the unintentional collection of ESA-listed SR sockeye. There are no listed sockeye salmon ESU's in the upper Columbia River, but some individual straying SR sockeye salmon could be affected.

Conservatively, a small proportion (less than 1%) of ESA-listed adult Chinook salmon or sockeye salmon could be unintentionally transported to the blocked area because some may not be distinguishable from target surplus fish. The handling and transport of adults could cause stress, injury, and mortality to individuals. Low mortality rates are observed in modern trap and haul operations even during relatively high temperatures (NMFS 2016a), however the increased likelihood of stress, injury, and mortality from transport is unavoidable.

Any transported ESA-listed adult Chinook salmon or sockeye salmon will not likely return to natal spawning areas, so spawning success will be limited to blocked area spawning for those individuals. Based on PIT-tag detections, in the last 12 years, no individuals from any ESA-listed Snake River salmon ESU that passed Wells Dam have ever been detected returning to Lower Granite Dam and natal tributaries or hatcheries (NMFS 2025). Therefore, unintentionally transporting individuals from a Snake River salmon ESU will have zero to minimal effect at the population level because there is no evidence that these stray individuals would have spawned within natal spawning areas after passing Wells Dam. Further, removing Snake River origin fish

would reduce the potential for spawning with Upper Columbia fish stocks, further reducing the potential for genetic introgression from these straying adults. Some adult SRB steelhead have returned to spawn; however, for P2IP, all steelhead will be released immediately and no steelhead will be transported to the blocked area. The effects of capture, handling, and transport to ESA-listed salmon and steelhead are assessed by individual species in the sections below.

2.5.3.1 Effects to Snake River fall-run Chinook from Interim Fish Passage

Juvenile SR fall-run Chinook salmon would not be affected by interim fish passage because they are not present in the action area.

There will be no intentional tagging or transport of adult SR fall-run Chinook salmon; therefore, the effects described from research tagging activities would not affect most individuals. However, some SR fall-run Chinook salmon could be misidentified, handled, and transported as a target UCR summer/fall-run Chinook salmon, and there would be potential for Snake River fall-run Chinook salmon to be affected during handling and transport operations. These effects could result in increased stress and the potential for injury and mortality of individuals. However, we expect this probability to be low as the potential effect would be limited by the relatively low likelihood that those fish would be present at the proposed capture facilities during trapping.

An average of 12 PIT-tagged adult SR fall-run Chinook salmon have been detected at Priest Rapids Dam annually from 2013-2024. This represents an average of 1.0% of the PIT-tagged SR fall-run Chinook salmon return passing McNary Dam. The number of adult SR fall-run Chinook salmon potentially encountered by P2IP in the action area will be 5760 adults over a 12-year period (12 PIT-tag detected adults over 12 years x 40 individuals represented per tag = 5760 individuals). Based on this analysis, an average of approximately 480 adult SR fall-run Chinook salmon (tagged and untagged) are expected to migrate through Priest Rapids Dam annually (5760/12 years = 480). With a maximum Chinook salmon capture rate of 12%, we expect 58 SR fall Chinook adults could be captured and potentially transported to the action area annually (12% of 480 = 57.6, rounded up to 58). This total will be lower if facilities upstream are used to collect fish. This represents 0.17% of the total ESU counted at Ice Harbor Dam annually. The actual number of SR fall-run Chinook salmon captured will likely be much lower because most study fish will be captured before the SR fall-run Chinook salmon run, and many will be captured at facilities upstream of Priest Rapids Dam, which have lower SR fall-run Chinook salmon encounter rates.

Snake River fall-run Chinook salmon enter the action area in late August to early December. EPMs and P2IP design features would reduce the effects on Chinook salmon from the proposed activities; however, there would still be a potential for injury and mortality on individuals from the proposed activities. We expect the effect of this to be very low since there is no evidence that a SR fall-run Chinook salmon entering the action area return to spawn in the Snake River (NMFS 2025), the EPM's will provide adequate protection, and the probability of encountering SR fall-run Chinook salmon is low.

2.5.3.2 Effects to Snake River Spring/Summer-run Chinook from Interim Fish Passage

Juvenile SR spring/summer-run Chinook salmon would not be affected by interim fish passage because they are not present in the action area.

A few adult PIT-tagged SR spring/summer-run Chinook salmon have been present within the action area. Based on PIT-tag detections at McNary Dan and Wells Dam from 2013-2024, the annual percentage of SR spring/summer-run Chinook salmon above Wells Dam averages 0.15% and ranges 0.0-0.6% annually (NMFS 2025).

Adult SR spring/summer-run Chinook salmon have been present at several of the proposed adult collection facilities. In all years between 2013- 2024, PIT-tagged adult SR spring/summer-run Chinook salmon have been detected at P2IP proposed collection facilities. In the last twelve migration years, these include the following individual detections: Priest Rapids Dam (44), Priest Rapids Hatchery (4) Wells Dam (20), Wells Hatchery (5) Chief Joseph Hatchery (7), Rocky Reach Bypass (1), Tumwater Dam (1) and Ringold Hatchery (5). Based on PIT-tag detection to count ratios at Lower Granite Dam (NMFS 2025), each one of these is expected to represent approximately 50 adult SR spring/summer-run Chinook individuals.

