

INSTITUTIONAL REPOSITORY SUBMISSION COVER PAGE

Project Title:

Sediment Removal Activities at Roza, Sunnyside, Nelson, and Town Diversion Dams, Yakima and Kittitas Counties, Washington

- Biological Opinion
 Concurrence Letter

Consultation Conducted By:

Interior Columbia Basin Area Office, West Coast Region, National Marine Fisheries Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce

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UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
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Refer to NMFS No: WCRO-2019-03438

December 2, 2019

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Re: Endangered Species Act Section 7(a)(2) Biological Opinion, and Magnuson–Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the Sediment Removal Activities at Roza, Sunnyside, Nelson, and Town Diversion Dams, Yakima and Kittitas Counties, Washington.

Dear Ms. McKinley:

Thank you for your letter of September 27, 2019, requesting initiation of consultation with NOAA's National Marine Fisheries Service (NMFS) pursuant to section 7 of the Endangered Species Act of 1973 (ESA) (16 U.S.C. 1531 et seq.) for Sediment Removal Activities at Roza, Sunnyside, Nelson, and Town Diversion Dams. This consultation was conducted in accordance with the 2019 revised regulations that implement section 7 of the ESA (50 CFR 402, 84 FR 45016).

Thank you, also, for your request for consultation pursuant to the essential fish habitat (EFH) provisions in Section 305(b) of the Magnuson–Stevens Fishery Conservation and Management Act (MSA)(16 U.S.C. 1855(b)) for this action. We have included the results of that review in Section 3 of this document.

In the biological opinion (opinion), NMFS concludes that the proposed action is not likely to jeopardize the continued existence of ESA-listed Middle Columbia River (MCR) steelhead (*Oncorhynchus mykiss*). NMFS also determined the action will not destroy or adversely modify designated critical habitat for MCR steelhead. Rationale for our conclusions is provided in the attached opinion.

As required by section 7 of the ESA, NMFS provided an incidental take statement (ITS) with the opinion. The ITS describes reasonable and prudent measures (RPMs) that NMFS considers



necessary or appropriate to minimize incidental take associated with the proposed actions. The take statement sets forth nondiscretionary terms and conditions, including reporting requirements that the U.S. Bureau of Reclamation (Reclamation) and any person who performs the actions must comply with to carry out the RPMs. Incidental take from the proposed action that meets these terms and conditions will be exempt from the ESA take prohibition.

Our EFH analysis includes one conservation recommendation to avoid, minimize, or otherwise offset potential adverse effects to EFH. If your response is inconsistent with the EFH conservation recommendations, Reclamation must explain why, including the justification for any disagreements over the effects of the action and the recommendations. In response to increased oversight of overall EFH program effectiveness by the Office of Management and Budget, NMFS established a quarterly reporting requirement to determine how many conservation recommendations are provided as part of each EFH consultation and how many are adopted by the action agency. Therefore, in your statutory reply to the EFH portion of this consultation, we ask that you clearly identify the number of conservation recommendations accepted.

Please contact Sean Gross, Ellensburg, Washington, (509) 962-8911 ext. 806 or sean.gross@noaa.gov, if you have any questions concerning this consultation or if you require additional information.

Sincerely,



Michael P. Tehan
Assistant Regional Administrator
Interior Columbia Basin Office
NOAA Fisheries, West Coast Region

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

Sediment Removal Activities at Roza, Sunnyside, Nelson, and Town Diversion Dams

NMFS Consultation Number: WCRO-2019-03438


Action Agency: U.S. Bureau of Reclamation

Affected Species and NMFS’ Determinations:

| ESA-Listed Species | Status | Is Action Likely to Adversely Affect Species? | Is Action Likely To Jeopardize the Species? | Is Action Likely to Adversely Affect Critical Habitat? | Is Action Likely To Destroy or Adversely Modify Critical Habitat? |
|--|------------|---|---|--|---|
| Middle Columbia River steelhead (<i>Oncorhynchus mykiss</i>) | Threatened | Yes | No | Yes | No |

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

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

Issued By: 
 Michael P. Tehan
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Date: December 2, 2019

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ACRONYM GLOSSARY

| | |
|-------------|--|
| BA | Biological Assessment |
| DPS | Distinct Population Segment |
| DQA | Data Quality Act |
| EFH | Essential Fish Habitat |
| ESA | Endangered Species Act |
| ESU | Evolutionarily Significant Unit |
| HUC | Hydrologic Unit Code |
| ICTRT | Interior Columbia Basin Technical Recovery Team |
| ISAB | Independent Scientific Advisory Board |
| ITS | Incidental Take Statement |
| MCR | Middle Columbia River |
| MPG | Major Population Group |
| MSA | Magnuson–Stevens Fishery Conservation and Management Act |
| NMFS | National Marine Fisheries Service |
| opinion | Biological Opinion |
| PAH | Polycyclic Aromatic Hydrocarbon |
| PBF | Physical or Biological Features |
| PCE | Primary Constituent Element |
| Reclamation | Bureau of Reclamation |
| RPM | Reasonable and Prudent Measure |
| VSP | Viable Salmonid Population |

1. INTRODUCTION

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

1.1. Background

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

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

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

1.2. Consultation History

On September 27, 2019, NMFS received a letter requesting initiation of formal consultation and a Biological Assessment (BA) from the U.S. Bureau of Reclamation (Reclamation).

On November 1, 2019, NMFS sent electronic mail to Reclamation requesting several details about the proposed action, including the amount of excavation proposed at Sunnyside Dam.

On November 5, 2019, NMFS received electronic mail from Reclamation with additional information and an amended BA.

On November 7, 2019, NMFS sent electronic mail to Reclamation clarifying a discrepancy in information provided regarding the amount of excavation proposed at Sunnyside Dam. Reclamation responded on the same day, indicating that its proposed action included dredging 84 cubic yards from the Yakima River near Sunnyside Dam.

Consultation was initiated on November 7, 2019.

1.3. Proposed Federal Action

For the purposes of ESA consultation, “Action” means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by federal agencies (50 CFR 402.02). For the purposes of EFH consultation, a federal action means any action authorized, funded, or

undertaken, or proposed to be authorized, funded, or undertaken by a federal agency (50 CFR 600.910).]

