UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
1201 NE Lloyd Boulevard, Suite 1100
PORTLAND, OREGON 97232-1274

December 19, 2011

VIA ELECTRONIC FILING

Refer to NMFS No:
2008/01301

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Re: Endangered Species Act Section 7 and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for Northern Wasco County PUD's North Shore Hydroelectric Project (FERC No. 7076-033) at The Dalles Dam in the Columbia River

Dear Secretary Bose:

Enclosed is National Marine Fisheries Services Endangered Species Act Biological Opinion, Incidental Take Statement, and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for Northern Wasco County PUD's North Shore Hydroelectric Project.

Sincerely,

for

William W. Stelle, Jr.
Regional Administrator

Enclosure

cc: Service List
Dwight Langor, Northern Wasco Co. PUD – The Dalles
Rick Martinson, PSMFC – The Dalles

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Endangered Species Act Section 7 Consultation	) North Shore Hydroelectric Project
	) FERC No. 7076-033
Northern Wasco County People's Utility District	)

CERTIFICATE OF SERVICE

I hereby certify that I have this day served, by electronic mail, a letter to Kimberly D. Bose, Secretary, Federal Energy Regulatory Commission, from National Marine Fisheries Service regarding Biological Opinion for the North Shore Hydroelectric Project, FERC No. 7076 (NMFS Consultation No. 2008/01301) and the foregoing document and this Certificate of Service has been served to each person designated on the official service list compiled by the Commission in the above captioned proceeding.

Dated on December 19, 2011

Bonnie Hossack

Bonnie Hossack, Secretary
FERC and Water Diversions Branch
Hydropower Division

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

Northern Wasco County PUD's North Shore Hydroelectric Project (FERC No. 7076) at The Dalles Dam in the Columbia River (RM 191.5), Sixth Field HUC 170701050406, Wasco County, Washington

NMFS Consultation Number: 2008/*01301*

Action Agency: Federal Energy Regulatory Commission (FERC)

Affected Species and Determinations:

ESA-Listed Species	Status	Is Action Likely to Adversely Affect Species or Critical Habitat?	Is Action Likely To Jeopardize the Species?	Is Action Likely To Destroy or Adversely Modify Critical Habitat?
Snake River fall Chinook (*Oncorhynchus tshawytscha*)	Threatened	Yes	No	No
Snake River spring/summer Chinook (*O. tshawytscha*)	Threatened	Yes	No	No
Upper Columbia River spring Chinook (*O. tshawytscha*)	Endangered	Yes	No	No
Snake River sockeye (*O. nerka*)	Endangered	Yes	No	No
Snake River steelhead (*O. mykiss*)	Threatened	Yes	No	No
Upper Columbia River steelhead (*O. mykiss*)	Threatened	Yes	No	No
Middle Columbia River steelhead (*O. mykiss*)	Threatened	Yes	No	No
Southern Resident killer whale (Orcinus orca)	Endangered	No	No	No

Fishery Management Plan That Describes EFH in the Project Area	Does Action Have an Adverse Effect on EFH?	Are EFH Conservation Recommendations Provided?
Pacific Coast Salmon	No	No

Consultation Conducted By: National Marine Fisheries Service, Northwest Region

Issued By:

William W. Stelle, Jr.
Regional Administrator

Date: December 19, 2011

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Acronyms and Abbreviations

AWS	Auxiliary Water System
BA	Biological Assessment
ºC	Celsius
CFS	Cubic Feet per Second
DPS	Distinct Population Segment
DQA	Data Quality Act
EFH	Essential Fish Habitat
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
FCRPS	Federal Columbia River Power System
FERC	Federal Energy Regulatory Commission
FWS	U.S. Fish and Wildlife Service
ICTRT	Interior Columbia 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
PCE	Primary Constituent Element
PFMC	Pacific Fishery Management Council
PIT-TAGS	Passive Integrated Transponder Tags
PUD	People's Utility District
RM&E	Research, Monitoring, & Evaluation
R/S	Recruits-Per-Spawner
RPA	Reasonable and Prudent Alternative
RPM	Reasonable and Prudent Measures
SR	Snake River
UCR	Upper Columbia River
USFWS	U.S. Fish and Wildlife Services
VSP	Viable Salmonid Populations

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

NMFS also completed an Essential Fish Habitat (EFH) consultation. It was prepared 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.

The opinion is in compliance with section 515 of the Treasury and General Government Appropriations Act of 2001 (Public Law 106-5444) ("Data Quality Act") and underwent pre-dissemination review.

The Northern Wasco County People's Utility District (PUD) owns and operates a hydroelectric project located on the north shore of The Dalles Dam. It is called the North Shore Fishway Hydroelectric Project, FERC Project No. 7076 (the Project).

1.2 Consultation History

This biological opinion is based on information provided in the January 31, 2008 biological assessment (FERC 2008), October 2010 Report entitled Fish Passage Monitoring of the North Shore Fishway Hydroelectric Project at The Dalles Dam (Martinson 2010), and e-mail exchanges (March 15, 2011, from Rick Martinson, to Michelle Day, NMFS (Martinson 2011a); May 10, 2011, from Rick Martinson, to Michelle Day, NMFS (Martinson 2011b). The Project began operating in 1991. Fish monitoring activities have been conducted under the authority of an ESA Section 10 permit for the Smolt Monitoring Program for the Federal Columbia River Power System in 1992 and annual permits issued by NMFS' under Section 10(a)(1)(A) of the ESA from 1994 through 2006. Sampling times were shifted to avoid collection of ESA listed species in 1993, so that no permit was required for that year. No sampling was conducted in 2007, but occurred from 2008 through 2010 with NMFS agreement that this was allowed for the purpose of describing the effects of the project while the PUD was engaged in ESA consultation. A complete record of this consultation is on file at the NMFS' Northwest Regional Office in Portland, Oregon. The opinion covers the term of the Federal Energy Regulatory Commission (FERC) license, which expires 2037.

1.3 Proposed Action

The Proposed Action is the implementation of a plan to monitor the effectiveness of fish screens and of the downstream fish bypass facility required by the North Shore Hydroelectric Project FERC license. "Action" means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies. FERC is the Federal action agency for this consultation. While the January 31, 2008, biological assessment from FERC focused solely on the PUD's fish sampling and monitoring program, the proposed action analyzed in this opinion is the continued operation of the FERC licensed project which has not previously undergone consultation. The Project consists of the existence and operation of a fish screened turbine, its intake and outfall, the fish bypass pipe, and monitoring of the fish screen and bypass facility. The Project is located at The Dalles Dam near the spillway and the North Fish Ladder (Figure 1).

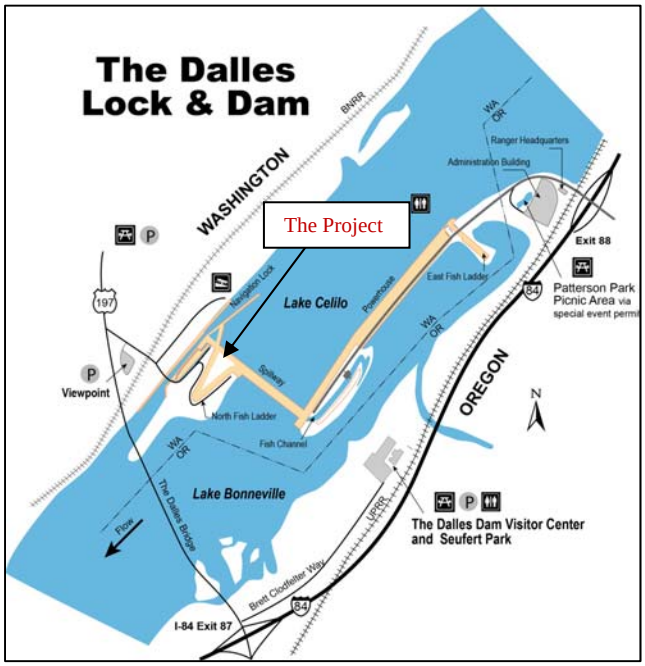


Figure 1. The Dalles Dam with arrow pointing to area of the Project (From **www.nwp.usace.army.mil/locations/thedalles.asp**)

The Project turbine is powered by about 800 cubic feet per second (cfs) from the forebay of The Dalles Dam, which prior to the PUD's turbine construction, was delivered through a series of energy dissipating plunge pools to the auxiliary water system (AWS) for the adult fish ladder. So, in addition to the generation of power, the project is responsible for regulation of flow to the north shore adult fish ladder entrance at The Dalles Dam (owned and operated by the U.S. Army Corps of Engineers). The AWS system supplements the flow coming down the fish ladder to create the required differential at the entrance to the ladder. As part of the agreement to use this water to generate electricity, the PUD assumed responsibility for maintaining required differentials at the north shore fish ladder entrance.

The PUD directs that flow into a 150-foot long screened dewatering structure (the Fingerling Bypass) that separates the juvenile fish from the unit's penstock flow (Figure 2). The 21foot by 105-foot fish screen is made of 1/8 inch stainless steel vertical bar stock spaced 1/8 inch apart. This vertical wall screen extends the length of the dewatering structure and is oriented diagonally, tapering down to about a 24 inch width across the floor at its exit,

Figure 2. Intake structure looking downstream. (Emergency gates to left)

The last 20 feet of the structure features an ascending floor to further direct fish to the exit where a weir gate monitors the dewatering structure channel elevation to maintain a pre-set differential. When smolts are not being sampled, it is set to maintain a one-foot differential between channel elevation and the top of the weir gate. This provides 10 to 12 cfs of discharge flow. Flow from the weir gate drops into a 6 foot by 10 foot by 20-foot deep plunge pool that exits to a 24-inch hard plastic bypass pipe. That 1500-foot pipe carries the flow from the fish weir gate plunge pool to its outflow 30 feet downstream from the N1 fish ladder entrance in the tailrace (Figure 3).

Figure 3. Fish bypass outfall at tailrace entrance to N1 ladderr

During the smolt sampling period (one 24 hour period per week from April through July), the depth at the weir is reduced to about 0.2 foot to reduce turbulence in the sample collection tank.

The vertical wall screen has one vertical cleaning brush arm that moves along the length of the screen, cleaning it to the point where the floor starts ascending toward the exit. The screens in the ascending floor section are cleaned by two wiper type brushes. All cleaners are operated manually each week prior to sampling and are set to operate automatically if the differential

between water elevations in front of the screen compared to that behind is greater than six inches. To protect juvenile fish, the screens are baffled progressively over the length of the structure to maintain a uniform dewatering rate (through screen velocity of 0.4 foot per second or less)

The intake structure trash racks are ¾ inch steel bar stock with a 7/8 inch spacing to prevent large trash and adult fish from entering the intake.

Since the unit went on line in 1991, annual evaluations of passage conditions have been conducted every year except 2007. Evaluations are based on the condition of the sampled fish; if they are uninjured, it is assumed that the bypass system is in good condition and passing fish safely. This monitoring is stipulated in the FERC issued Project license. The FERC license stipulates, "… a plan to monitor the effectiveness of the fish screens and of the downstream fish bypass facility is required". The monitoring program is scheduled to occur during the middle 80 percent of the juvenile salmon migration (April through July). The dates are based on data generated by the Smolt Monitoring Program at John Day Dam (available through the Fish Passage Center, Portland, Oregon or at www.fpc.org).