The probability of encountering adult SR spring/summer-run Chinook salmon is low. Priest Rapids Dam has the highest likelihood of encountering individuals from this ESU. Using the proposed collection dates to help avoid interactions with ESA-listed species, the number of adult SR spring/summer-run Chinook salmon potentially encountered by P2IP in the action area will be reduced to an average of 2030 adults over a 12-year period (35 PIT-tag detected adults over 12 years after the harvest management transition date x 58 individuals represented per tag = 2030 individuals over a 12-year period). Based on this analysis, an average of approximately 170 adult SR spring/summer-run Chinook salmon (tagged and untagged) are expected to migrate through Priest Rapids Dam annually after the harvest management transition date (2030 adults over 12 years ÷ 12 years = 169.1, rounded up to 170). These adults represent 0.32% of the ESU based on SR spring/summer-run Chinook adults detected at McNary Dam.

Based on a non-listed Upper Columbia summer/fall Chinook salmon collection goal of 15,000 adults annually, and a 12% collection rate to meet that goal, we would expect that 21 adult SR spring/summer-run Chinook salmon may be misidentified as target fish and transported to the blocked area annually (12% of 170 adults expected above Priest Rapids Dam annually = 21). This number could be lower as many P2IP target fish will be collected consistent with current ESA consultations that have later collection dates (i.e., avoid the time of year when ESA-listed salmon may be in the action area [e.g., NMFS 2017a; 2017b]) and will occur at upstream facilities where encounters with adult SR spring/summer-run Chinook salmon are much lower. Additionally, many adult SR spring/summer-run Chinook salmon may be excluded as non-target fish by PIT-tag presence or morphological traits (e.g., further developed secondary sexual characteristics).

To further avoid the run-timing of SR spring/summer-run Chinook salmon fish collection will be consistent with existing ongoing ESA consultations. All efforts to correctly identify target fish will be made and only the fish misidentified as P2IP target fish will be transported and potentially affected by interim fish passage. Fin clips will be taken for genetic analysis and

results from these analyses may be used to adaptively manage P2IP for the purposes of avoiding adverse effects to all ESA-listed salmon and steelhead. In years 2013-2024, there is no evidence that PIT-tagged SR spring/summer-run Chinook salmon encountered at P2IP facilities have subsequently been detected migrating up the Snake River to spawn (NMFS 2025).

2.5.3.3 Effects to Upper Columbia Spring-run Chinook from Interim Fish Passage

A very small number of juvenile UCR spring-run Chinook could be captured in activities targeting salmon for blocked area introduction. The effects of collection activities on juvenile UCR spring-run Chinook juveniles are covered under separate consultations (BOR 2024a).

Adult UCR spring-run Chinook salmon may be collected and handled during the proposed efforts to collect and transport up to 15,000 non-listed Upper Columbia summer/fall Chinook salmon annually. The Upper Columbia River spring-run Chinook salmon enter the Upper Columbia River tributaries from April through July. The collection of UCR summer/fall Chinook and UC sockeye, for the purpose of P2IP, will begin after harvest management spring/summer run transition dates at each facility, and will be consistent with completed ESA consultations, although known source PIT-tagged fish originating in the blocked area will be collected and transported prior to the spring/summer harvest management transition dates.

Based on PIT-tag detections, and assuming they represent behavior of all fish within the ESU, an average of 27.4% of UCR spring-run Chinook will pass Priest Rapids Dam after June 14. Collection facilities do not encounter 100% of the run and are not typically operated continuously, so the portion of fish handled will be greatly reduced. Further, completed consultations require later summer/fall Chinook salmon collection dates to avoid impacts to UCR spring-run Chinook salmon (NMFS 2017a; 2017b). Some of the captured UCR spring-run Chinook will also be identified as non-targeted fish using morphological characteristics, tags, or marks, and released back to the river with minimal handling.

The probability of capturing a UCR spring-run Chinook varies greatly within the action area depending on the facility and time of year. Some UCR spring-run Chinook may not be correctly identified due to similar run timing and a lack of distinguishing characteristics such as morphology, tag, or fin clip. This could lead to some UCR spring-run Chinook being transported to the blocked area unintentionally. Transport into the blocked area, hatcheries, and acclimation facilities would cause stress, injuries, or even mortalities to individuals.

All efforts to identify non-targeted fish by tag, run type, and adipose fin clip will be made to avoid the possibility of unintentionally transporting non-targeted ESU's. Genetics will be taken from a sample of tagged and transported fish and can be used to determine how frequently ESA listed fish are handled for the purposes of P2IP. The release of non-target fish from active collection facilities and the daily monitoring of non-target fish at passive collection facilities, would reduce or minimize these effects. Priest Rapids Dam has the highest likelihood of encountering individuals from this ESU. The collection of UCR summer/fall Chinook and UC sockeye for the purpose of P2IP will begin after harvest management spring/summer-run transition dates at each facility, will be consistent with ongoing consultations, and collection may be adjusted further to avoid UCR spring/run Chinook run timing (BOR 2024a).

Some transported UCR spring-run Chinook adults could experience mortality even using EPM's. The risk of incidental adverse effects on individual Upper Columbia River spring-run Chinook salmon during collection can be minimized but cannot be eliminated. P2IP activities are only expected to inadvertently collect and transport some non-target UCR spring-run Chinook adults and release these fish to sites upstream Chief Joseph Dam resulting in the likely loss of these individuals to the ESU as it is unlikely that they would pass back downstream to spawn in their natal areas. Because P2IP only intends to use surplus fish collected consistent with completed consultations, the effects on collected adult UCR spring-run Chinook adults are considered under separate consultations (NMFS 2017a; 2017b).