Reclamation proposes to remove sediment in the vicinity of four diversion dams that are part of Reclamation's Yakima Irrigation Project to ensure proper operation of fish passage facilities. The fish screens and fish ladders at each dam are operated and maintained by Reclamation. At each site, sediments transported by the river have been deposited such that they hinder proper operation of the facilities and increase the risk that the facilities will not function adequately for safe and timely fish passage. The work is to aid fish migration and will not affect the ability of Reclamation to divert water for irrigation and hydropower.

Reclamation proposes periodic dredging at specific locations near the four diversion dams. In general, heavy equipment will excavate sediments during low river flows. Equipment operators will minimize, but not avoid, in-water work. Site conditions and the details of proposed work at each diversion dam are as follows:

Roza Dam

Fine sediment accumulates every year upstream of Roza Dam, forming a mud flat along the left bank that is exposed when the forebay pool is drawn down for annual maintenance. In some cases, the sediment reduces flow into the low-flow fish ladder's attraction flow intake, resulting in insufficient water to meet operating criteria; this may result in migration delays for upstream-bound fish.

Reclamation proposes to dredge up to 1,500 cubic yards of sediment per year from this location during January 1 to January 31, when the pool is at its lowest elevation (1,207 feet). An excavator or backhoe will remove most of the material in dry, or in wet conditions separated from the river by accumulated sediments, and remove the final waterward plug of material to allow river water to access the excavated area. Dredged material will be removed from a 6,700-square-foot area and transported via dump trucks to an existing upland disposal site. All access routes for heavy equipment are already established.

Sunnyside Dam

Sediment has accumulated upstream of the right bank fish ladder and inhibits ladder function. Reclamation will remove 84 cubic yards of material from a 300-square-foot area during July 15–August 31. Dredging would occur over no more than 3 days approximately every 3 years. Sediment will be excavated by equipment positioned on an existing access point on the bank, and deposited in an area of slow water downstream of the dam in hope of preserving the lives of juvenile lamprey within the dredged sediment.

Nelson (aka Naches Cowiche) Dam

Coarse sediment deposition near Nelson Dam hinders fish passage during some conditions at the entrance of the fish ladder and the exit of the fish screen bypass. Reclamation has removed sediment at this site during emergency conditions and as part of previous Section 7 consultations whose terms have expired.

Reclamation will access the river at two points: upstream of the fish ladder from the left bank, and downstream of the bypass exit from the right bank. At each location, an excavator will work from a dry gravel bar to remove sediment (mostly gravel) that impedes sufficiently deep flow between the fish passage facility and the wetted area of the river. Dredged sediments will be deposited on nearby dry gravel bars to prevent the project from exacerbating low gravel recruitment downstream of the dam. Reclamation will dredge approximately 150 cubic yards of gravel from an area of approximately 1,400 square feet.

The work is expected to take 2 days between July 16 and August 31, and to occur every 3 years until Nelson Dam is rebuilt, which is currently scheduled for 2021 and 2022.

Town Diversion Dam

Sediment accumulation near the fish ladder at the Town Diversion dam may impede use of the fish ladder. Reclamation will remove material with equipment operating from an established access route on the bank or a gravel bar. Rip-rap armoring on the bank may be removed and replaced for access to the gravel bar. Dredged material will be disposed on a dry gravel bar downstream of the dam.

Reclamation will remove 150 cubic yards of sediment within an 840-square-foot area along the right bank. Work may take up to 3 days to complete every 3 years in the September 1–September 31 work window.

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

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

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

2.1. Analytical Approach

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

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

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

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

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

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

2.2. Rangewide Status of the Species and Critical Habitat

This opinion examines the status of each species that would be adversely affected by the proposed action. The status is determined by the level of extinction risk that the listed species face, based on parameters considered in documents such as recovery plans, status reviews, and listing decisions. This informs the description of the species’ likelihood of both survival and recovery. The species status section also helps to inform the description of the species’ current “reproduction, numbers, or distribution” as described in 50 CFR 402.02. The opinion also examines the condition of critical habitat throughout the designated area, evaluates the conservation value of the various watersheds and coastal and marine environments that make up the designated area, and discusses the current function of the essential PBFs that help to form that conservation value.

2.2.1 Status of the Species

When examining the status of a species, NMFS uses criteria that describe a “Viable Salmonid Population” (VSP) (McElhany et al. 2000). Attributes associated with a VSP are the levels of abundance (number of adult spawners in natural production areas), productivity (adult progeny per parent), and the spatial structure and diversity necessary to: (1) safeguard the genetic diversity of the listed Evolutionarily Significant Unit (ESU) or Distinct Population Segment (DPS), (2) enhance its capacity to adapt to various environmental conditions, and (3) allow it to become self-sustaining in the natural environment.

In 2007, the Interior Columbia Basin Technical Recovery Team (ICTRT) further defined population-level viability criteria to address, abundance, productivity, spatial structure and diversity (ICTRT 2007a). These viability attributes are influenced by survival, behavior, and experiences throughout the entire life cycle, characteristics that are influenced in turn by habitat and other environmental 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. The greater the present risk, the more likely any additional risk resulting from the proposed action’s effects on the abundance (population size), productivity, distribution, or genetic diversity of the ESU/DPS will be an appreciable reduction (McElhany et al. 2000).

Middle Columbia River Steelhead. The MCR steelhead DPS was listed as threatened on March 25, 1999 (64 FR 14517) and its threatened status was reaffirmed on June 28, 2005 (70 FR 37160), August 15, 2011 (76 FR 50448), and May 26, 2016 (81 FR 33468). The DPS includes all naturally spawning populations of steelhead using tributaries upstream and exclusive of the Wind River, Washington, and the Hood River, Oregon, excluding the Upper Columbia River and its tributaries (upstream of the Yakima River), and the Snake River. The ICTRT (2007b) identified 20 populations in four major population groups (Eastern Cascades, John Day River, the Umatilla River/Walla Walla drainages, and the Yakima River). Three of these populations are extinct: the White Salmon and Crooked River populations in the Eastern Cascades Major Population Group (MPG), and the Willow Creek population in the Umatilla River/Walla Walla MPG. Seven artificial propagation programs are considered part of the DPS: the Touchet River Endemic, Yakima River Kelt Reconditioning Program (in Satus Creek, Toppenish Creek, Naches River, and Upper Yakima River), Umatilla River, and the Deschutes River steelhead hatchery programs. Major watersheds within this DPS include the Klickitat, Fifteen Mile, Deschutes, John Day, Umatilla, Yakima, and Walla Walla River Basins. NMFS has defined the steelhead DPSs to include only the anadromous members of this species (70 FR 67130).