Fish samples to evaluate the dewatering structure fish screens and passage conditions are collected by placing the collection tank under the fish weir gate outflow and over the fish weir plunge pool (Figure 4). The water depth over the weir is reduced from about 1 foot to 0.2 foot to reduce the turbulence in the collection tank. The tank is fitted with baffles which create a sanctuary area at the downstream end of the tank (to the right in Figure 4). Excess water drains out through perforated plates on the sides and upstream end of the tank.

Figure 4. Position of fish collection tank during smolt sampling

To process the sample, the water level in the tank is lowered and about 180 ml of MS-222 are added to mildly sedate the fish for transfer to an examination sink containing more MS-222. The fish are examined once fully anesthetized. Data collected includes identification to species, size (fork length), condition (percent of scale loss), injuries or symptoms of disease, and operational information such as mainstem forebay elevation, flow rate, and water temperature at the time of collection. Fish are allowed to recover from the effects of the anesthesia before being returned to the river via the bypass outfall pipe. Sampling operations on a specific day depend on mainstem flow conditions: no sampling would be scheduled when forebay levels are anticipated to be below minimum operating level (elevation 156 feet 6 inches) for the PUD's fish sampling apparatus. When postponed, an alternate sampling day may be scheduled during the same week. The objective of the fish monitoring is to evaluate the passage conditions for ESA listed species in the dewatering structure of the PUD hydroplant. As described in the Biological Assessment BA, these tasks are:

1. Sample fish during one 24 hour per week period throughout the monitoring season, April through July.
2. Report sample totals by species.
3. Collect descaling and mortality information by species.
4. Collect length and condition data.
5. Collect forebay elevation and flow data for sample days.
6. Conduct data analysis and verification as needed to insure accurate data.
7. Generate and submit reports and applications in accordance with scheduled deadlines.
8. Conduct project fish facility inspections and consult with PUD staff or agency personnel on fish related issues as needed.

Interrelated actions are those that are part of a larger action and depend on the larger action for their justification (50 CFR § 402.02). Interdependent actions are those that have no independent utility apart from the action under consideration. Although this proposed action is related to The Dalles Dam and the larger Federal Columbia River Hydropower System (FCRPS), the Northern Wasco County PUD's North Shore Hydroelectric Project, Project No. 7076-033 has independent utility and therefore is not an interrelated or interdependent with the FCRPS. NMFS has not identified any interrelated or interdependent actions for this proposed action.

1.4 Action Area

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

The action area is immediately downstream of the trash racks for the auxiliary water intake for the North Fish Ladder to the outflow of the Fingerling Bypass, including the generator outfall in the ladder and the sluice gates emergency auxiliary water supply into the ladder (Figure 5). This is the area within which any direct or indirect effects would occur. Effects beyond the adult ladder are so small that the effects are undetectable. The action area does include all the different components that could impact listed fish: trash racks, screen, outfall into adult ladder, bypass, monitoring tank, and outfall into the tailrace.

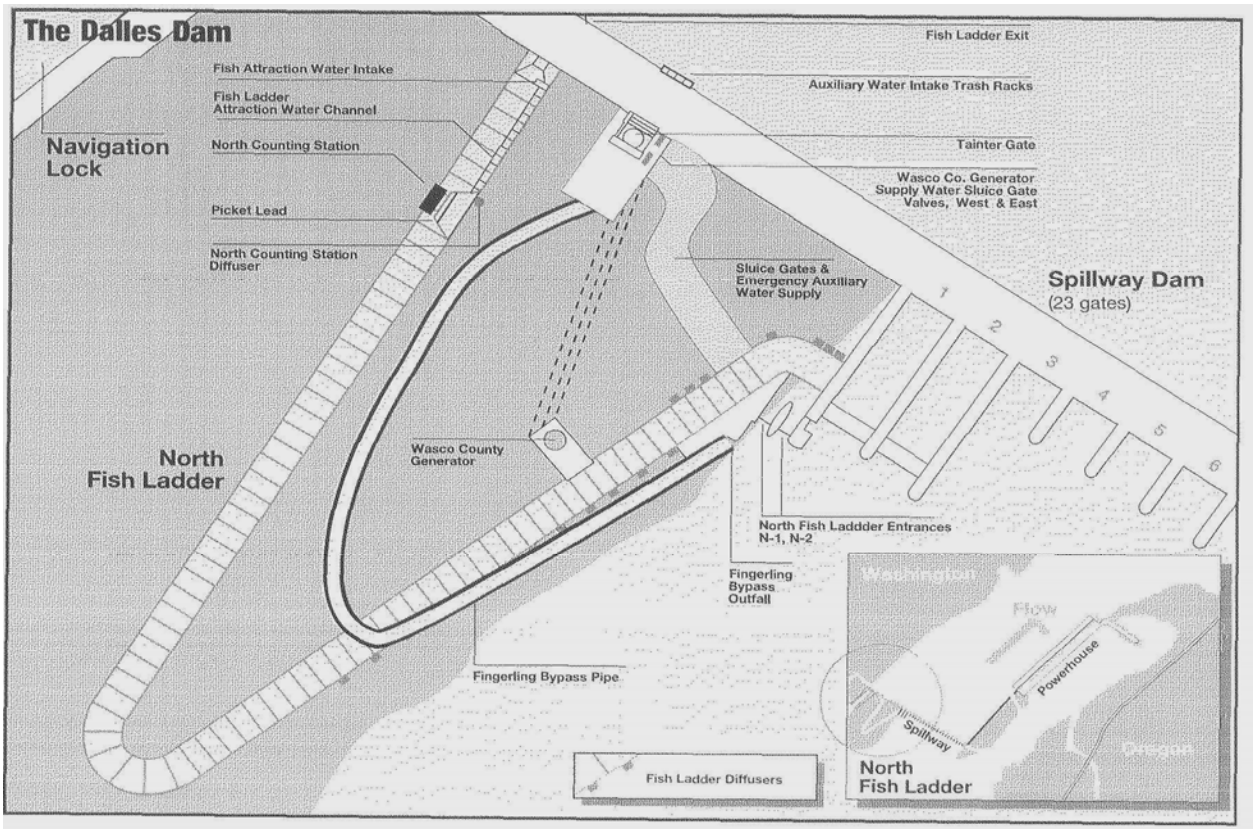


Figure 5. Northern Wasco County PUD Hydroplant Footprint

1.5 Southern Resident Killer Whales

The proposed action may indirectly affect prey available to Southern Resident killer whales (*Orcinus orca*), a marine mammal species that was listed as endangered in 2005 (NMFS 2005a), with critical habitat designated in 2006 (NMFS 2006a). Informal consultation on this species is described in Section 2.11 "Not Likely to Adversely Affect" Determinations.

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 on which they depend. Section 7(a)(2) of the ESA requires Federal agencies to consult with the United States Fish and Wildlife Service (FWS), NMFS, or both, to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or adversely modify or destroy their designated critical habitat. Section 7(b)(3) requires that at the conclusion of consultation, FWS, NMFS, or both, provide an opinion stating how the agencies' actions will affect listed species or their critical habitat. If incidental take is expected, Section 7(b)(4) requires the provision of an incidental take statement (ITS) specifying the impact of any incidental taking, and including reasonable and prudent measures to minimize such impacts.

2.1 Introduction to the Biological Opinion

Section 7(a)(2) of the ESA requires Federal agencies, in consultation with NMFS, to insure that their actions are not likely to jeopardize the continued existence of endangered or threatened species, or adversely modify or destroy their designated critical habitat. The jeopardy analysis considers both survival and recovery of the species. The adverse modification analysis considers the impacts to the conservation value of the designated critical habitat.

"To jeopardize the continued existence of a listed species" means to engage in an action that would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR 402.02).

This biological opinion does not rely on the regulatory definition of 'destruction or adverse modification' of critical habitat at 50 C.F.R. 402.02. Instead, we have relied upon the statutory provisions of the ESA to complete the following analysis with respect to critical habitat (NMFS 2005b).

We will use the following approach to determine whether the proposed action described in Section 1.3 is likely to jeopardize listed species or destroy or adversely modify critical habitat:

- *Identify the rangewide status of the species and critical habitat likely to be adversely affected by the proposed action*. This section describes the current status of each listed species and its critical habitat relative to the conditions needed for recovery. For listed salmon and steelhead, NMFS has developed specific guidance for analyzing the status of the listed species' component populations in a "viable salmonid populations" paper (VSP; McElhany et al. 2000). The VSP approach considers the abundance, productivity, spatial structure, and diversity of each population as part of the overall review of a species' status. For listed salmon and steelhead, the VSP criteria therefore encompass the species' "reproduction, numbers, or distribution" (50 CFR 402.02). In describing the range-wide status of listed species, we rely on viability assessments and criteria in technical recovery team documents and recovery plans, where available, that describe how VSP criteria are applied to specific populations, major population groups, and species. We determine the rangewide status of critical habitat by examining the condition of its physical or biological features (also called "primary constituent elements" or PCEs in some designations) - which were identified when the critical habitat was designated. Species and critical habitat status are discussed in Section 2.2.
- *Describe the environmental baseline for the proposed action*. The environmental baseline includes the past and present impacts of Federal, state, or private actions and other human activities *in the action area*. It includes the anticipated impacts of proposed Federal projects that have already undergone formal or early Section 7 consultation and the impacts of state or private actions that are contemporaneous with the consultation in process. The environmental baseline is discussed in Section 2.3 of this opinion.
- *Analyze the effects of the proposed actions*. In this step, NMFS considers how the proposed action would affect the species' reproduction, numbers, and distribution or, in the case of salmon and steelhead, their VSP characteristics. NMFS also evaluates the proposed action's effects on critical habitat features. The effects of the action are described in Section 2.4 of this opinion.

- *Describe any cumulative effects.* Cumulative effects, as defined in NMFS' implementing regulations (50 CFR 402.02), are the effects of future state or private activities, not involving Federal activities, that are reasonably certain to occur within the action area. Future Federal actions that are unrelated to the proposed action are not considered because they require separate Section 7 consultation. Cumulative effects are considered in Section 2.5 of this opinion.
- *Integrate and synthesize the above factors to assess the risk that the proposed action poses to species and critical habitat.* In this step, NMFS adds the effects of the action (Section 2.4) to the environmental baseline (Section 2.3) and the cumulative effects (Section 2.5) to assess whether the action could reasonably be expected to: (1) appreciably reduce the likelihood of both survival and recovery of the species in the wild by reducing its numbers, reproduction, or distribution; or (2) reduce the value of designated or proposed critical habitat for the conservation of the species. These assessments are made in full consideration of the status of the species and critical habitat (Section 2.2). Integration and synthesis occurs in Section 2.6 of this opinion.
- *Reach jeopardy and adverse modification conclusions.* Conclusions regarding jeopardy and the destruction or adverse modification of critical habitat are presented in Section 2.7. These conclusions flow from the logic and rationale presented in the Integration and Synthesis Section (2.6).
- *If necessary, define a reasonable and prudent alternative to the proposed action.* If, in completing the last step in the analysis, NMFS determines that the action under consultation is likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat, NMFS must identify a reasonable and prudent alternative (RPA) to the action in Section 2.8. The RPA must not be likely to jeopardize the continued existence of ESA-listed species nor adversely modify their designated critical habitat and it must meet other regulatory requirements.