Adaptive management of capture timing, and EPM's would reduce the effects on the UCR spring-run Chinook salmon from the proposed activities; however, there would still be a potential for injury and mortality on individuals. Research studies would allow for a better understanding of salmon migration behaviors and habitat utilization, and would help to assess the effectiveness of hatchery programs. Adaptive management will reduce capture activities that interact with facilities with higher UCR spring-run Chinook encounter rates during peak migration. Capture reports, genetics, and tag data will inform adaptive management of these risks.

2.5.3.4 Effects to Snake River Sockeye from Interim Fish Passage

Juvenile SR sockeye salmon would not be affected by interim fish passage because they are not present in the action area.

Adult SR sockeye salmon detections at Wells Dam suggest a relatively small fraction of the total adult returns may use the action area. Based on PIT-tag detections at McNary and Wells Dams from 2013-2024, the percentage of stray adult SR sockeye salmon above Wells Dam averages 6.5% and ranges 0.0-18.7% annually. The spawning success of these stray adults is unknown, but based on PIT-tag detections, they are not subsequently detected at dams in the Lower Snake River, which strongly indicates they are not returning to the Upper Salmon River Basin to spawn in their natal stream (NMFS 2025). For this reason, spawning success of these stray adult SR sockeye salmon is extremely unlikely.

Adult SR sockeye salmon have been present at some proposed adult collection facilities within the action area. While a few adults have been detected at most of these facilities, P2IP will focus on the collection of non-listed Upper Columbia summer/fall Chinook and sockeye salmon and will intend to avoid interactions with SR sockeye salmon. Further, surplus fish will only be captured consistent with existing ESA consultations. Only the fish that cannot be correctly identified as P2IP-targeted fish will be transported and, thus, potentially affected by this action. All efforts to correctly identify target fish will be made to avoid this effect. Any previously PIT-tagged SR sockeye salmon will be immediately released unharmed. Fin clips for genetic analysis will be taken from adult SR sockeye salmon and results from these analyses may be used to adaptively manage P2IP for the purposes of avoiding adverse effects to all ESA-listed salmon and steelhead. Adult SR sockeye salmon unintentionally transported into the blocked area will be unable to spawn in natal spawning areas and will be unable to contribute to the ESU.

Priest Rapids Dam has the highest likelihood of encountering individuals from this ESU. A total of 87 SR sockeye salmon have been detected at Priest Rapids Dam over 12 years from 2013-2024. Based on a PIT-tagging rate of 16.8% (Peterson 2015), we expect, on average, that 43 tagged and untagged adult SR sockeye salmon will be available for capture annually (87 PIT-tag detected adults x 6 individuals represented per tag / 12 years = 43 individuals). With a sockeye capture rate of 5%, we expect up to 3 adult SR sockeye salmon could be captured annually and potentially misidentified as a target fish and transported to the action area. This represents less than 0.5% of the SR sockeye salmon estimated to pass McNary Dam. Collection activities occurring at upstream facilities would be expected to have an even smaller proportional effect given the lower historical presence of PIT-tagged SR sockeye. This effect is minimal at the population level since there is no evidence that any SR sockeye salmon migrating above Wells Dam and into the action area would have successfully spawned in their natal stream (NMFS 2025).

2.5.3.5 Effects to Snake River Basin Steelhead from Interim Fish Passage

Juvenile SRB steelhead would not be affected by interim fish passage because they are not present in the action area.

Low numbers of adult SRB steelhead migrate into the action area and use the Upper Columbia River up to Chief Joseph Dam to overwinter. Based on PIT-tag detections, an average of 0.7% of PIT-tagged SRB steelhead migrated above Wells Dam annually since 2013. Annually, an average of 18 SRB steelhead are detected at Priest Rapids Dam in the last 12 years. The annual average of 18 SRB steelhead detected at Priest Rapids Dam represent 1,500 individuals based on PIT-tag detection/adult count ratios observed at Ice Harbor Dam from 2013-2024. Adult SRB steelhead entering the action area may encounter up to a 12% UCR summer/fall collection rate. Annually 180 adult SRB steelhead (1,500 * 0.12) may be collected, handled, and released annually.

There is evidence that at least a portion of SRB steelhead overwintering in the action area return to the Snake River to spawn. Steelhead will not be transported into the blocked area, and any steelhead captured will be released back to the river unharmed as soon as possible. A very low proportion of steelhead may be harmed or killed by handling and release activities. We expect the number of SRB steelhead injured or killed by handling activities will be low (less than 0.3% [0-5] individuals annually) based on past salmon and steelhead capture activities in the Columbia Basin. The installation of the telemetry array below Chief Joseph Dam will have no effect on SRB steelhead.

2.5.3.6 Effects to Upper Columbia River Steelhead from Interim Fish Passage

A very small number of juvenile UCR steelhead could be captured in activities targeting juveniles for blocked area introduction. The effects of capture and handling for the purposes of P2IP are covered under separate consultations (BOR 2024a).