Our approach to assessing the current status of a steelhead DPS is based on evaluating information on the abundance, productivity, spatial structure, and diversity of the anadromous component of this species (Good et al. 2005, 70 FR 67130). Many steelhead populations along the U.S. West Coast co-occur with conspecific populations of resident rainbow trout. There may be situations where reproductive contributions from resident rainbow trout may mitigate short-term extinction risk for some steelhead DPSs (Good et al. 2005, 70 FR 67130). We assume that any benefits to an anadromous population resulting from the presence of a conspecific resident form will be reflected in direct measures of the current status of the anadromous form (Ford 2011).

Life History. Life history characteristics for MCR steelhead are similar to those of other inland steelhead DPSs. Most fish smolt at 2 years and spend 1 to 2 years in salt water before re-entering freshwater, where they may remain up to a year before spawning (Howell et al. 1985). All steelhead upstream of The Dalles Dam are summer-run fish that enter the Columbia River from June to August (Reisenbichler et al. 1992). Adult steelhead ascend mainstem rivers and their tributaries throughout the winter and spring, spawning in the late winter through spring. Fry emergence typically occurs between May and August.

Limiting Factors. The major factors limiting recovery of the MCR steelhead DPS include: (1) Mainstem Columbia River hydropower system mortality, (2) reduced streamflow in tributaries, (3) impaired passage in tributaries, (4) excessive sediment, (5) degraded water quality, and (6) altered channel morphology (NMFS 2005).

Abundance and Productivity. According to the most recent 5-year status review (2010 to 2014 data), 7 of 15 populations are currently above the minimum abundance thresholds identified by the ICTRT (Northwest Fisheries Science Center (NWFSC) 2015). There are insufficient data to identify 5-year abundances for the Klickitat River and Rock Creek. Total escapement and natural-origin escapements for all five John Day populations increased relative to Ford’s (2011) prior 5-year review. The 5-year geometric mean natural origin and total abundance estimates for all four populations in the Yakima River MPG also increased relative to the prior review (Table 1). Total spawning escapements have increased in the most recent brood cycle for all three populations in the Umatilla-Walla Walla MPG as well. In the Eastern Cascades MPG, total escapement and natural-origin escapements for two of three populations have increased since the previous 5-year review.

The proposed action will take place within the Yakima River Basin MPG population boundaries and will affect the Naches and Upper Yakima populations. The MCR Steelhead Recovery Plan (NMFS 2009) characterized five MCR steelhead populations as being at high risk of extinction in terms of abundance based on 1995 to 2004 spawner numbers. Two of those high risk populations included the Naches and Upper Yakima. However, Ford (2011) rated the Naches population integrated abundance and productivity risk as moderate, and the Upper Yakima River population risk was also rated moderate in the NWFSC (2015) review. The Satus and Toppenish Creek populations were rated low for the integrated abundance and productivity risk of extinction (NWFSC 2015). Recent spawner abundances are given in Table 1.

Table 1. Minimum abundance thresholds set by the Interior Columbia Basin Technical Recovery Team (ICTRT 2007b), and the most recent 5-year geometric mean of natural spawner estimates for Yakima River steelhead populations (NWFSC 2015).

| Population | ICTRT minimum abundance threshold | Natural spawner abundance, 2005–2009 | Natural spawner abundance, 2010–2014 |
|--------------------|-----------------------------------|--------------------------------------|--------------------------------------|
| Satus Creek | 1,000 | 807 | 1,585 |
| Toppenish Creek | 500 | 468 | 575 |
| Naches River | 1,500 | 823 | 1,775 |
| Upper Yakima River | 1,500 | 155 | 390 |

Spatial Structure and Diversity. The NWFSC (2015) reported no change in the integrated spatial structure and diversity risk for all 17 MCR steelhead populations relative to the previous status review by Ford (2011). Two populations are considered to be at low risk, 14 at moderate risk, and one with a high risk of extinction based on spatial structure and diversity criteria. Within the Yakima River MPG, Satus and Toppenish Creeks, and the Naches River are at moderate risk of extinction, while the Upper Yakima population is characterized as high risk.

Biological Risk Summary. The NWFSC (2015) reported that there have been improvements in the viability ratings for some of the component populations, but the MCR steelhead DPS is not currently meeting the viability criteria described in the Mid-Columbia Steelhead Recovery Plan. Natural origin returns to the majority of populations in two of the four MPGs in this DPS increased modestly relative to the levels reported in the previous 5-year review. Abundance estimates for two of three populations with sufficient data in the remaining two MPGs (Eastside Cascades and Umatilla/Walla Walla) were marginally lower. Updated information indicates that stray levels into the John Day River populations have decreased in recent years. Out-of-basin hatchery stray proportions, although reduced, remain high in spawning reaches within the Deschutes River Basin populations. In general, the majority of population level viability ratings remained unchanged from prior reviews for each MPG within the DPS (NWFSC 2015). For the Yakima River MPG, NWFSC (2015) gave overall viability ratings of Viable for the Satus and Toppenish Creek populations, Moderate for the Naches River population, and High Risk for the Upper Yakima River population.

Climate Change. Climate change has negative implications for salmon, steelhead, and their designated critical habitat in the Pacific Northwest (ISAB 2007; Scheuerell and Williams 2005; Zabel et al. 2006). Average annual Northwest air temperatures have increased by approximately 1°C since 1900, or about 50 percent more than the global average over the same period (ISAB 2007). The latest climate models project a warming of 0.1°C to 0.6°C per decade over the next century.