2.2 Rangewide Status of the Species and Critical Habitat

The following ESA-listed anadromous fish species[1] are present in the action area for this consultation**:**

Snake River fall Chinook salmon (*Oncorhynchus tshawytscha*)
Snake River spring/summer Chinook salmon (*O. tshawytscha*)
Upper Columbia River spring Chinook salmon (*O. tshawytscha*)
Snake River sockeye salmon (*O. nerka*)
Snake River steelhead (*O. mykiss*)
Upper Columbia River steelhead (*O. mykiss*)
Middle Columbia River steelhead (*O. mykiss*)

The biological requirements, life histories, historical abundance, current viability, and factors contributing to the decline of these salmon and steelhead species have been well documented. The following sections summarize the rangewide status of each species and its designated critical habitat from recent technical reports, most of which are available on the Web sites for NMFS' Northwest Regional Office or Northwest Fisheries Science Center (e.g., see Ford et al. 2010; and NMFS 2005c and 2006).

[1] An "evolutionarily significant unit" (ESU) of Pacific Salmon (Waples 1991) and a "distinct population segment" (DPS) of steelhead (NMFS 2006b) are considered to be "species" as defined in Section 3 of the ESA.

Snake River Fall Chinook Salmon
Species Overview
Background

The Snake River (SR) fall Chinook salmon ESU includes fish spawning in the lower mainstem of the Snake River and the lower reaches of several of the associated major tributaries including the Tucannon, the Grande Ronde, Clearwater, Salmon and Imnaha Rivers, as well as four artificial propagation programs: the Lyons Ferry Hatchery, Fall Chinook Acclimation Ponds Program, Nez Perce Tribal Hatchery, and Oxbow Hatchery fall-run Chinook hatchery programs. On August 15, 2011, NMFS completed a five-year review for the SR fall Chinook ESU and concluded that the species should remain listed as threatened (NMFS 2011).

Historically, this ESU included two large additional populations spawning in the mainstem of the Snake River upstream of the Hells Canyon Dam complex. The decline of this ESU was due to heavy fishing pressure beginning in the 1890s and loss of habitat with the construction of Swan Falls Dam in 1901 and the Hells Canyon Complex from 1958 to 1967, which extirpated two of the historical populations. The spawning and rearing habitat associated with the current extant population represents approximately 20 percent of the total historical habitat available to the ESU (Ford et al. 2010).

Current Status & Recent Trends

Abundance and productivity estimates for the single remaining population of Snake River Fall Chinook salmon have improved substantially relative to the time of listing. However, the current combined estimates of abundance and productivity population still result in a moderate risk of extinction of between 5 and 25 percent in 100 years. The extant population of Snake River Fall Chinook is the only remaining from an historical ESU that also included large mainstem populations upstream of the current location of the Hells Canyon Dam complex. The recent increases in natural origin abundance are encouraging. However, hatchery origin spawner proportions have increased dramatically in recent years – on average, 78 percent of the estimated adult spawners have been hatchery origin over the most recent brood cycle (Ford et al. 2010).

Limiting Factors and Threats

Limiting factors for SR fall Chinook include mainstem hydroelectric projects in the Columbia and Snake rivers, predation, harvest, hatcheries, the estuary, and tributary habitat. Ocean conditions have also affected the status of this ESU. Generally, ocean conditions have been poor for this ESU over the past 20 years, improving only recently.

Recent Ocean and Mainstem Harvest

Snake River fall Chinook have a very broad ocean distribution and have been taken in ocean salmon fisheries from central California through southeast Alaska. They are also harvested in-river in tribal and non-tribal fisheries. Historically they were subject to total exploitation rates on the order of 80 percent. Since they were originally listed in 1992, fishery impacts have been reduced in both ocean and river fisheries. Ocean fisheries have been required since 1996, through ESA consultation, to achieve a 30 percent reduction in the average exploitation rate observed during the 1988 to 1993 base period. In recent years, about 14 percent of the incidental take has occurred in the southeast Alaska fishery, about 23 percent in the Canadian fishery (primarily off the west coast of Vancouver Island), about 20 percent in the coastal fishery

(primarily off Washington, and to a lesser degree off Oregon and Northern California), about 11 percent in the non-Treaty fishery in the Columbia River, and about 30 percent in the Columbia River tribal treaty-right fishery. Total exploitation rate has been relatively stable in the range of 40 percent to 50 percent since the mid-1990s (Ford et al. 2010).

Rangewide Status of Critical Habitat

Designated critical habitat for SR fall Chinook salmon includes all Columbia River estuarine areas and river reaches proceeding upstream to the confluence of the Columbia and Snake rivers; all Snake River reaches from the confluence of the Columbia River upstream to Hells Canyon Dam; the Palouse River from its confluence with the Snake River upstream to Palouse Falls; the Clearwater River from its confluence with the Snake River upstream to its confluence with Lolo Creek; and the North Fork Clearwater River from its confluence with the Clearwater River upstream to Dworshak Dam. Critical habitat also includes river reaches presently or historically accessible (except those above impassable natural falls and Dworshak and Hells Canyon dams) in the following subbasins: Clearwater, Hells Canyon, Imnaha, Lower Grande Ronde, Lower North Fork Clearwater, Lower Salmon, Lower Snake, Lower Snake-Asotin, Lower Snake-Tucannon, and Palouse. The lower Columbia River corridor is among the areas of high conservation value to the ESU because it connects every population with the ocean and is used by rearing/migrating juveniles and migrating adults. The Columbia River estuary is a unique and essential area for juveniles and adults making the physiological transition between life in freshwater and marine habitats. Designated areas consist of the water, waterway bottom, and the adjacent riparian zone (defined as an area 300 feet from the normal high water line on each side of the river channel) (NMFS 1993).

Snake River Spring/Summer Chinook Salmon

Species Overview

Background

The Snake River Spring-Summer Chinook salmon ESU includes all naturally spawned populations of spring/summer-run Chinook salmon in the mainstem Snake River and the Tucannon River, Grande Ronde River, Imnaha River, and Salmon River subbasins, as well as fifteen artificial propagation programs. On August 15, 2011 NMFS completed a five-year review for the SR spring/summer Chinook salmon ESU and concluded that the species should remain listed as threatened (NMFS 2011). The ESU was first listed under the ESA in 1992, and the listing was reaffirmed in 2005.

Current Status & Recent Trends

The SR spring/summer Chinook's five major population groups (MPGs) are further composed of 28 extant populations. Although natural spawning abundance estimates have increased, all populations remain below minimum natural origin abundance thresholds. Relatively low natural production rates and spawning levels below minimum abundance thresholds remain a major concern across the ESU. The ability of populations to be self-sustaining through normal periods of relatively low ocean survival remains uncertain (Ford et al. 2010).

Limiting Factors and Threats

Limiting factors for the Snake River spring/summer Chinook include the Federal and private hydropower projects, predation, harvest, the estuary, and tributary habitat. Ocean conditions have also affected the status of this ESU. These conditions have been generally poor for this ESU over the last four brood cycles, improving only in the last few years. Although hatchery management is not identified as a limiting factor for the ESU as a whole, the Interior Columbia Technical Recovery Team (ICTRT) has indicated potential hatchery impacts for a few individual populations.

Recent Ocean and Mainstem Harvest

The ocean fishery mortality on Snake River spring/summer Chinook is very low and, for practical purposes, assumed to be zero. Incidental take of Snake River spring/summer Chinook occurs in spring and summer season fisheries in the mainstem Columbia River that target harvestable hatchery and natural-origin stocks. All harvest occurs in the lower portion of the mainstem Columbia River. Snake River summer Chinook share the ocean distribution patterns of the upper basin spring runs and are only subject to significant harvest in the mainstem Columbia River. Harvest of summer Chinook has been more constrained than that of spring Chinook with consequently lower exploitation rates on the summer component of this ESU. Harvest rates on the aggregate runs of up-river spring and summer Chinook salmon were generally reduced in the 1970s in response to abrupt declines in returns of naturally produced fish. The fisheries on harvestable runs were limited to ensure that incidental take of ESA-listed Snake River spring/summer Chinook does not exceed a rate of from 5.5 to 17 percent. The incidental take of natural-origin upriver spring/summer Chinook has averaged around 10 percent since 2001.

Rangewide Status of Critical Habitat

Designated critical habitat for SR spring/summer Chinook salmon includes all Columbia River estuarine areas and river reaches proceeding upstream to the confluence of the Columbia and Snake rivers, and all Snake River reaches from the confluence of the Columbia River upstream to Hells Canyon Dam (NMFS 1999). Critical habitat also includes river reaches presently or historically accessible (except those above impassable natural falls, including Napias Creek Falls, and Dworshak and Hells Canyon dams) in the following subbasins: Hells Canyon, Imnaha, Lemhi, Little Salmon, Lower Grande Ronde, Lower Middle Fork Salmon, Lower Salmon, Lower Snake-Asotin, Lower Snake-Tucannon, Middle Salmon-Chamberlain, Middle Salmon-Panther, Pahsimeroi, South Fork Salmon, Upper Middle Fork Salmon, Upper Grande Ronde, Upper Salmon, and Wallowa. The lower Columbia River corridor is among the areas of high conservation value to the ESU because it connects every population with the ocean and is used by rearing/migrating juveniles and migrating adults. The Columbia River estuary is a unique and essential area for juveniles and adults making the physiological transition between life in freshwater and marine habitats. Designated areas consist of the water, waterway bottom, and the adjacent riparian zone (defined as an area 300 feet from the normal high water line on each side of the river channel) (NMFS 1999). Designation did not involve rating the conservation value of specific watersheds as was done in subsequent designations (NMFS 2005d).

Upper Columbia River Spring Chinook Salmon

Species Overview

Background

The Upper Columbia River (UCR) Spring-run Chinook Salmon (ESU) includes naturally spawning spring-run Chinook salmon in the major tributaries entering the Columbia River upstream of Rock Island Dam and the associated hatchery programs. On August 15, 2011, NMFS completed a five-year review for the UCR spring Chinook salmon ESU and concluded that the species should remain listed as endangered (NMFS 2011).

Current Status & Recent Trends

The Upper Columbia Spring Chinook ESU is not currently meeting the viability criteria (adapted from the ICTRT) in the Upper Columbia Recovery Plan. Abundance for most populations declined to extremely low levels in the mid-1990s, increased to levels above (Wenatchee and Methow) or near (Entiat) the recovery abundance thresholds in the early 2000s, however, average productivity levels remain extremely low (Ford et al. 2010).

Limiting Factors and Threats

The key limiting factors and threats for the UCR spring Chinook include hydropower projects, predation, harvest, hatchery effects, degraded estuary habitat, and degraded tributary habitat. Risk due to spatial structure is low for the Wenatchee and Methow River populations and moderate for the Entiat populations due to loss of production in lower section, which increases the effective distance[2] to other populations. All three of the extant populations are rated at high risk for diversity, driven primarily by chronically high proportions of hatchery-origin spawners in natural spawning areas and lack of genetic diversity among the natural-origin spawners (ICTRT 2008).