There would be the potential for adult UCR steelhead to be encountered during interim adult trapping efforts downstream of Chief Joseph Dam. While steelhead will not be targeted for transport, this species could endure increased stress, injury, or mortality from holding and

handling. These effects to collected adult steelhead are considered under separate consultations (BOR 2024a). The probability of capturing an adult UCR steelhead within the action area is variable; high numbers are present depending on the facility and the time of year. The EPMs will be followed under the current program so capture and handling effects 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.

An action reasonably certain to occur within the action area with the potential to affect UCR, SR spring/summer-run, SR fall-run Chinook salmon, SR sockeye salmon, and UCR and SRB steelhead includes the Colville Confederated Tribes Wireless, Middle Mile and Fiber to the Home Project, which would require new road development and construction of new towers and fiber cables. Construction of new roads could cause a new source of sediment to streams, which could impact water quality; this would indirectly affect fish, as described above under Effects from Interim Fish Passage. These activities would increase soil disturbance and changes in water quality in the blocked area, but are unlikely to affect water quality below the blocked area.

The current Coeur d'Alene Tribe nikwin Hatchery project is an artificial production facility that is used to rear juvenile UCR summer/fall Chinook from fertilized egg through yearling life stages. This facility is also currently used to mark juvenile UCR summer/fall Chinook salmon with PIT-tags and acoustic transponders that are used for survival and behavioral studies. These uses would be expected to continue over the entire 20-year P2IP time frame. This could cause additional effects, such as stress and injury or mortality to fish species, as described above. No construction actions or modifications to existing infrastructure are planned for this hatchery to accommodate artificial production.

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 earlier in the discussion of environmental baseline (Section 2.4). We note here that the reintroduction of salmon to areas upstream of Chief Joseph Dam and Grand Coulee Dam would allow fish access to habitat that would be the most resilient to the climate change effects expected over the next 80 years.

2.7 Integration and Synthesis

The Integration and Synthesis section is the final step in assessing the risk that the proposed action poses to ESA-listed species. 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 rangewide status of the species (Section 2.2), to formulate the agency's opinion as to

whether the proposed action is likely to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing its numbers, reproduction, or distribution. Habitat in the action area is highly degraded, primarily as a result of operation of the federal and non-federal dams on the Columbia River that has transformed the action area from a free-flowing river into a series of reservoirs with slower-moving water, an altered thermal regime, and an abundance of native and non-native predators of juvenile salmonids. Water management activities have reduced flows in the Columbia River, measured at Bonneville Dam, from April through July and hydrosystem operations have decreased the delivery of sediment to the lower river and estuary by more than 50 percent. The overall reduction in sediment, combined with bank armoring and in-water structures that focus flow in the navigation channel, has reduced the availability of shallow water habitat along the margins of the Columbia River. Further, climate change has likely contributed to an increase in summer temperature in the Columbia Basin, and high temperatures impact survival and spawning success of migrating ESA-listed salmon and steelhead.

The status of the ESA-listed salmon and steelhead subject to this opinion remains unchanged from the most recent 5-Year Reviews completed in 2022. UCR spring-run Chinook salmon and SR sockeye salmon remain endangered under the ESA. The SR spring/summer-run and fall-run Chinook salmon and UCR and SRB steelhead remain threatened under the ESA. This is largely due to a combination of effects in their natal systems (e.g., water diversions, riparian habitat loss, loss of flood plain connectivity, high stream temperatures, embedded gravels, hatchery programs, and tribal and recreational fisheries) and of the existence and operation of the federal and non-federal dams on Columbia River impairing habitat throughout the Columbia River Basin.

During P2IP interim fish passage activities, we expect very few adults from each ESA-listed ESU and DPS will be collected, handled, and released to the river. Low proportions of SR fall-run, SR spring/summer-run, and UCR spring-run Chinook salmon or SR sockeye salmon may be misidentified as target fish, handled, tagged, and transported to the blocked area. These fish would incur injury or mortality from transport and release and would be unlikely to migrate downstream through Chief Joseph and Grand Coulee dams to spawn in their natal habitat. We expect these adverse effects to occur to a very few ESA-listed Chinook and sockeye salmon, given the relatively low historic encounter rates, high transport survival rates, and proposed conservation measures. Starting collection of P2IP targeted fish after the existing consultation or harvest management transition collection dates will further help avoid interactions with ESA-listed species.

A small number of juvenile UCR spring-run Chinook and UCR steelhead could be captured in activities targeting salmon for blocked area introduction. As previously noted, collection of any juvenile ESA-listed salmon or steelhead will occur at hatcheries covered by existing opinions. In addition, some juvenile UCR steelhead and UCR spring-run Chinook salmon could be displaced when installing and maintaining acoustic telemetry arrays. We expect effects to juveniles from the installation and maintenance of telemetry equipment to be temporary and minimal as the installation and maintenance will occur for a brief period over a relatively small area of the river, during a time when very few individual ESA-listed salmon and steelhead are present in the immediate vicinity.

Cumulative effects include ongoing climate change which is expected to cause a slight degradation of habitat conditions in the action area over the coming decades. Some continuing non-federal activities are reasonably certain to contribute to climate effects within the action area. The Colville Confederated Tribes National Telecommunications and Information Administration 2.5 GHZ Wireless Projects, would require new road development and construction within the blocked area.