Several studies have demonstrated that climate change has the potential to affect ecosystems in nearly all tributaries throughout the Interior Columbia Basin (Battin et al. 2007; ISAB 2007). While the intensity of effects will vary by region (ISAB 2007), climate change is generally expected to alter aquatic habitat (water yield, peak flows, and stream temperature). As climate change alters the structure and distribution of rainfall, snowpack, and glaciations, each factor will in turn alter riverine hydrographs. Given the increasing certainty that climate change is occurring and is accelerating (Battin et al. 2007), NMFS anticipates salmonid habitats will be affected. Climate and hydrology models project significant reductions in both total snow pack and low-elevation snow pack in the Pacific Northwest over the next 50 years (Mote and Salathé 2009), changes that will shrink the extent of the snowmelt-dominated habitat available to salmon. Such changes may restrict our ability to conserve diverse salmon life histories.

The earth's oceans are also warming, with considerable inter-annual and inter-decadal variability superimposed on the longer-term trend (Bindoff et al. 2007). Historically, warm periods in the coastal Pacific Ocean have coincided with relatively low abundances of salmon and steelhead, while cooler ocean periods have coincided with relatively high abundances (Scheuerell and Williams 2005; Zabel et al. 2006; USGCRP 2009). Ocean conditions adverse to salmon and

steelhead may be more likely under a warming climate (Zabel et al. 2006). Moreover, as atmospheric carbon emissions increase, increasing levels of carbon are absorbed by the oceans, changing the pH of the water. Marine fish species have exhibited negative responses to ocean acidification conditions that include changes in growth, survivorship, and behavior. Marine phytoplankton species have shown diverse responses to elevated pCO₂ under laboratory conditions including changes in growth rate and calcification (reviewed in Feely et al. 2012).

The Independent Scientific Advisory Board (ISAB) identified a number of effects climate change would have on Columbia Basin salmon. A few of these include: (1) water temperature increases, and depletion of cold water habitat that could reduce the amount of suitable salmon habitat by about 22 percent by 2090 in Washington State, (2) variations in precipitation that may alter the seasonal hydrograph and modify shallow mainstem rearing habitat, and (3) earlier snowmelt and higher spring flows with warmer temperatures that may cause spring Chinook salmon and steelhead yearlings to smolt and emigrate to the ocean earlier in the spring (ISAB 2007, O'Neal 2002).

Climate change is expected to make recovery targets for these salmon populations more difficult to achieve. However, habitat restoration action can address the adverse impacts of climate change on salmon. Examples include restoring connections to historical floodplains, and freshwater and estuarine habitats to provide fish refugia and areas to store excess floodwaters; protecting and restoring riparian vegetation to ameliorate stream temperature increases; and purchasing or applying easements to lands that provide important cold water or refuge habitat (Battin et al. 2007; ISAB 2007).

2.2.2 Status of Critical Habitat

This section examines the status of designated critical habitat affected by the proposed action by examining the condition and trends of PBFs throughout the designated areas. These features are essential to the conservation of the listed species because they support one or more of the species' life stages (e.g., sites with conditions that support spawning, rearing, migration, and foraging).

For salmon and steelhead, NMFS ranked watersheds within designated critical habitat at the scale of the Hydrologic Unit Code 5 (HUC 5) in terms of the conservation value they provide to the listed species they support. The conservation rankings are high, medium, or low. To determine the conservation value of each watershed to species viability, NMFS' critical habitat analytical review teams evaluated:

- The quantity and quality of habitat features (e.g., spawning gravels, wood and water condition, side channels).
- The relationship of the area compared to other areas within the species' range.
- The significance of the population occupying that area to the species' viability criteria.

Thus, even a location that has poor quality habitat could be ranked as a high conservation value, if it were essential due to factors such as limited availability (e.g., one of a very few spawning areas), a unique contribution of the population it served (e.g., a population at the extreme end of

geographic distribution), or the fact that it serves another important role (e.g., obligate area for migration to upstream spawning areas).

The following table describes the PBFs of the habitat types within the full range of habitat designated as critical for the listed salmonid species. Range-wide, all habitat types are impaired to some degree, even though many of the watersheds comprising the fully designated area are ranked as providing high conservation value. The proposed action, however, affects only freshwater habitats.

Table 2. Physical and biological features of critical habitats designated for ESA-listed salmon and steelhead species considered in this opinion.

| Physical and Biological Features | | Species Life History Event |
|----------------------------------|--|---|
| Site Type | Site Attribute | |
| Freshwater spawning | Substrate Water quality Water quantity | Adult spawning Embryo incubation Alevin growth and development |
| Freshwater rearing | Floodplain connectivity Forage Natural cover Water quality Water quantity | Fry emergence from gravel Fry/parr/smolt growth and development |
| Freshwater migration | Free of artificial obstruction Natural cover Water quality Water quantity | Adult sexual maturation Adult upstream migration and holding Kelt (steelhead) seaward migration Fry/parr/smolt growth, development, and seaward migration |
| Estuarine areas | Forage Free of artificial obstruction Natural cover Salinity Water quality Water quantity | Adult sexual maturation and “reverse smoltification” Adult upstream migration and holding Kelt (steelhead) seaward migration Fry/parr/smolt growth, development, and seaward migration |
| Nearshore marine areas | Forage Free of artificial obstruction Natural cover Water quantity Water quality | Adult growth and sexual maturation Adult spawning migration Nearshore juvenile rearing |
| Offshore marine areas | Forage Water quality | Adult growth and sexual maturation Adult spawning migration Subadult rearing |

The PBFs of freshwater spawning and incubation sites include water flow, quality and temperature conditions and suitable substrate for spawning and incubation, as well as migratory access for adults and juveniles (Table 2). These features are essential to conservation because without them the species cannot successfully spawn and produce offspring.

The PBFs of freshwater migration corridors associated with spawning and incubation sites include water flow, water quality, and temperature conditions supporting larval and adult mobility, abundant prey items supporting larval feeding after yolk sac depletion, and free passage (no obstructions) for adults and juveniles. These features are essential to conservation because they allow adult fish to swim upstream to reach spawning areas and they allow larval fish to proceed downstream and reach the ocean.