Recent Ocean and Mainstem Harvest Rates

The ocean fishery mortality affecting Upper Columbia River spring Chinook is low, due to migration patterns, which have minimal intersection with ocean fisheries, and for practical purposes, assumed to be zero. Incidental take occurs in spring season fisheries in the mainstem Columbia River, which are intended to target harvestable hatchery and natural-origin stocks. Under the 2008 *U.S. v. Oregon* harvest agreement, the mainstem fishery is currently limited to assure that incidental take does not exceed 5.5 to 17 percent. Exploitation rates have remained relatively low, generally below 10 percent, though they have been allowed to increase in recent years in response to record returns of hatchery spring Chinook to the Columbia River basin (Ford et al. 2010).

Rangewide Status of Critical Habitat

Designated critical habitat for UCR spring Chinook includes all Columbia River estuarine areas and river reaches proceeding upstream to Chief Joseph Dam as well as specific stream reaches in the following subbasins: Chief Joseph, Methow, Upper Columbia/Entiat, and Wenatchee (NMFS 2005d). Of the 31 watersheds within the range of this ESU, NMFS' Critical Habitat Analytical Review Teams rated the conservation value of five as medium and 26 as high (NMFS 2005d). The Columbia River rearing/migration corridor downstream of the spawning range is considered

[2] Effective distance: loss of fish in lower sections means that the distance between populations increases; thus the likelihood of straying between them decreases, reducing demographic and genetic linkages.

to have a high conservation value and is the only habitat area designated in 15 of the high value watersheds identified above. This corridor connects every population with the ocean and is used by rearing/migrating juveniles and migrating adults.

Snake River Sockeye Salmon
Species Overview
Background
The ESU includes all anadromous and residual sockeye salmon from the Snake River Basin, Idaho, as well as artificially propagated sockeye salmon from the Redfish Lake captive propagation program. On August 15, 2011, NMFS completed a five-year review for the SR sockeye salmon ESU and concluded that the species should remain listed as endangered (NMFS 2011).

Sockeye salmon were historically numerous in many areas of the Snake River basin prior to the European westward expansion. However, intense commercial harvest of sockeye along with other salmon species beginning in the mid-1880s; the existence of Sunbeam Dam as a migration barrier between 1910 and the early 1930s; the eradication of sockeye from Sawtooth Valley lakes in the 1950s and 1960s; the development of mainstem hydropower projects on the lower Snake and Columbia Rivers in the 1970s and 1980s; and poor ocean conditions in 1977 through the late 1990s probably combined to reduce the stock to a very small remnant population. Snake River sockeye salmon are now found predominantly in a captive broodstock program associated with Redfish and the other Sawtooth Valley lakes. At the time of listing in 1991, one, one, and zero fish had returned to Redfish Lake in the three preceding years, respectively.

Current Status & Recent Trends
This species has a very high risk of extinction. Between 1991 and 1998, all 16 of the natural-origin adult sockeye salmon that returned to the weir at Redfish Lake were incorporated into the captive broodstock program. The program has used multiple rearing sites to minimize chances of catastrophic loss of broodstock and has produced several hundred thousand eggs and juveniles, as well as several hundred adults, for release into the wild. Between 1999 and 2007, more that 355 adults returned from the ocean from captive broodstock releases—almost 20 times the number of wild fish that returned in the 1990s. The program has been successful in its goals of preserving important lineages of Redfish Lake sockeye salmon for genetic variability and in preventing extinction in the near-term. Adult returns in 2008 and 2009 were the highest since the current captive brood-based program began with a total of 650 and 809 adults counted back to the Stanley Basin.

Limiting Factors and Threats
By the time Snake River Sockeye were listed in 1991, the species had declined to the point that there was no longer a self-sustaining, naturally spawning anadromous sockeye population. This has been the largest factor limiting the recovery of this ESU, important in terms of both risks due to catastrophic loss and potentially to genetic diversity. It is not yet clear whether the existing population retains sufficient genetic diversity to successfully adapt to the range of variable conditions that occur within its natural habitat. However, unpublished data from geneticists for the Stanley Basin Sockeye Technical Oversight Committee indicate that the captive broodstock has similar levels of haplotype diversity as other sockeye populations in the Pacific Northwest

and that the program has been able to maintain rare alleles in the population over time. The broodstock program reduces the risk of domestication by using a spread-the-risk strategy, outplanting prespawning adults and fertilized eyed eggs as well as juveniles raised in the hatchery. The progeny of adults that spawn in the lakes and juveniles that hatch successfully from the eyed eggs are likely to have adapted to the lake environment rather than become "domesticated" to hatchery rearing conditions.

Recent Ocean and Mainstem Harvest

Few sockeye are caught in ocean fisheries. Ocean fisheries do not significantly impact Snake River sockeye. Within the mainstem Columbia River, treaty tribal net fisheries and non-tribal fisheries directed at Chinook salmon do incidentally take small numbers of sockeye. Most of the sockeye harvested are from the Upper Columbia River (Canada and Lake Wenatchee), but very small numbers of Snake River sockeye are taken incidental to summer fisheries directed at Chinook salmon.

Current Rangewide Status of Critical Habitat

Designated critical habitat for SR sockeye salmon includes all Columbia River estuarine areas and river reaches proceeding upstream to the confluence of the Columbia and Snake rivers; all Snake River reaches from the confluence of the Columbia River upstream to the confluence of the Salmon River; all Salmon River reaches from the confluence of the Snake River upstream to Alturas Lake Creek; Stanley, Redfish, Yellow Belly, Pettit, and Alturas lakes (including their inlet and outlet creeks); Alturas Lake Creek; and that portion of Valley Creek between Stanley Lake Creek and the Salmon River (NMFS 1993). The lower Columbia River corridor is among the areas of high conservation value to the ESU because it connects every population with the ocean and is used by rearing/migrating juveniles and migrating adults. The Columbia River estuary is a unique and essential area for juveniles and adults making the physiological transition between life in freshwater and marine habitats. Designated areas consist of the water, waterway bottom, and the adjacent riparian zone (defined as an area 300 feet from the normal high water line on each side of the river channel) (NMFS 1993). Designation did not involve rating the conservation value of specific watersheds as was done in subsequent designations (NMFS 2005d).

Snake River Steelhead

Species Overview

Background

The Snake River steelhead DPS includes all anadromous populations that spawn and rear in the mainstem Snake River and its tributaries between Ice Harbor and the Hells Canyon hydro complex, as well as six artificial propagation programs: the Tucannon River, Dworshak NFH, Lolo Creek, North Fork Clearwater, East Fork Salmon River, and the Little Sheep Creek/Imnaha River Hatchery steelhead hatchery programs. There are five major population groups with 24 populations. On August 15, 2011, NMFS completed a five-year review for the SR steelhead DPS and concluded that the species should remain listed as threatened (NMFS 2011).

Fisheries managers classify Columbia River summer run steelhead into two aggregate groups, A-run and B-run, based on ocean age at return, adult size at return and migration timing. A-run steelhead are predominately spend one year at sea and are assumed to be associated with low to

mid-elevation streams throughout the Interior Columbia basin. B-run steelhead are larger with most individuals returning after 2 years in the ocean. Snake River steelhead are classified as summer run based on their adult run timing patterns. Much of the freshwater habitat used by Snake River steelhead for spawning and rearing is warmer and drier than that associated with other steelhead DPSs. Snake River steelhead spawn and rear as juveniles across a wide range of freshwater temperature/precipitation regimes. A-run steelhead are believed to occur throughout the steelhead streams in the Snake River Basin, and B-run are thought to produce only in the Clearwater and Salmon rivers. This DPS was listed under the ESA as threatened in 1997, reaffirmed in 2006.

Current Status & Recent Trends
Population-level natural origin abundance and productivity inferred from aggregate data and juvenile indices indicate that many populations are likely below the minimum combinations defined by the ICTRT viability criteria and the status of most populations in this DPS remains highly uncertain. A great deal of uncertainty also remains regarding the relative proportion of hatchery fish in natural spawning areas near major hatchery release sites (Ford et al. 2010).

Limiting Factors and Threats
Limiting factors identify the most important biological requirements of the species. Historically, the key limiting factors for the Snake River steelhead include hydropower projects, predation, harvest, hatchery effects, and tributary habitat. Ocean conditions have also affected the status of this DPS. These generally have been poor over at least the last 20 years, improving only in the last few years.

Recent Ocean and Mainstem Harvest
Few steelhead are caught in ocean fisheries. Ocean fishing mortality on Snake River steelhead is assumed to be zero. Steelhead were historically taken in tribal and non-tribal gillnet fisheries, and in recreational fisheries in the mainstem Columbia River and in tributaries. In the 1970s, retention of steelhead in non-tribal commercial fisheries was prohibited, and in the mid-1980s, tributary recreational fisheries in Washington adopted mark-selective regulations. Steelhead are still harvested in tribal fisheries, in mainstem recreational fisheries, and there is incidental mortality associated with mark-selective recreational fisheries. The majority of impacts on the summer run occur in tribal gillnet and dip net fisheries targeting Chinook salmon. Because of their larger size, the B-run fish are more vulnerable to the gillnet gear. Consequently, this component of the summer run experiences higher fishing mortality than the A-run component. In recent years, total exploitation rates on the A-run have been stable at around 5 percent, while exploitation rates on the B-run have generally been in the range of 15 to 20 percent. (Ford et al 2010).

Current Rangewide Status of Critical Habitat
Designated critical habitat for SR steelhead includes all Columbia River estuarine areas and river reaches proceeding upstream to the confluence of the Columbia and Snake rivers as well as specific stream reaches in the following subbasins: Hells Canyon, Imnaha River, Lower Snake/Asotin, Upper Grande Ronde River, Wallowa River, Lower Grande Ronde, Lower Snake/Tucannon, Lower Snake River, Upper Salmon, Pahsimeroi, Middle Salmon-Panther, Lemhi, Upper Middle Fork Salmon, Lower Middle Fork Salmon, Middle Salmon-Chamberlain,

South Fork Salmon, Lower Salmon, Little Salmon, Upper Selway, Lower Selway, Lochsa, Middle Fork Clearwater, South Fork Clearwater, and Clearwater (NMFS 2005d). There are 289 watersheds within the range of this DPS. Fourteen watersheds received a low rating, 44 received a medium rating, and 231 received a high rating of conservation value to the DPS. The lower Snake/Columbia River rearing/migration corridor downstream of the spawning range is considered to have a high conservation value and is the only habitat area designated in 15 of the high value watersheds identified above. This corridor connects every population with the ocean and is used by rearing/migrating juveniles and migrating adults. The Columbia River estuary is a unique and essential area for juveniles and adults making the physiological transition between life in freshwater and marine habitats. Of the 8,225 miles of habitat areas eligible for designation, 8,049 miles of stream are designated critical habitat.

Upper Columbia River Steelhead
Species Overview
Background
The Upper Columbia River Steelhead DPS includes all naturally spawned anadromous *O. mykiss* (steelhead) populations below natural and manmade impassable barriers in streams in the Columbia River Basin upstream from the Yakima River, Washington, to the US-Canada border, as well as six artificial propagation programs: the Wenatchee River, Wells Hatchery (in the Methow and Okanogan Rivers), Winthrop NFH, Omak Creek and the Ringold steelhead hatchery programs. On August 15, 2011, NMFS completed a five-year review for the UCR steelhead DPS and concluded that the species should remain listed as threatened (NMFS 2011).