We do not expect a reduction in overall abundance and productivity values for any of the individual populations affected nor do we expect the proposed action to alter the trajectory toward recovery for any ESU or DPS. The very small number of adults injured, displaced, or killed by activities for the purpose of P2IP will not appreciably reduce the survival and recovery of any of the ESA-listed species addressed in this opinion.

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, the effects of other activities caused by the proposed action, and the cumulative effects, it is NMFS' biological opinion that the proposed action is not likely to jeopardize the continued existence of SR fall-run, SR spring/summer-run, and UCR spring-run Chinook salmon, SR sockeye salmon, and SRB and UCR steelhead.

2.9 Incidental Take Statement

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

2.9.1 Amount or Extent of Take

In the opinion, NMFS determined that incidental take is reasonably certain to occur to ESA-listed salmon and steelhead as follows:

Adult SR fall-run Chinook salmon may incur injury or death from handling and transport activities for the purpose of P2IP. In Section 2.5.3.1 of our opinion, we calculated that an average of 58 adults may be captured annually, and a portion of these may be injured or killed.

Adult SR spring/summer-run Chinook salmon may incur injury or death from handling and transport activities for the purpose of P2IP. In Section 2.5.3.2 of our opinion, we calculated that an average of 21 adults may be captured annually, and a portion of these may be injured, or killed.

Adult SR sockeye salmon may incur injury or death from handling and transport activities for the purpose of P2IP. In Section 2.5.3.4 of our opinion, we calculated that an average of 3 adults may be caught annually. Some adult SR sockeye salmon will be identified as previously tagged and released immediately while others may be transported and/or injured or killed.

Adult SRB steelhead may incur injury or death from capture and handling activities for the purpose of P2IP. In Section 2.5.3.5 of our opinion, we calculated that an average of 180 adults may be captured and released annually. In the process of handling, some of these fish could be delayed, stressed, or injured. Of those 180 fish, we estimate that up to 5 adult SRB steelhead per year could be killed.

2.9.2 Effect of the Take

In the biological 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

"Reasonable and prudent measures" (RPMs) refer to those actions the Director considers necessary or appropriate to minimize the impact of the incidental take on the species (50 CFR 402.02). NMFS believes that the following RPMs are necessary and appropriate.

The action agencies shall:

1. Minimize incidental take of non-target, ESA-listed fish from collection, handling, transportation, and release of ESA-listed fish.

2. Monitor the implementation of the P2IP to ensure that it is carried out in the manner described in the BA (BOR 2024a) and that the extent of take is not exceeded.

2.9.4 Terms and Conditions

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

1. To implement RPM 1 (minimize take), the action agencies shall:

   a. In coordination with NMFS (see 2b below), adaptively manage the Environmental Protection Measures that serve as conservation measures found in Section 2.1.5 and described in more detail in Appendix A of the BA (BOR 2024a) during implementation of the P2IP and reduce environmental impacts that were not anticipated in the BA as necessary and feasible.

   b. As explained in the BA (BOR 2024a) and this opinion, P2IP activities will comply with the sampling requirements and collection timing imposed at specific facilities and activities described in this opinion and covered by existing NMFS biological opinions to reduce encounters with ESA-listed fish. If these collection dates result in unexpected take, the collection and transport of fish for the purpose of P2IP will be adjusted, in coordination with NMFS (see 2b below), to avoid more effectively encounters with ESA-listed species.

2. To implement RPM 2 (monitoring and reporting), the action agencies shall:

   a. Submit a project joint report annually by April 1st to the NMFS Portland office by email (icbo.consultations@noaa.gov), using the NMFS tracking number WCRO-2024-02940 and "Annual P2IP Project Report" in the subject line. The annual report shall include, at a minimum, the following:

      i. A list of all PIT-tag detections of ESA-listed species encountered while conducting P2IP collection activities and any known fate (i.e., released unharmed, injured, mortality, etc.)

      ii. A list of the number of Chinook and sockeye salmon included in P2IP studies.

      iii. Report any salmon or steelhead that were collected below the blocked area that were handled and considered for P2IP, but were rejected specifically because of morphological characteristics or identifying marks indicating they may not be a target fish for P2IP.

      iv. Provide results of all genetic analyses with information on ESA-listed fish encountered, as available.

   b. Meet with NMFS annually at least once within the April 15-May 31 timeframe to discuss the results of the annual report, develop the disposition plan, and adaptively manage and improve the Environmental Protection Measures, as necessary.

   c. Stop project activities and notify NMFS immediately by email (icbo.consultations@noaa.gov), using the NMFS tracking number WCRO-2024-02940 and "Take Exceeded" in the subject line, if the amount or extent of take is exceeded.

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 ESA-listed species or regarding the development of information (50 CFR 402.02). The following conservation recommendations are discretionary measures that NMFS believes are consistent with this obligation and therefore should be carried out by the federal action agency:

1. Continue to work collaboratively with NMFS and regional partners to design and develop fish passage structures and operations to restore passage into the blocked area.

2. Work collaboratively with NMFS and regional partners to develop methods to reduce predation risk that invasive fish predators (e.g., walleye, northern pike, smallmouth bass) and avian predators (e.g., gull, terns, and cormorants) have on ESA-listed salmonids in the action area.