Interior Columbia Recovery Domain

Habitat quality in tributary streams in the Interior Columbia Recovery Domain range from excellent in wilderness and roadless areas to poor in areas subject to heavy agricultural and urban development (NMFS 2009; Wissmar et al. 1994). Critical habitat throughout much of the Interior Columbia Recovery Domain has been degraded by intense agriculture, alteration of stream morphology (i.e., channel modifications and diking), riparian vegetation disturbance, wetland draining and conversion, livestock grazing, dredging, road construction and maintenance, logging, mining, and urbanization. Reduced summer stream flows, impaired water quality, and reduction of habitat complexity are common problems for critical habitat in developed areas.

Many stream reaches designated as critical habitat in the Interior Columbia Recovery Domain are over-allocated, with more allocated water rights than existing streamflow conditions can support. Withdrawal of water, particularly during low-flow periods that commonly overlap with agricultural withdrawals, often increase summer stream temperatures, block fish migration, strand fish, and alter sediment transport (Spence et al. 1996). Reduced tributary stream flow has been identified as a major limiting factor for MCR steelhead in this area (NMFS 2007; NMFS 2011).

Despite these degraded habitat conditions, the HUCs that have been identified as critical habitat for this species are largely ranked as having high conservation value. Conservation value reflects several factors, including: (1) how important the area is for various life history stages, (2) how necessary the area is to access other vital areas of habitat, and (3) the relative importance of the populations the area supports relative to the overall viability of the DPS.

2.3. Action Area

“Action area” means all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action (50 CFR 402.02).

For the purposes of this consultation, the action area is comprised of four disconnected locations. The action area is comprised of three segments of the Yakima River that are within 300 feet upstream and downstream of Roza Dam, Sunnyside Dam, and the Town Diversion Dam, and one segment of the Naches River that is within 400 feet upstream and downstream of Nelson Dam. The extent of the action area is based on the expected spatial extent over which turbidity will be elevated during the proposed action. The action area extends further from Nelson Dam than at the other work sites because the dredging near Nelson Dam extends further upstream and downstream of the dam than does the dredging at the other dam sites.

2.4. Environmental Baseline

The “environmental baseline” refers to the condition of the listed species or its designated critical habitat in the action area, without the consequences to the listed species or designated critical habitat caused by the proposed action. The environmental baseline includes the past and present impacts of all federal, state, or private actions and other human activities in the action area, the anticipated impacts of all proposed federal projects in the action area that have already undergone formal or early section 7 consultations, and the impact of state or private actions

which are contemporaneous with the consultation in process. The consequences to listed species or designated critical habitat from ongoing agency activities or existing agency facilities that are not within the agency's discretion to modify are part of the environmental baseline (50 CFR 402.02).

The environmental baseline in the four segments of the action area is largely a function of the existence and operation of the four diversion dams. In general terms, each site features a forebay upstream of the dam, where sediment conveyed by the river accumulates because the dam slows water velocity. The dams themselves all feature several routes by which steelhead may migrate upstream or downstream, with varying levels of delay and mortality. Each dam is associated with a fish screen system and canal headgate at which significant volumes of river flow are diverted for irrigation and/or hydropower. The tailrace downstream of each dam usually features a pool adjacent to the dam and a riffle slightly farther downstream. Each tailrace also features one or more entrances to a fish ladder for adults to swim upstream past the dam, and a fish screen bypass return pipe outfall, where fish that are screened from entering the canal are returned to the river downstream of the dam.

The action area is primarily used for juvenile and adult migration. The dams and diversion facilities at each site impact migrating steelhead through delay, mechanical trauma, entrainment, and/or increasing predator success.

- At Roza Dam, steelhead smolts are delayed in the forebay before passing the dam via the overtopped west gate, undershot east gate, or the fish screen bypass system. Recent evaluations (Perry et al. 2016, Kock et al. 2016) demonstrate that very high proportions of smolts transiting the east gate are killed and delay is pronounced through the fish screen bypass system; study results are conflicting regarding the degree of mortality incurred through the bypass system. Mortality is likely a combination of mechanical trauma and increased predation. Adult migration is likely delayed somewhat at Roza, but is not known to reduce spawning success.
- At Sunnyside Dam, there is evidence of smolt mortality through the fish screen bypass system (Toby Koch, USGS, pers. comm.), and predators are thought to take advantage of the forebay and bypass outfall to prey on smolts. Adult migration is likely delayed at the dam, particularly on occasions when fish ladders are closed during high flow events; the impact of these delays is unknown.
- At Nelson Dam, smolt mortality is nearly certain to occur when the bypass outfall is buried under accumulated gravel, which has happened occasionally. Adult steelhead migration is likely inhibited during conditions when river flows are fairly low and the fish ladder exit is buried by deposited sediment; under higher flow conditions, it is thought that most or all adult steelhead can jump over the dam.
- At Town Diversion Dam, very little is known about effects to migration caused by the dam.

Rearing occurs within the action area and the quality of rearing habitat varies across sites.

- At Roza Dam, the forebay is poor habitat, being deep and lacking complexity. The tailrace has adequate substrate for rearing, but appears to support many large pikeminnow that would prey on rearing steelhead.

- At Sunnyside Dam, rearing habitat lacks complexity in the forebay and tailrace and is relatively poor.
- At Nelson Dam, the large coarse sediment load provides a modicum of complexity, and provides moderate quality habitat for larger steelhead parr, but poor habitat for young-of-the-year fish due to excessive velocity and/or depth.
- At Town Diversion Dam, rearing habitat is poor to moderate for rearing due to depth and lack of complexity, but rearing habitat quality increases slightly in the tailrace during fall and winter as river flows decrease from the unnaturally high summer discharge caused by operation of the Yakima Irrigation Project.

Spawning is not known to occur at any of the sites, but could occur periodically in the tailraces of every dam and in the forebays of Nelson and Town Diversion dams. The river bed in the forebays of Roza and Sunnyside dams are too fine-grained to support steelhead spawning.