Hatchery steelhead have been released into the Methow and Okanogan since the late 1960s and into the Wenatchee and Entiat systems since the 1970s. Through the 1980s, operations were designed to accommodate harvest and there was no attempt to limit introgression of hatchery fish into the native populations. In many cases, the hatchery broodstock originated from outside the upper Columbia area. Naturally spawning hatchery fish were not adapted to local conditions, which most likely limited their effectiveness and depressed the production of the population as a whole. While there is no precise means to measure the full effect of these practices, they likely contributed substantially to the current low recruits-per-spawner (R/S) productivities for naturally spawning fish.

Since the early 1990s, hatchery programs that operate in the Wenatchee, Methow, and Okanogan basins have implemented reforms to support steelhead conservation and recovery. No hatchery fish are released into the Entiat and the hatchery broodstocks in other watersheds are now composed exclusively of steelhead from the Upper Columbia River DPS. The hatchery programs are managed to preserve natural genetic resources.

Current Status & Recent Trends
Upper Columbia River steelhead is a species composed of the anadromous *O. mykiss* in four extant populations in one major population group (MPG). For all populations, abundance over the most recent 10-year period is below the thresholds that the ICTRT has identified as a minimum for recovery. Upper Columbia River steelhead populations have increased in natural origin abundance in recent years, but productivity levels remain low. Abundance for most populations declined to extremely low levels in the mid-1990s, increased to levels above or near

the recovery abundance thresholds (all populations except the Okanogan) in a few years in the early 2000s, and is now at levels intermediate to those of the mid-1990s and early 2000s. Abundance since 2001 has substantially increased for the DPS as a whole. The proportions of hatchery origin returns in natural spawning areas remain extremely high across the DPS, especially in the Methow and Okanogan River populations.

Limiting Factors and Threats

The key limiting factors and threats for UCR steelhead include hydropower projects, predation, harvest, hatchery effects, degraded tributary habitat and degraded estuary habitat. Ocean conditions generally have been poor for this DPS over the last 20 years, improving only in the last few years.

Recent Ocean and Mainstem Harvest

Few steelhead are caught in ocean fisheries. Ocean fishing mortality on UCR steelhead is assumed to be zero. Upriver summer steelhead, which include UCR steelhead, are categorized as A-run or B-run based on run timing and age and size characteristics. Upper Columbia River are all A-run fish.

Steelhead were historically taken in tribal and non-tribal gillnet fisheries, and in recreational fisheries in the mainstem Columbia River and in tributaries. In the 1970s, retention of steelhead in non-tribal commercial fisheries was prohibited, and in the mid 1980s, tributary recreational fisheries in Washington adopted mark-selective regulations. Steelhead are still harvested in tribal fisheries, in mainstem recreational fisheries, and there is incidental mortality associated with mark-selective recreational fisheries. The majority of impacts on the summer run occur in tribal gillnet and dip net fisheries targeting Chinook salmon. Because of their larger size, the B-run fish are more vulnerable to the gillnet gear. Consequently, this component of the summer run experiences higher fishing mortality than the A-run component. In recent years, total exploitation rates on the A-run have been stable at around 5 percent, while exploitation rates on the B-run have generally been in the range of 15 to 20 percent. (Ford et al. 2010)

Rangewide Status of Critical Habitat

Designated critical habitat for UCR steelhead includes all Columbia River estuarine areas and river reaches proceeding upstream to Chief Joseph Dam as well as specific stream reaches in the following subbasins: Chief Joseph, Okanogan, Similkameen, Methow, Upper Columbia/Entiat, Wenatchee, Lower Crab, and Upper Columbia/Priest Rapids (NMFS 2005d). There are 42 watersheds within the range of this DPS. Three watersheds received a low rating, 8 received a medium rating, and 31 received a high rating of conservation value to the DPS. The Columbia River rearing/migration corridor downstream of the spawning range is considered to have a high conservation value and is the only habitat area designated in 11 of the high value watersheds identified above. This corridor connects every population with the ocean and is used by rearing/migrating juveniles and migrating adults. The Columbia River estuary is a unique and essential area for juveniles and adults making the physiological transition between life in freshwater and marine habitats. Of the 1,332 miles of habitat areas eligible for designation, 1,262 miles of stream are designated critical habitat.

Middle Columbia River Steelhead

Species Overview

Background

The Middle Columbia River (MCR) Steelhead DPS includes anadromous populations in Oregon and Washington subbasins upstream of the Hood and Wind River systems to and including the Yakima River, as well seven artificial propagation programs: 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. There are four major population groups with 17 populations in this DPS. Almost all populations are summer-run fish; two winter-run populations return to the Klickitat and Fifteenmile Creek watersheds. Blockages have prevented access to sizable historical production areas in the Deschutes, White Salmon, and White Salmon rivers. On August 15, 2011, NMFS completed a five-year review for the MCR steelhead DPS and concluded that the species should remain listed as threatened (NMFS 2011).

Current Status & Recent Trends

The Mid-Columbia Steelhead DPS is not currently meeting the viability criteria (adopted from the ICTRT) in the Mid-Columbia Steelhead Recovery Plan. Recent trends in abundance are positive or stable for eleven of the populations and negative for the remainder. Natural origin spawning estimates are highly variable relative to minimum abundance thresholds across the populations in the DPS (Ford et al. 2010).

Limiting Factors and Threats

Historically, the key limiting factors for MCR steelhead include mainstem hydropower projects, tributary habitat and hydropower, water storage projects, predation, hatchery effects, harvest, and estuary conditions. Ocean conditions have been generally poor over most of the last 20 years, improving only in the last few years.

Recent Ocean and Mainstem Harvest

Few steelhead are caught in ocean fisheries. Ocean fishing mortality on MCR steelhead is assumed to be zero. The MCR steelhead DPS is made up of mostly summer run populations, although there are a few populations with winter run timing. The summer run populations are all categorized as A-run based on run timing and age and size characteristics.

Fisheries in the Columbia River are limited to assure that the incidental take of ESA-listed Middle Columbia River steelhead does not exceed specified rates. Non-Treaty fisheries were subject to a 2 percent harvest rate limit on A-run steelhead. Treaty Indian fall season fisheries were subject to a 15 percent harvest rate limit on B-run steelhead, but were not subject to a particular A-run harvest rate constraint since B-run steelhead are generally more limiting. Recent harvest rates on Middle Columbia River A-run steelhead in non-Treaty and treaty Indian fisheries ranged from 1.0 to 1.9 percent, and 4.1 to 12.4 percent, respectively.

Rangewide Status of Critical Habitat

Designated critical habitat for MCR steelhead includes all Columbia River estuarine areas and river reaches in the following subbasins: Upper Yakima, Naches, Lower Yakima, Middle Columbia/Lake Wallula, Walla Walla, Umatilla, Middle Columbia/Hood, Klickitat, Upper John

Day, North Fork John Day, Middle Fork John Day, Lower John Day, Lower Deschutes, Trout, and Upper Columbia/Priest Rapids (NMFS 2005d). There are 114 watersheds within the range of this DPS. Nine watersheds received a low rating, 24 received a medium rating, and 81 received a high rating of conservation value to the DPS. The lower Columbia River rearing/migration corridor downstream of the spawning range is considered to have a high conservation value and is the only habitat area designated in three of the high value watersheds identified above. This corridor connects every population with the ocean and is used by rearing/migrating juveniles and migrating adults. The Columbia River estuary is a unique and essential area for juveniles and adults making the physiological transition between life in freshwater and marine habitats. Of the 6,529 miles of habitat areas eligible for designation, 5,815 miles of stream are designated critical habitat.

Effects of Climate Change on all ESUs and DPSs

As reviewed in Independent Scientific Advisory Board ((ISAB) (2007)), the current status of salmon and steelhead species and their critical habitat in the Pacific Northwest has been influenced by climate change over the past 50-100 years and this change is expected to continue into the future. Average annual Northwest air temperatures have increased by approximately 1°C since 1900, which is nearly twice that for the last 100 years, indicating an increasing rate of change. The latest climate models project a warming of 0.1 to 0.6°C per decade over the next century. This change in surface temperature has already modified, and is likely to continue to modify, freshwater, estuarine, and marine habitats of salmon and steelhead, including designated critical habitat. Consequently, abundance, productivity, spatial distribution, and diversity of salmonid life stages occupying each type of affected habitat is likely to be further modified, generally in a detrimental manner. There is still a great deal of uncertainty associated with predicting specific changes in timing, location and magnitude of future climate change. It is also likely that the intensity of climate change effects on salmon, steelhead, eulachon, and green sturgeon will vary by geographic area.

Tributary Habitat

As described in ISAB (2007), effects of climate change that have influenced the habitat and species in the Northwest, and that are expected to continue to do so in the future, include: reduction of cold water habitat, variation in quality and quantity of tributary rearing habitat, alterations to migration patterns, accelerated embryo development, premature emergence of fry, and competition among species. Recent modeling results indicate that increased summer temperatures or decreased fall streamflow are likely to significantly reduce parr-smolt survival of Snake River spring/summer Chinook by 2040, and this result may also be applicable to other species with similar life history strategies in the Northwest.

Estuarine Habitat

As described in ISAB (2007), effects of climate change that have influenced the habitat and species in the Northwest, and that are expected to continue to do so in the future include: higher winter freshwater flows and higher sea level elevation may lead to increased sediment deposition and wave damage; lower freshwater flows in late spring and summer may lead to upstream extension of the salt wedge, possibly influencing the distribution of salmonid prey and predators; and increased temperature of freshwater inflows may extend the range of warm-adapted non-indigenous species that are normally found only in freshwater. In all of these cases, the specific

effects on salmon and steelhead abundance, productivity, spatial distribution and diversity are poorly understood.

Ocean Conditions
As described in ISAB (2007), effects of climate change that have influenced the biological requirements of listed species in the ocean, and that are expected to continue to do so in the future include: increased water temperature, increased stratification of the water column, and changes in intensity and timing of coastal upwelling. These continuing changes will alter primary and secondary productivity, the structure of marine communities, and in turn, the growth, productivity, survival, and migrations of salmonids. A mismatch between earlier smolt migrations (due to earlier peak spring freshwater flows and decreased incubation period) and altered upwelling may reduce marine survival rates. Increased concentration of CO_2 reduces the availability of carbonate for shell-forming invertebrates, including some that are prey items for juvenile salmonids.

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

The action area includes a migration and rearing corridor that has been modified by The Dalles Dam. There are various downstream fish passage routes at The Dalles Dam, most of which are part of the hydroproject owned by the U.S. Government and operated by the Corps of Engineers. These routes are: turbines, spillway, sluiceways, fish ladder, navigation lock, and the PUD's Project. As mentioned earlier, there is an ESA Biological Opinion for the Federal Columbia River Power System (FCRPS) (NMFS 2008 incorporated into the supplemental 2010 Biological Opinion (NMFS 2010)) through 2013 that covers mortality from fish passage through all routes past The Dalles Dam, including those operated by the PUD. The dam passage survival targets established by that consultation for salmon and steelhead are 96 percent for both yearling Chinook salmon and steelhead smolts, and 93 percent for sub-yearling Chinook salmon, including survival through the PUD's bypass and sampling facility. Studies in 2010 showed that 96 percent of yearling Chinook salmon, 94 percent of sub-yearling Chinook salmon, and 95 percent of steelhead passed the dam safely (Johnson et al. 2010).