Please notify NMFS if the action agencies carry out these recommendations so that we will be kept informed of actions that minimize or avoid adverse effects and those that benefit ESA-listed species and their designated critical habitat.

2.11 Reinitiation of Consultation

This concludes formal consultation for the P2IP.

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

Furthermore, the incidental take statement in this biological opinion is predicated upon the use of facilities or activities that have already undergone ESA consultation. Expanding collection activities beyond what is covered in those consultations (e.g., timing, duration, extent) could result in additional take that is not anticipated in this consultation. If this were to occur, it could trigger the need to reinitiate consultation.

3. DATA QUALITY ACT DOCUMENTATION AND PRE-DISSEMINATION REVIEW

The DQA specifies three components contributing to the quality of a document. They are utility, integrity, and objectivity. This section of the opinion addresses these DQA components,

documents compliance with the DQA, and certifies that this opinion has undergone pre-dissemination review.

3.1. Utility

Utility principally refers to ensuring that the information contained in this consultation is helpful, serviceable, and beneficial to the intended users. The intended users of this opinion are the Bureau of Reclamation, the United States Army Corps of Engineers, Bonneville Power Administration, and the United States Fish and Wildlife Service. Individual copies of this opinion were provided to the CTCR, Spokane Tribe of Indians, and Coeur d'Alene Tribe, through and with the assistance from the UCUT. The document will be available within 2 weeks at the NOAA Library Institutional Repository (https://repository.library.noaa.gov/welcome). The format and naming adhere to conventional standards for style.

3.2. Integrity

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

3.3. Objectivity

Information Product Category: Natural Resource Plan

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

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

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

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

4. REFERENCES

Bowerman, T., M. L. Keefer, and C. C. Caudill. 2021. Elevated stream temperature, origin, and individual size influence Chinook salmon prespawn mortality across the Columbia River Basin. Fisheries Research 237:105874.

Bureau of Reclamation (BOR). 2024a. Biological Assessment for the Federal Support for the Phase 2 Implementation Plan Testing the Feasibility of Salmon Reintroduction in the Upper Columbia River Basin. November 2024. 158 pp.

Bureau of Reclamation (BOR). 2024b. Draft Programmatic Environmental Assessment Addressing Federal Support of the Phase 2 Implementation Plan: Testing the Feasibility of Reintroducing Salmon in the Upper Columbia River Basin. November 2024.

Caudill, C. C., M. L. Keefer, T. S. Clabough, G. P. Naughton, B. J. Burke, and C. A. Peery. 2013. Indirect effects of impoundment on migrating fish: temperature gradients in fish ladders slow dam passage by adult Chinook salmon and steelhead. PLOS ONE 8(12): e85586.

Crozier, L. G., A. P. Hendry, P. W. Lawson, T. P. Quinn, N. J. Mantua, J. Battin, R. G. Shaw, and R. B. Huey. 2008. Potential responses to climate change for organisms with complex life histories: evolution and plasticity in Pacific salmon. Evolutionary Applications 1(1):252–270.

Crozier, L., L. Wiesebron, E. Dorfmeier, and B. Burke. 2017. River conditions, fisheries and fish history drive variation in upstream survival and fallback for upper Columbia River spring and Snake River spring/summer Chinook salmon. U.S Department of Commerce, report of research by Fish Ecology Division, Northwest Fisheries Science Center, Seattle, WA. 5/2017.

Crozier, L. G., M. M. McClure, T. Beechie, S. J. Bograd, D. A. Boughton, M. Carr, T. D. Cooney, J. B. Dunham, C. M. Greene, M. A. Haltuch, E. L. Hazen, D. M. Holzer, D. D. Huff, R. C. Johnson, C. E. Jordan, I.C. Kaplan, S. T. Lindley, N. J. Mantua, P. B. Moyle, J. M. Myers, M. W. Nelson, B. C. Spence, L. A. Weitkamp, T. H. Williams, and E. Willis-Norton. 2019. Climate vulnerability assessment for Pacific salmon and steelhead in the California Current Large Marine Ecosystem: PLoS ONE, https://doi.org/10.1371/journal.pone.0217711.

Crozier, L. G., J. E. Siegel, L. E. Wiesebron, E. M. Trujillo, B. J. Burke, B. P. Sandford, and D. L. Widener. 2020. Snake River sockeye and Chinook salmon in a changing climate: Implications for upstream migration survival during recent extreme and future climates. PLoS ONE 15(9): e0238886. https:// journals.plos.org/plosone/article?id=10.1371/journal.pone.0238886.

Crozier, L. G., B. J. Burke, B. E. Chasco, D. L. Widener, and R. W. Zabel. 2021. Climate change threatens Chinook salmon throughout their life cycle. Available at: https://www.nature.com/articles/s42003- 021-01734-w.pdf.

EPA (Environmental Protection Agency). 2021a. Columbia and Lower Snake Rivers Temperature Total Maximum Daily Load. U.S. Environmental Protection Agency, Seattle, WA. August 2021. Available at TMDL for Temperature in the Columbia and Lower Snake Rivers | US EPA.

EPA. 2021b. Assessment of Impacts to Columbia and Snake River Temperatures using the RBM10 Model Scenario Report: Appendix D to the Columbia and Lower Snake Rivers Temperature Total Maximum Daily Load. U.S. Environmental Protection Agency, Seattle, WA. May 2021. Available at TMDL for Temperature in the Columbia and Lower Snake Rivers | US EPA.