In summary, the existence and operation of the dam and diversion facilities at the four sites within the action area cause the death of significant numbers of steelhead smolts, cause some delay to adult steelhead with unknown consequences, locally reduce rearing capacity, and locally reduce spawning habitat quality.

2.5. Effects of the Action

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

2.5.1 Effects on Species

Presence and Exposure

The action area is used by various life stages of steelhead throughout the year. However, potential exposure of steelhead to dredging activities at each of the four sites differs because Reclamation has proposed different work windows at each site. Juvenile rearing may occur year-round in all parts of the action area, although the Sunnyside Dam site appears to be near the downstream-most extent of steelhead summer rearing such that juveniles are absent or at low densities from July through September. Adult steelhead may be at the Town Diversion or Roza sites during dredging, but will not be present at Sunnyside or Nelson Dams during dredging because work at those sites will occur during July and August, when steelhead adults are unlikely to be in the basin.

The presence of steelhead life stages during dredging activities is summarized in Table 3.

Table 3. Summary of proposed dredging and steelhead presence.

| Name of Dam | Location | Dredged Area (square feet) | Dredge Volume (cubic yards) | Work Window | Duration of Work | Frequency of Work | Fate of Dredge Spoils | Potential Steelhead in Action Area During Work Window |
|----------------|-------------------------|----------------------------|-----------------------------|----------------|------------------|------------------------------------|----------------------------|---|
| Roza | Yakima River Mile 127.9 | 6,700 | 1,500 | Jan 1-31 | 15 days | Every year | Upland disposal site | Juvenile rearing Adult migration and holding |
| Sunnyside | Yakima River Mile 103.8 | 300 | 84 | July 15–Aug 31 | 3 days | Every 3 years | In-river | Juvenile Rearing |
| Nelson | Naches River Mile 3.6 | 1,400 | 150 | July 16–Aug 31 | 2 days | Every 3 years until dam is rebuilt | In-river on dry gravel bar | Juvenile Rearing |
| Town Diversion | Yakima River Mile 161.3 | 840 | 150 | Sept 1-31 | 3 days | Every 3 years | In-river on dry gravel bar | Juvenile rearing Adult migration and holding |

Water Quality

The proposed action will affect water quality during dredging and in-river disposal of spoils, temporarily resuspending fine sediments and increasing turbidity.

NMFS expects that the resuspended fine sediments will be thoroughly mixed and/or diluted and approach background levels within 300 feet of the work area, as generally required by Washington State law.

Increased fine sediment can be detrimental to juvenile salmon and steelhead in several ways including avoidance of the area, abandonment of cover, stress, and reduced growth rates (Newcombe and Jensen 1996). NMFS expects that the turbidity levels generated by this action will be sufficient in the action area to cause temporary behavioral changes to steelhead that include changes in feeding and movement of fish within turbidity plumes (Berg and Northcote 1985). However, NMFS does not expect any fish to be injured or killed by exposure to turbidity caused by this action.

Additional impairment of water quality may result from accidental releases of fuel, oil, and other contaminants that can injure or kill aquatic organisms. Such releases, while rare, are reasonably likely to occur from the use of heavy equipment. Petroleum-based contaminants, such as fuel, oil, and some hydraulic fluids, contain polycyclic aromatic hydrocarbons (PAHs), which can kill salmon at high levels of exposure, and can cause sublethal, adverse effects at lower concentrations (Meador et al. 2006). NMFS anticipates PAH releases of only very small quantities (ounces) are likely with each accidental release or spill, and therefore effects among fish are likely to be minimal given the high flow rate of the river and potential for rapid dilution. Spills or releases larger than a few ounces are not reasonably certain to occur.

Mechanical Injury

Dredging is likely to directly affect steelhead juveniles in the work area. Fish present in the footprint of in-water work are at risk of being crushed or captured with dredged sediment. For the proposed work, heavy equipment will generally work from above the bank or from gravel bars such that it is unlikely that tracks will crush any fish. NMFS conservatively assumes that all juveniles present in the footprint of dredging will be injured or killed. Adult steelhead, if present, are expected to easily avoid dredging activities and are therefore not expected to be harmed.

Across the four sites, approximately 9,240 square feet of riverbed will be dredged. It is possible to derive a rough estimate of the number of juveniles that could be killed or injured by dredging in the work area. Mullan et al. (1992) reported that total juvenile (age-0 plus parr) steelhead densities in “fair” habitats in Upper Columbia River tributaries averaged 3.6 per 120 square yards, and densities in “poor” habitats averaged 2.4 per 120 square yards. NMFS considers the rearing habitat in the project footprint at Roza (6,700 square feet) to be “poor”, and at the other sites (totaling 2,540 square feet) to be “fair” per Mullan et al. (1992). Note that “fair” habitat is considered to have fewer fish than “average” habitat.

Assuming the fish density documented by Mullan et al. (1992), the area of in-water work in waters occupied by juvenile steelhead, and a 100 percent rate of death or injury, NMFS estimates that the disturbance will kill or injure 24 juvenile steelhead during dredging operations in the first year. However, in subsequent years, fewer steelhead will be killed or injured because the Sunnyside and Town Diversion sites will be dredged only every 3 years, and the Nelson site will likely be dredged only once before a new dam is built. Therefore, expected death and injury is expected to range between 15 and 19 steelhead juveniles after the first year of dredging.

Relevance of Effects on Individual Fish to Salmonid Population Viability

NMFS assesses the importance of effects in the action area (on individual fish) to an ESU or DPS by examining the relevance of those effects to the characteristics of VSPs. The characteristics of VSPs are sufficient abundance, population growth rate (productivity), spatial structure, and diversity. While these characteristics are described as unique components of population dynamics, each characteristic exerts significant influence on the others. For example, declining abundance can reduce spatial structure of a population; and when habitats are less varied, then diversity among the population declines.