Historically, NMFS issued Section 10 permits for scientific research or enhancement for propagation and survival under the ESA after consulting with itself (NMFS 2001). Since the project was authorized by FERC in December 31, 1987, NMFS has changed its practice to consult with FERC over entire hydropower projects and then issue take authorizations in the context of these Section 7 consultations. To account for the past effects of the operation of the project, NMFS has considered its past consultation in support of its issuance of Section 10 permits as well as those past effects of the entire FERC project to be part of the environmental baseline. The project has been operated as described under the proposed action. The juvenile

monitoring program has been modified over the years to respond to areas that seemed to cause injury or mortality to the fish sampled. For example, high velocities at the dewatering plate used to impinge fry. The sampling facility was modified to eliminate this.

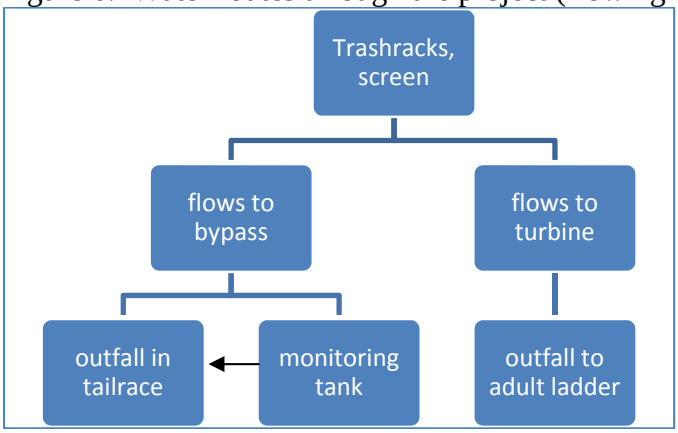
2.4 Effects of the Action on the Species and its Designated Critical Habitat

"Effects of the action" means the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline (50 CFR 402.02). Indirect effects are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur.

Following the route of water through the Project lends a way to identify all the different areas where fish could be affected. Water flows through two routes within the Project (Figure 6). It enters through the trashracks and then bifurcates into these routes. Most of the flow goes through the screen and to the turbine and then exits into the north shore adult ladder. A small amount of water (about 10 to 12 cfs) passes over the weir and into a bypass pipe, or when fish monitoring is occurring, into a monitoring tank. The outfall from the bypass pipe is into The Dalles tailrace.

The different areas that could impact fish are: the trash racks in front of the auxiliary water intake in the dam's forebay (Figure 5), the outfall from the turbine route into the adult ladder, the route past the 105 feet long vertical screens in the dewatering structure, the monitoring tank, and the outfall from the dewatering structure and the monitoring tank into the tailrace. With the exception of the dewatering structure, each of these impact pathways is the same for each ESU or DPS. Therefore, the effects analysis below is applicable to each ESU or DPS in this opinion.

Figure 6. Water routes through the project (flowing down).



Looking at the 2010 monthly average flows passed through The Dalles Dam, 0.24 to 0.91 percent of flow past The Dalles Dam went through the PUD's Project as compared to other routes. Given NMFS does not know the number of fish per unit flow entering the Project, we are

assuming a one to one ratio (i.e., one unit of flow equals one unit of fish[3]). Therefore, less than one percent of the fish that passed The Dalles Dam went through the Project.

Trash racks

The trash rack spacing (less than one inch between bars) precludes adult fish and large debris from entering the Project. The trash racks are cleaned when the elevation differential across the rack exceeds 0.5 feet.

Dewatering structure - screen and discharge

The fish monitoring performed from 1991 through 2010 indicates on average a low level of fish injury or mortality due to the screen (Table 1). The average percent injury has ranged from 0.5 to 5.2 between the different ESUs/DPSs with an overall average of 1.1 percent for all species. The average percent mortality has ranged from 1 to 6.4 between the different types of fish with an overall average of 5.8. Despite the variability of percentages within the range of years analyzed, in many years, no injury or mortalities were seen (see for example, percent years no injury in Table 1).

Table 1. Yearly average rates of injury and mortality and percent of years with no injury or mortality seen for juvenile salmonids passing though the PUD's Project at The Dalles Dam, 1991 through 2010 (Martinson 2011b).[4]

Type of Fish	**Avg. Number Sampled**	**Avg. Percent Injury[5] (percent years with no injury)**	**Avg. Percent Mortality (percent years with no mortality)**
yearling Chinook	131	2.7 (42%)	4.2 (42%)
subyearling Chinook	1,014[6]	0.5 (58%)	6.4 (0%)
Coho	27	1.2 (84%)	1 (79%)
Steelhead	52	4.4 (47%)	1.6 (68%)
Sockeye	24	5.2 (58%)	3.6 (58%)
Total	Total of Avg. 1248	Avg. 1.1	Avg. 5.8

Subyearling Chinook have the highest average percent mortality. Although the cause of fry mortality is difficult to identify with certainty, the research biologist working at this project believes this is more of a problem with the sample collection system than the dewatering structure (screen) (Martinson 2011b). The sample collection system was hampered in the past by a manual dewatering chute that could dry up if forebay elevation dropped too low. This flume was eliminated and replaced with a larger collection tank that allowed the discharge to plunge directly into the monitoring tank. A large amount of turbulence was created by the plunging discharge. Although the turbulence has been reduced by reducing the volume of water being discharged into the monitoring tank, the problem has not been completely resolved and is exacerbated when debris is present. Since fry-sized juvenile Chinook are not strong swimmers,

[3] This is probably over estimating the number of fish through the Project since it is likely more fish are attracted to the higher flows of The Dalles Dam spillway.

[4] These percentages are of the fish that go through the Project, less than one percent of the total number of fish passing The Dalles Dam.

[5] Injury is determined by descaling.

[6] Of this, 70.5 percent were fry.

if they get caught up in debris or impinged on the screen, it can be lethal. This effect also carries over to other types of fish, but to a lesser degree. The PUD is pursuing a sample collection system that would be built downstream of the plunge pool so that the fluctuating forebay and turbulence in the collection tank would not create problems for juvenile fish.

Monitoring Tank

Fish handling effects

Capturing and handling fish causes them stress, which can lead to loss of condition (and reproductive fitness) and even injury or mortality. In general, the primary contributing factors to stress, injury, and mortality from handling are excessive doses of anesthetic, differences in water temperature between the river and tank where the fish are held, dissolved oxygen conditions, the amount of time that fish are held out of the water, and physical trauma. Stress on salmonids from handling increases rapidly if the water temperature exceeds 18 ˚C (64.4 ˚F) or dissolved oxygen in the tank is below saturation. Fish that are transferred to holding tanks can experience trauma if care is not taken in the transfer process, and fish can experience stress and injury from overcrowding in traps that are not emptied on a regular basis. Debris buildup at traps can also kill or injure fish if the traps are not monitored and cleared on a regular basis.

The PUD closely monitors the doses of anesthetic used in its sampling program and anesthetized fish are allowed to recover before being released. Water temperatures in the monitoring facility are maintained at those in the river by constant mixing of water during collection and shading from the walls and timing of the sample workup which is usually in early morning. When sampling, the fish are held for a maximum of 24 hours. Debris in the trap is monitored and cleaned one or two times during the 24-hour collection period, depending on load.

Based on the PUD's prior experience with the techniques and protocols that would be used to conduct the proposed monitoring, no more than 5 percent of the juvenile salmonids and no more than 25 percent of fry encountered are likely to be killed as a result of being captured and handled. In most cases, mitigation measures will be employed, thereby keeping adverse effects to a minimum.

Water quality impacts

The Project uses about 50 grams of Finquel (also known as MS-222) per season (Martinson 2011 a). It is diluted in a stock solution and then further diluted when added to the water in the sample holding tank. Once sampling is complete, it is drained to the river via the bypass pipe. On a weekly basis, that amounts to about 2 grams diluted into roughly 200,000 cubic feet per second of river flow, varying from year to year. Because the dilution factor is substantial, the dose of Finquel used in the PUD's sampling tank is not likely to affect any fish in the tailrace or entrance of the north shore ladder.

Outfall into the Adult Ladder

This action provides a positive effect to fish. This auxiliary water combines with water in the fish ladder resulting in a total flow that benefits adult fish passage at The Dalles Dam. The ladder will remain watered up regardless of Project operations.

Bypass Pipe

An evaluation of the bypass was conducted in 1994 by releasing groups of yearling spring Chinook into the bypass pipe and collecting them at the outfall (Johnsen 1995). There were no mortalities. Although there was some descaling, the amount was not a significantly different from the control fish. In other facilities, subyearlings often fare better through bypass systems than yearlings. Because they are less smolted, they are not as fragile and are less likely to be descaled.

Outfall in Tailrace

The 10 to 12 cfs of water released into The Dalles tailrace would be a small percentage of total flow. If it had any effect to adults, it would be beneficial by adding slightly more attraction flow to the adult ladder entrance. Juvenile fish discharged to the tailrace may be susceptible to predation since this is a fixed location and predators may stage there. Because this flow is caught up in the spill flow during the fish passage season and because the spill pattern is designed to minimize predation, it is unlikely that there is much predation on these bypassed fish.

If water to this route is stopped, then the bypass pipe drains out taking the fish with the flow. Recent video camera evaluation of the pipe showed that it was smooth and consistent in slope. There is also a valve that could be operated, if necessary, to add water to the bypass pipe.

Turbine Shutdown

In the event the turbine is shut down, the sluice gates open to allow for emergency auxiliary water supply to the ladder (Figure 5). Juvenile fish would either go through this route and into the ladder or hold in the dewatering structure that, while not operating to dewatering, is still watered.

Amount of Take

Take is identified below.

The estimated number of fish passing through the Project (Table 3) during the fish passage season is a small proportion of the total fish passing The Dalles Dam (Table 4). The estimated number of fish passing through the Project was derived by multiplying the estimated number of fish passing through the Project during sampling (Table 2) by 7 (representing 7 days of the week). The proportion of fish passing The Dalles Dam which pass through the Project (Table 5) was estimated by comparing the estimated number of total fish passing through the Project (Table 3) to the estimated total fish (listed and unlisted) passing The Dalles Dam (Table 4).

Table 6 presents the estimated percentage of fish mortality of total fish passing The Dalles Dam resulting from the Project. Table 7 presents the estimated percentage of fish injury of total fish passing The Dalles Dam resulting from the Project. These values give perspective to the impact to the individual species. The percentages are so far out into the decimal points that it is fair to conclude that the Project will not have result in detrimental overall impacts to the species.

Table 8 presents the estimated number of fish passing the Project that are mortalities. Table 9 presents the estimated number of fish passing the Project that are injuries.

Table 2. Estimated number of fish passing through the Project during sampling (source: Martinson 2010)

	One single 24 hour sampling period per week				
	total seasonal sampling catch				
	Yearling Chinook	Subyearling Chinook	Steelhead	coho	Sockeye
2005	60	1600	1	27	0
2006	44	101	13	9	2
2007	0	0	0	0	0
2008	2	45	4	4	0
2009	0	42	0	0	0
2010	78	346	9	5	26
6 year avg	30.7	355.7	4.5	7.5	4.7

Table 3. Estimated number of total fish passing through the Project (7 x total season catch from Table 2.