EPA (Environmental Protection Agency). 2021c. Columbia River Cold Water Refuges Plan. U.S. Environmental Protection Agency, Seattle, WA. January 2021. Available at https://www.epa.gov/ 38 Columbia River/Columbia-river-cold-water-refuges-plan.

Ford 2022. Biological Viability Assessment Update for Pacific Salmon and Steelhead Listed under the Endangered Species Act: Pacific Northwest. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Northwest Fisheries Science Center. Internet website: https://doi.org/10.25923/kq2n-ke70.

ISAB (Independent Scientific Advisory Board). 2007. Climate change impacts on Columbia River basin fish and wildlife. ISAB Report 2007-2, Portland, Oregon, 5/11/2007.

Hinch, S. G., Bett, N. N., Eliason, E. J., Farrell, A. P., Cooke, S. J., and Patterson D. A. 2021. Exceptionally high mortality of adult female salmon: a large-scale pattern and a conservation concern. Can. J. Fish. Aquat. Sci. 78: 639–654 (2021) dx.doi.org/10.1139/cjfas-2020-0385.

ICTRT. 2007. Interior Columbia Basin TRT: Viability criteria for application to Interior Columbia Basin Salmonid ESUs. Available at http:// www.nwfsc.noaa.gov/trt/trt_viability.cfm.

Isaak, D. J., C. H. Luce, D. L. Horan, G. L. Chandler, S. P. Wollrab, and D. E. Nagel. 2018. Global warming of salmon and trout rivers in the northwestern U.S.: road to ruin or path through purgatory? Transactions of the American Fisheries Society 147:566–587.

Jorgensen, J. C., C. Nicol, C. Fogel, and T. J. Beechie. 2021. Identifying the potential of anadromous salmonid habitat restoration with life cycle models. PLOS ONE 16(9): e0256792.

Lindsey and Dahlman. 2024. Climate Change: Global Temperature. January 18, 2024 https://www.climate.gov/news-features/understanding-climate/climate-change-global-temperature.

LCREP (Lower Columbia River Estuary Partnership). 2007. Lower Columbia River and estuary ecosystem monitoring: Water quality and salmon sampling report. Lower Columbia River Estuary Partnership.

McElhany, P., M. H. Rucklelshaus, M. J. Ford, T. C. Wainwright, and E. P. Bjorkstedt. 2000. Viable salmonid populations and the recovery of evolutionarily significant units. U.S. Department of Commerce, NOAA NOAA Technical Memorandum NMFS-NWFSC-42, 6/1/2000.

NMFS (National Marine Fisheries Service). 2003a. Biological Opinion, Unlisted Species Analysis and Magnuson-Stevens Fishery Conservation and Management Act Consultation for Proposed Issuance of a Section 10 Incidental Take Permit to Public Utility District No. 1 of Douglas County for the Wells Hydroelectric Project (FERC No. 2149) Anadromous Fish Agreement and Habitat Conservation Plan. NMFS, Portland, Oregon.

NMFS (National Marine Fisheries Service). 2003b. Biological Opinion, Unlisted Species Analysis and Magnuson-Stevens Fishery Conservation and Management Act Consultation for Proposed Issuance of a Section 10 Incidental Take Permit to Public Utility District No. 1 of Chelan County for the Rocky Reach Hydroelectric Project (FERC No. 2145) Anadromous Fish Agreement and Habitat Conservation Plan. NMFS, Portland, Oregon.

NMFS (National Marine Fisheries Service). 2003c. Biological Opinion, Unlisted Species Analysis and Magnuson-Stevens Fishery Conservation and Management Act Consultation for Proposed Issuance of a Section 10 Incidental Take Permit to Public Utility District No. 1 of Chelan County for the Rock Island Hydroelectric Project (FERC No. 943) Anadromous Fish Agreement and Habitat Conservation Plan. NMFS, Portland, Oregon.

NMFS (National Marine Fisheries Service). 2004. Endangered Species Act - Section 7 Consultation Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Consultation on interim protection plan for operation of the Priest Rapids Hydroelectric Project, FERC Project No. 2114. NMFS, Portland, Oregon.

NMFS (National Marine Fisheries Service). 2008. Endangered Species Act - Section 7 Consultation Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Consultation on a New License for the Priest Rapids Hydroelectric Project FERC Project No. 2114. Columbia River, HUC 1702001604 - Grant, Yakima, Kittitas, Douglas, Benton, and Chelan Counties, Washington.

NMFS (National Marine Fisheries Service). 2013A. Endangered Species Act Section 7(a)(2) Biological Opinion, Section 7(a)(2) Not Likely to Adversely Affect Determination, and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat (EFH) Consultation. Entiat National Fish Hatchery Summer Chinook Hatchery Program. April 18, 2013. NMFS Consultation No.: NWR-2012-00841. 79p.

NMFS. 2015a. Endangered Species Act Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat (EFH) Consultation (Reinitiation 2015). Reinitiation of the Issuance of Three Section 10(a)(1)(A) Permits for the Upper Columbia River Chiwawa River, Nason Creek, and White River Spring Chinook Salmon Hatchery Programs. May 29, 2015. NMFS Consultation No.: NWR-2013-9707. 128p.