Abundance. The proposed action is conservatively estimated to injure or kill 24 juvenile MCR steelhead in the first year of dredging and 15 to 19 in subsequent years. Based on the location of dredging, the affected steelhead would be members of the Naches or Upper Yakima populations of MCR steelhead. Based on typical tributary smolt-to-adult return rates varying around 0.5 percent (YBFWRB 2009, their Table 2.20), and the mortality that juveniles are subjected to between the fry and smolting life stages, killing and injuring between 15 and 24 juveniles would be expected to reduce returns of adult steelhead to the basin by an average of far less than one-tenth of an adult equivalent per year. Put another way, the expected impact of the proposed action is to result in a total of less than one fewer adult steelhead returning to the Yakima basin every 10 years. This loss is not expected to appreciably alter the abundance of the Naches or Upper Yakima populations or appreciably affect population trends. By helping to ensure proper function of fish passage facilities, the proposed action may positively influence abundance of both the Naches and Upper Yakima populations.

Productivity. The proposed action will have a very small effect on freshwater productivity by leading to the injury or death of an estimated 24 juveniles in the first year and 14 to 19 juveniles in subsequent years. However, the scale of impact is so small that it will not appreciably affect productivity. Again, improved fish passage facility function may improve productivity.

Spatial Structure. The proposed action will not affect spatial structure.

Diversity. The proposed action will not affect genetic or life-history diversity.

2.5.2 Effects on Critical Habitat

The proposed action could affect Critical Habitat PBFs via temporary degradation of water quality. As described above, the action is expected to suspend fine sediment during dredging, increasing turbidity in the Yakima and Naches rivers. NMFS also expects minor leaks and spills of petroleum-based fluids that will be well diluted by the large volume of river water.

The proposed action is scheduled to occur when steelhead are not spawning or incubating in the action area, and all effects of the action to critical habitat will only persist for a period of minutes to hours after dredging and spoils disposal ceases. Therefore, the proposed action will have no effect on the PBFs that support freshwater spawning.

The PBFs that support freshwater rearing and migration will be temporarily affected by degraded water quality within the action area. The temporary nature of the degradation of water quality, combined with its limited magnitude and spatial extent, render the effects of the action on the PBFs to be minor. Therefore, the proposed action will not significantly affect the conservation value of critical habitat in the action area.

2.6. Cumulative Effects

“Cumulative effects” are those effects of future state or private activities, not involving federal activities, that are reasonably certain to occur within the action area of the federal action subject to consultation (50 CFR 402.02 and 402.17(a)). Future federal actions that are unrelated to the

proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

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

During this consultation, NMFS searched for information on future state, tribal, local, or private actions that were reasonably certain to occur in the action area. Almost all reasonably certain future activities that will meaningfully affect the ability of the action area to support MCR steelhead are expected to be federal actions, such as Reclamation's operation of the facilities comprising the Yakima Irrigation Project, or issuance of permits by the Corps for in-water work. NMFS is not aware of any specific future state, tribal, local, or private actions that will meaningfully affect the action area.

2.7. Integration and Synthesis

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

The status of MCR steelhead is driven by the varying risks of extinction from low abundance, productivity, spatial structure, and diversity for some component populations. The DPS as a whole is unviable, largely because a majority of populations within the DPS are at moderate (5 to 25 percent) risk of extinction; however, four of 17 populations are identified as viable or highly viable. The DPS cannot achieve viability and the associated low risk of extinction without significant improvements in abundance, productivity, and diversity for many populations.

The action area is used by individuals of two independent populations of MCR steelhead: the Upper Yakima population and the Naches population. The Naches population is at moderate risk of extinction due to low abundance and exhibits low productivity. The Upper Yakima population is one of the populations at highest risk of extinction in the DPS, due primarily to high component extinction risks for low abundance, productivity, and diversity.

The environmental baseline (Section 2.4) is degraded by the presence and operation of the four dams and diversion facilities in the action area. The cumulative effects of state and private actions within the action area are anticipated to continue at approximately the same level that they are now occurring.

Species

As described in Section 2.5.1, the proposed action will have effects on individual MCR steelhead. The action will only affect juveniles of the Naches and Upper Yakima populations. An estimated 14 to 24 juveniles will be injured or killed by the proposed action per year. NMFS estimates that the proposed action will reduce the number of adults returning by less than one adult per 10 years. This reduction is not expected to appreciably alter the abundance, productivity, spatial structure, or diversity of the Naches or Upper Yakima populations or appreciably affect any population trends. Furthermore, this reduction may be offset by survival gains resulting from improved function of fish passage facilities. Because the action will not appreciably alter the abundance, productivity, spatial structure, or diversity of the Naches or Upper Yakima populations, and considering the baseline, status of the species, and cumulative effects, the action will also not likely reduce the likelihood of the survival and recovery of the MCR steelhead.

Critical Habitat

As noted in Section 2.2, climate change is likely to impact MCR steelhead and their critical habitat. Increases in water temperature and changes to the hydrological regime will reduce suitable salmon habitat and cause earlier migration of smolts. Warmer temperatures will likely lead to increased predation on juvenile salmonids in mainstem reservoirs (ISAB 2007). This is particularly true of non-native species such as bass and channel catfish where climate change will likely further accelerate their expansion (ISAB 2007). In addition, the warmer water temperatures will increase consumption rates by predators due to increased metabolic rates, which influence food demand.

The potential impact of the proposed action on MCR steelhead critical habitat is described in Section 2.5.2. The proposed action will have temporary effects on water quality. There will be no meaningful effect to PBFs that support freshwater spawning. Degradation of water quality (turbidity and pollutants) will be limited to the extent that the proposed action will not greatly affect the conservation value of the PBFs that support freshwater rearing and migration in the action area. Considering this and the status of critical habitat, baseline, and cumulative effects, the proposed action will not likely reduce the conservation value of critical habitat at the scale of the MCR steelhead designation.

2.8. Conclusion

After reviewing and analyzing the current status of the listed species and critical habitat, the environmental baseline within the action area, the effects of the proposed action, the effects of other activities caused by the proposed action, and cumulative effects, it is NMFS' biological opinion that the proposed action is not likely to jeopardize the continued existence of MCR steelhead or destroy or adversely modify its designated critical habitat.