	Season total passage Estimate				
	Yearling Chinook	Subyearling Chinook	Steelhead	coho	Sockeye
2005	420	11200	7	189	0
2006	308	707	91	63	14
2007	0	0	0	0	0
2008	14	315	28	28	0
2009	0	294	0	0	0
2010	546	2422	63	35	182
6 year avg	214.7	2489.7	31.5	52.5	32.7

Table 4. Estimation of total fish (listed and unlisted) passing The Dalles Dam (Ferguson 2005, 2006, 2007, 2009a, 2009b, 2010.

	Yearling Chinook	subyearling Chinook	Coho	Steelhead	Sockeye	total salmonids
2005	2904211	1782543	1310680	1873470	530782	8401686
2006	4204443	1430078	1184329	1469992	593699	8882541
2007	3,869,496	3,651,619	1,070,256	1,502,451	655501	10749323
2008	3475697	1732588	1156638	1380818	640083	8385824
2009	2635142	3194457	1153648	1293025	622455	8898727
2010	3354011	3298219	995937	1693280	596302	9937749
6 Year average	3407166.7	2514917.3	1145248.0	1535506.0	606470.3	9209308.33

Table 5. Estimation of proportion of total fish passing The Dalles Dam which pass through the Project (Table 3 compared to Table 4

	Yearling Chinook	subyearling Chinook	Coho	Steelhead	Sockeye
2005	0.01446%	0.62832%	0.00053%	0.01009%	0.00000%
2006	0.00733%	0.04944%	0.00768%	0.00429%	0.00236%
2007	0.00000%	0.00000%	0.00000%	0.00000%	0.00000%
2008	0.00040%	0.01818%	0.00242%	0.00203%	0.00000%
2009	0.00000%	0.00920%	0.00000%	0.00000%	0.00000%
2010	0.01628%	0.07343%	0.00633%	0.00207%	0.03052%
6 Year average	0.00630%	0.09900%	0.00275%	0.00342%	0.00539%

Table 6. Estimated percent mortality of total fish passing The Dalles Dam resulting from the Project (Table 1 values multiplied to Table 5 values).

	Yearling Chinook	subyearling Chinook	Coho	Steelhead	Sockeye
2005	0.00061%	0.04021%	0.00001%	0.00016%	0.00000%
2006	0.00031%	0.00316%	0.00008%	0.00007%	0.00008%
2007	0.00000%	0.00000%	0.00000%	0.00000%	0.00000%
2008	0.00002%	0.00116%	0.00002%	0.00003%	0.00000%
2009	0.00000%	0.00059%	0.00000%	0.00000%	0.00000%
2010	0.00068%	0.00470%	0.00006%	0.00003%	0.00110%
6 Year average	0.00027%	0.00830%	0.00003%	0.00005%	0.00020%

Table 7. Estimated percent injury of total fish passing The Dalles Dam resulting from the Project (Table 1 values multiplied to Table 5 values).

	Yearling Chinook	subyearling Chinook	Coho	Steelhead	Sockeye
2005	0.00039%	0.00314%	0.00001%	0.00044%	0.00000%
2006	0.00020%	0.00025%	0.00009%	0.00019%	0.00012%
2007	0.00000%	0.00000%	0.00000%	0.00000%	0.00000%
2008	0.00001%	0.00009%	0.00003%	0.00009%	0.00000%
2009	0.00000%	0.00005%	0.00000%	0.00000%	0.00000%
2010	0.00044%	0.00037%	0.00008%	0.00009%	0.00159%
6 Year average	0.00017%	0.00065%	0.00003%	0.00014%	0.00028%

Table 8. Estimated number of fish passing the Project that are mortalities (Table 1 mortality values multiplied by Table 3 values).

	Yearling Chinook	subyearling Chinook	Coho	Steelhead	Sockeye
2005	17.64	716.80	0.07	3.02	0.00
2006	12.94	45.25	0.91	1.01	0.50
2007	0.00	0.00	0.00	0.00	0.00
2008	0.59	20.16	0.28	0.45	0.00
2009	0.00	18.82	0.00	0.00	0.00
2010	22.93	155.01	0.63	0.56	6.55
6 Year average	9.02	159.34	0.32	0.84	1.18

Table 9. Estimated number of fish passing through the Project that are injured (Table 1 injury values multiplied by Table 3 values).

	Yearling Chinook	subyearling Chinook	Coho	Steelhead	Sockeye
2005	11.34	56.00	0.08	8.32	0.00
2006	8.32	3.54	1.09	2.77	0.73
2007	0.00	0.00	0.00	0.00	0.00
2008	0.38	1.58	0.34	1.23	0.00
2009	0.00	1.47	0.00	0.00	0.00
2010	14.74	12.11	0.76	1.54	9.46
6 Year average	5.80	12.45	0.38	2.31	1.70

Table 10 provides the maximum number of injury and mortality observed in years 2005 through 2010. The impacts of these maximum values were evaluated by looking at the percent of the species that this represented (Table 11).

Table 10. The maximum number of injury and mortality observed in prior years (2005-2010).

	Yearling Chinook	Subyearling Chinook	Coho	Steelhead	Sockeye
mortality	22.93	716.80	0.91	3.02	6.55
Injury	14.74	56.00	1.09	8.32	9.46
Total	38	773	2	11	16

Table 11. The number of fish from each listed species that are mortalities or injuries when the totals from Table 10 are used.

ESU totals	Number of mortalities and injuries	Proportion of observed mortalities and injuries	percent of ESU run at The Dalles
yearling Chinook			
Snake River Spring/Summer	5.01	0.13	1.22E-05
Snake River Fall	6.53	0.17	1.06E-05
Upper Columbia River	3.78	0.10	1.07E-05
Subyearling Chinook			
Snake River Fall	47.39	0.06	0.0003
Steelhead			
Snake River Steelhead	1.26	0.11	7.16E-08
Upper Columbia River	2.44	0.22	7.16E-08
Middle Columbia River	4.29	0.39	7.16E-08
Sockeye			
Snake River Sockeye	0.11	0.0071	2.64E-06

Given that the small level of mortalities and injured fish numbers have a minuscule effect to the species and that the actual numbers vary from year to year, NMFS is increasing the allowed take above what is shown in Table 11. These increased levels protect the species and allow for variations over the years. These values (Table 12) have been derived by considering the past 10(a)(1)(A) permitted numbers and the historic records of what numbers were seen at the project. The impacts to the species were evaluated by looking at the percent of each species that these numbers represent. These take levels will not jeopardize any of the species and will not hinder recovery.

Table 12. Take per year per species.

ESU	Life Stage	Origin	Type of Take	Total Take Authorized by ESU or DPS per Year
Snake River fall Chinook	Juvenile	Naturally Produced, Artificially Propagated	Capture, Handling, Release, Indirect Mortality	53
Snake River spring/summer Chinook	Juvenile	Naturally Produced, Artificially Propagated	Capture, Handling, Release, Indirect Mortality	8
Upper Columbia River spring Chinook	Juvenile	Naturally Produced, Artificially Propagated	Capture, Handling, Release, Indirect Mortality	7
Snake River sockeye	Juvenile	Naturally Produced, Artificially Propagated	Capture, Handling, Release, Indirect Mortality	1
Snake River steelhead	Juvenile	Naturally Produced, Artificially Propagated	Capture, Handling, Release, Indirect Mortality	3
Upper Columbia River steelhead	Juvenile	Naturally Produced, Artificially Propagated	Capture, Handling, Release, Indirect Mortality	26
Middle Columbia River steelhead	Juvenile	Naturally Produced, Artificially Propagated	Capture, Handling, Release, Indirect Mortality	7

Table 13. Proportion of total population with allowed take numbers in Table 12.

ESU totals	Number of mortalities and injuries	percent of ESU run at The Dalles
yearling Chinook		
Snake River Spring/Summer	8	1.94E-05
Snake River Fall	53	8.63E-05
Upper Columbia River	7	1.98E-05
Subyearling Chinook		
Snake River Fall	53	0.00034
Steelhead		
Snake River Steelhead	3	1.71E-07
Upper Columbia River	26	7.64E-07
Middle Columbia River	7	1.17E-07
Sockeye		
Snake River Sockeye	1	0.00023

The level of take is less than one percent of the average total runs from 2006 through 2010.

Effects to Critical Habitat

Effects to critical habitat are negligible. The action area is small and adaptive management of the facility based on results of monitoring ensures acceptable passage conditions for juvenile fish. The MS-222 released into the tailrace is diluted to such a degree that adequate water quality for juvenile and adult salmonids is maintained. The release of project waters into The Dalles tailrace and the north shore ladder improves passage conditions for adult fish using the ladder.

2.5 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 Act.

Cumulative effects have not been identified in the action area for this consultation, which is a small portion of The Dalles Dam and tailrace.

2.6 Integration and Synthesis

The Integration and Synthesis section is the final step of NMFS' 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 2.4) to the environmental baseline (Section 2.3) and the cumulative effects (Section 2.5) to formulate the agency's biological opinion as to whether the

proposed action is likely to: (1) result in appreciable reductions in the likelihood of both survival and recovery of the species in the wild by reducing its numbers, reproduction, or distribution; or (2) reduce the value of designated or proposed critical habitat for the conservation of the species. These assessments are made in full consideration of the status of the species and critical habitat (Section 2.2).

The rangewide status of the species affected by the proposed action is generally poor (moderate to high risk of extinction). Passage conditions under the environmental baseline, including the PUD's Project are close to the FCRPS survival targets for The Dalles Dam and a very small number of juveniles of each species are negatively affected by the PUD's Project (stress, injury, or mortality). The continued operation of the Project and its monitoring program do not impact recovery in any significant way. Any negative effects on PCEs within the action area are very small and would not affect the conservation value of designated critical habitat. NMFS did not identify any cumulative effects.

2.7 Conclusion

After reviewing the current status of the listed species, the environmental baseline within the action area, the effects of the proposed action, and cumulative effects, it is NMFS' biological opinion that the proposed action is not likely to jeopardize the continued existence of the Snake River fall Chinook salmon ESU, Snake River spring/summer Chinook salmon ESU, Upper Columbia River spring Chinook salmon ESU, Snake River sockeye salmon ESU, Snake River steelhead DPS, Upper Columbia River steelhead DPS, or Middle Columbia River steelhead DPS, or to destroy or adversely modify their designated critical habitat.

2.8. Incidental Take Statement

Section 9 of the ESA and Federal regulation 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 results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. For purposes of this consultation, we interpret "harass" to mean an intentional or negligent action that has the potential to injure an animal or disrupt its normal behaviors to a point where such behaviors are abandoned or significantly altered.[7] 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 incidental take statement.

2.8.1 Amount or Extent of Take

The amount of take is identified in section 2.4 Effects of the Action on the Species and its

[7] NMFS has not adopted a regulatory definition of harassment under the ESA. The World English Dictionary defines harass as "to trouble, torment, or confuse by continual persistent attacks, questions, etc." The U.S. Fish and Wildlife Service defines "harass" in its regulations as an intentional or negligent act or omission which creates 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 (50 CFR 17.3).
The interpretation we adopt in this consultation is consistent with our understanding of the dictionary definition of harass and is consistent with the U.S. Fish and Wildlife interpretation of the term.