NMFS (National Marine Fisheries Service). 2016a. 2015 Adult sockeye salmon passage report, 9/2016.

NMFS (National Marine Fisheries Service). 2016b. 2016 5-Year review: Summary & evaluation of Snake River sockeye, Snake River spring/summer Chinook, Snake River fall-run Chinook, Snake River Basin steelhead. National Marine Fisheries Service, West Coast Region.

NMFS (National Marine Fisheries Service 2016c. Endangered Species Act Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat (EFH) Consultation. Issuance of Four Section 10(a)(1)(A) Permits for Spring Chinook Salmon Hatchery Programs in the Methow Subbasin. October 13, 2016. NMFS Consultation No.: WCR-2015-3845. 116p.

NMFS (National Marine Fisheries Service). 2017a. Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat (EFH) Consultation. Four Summer/Fall Chinook Salmon and Two Fall Chinook Salmon Hatchery Programs in the Upper Columbia River Basin. December 26, 2017. NMFS Consultation No.: WCR-2015-3607. 186p.

NMFS (National Marine Fisheries Service). 2017b. Consultation on the Confederated Tribes of the Colville Reservation (CTCR) Tribal Resource Management Plan (TRMP) under the Endangered Species Act (ESA) Tribal 4(d) Rule-Decision Memorandum. 82 FR 18614. 4/20/2017.

NMFS (National Marine Fisheries Service). 2017c. Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat (EFH) Consultation. Leavenworth National Fish Hatchery Spring Chinook Salmon Program (Reinitiation 2016). September 29, 2017. NMFS Consultation No.: WCR-2017-7345. 261p.

NMFS (National Marine Fisheries Service). 2017d. Endangered Species Act Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat (EFH) Consultation. Two Steelhead Hatchery Programs in the Methow River. October 10, 2017. NMFS Consultation No.: WCR-2017-6986. 117p.

NMFS (National Marine Fisheries Service). 2017e. National Marine Fisheries Service Section 10(a)(1)(A) Permit for Take of Endangered/Threatened Species. Operation, monitoring, and evaluation of the Wenatchee River summer steelhead hatchery program. Permit 18583. December 26, 2017. 25p.

NMFS (National Marine Fisheries Service). 2017f. ESA recovery plan for Snake River fall Chinook salmon (Oncorhynchus tshawytscha). National Marine Fisheries Service, West Coast Region, 11/1/2017.

NMFS (National Marine Fisheries Service). 2020. Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat (EFH) Consultation. Wells Summer Chinook Hatchery Program for Southern Resident Killer Whales. National Marine Fisheries Service West Coast Region: 112.

NMFS 2022. 5-Year Review: Summary and Evaluation of Upper Columbia River Spring-run Chinook Salmon and Upper Columbia River Steelhead. Internet website: https://www.fisheries.noaa.gov/resource/document/2022-5-year-review-summary-evaluation-upper-columbia-river-spring-run-Chinook.

NMFS (National Marine Fisheries Service). 2025. Memo from Conder. T. Estimating Take Associated with the P2IP Proposed Action by ESU/DPS.

NOAA (National Oceanic and Atmospheric Administration). 2024. Ocean Conditions Indicators Trends web page accessed on December 9, 2024. https://www.fisheries.noaa.gov/content/ocean-conditions-indicators-trends.

Peterson, M. 2015. Snake River sockeye tag rate. Communication to T. Conder (NMFS) from M. Peterson. RE: Snake River Sockeye Salmon adult return update for 2015. 7/8/15.

PFMC. 2014. Appendix A to the Pacific Coast Salmon Fishery Management Plan, as modified by Amendment 18. Identification and description of essential fish habitat, adverse impacts, and recommended conservation measures for salmon

Philip, S. Y., S. F. Kew, G. J. van Oldenborgh, F. S. Anslow, S. I Seneviratne, R. Vautard, D. Coumou, K. L. Ebi, J. Arrighi, R. Singh, M. van Aalst, C. Pereira Marghidan, M. Wehner, W. Yang, S. Li, D. L. Schumacher, M. Hauser, R. Bonnet, L. N. Luu, F. Lehner, N. Gillett, J. Tradowsky, G. A. Vecchi, C. Rodell, R. B. Stull, R. Howard, and F. E. L. Otto. 2021. Rapid attribution analysis of the extraordinary heatwave on the Pacific Coast of the US and Canada. Earth System Dynamics. DOI: 10.5194/esd-2021-90.

PNFHPC (Pacific Northwest Fish Health Protection Committee). 2007. Pacific Northwest fish health protection committee guidelines.

Scott, M. H. 2020. Statistical Modeling of Historical Daily Water Temperatures in the Lower Columbia River. 2020. Dissertations and Theses. Paper 5594. https://doi.org/10.15760/etd.7466

Siegel, J., and L. Crozier. 2019. Impacts of Climate Change on Salmon of the Pacific Northwest: A review of the scientific literature published in 2018. Fish Ecology Division, Northwest Fisheries Science Center, National Marine Fisheries Service, NOAA. December.

Tonina, D., J. A. McKean, D. Isaak, R. M. Benjankar, C. Tang, and Q. Chen. 2022. Climate change shrinks and fragments salmon habitats in a snow dependent region. Geophysical Research Letters, 49, e2022GL098552. https://doi.org/10.1029/2022GL098552