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). “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 biological opinion, NMFS determined that incidental take would occur as follows: Effects of the action will coincide with the presence of MCR steelhead covered in this opinion such that incidental take in the form of death is reasonably certain to occur. MCR steelhead use portions of the action area for juvenile rearing, spawning, and adult and juvenile migrations. NMFS expects steelhead juveniles to be present in the action area during the work windows, exposing them to mechanical injury and ultimately death from in-water activities. Specifically, NMFS expects that up to 24 steelhead juveniles will be killed annually. It is not possible to actually count the number of fish killed but the frequency of dredging and extent is easily measured. When the specific number of individuals “killed” cannot be predicted, NMFS quantifies the extent of take based on the extent of habitat modified (June 3, 1986, 51 FR 19926 at 19954). The estimated extent of habitat affected by construction activities represents the extent of take exempted in this ITS. These extents are readily observable and therefore suffice to trigger reinitiation of consultation, if exceeded during the course of the proposed action (see H.R. Rep. No 97-567, 97th Cong., 2d Sess. 27 (1982)). Specifically, the extent of modified habitat is equivalent to the maximum area of riverbed that will be dredged by heavy equipment (9,240 square feet) each year: 6,700 square feet at Roza Dam, 1,400 square feet at Nelson Dam, 840 square feet at Town Diversion Dam, and 300 square feet at Sunnyside Dam. Although these surrogates could be considered coextensive with the proposed action, monitoring and reporting requirements will provide opportunities to check throughout the course of the proposed action whether the surrogates are exceeded. For this reason, the surrogates function as effective reinitiation triggers.

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 or destruction or adverse modification of critical habitat.

2.9.3. Reasonable and Prudent Measures

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

Reclamation shall:

1. Track and monitor the proposed action to ensure that the amount and extent of take are not exceeded.

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

2.9.4. Terms and Conditions

The terms and conditions described below are non-discretionary, and Reclamation or any applicant must comply with them in order to implement the RPMs (50 CFR 402.14). Reclamation or any applicant has a continuing duty to monitor the impacts of incidental take and must report the progress of the action and its impact on the species as specified in this ITS (50 CFR 402.14). If the entity to whom a term and condition is directed does not comply with the following terms and conditions, protective coverage for the proposed action would likely lapse.

1. The following terms and conditions implement RPM 1:
 - a. Reclamation shall determine the actual area of dredging each year.
 - b. Reclamation shall submit a completion of project report to NMFS 2 months after project completion. The completion report shall include, at a minimum, the following:
 - i. Total area of dredging.
 - ii. Number and species of fish observed injured or killed in the Yakima River, Naches River, or in dredge spoils.
 - iii. Dates of in-water work.
 - iv. Reference to NMFS consultation number WCRO-2019-03438.
 - c. All reports will be sent to National Marine Fisheries Service, Columbia Basin Branch, 304 South Water Street, Suite 201, Ellensburg, Washington 98926.
 - d. If the amount or extent of take is exceeded, stop project activities and notify NMFS immediately.

NOTICE: If a sick, injured or dead specimen of a threatened or endangered species is found in the action area, the finder must notify NMFS Law Enforcement at (206) 526-6133 or (800) 853-1964, through the contact person identified in the transmittal letter for this opinion, or through the NMFS Interior Columbia Basin Branch. The finder must take care in handling sick or injured specimens to ensure effective treatment, and in handling dead specimens to preserve biological material in the best possible condition for later analysis of cause of death. The finder should carry out instructions provided by Law Enforcement to ensure evidence intrinsic to the specimen is not disturbed unnecessarily.

2.10. Conservation Recommendations

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

NMFS is not recommending any conservation measures as part of this consultation.

2.11. Reinitiation of Consultation

This concludes formal consultation for Sediment Removal Activities at Roza, Sunnyside, Nelson, and Town Diversion Dams in Yakima County and Kittitas County, Washington.

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

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

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

This analysis is based, in part, on the EFH assessment provided by Reclamation and descriptions of EFH for Pacific Coast salmon (PFMC 2014) contained in the fishery management plans developed by the PFMC and approved by the Secretary of Commerce.

3.1. Essential Fish Habitat Affected by the Project

The proposed project action area includes essential fish habitat (EFH) for Chinook salmon

(*O. tshawytscha*) and coho salmon (*O. kisutch*) (PFMC 2014). Habitat areas of particular concern within the action area include complex channel and floodplain habitat, and spawning habitat (PFMC 2014).

3.2. Adverse Effects on Essential Fish Habitat

Based on information provided in the BA and the analysis of effects presented in the ESA portion of this document, NMFS concludes that the proposed action will adversely affect EFH designated for Chinook and coho salmon. Dredging will disturb rearing habitat for Chinook and coho salmon and cause resuspension of fine sediments that could settle on and impact spawning habitat for Chinook salmon.

3.3. Essential Fish Habitat Conservation Recommendations

We provide the following conservation recommendations:

1. Implement all of the RPMs and their terms and conditions described in the Incidental Take Statement in the ESA portion of this document.

Fully implementing these EFH conservation recommendations would protect, by avoiding or minimizing the adverse effects described in Section 3.2, above, approximately 9,240 square feet (0.21 acres) of designated EFH for Pacific Coast salmon.

3.4. Statutory Response Requirement

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

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

3.5. Supplemental Consultation

Reclamation must reinstate EFH consultation with NMFS if the proposed action is substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH Conservation Recommendations (50 CFR 600.920(1)).

4. DATA QUALITY ACT DOCUMENTATION AND PRE-DISSEMINATION REVIEW

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

4.1. Utility

Utility principally refers to ensuring that the information contained in this consultation is helpful, serviceable, and beneficial to the intended users. The intended users of this opinion is Reclamation. Other interested users could include irrigation districts or irrigators served by the subject diversion dams, or parties interested in the management of fish species in the Yakima basin. Individual copies of this opinion were provided to Reclamation. The document will be available within two weeks at the [NOAA Library Institutional Repository](https://repository.library.noaa.gov/welcome) [https://repository.library.noaa.gov/welcome]. The format and naming adheres to conventional standards for style.

4.2. Integrity

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

4.3. Objectivity

Information Product Category: Natural Resource Plan

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

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

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

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

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