Designated Critical Habitat under the Amount of Take Table 12 in this biological opinion which is repeated here.

Table 12. Take per year per species

ESU	Life Stage	Origin	Type of Take	Total Take Authorized by ESU or DPS per Year
Snake River fall Chinook	Juvenile	Naturally Produced, Artificially Propagated	Capture, Handling, Release, Indirect Mortality	53
Snake River spring/summer Chinook	Juvenile	Naturally Produced, Artificially Propagated	Capture, Handling, Release, Indirect Mortality	8
Upper Columbia River spring Chinook	Juvenile	Naturally Produced, Artificially Propagated	Capture, Handling, Release, Indirect Mortality	7
Snake River sockeye	Juvenile	Naturally Produced, Artificially Propagated	Capture, Handling, Release, Indirect Mortality	1
Snake River steelhead	Juvenile	Naturally Produced, Artificially Propagated	Capture, Handling, Release, Indirect Mortality	3
Upper Columbia River steelhead	Juvenile	Naturally Produced, Artificially Propagated	Capture, Handling, Release, Indirect Mortality	26
Middle Columbia River steelhead	Juvenile	Naturally Produced, Artificially Propagated	Capture, Handling, Release, Indirect Mortality	7

2.8.2 Effect of the Take

The level of take is less than one percent of the average total runs from 2006 through 2010.

2.8.3 Reasonable and Prudent Measures and Terms and Conditions

"Reasonable and prudent measures" are nondiscretionary measures to minimize the amount or extent of incidental take (50 CFR 402.02). "Terms and conditions" implement the reasonable and prudent measures (RPM) (50 CFR 402.14). These must be carried out for the exemption in section 7(o)(2) to apply.

Reasonable and prudent measure:

1. Conduct ongoing monitoring and reporting program required by the FERC license.
2. Northern Wasco PUD may apply for improvements to minimize impacts from monitoring to FERC in consultation with NMFS.

Terms and Conditions to implement reasonable and prudent measure 1:

a) Northern Wasco PUD will provide an annual report of the previous year's research related to anadromous fish, and other relevant data to NMFS no later than January 31 of each year. This report will also include study plans for research and monitoring to be conducted during the next year. NMFS will review these plans, and approve, approve with changes, or disapprove the study plans within three months after submission.

b) Northern Wasco PUD must make reasonable modifications to the plans to meet NMFS' approval.

c) Research and monitoring activities conducted in relation to the Opinion will meet the following standards:

i. All Research, Monitoring and Evaluation (RM&E) plans associated with anadromous fish must be approved by NMFS, with subsequent approval by FERC.

ii. The researcher must ensure that listed species are taken only at the levels, by the means, in the areas, and for the purposes stated in the plans developed, and according to the conditions in this permit.

iii. The researcher must not intentionally kill or cause to be killed any listed species unless the plan specifically allows intentional lethal take.

iv. The researcher must handle listed fish with extreme care and keep them in cold water to the maximum extent possible during sampling and processing procedures. When fish are transferred or held, a healthy environment must be provided; e.g., the holding units must contain adequate amounts of well-circulated water. When using gear that captures a mix of species, the researcher must process listed fish first to minimize handling stress.

v. The researcher must stop handling listed juvenile fish if the water temperature exceeds 70 degrees Fahrenheit at the capture site. Under these conditions, listed fish may only be visually identified and counted.

vi. If the researcher anesthetizes listed fish to avoid injuring or killing them during handling, the fish must be allowed to recover before being released. Fish that are only counted must remain in water and not be anesthetized.

vii. The researcher must use a sterilized needle for each individual injection when passive integrated transponder tags (PIT-tags) are inserted into listed fish.

viii. If the researcher unintentionally captures any listed adult fish while sampling for juveniles, the adult fish must be released without further handling and such take must be reported.

ix. The researcher must obtain approval from NMFS before changing sampling locations or research protocols.

x. The researcher must notify NMFS as soon as possible but no later than two days after any authorized level of take is exceeded or if such an event is likely. The researcher must submit a written report detailing why the authorized take level was exceeded or is likely to be exceeded.

xi. The researcher is responsible for any biological samples collected from listed species as long as they are used for research purposes. The permit holder may not transfer biological samples to anyone not listed in the approved plan without prior written approval from NMFS.

xii. The person(s) actually doing the research must have a copy of this ITS and the applicable plan on site while conducting the authorized activities.

xiii. The researcher must allow any NMFS employee or representative to accompany field personnel while they conduct the research activities.

xiv. The researcher must allow any NMFS employee or representative to inspect any records or facilities related to the permit activities.

xv. The researcher must obtain all other Federal, state, and local permits/authorizations needed for the research activities.

xvi. On or before January 31st of every year, the researcher must submit to NMFS a post-season report that contains the information in Attachment 1 describing the research activities, the number of listed fish taken and the location, the type of take, the number of fish intentionally killed and unintentionally killed, the take dates, and a brief summary of the research results. Falsifying annual reports or permit records is a violation of this ITS.

xvii. If the researcher violates any terms and condition they will be subject to any and all penalties provided by the ESA. NMFS may revoke this ITS if the authorized activities are not conducted in compliance with the permit and the requirements of the ESA or if NMFS determines that its ESA findings are no longer valid.

xviii. Dead listed fish and tissue samples will be returned to the capture site, archived in a scientific collection or destroyed. A record will be kept at the Northern Wasco Project of any archived specimens including number, species, and location of the archive.

Terms and Conditions to implement reasonable and prudent measure 2:

Northern Wasco PUD may continue to make improvements to their facility, including the collection system, when fish passage issues are identified. Northern Wasco PUD will submit to NMFS the proposed plan for improvements. NMFS will review these plans, and approve, approve with changes, or disapprove the plans within three months after submission.

2.9. 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 has not identified any conservation recommendations at this time.

2.10 Reinitiation of Consultation

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

2.11 "Not Likely to Adversely Affect" Determinations

In this section, NMFS presents its analysis of effects of the proposed action on Southern Resident killer whale (Southern Residents).

In completing the consultation on the Northern Wasco County PUD's North Shore Hydroelectric Project (FERC No. P-7076, NMFS tracking #2008/01301), NMFS considered potential effects on ESA-listed Southern Resident Killer Whales and determined that the proposed action may affect, but is not likely to adversely affect the species. In previous consultations such as the Federal Columbia River Hydropower System biological opinion (2008), NMFS has determined that the effects of inland hydropower operations on Southern Residents is typically limited to reduction of the prey base, with special emphasis on effects to Chinook salmon, the preferred prey of Southern Residents. Unless a project has a significant effect on the prey base, there are not likely to be adverse effects on Southern Residents.

In the present case, the project would have essentially no effect on the Southern Residents prey base. The baseline for this consultation included past operation of the project, and the continued operation would extend the project and its effects into the future unchanged. While the baseline does not include continued operation of the project, and status quo operations can have effects beyond those considered in the baseline, for Southern Residents the only notable effect would be a reduction in the size of the prey base, which is not predicted to occur as a result of this action. Moreover, the FCRPS biological opinion, also in the baseline for this project, accounted for mortality at The Dalles Dam. The proposed action would not change the mortality levels considered in that opinion.

3. MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT ESSENTIAL FISH HABITAT CONSULTATION

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

This analysis is based, in part, on the EFH assessment provided by FERC and descriptions of EFH for Pacific coast salmon (PFMC 1999) contained in the fishery management plans developed by the Pacific Fishery Management Council (PFMC) and approved by the Secretary of Commerce.

3.1 Essential Fish Habitat Affected by the Project

Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other water bodies currently or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC 1999) and longstanding, naturally impassable barriers (i.e., natural waterfalls in existence for several hundred years). This includes the mainstem Columbia River, which juvenile and adult Chinook and coho salmon use as a migration and rearing corridor. The proposed action and the action area for this consultation, described in the introduction to this document, are within the area designated as essential fish habitat.

3.2 Adverse Effects on Essential Fish Habitat

Based on information provided in the BA and the analysis of effects in the opinion and the nature of the action area[8], NMFS concludes that proposed action will not have adverse effects on EFH designated for Chinook salmon and coho salmon.

3.3 Essential Fish Habitat Conservation Recommendations

There are no EFH recommendations.

3.4 Statutory Response Requirement

A response is not required as there are no EFH recommendations.

[8] The action area for the proposed action is within the confines of The Dalles Dam and tailrace. The Project will not affect conditions above the upstream face of The Dalles Dam or below in the tailrace.

3.5 Supplemental Consultation

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

4. DATA QUALITY ACT DOCUMENTATION AND PRE-DISSEMINATION REVIEW

Section 515 of the Treasury and General Government Appropriations Act of 2001 (Public Law 106-554) (Data Quality Act) specifies three components contributing to the quality of a document. They are utility, integrity, and objectivity. This section of the Biological Opinion addresses these Data Quality Act (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.

This ESA consultation concludes that the proposed operation of the Northern Wasco County PUD's North Shore Hydroelectric Project will not jeopardize the affected listed species or adversely modify designated critical habitat. Therefore, FERC can authorize this action in accordance with its authority under the Federal Power Act. The intended users are the FERC and the applicant, Northern Wasco County PUD.

Individual copies were provided to the above-listed users. This consultation will be posted on the NMFS Northwest Region Web site (http://www.nwr.noaa.gov). 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 and analyses. They adhere to published standards including the FWS and NMFS ESA Consultation Handbook, ESA Regulations, 50 CFR 402.01, *et seq.*, and the MSA EFH regulations, 50 CFR 600.920(j).

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

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

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

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ATTACHMENT 1

Post-Season Monitoring and Evaluation Form
Scientific Research Permit
Annual Report

Date: _____

Permit No.: _____ **Evaluator's Name:** _____

Contact Name: _____ **Contact Email:** _____ **Contact Phone:** _____
(Contact = person submitting report)

Study Number and Title (if applicable)**:** _____
Provide separate tables for each study.

Part I: This is an example of how to fill out the table.

Replace all red text with the information in the plan. Replace all blue text with the actual results of your activities.

ESU/Species and population group if specified in your permit	**Life Stage**	**Origin**	**Take Activity**	**Number of Fish Authorized for Take**	**Actual Number of Listed Fish Taken**	**Authorized Unintentional Mortality**	**Actual Unintentional Mortality**	**Evaluation Location**	**Evaluation Period**
Lower Columbia River (LCR) Chinook	Juvenile	Naturally Produced	Capture, mark, release	100	90	5/100	4/90	Columbia River, Oregon	January – February
LCR Chinook	Adult	Artificially Propagated	Capture, handle, release	10	9	1/10	0/9	Bonneville Dam	June
LCR Chinook	Adult	Naturally Produced	Intentional mortality	20	15	**N/A**	**N/A**	Bonneville Dam	June
Oregon Coast Coho	Juvenile	Naturally Produced	Observe / Harass	500	400	**N/A**	**N/ A**	Nehalem River	October

Part I:

ESU/Species and population group if specified in your permit	**Life Stage**	**Origin**	**Take Activity**	**Number of Fish Authorized for Take**	**Actual Number of Listed Fish Taken**	**Authorized Unintentional Mortality**	**Actual Unintentional Mortality**	**Evaluation Location**	**Evaluation Period**