

COVER SHEET  
MAY 2003

Title of Environmental Review: Environmental Assessment of a National Marine Fisheries Service Action To Issue Three Research and Enhancement Permits Under Section 10(a)(1)(A) of the Endangered Species Act for Artificial Propagation of ESA-listed Upper Columbia River Steelhead

Evolutionarily Significant Units Affected: Upper Columbia River Steelhead and Upper Columbia River Spring Chinook Salmon

Responsible Agencies and Officials: D. Robert Lohn  
Regional Administrator  
NOAA - National Marine Fisheries Service  
7600 Sand Point Way NE  
Seattle, WA 98115-0070  
(206) 526-6150

Contacts: Kristine Petersen  
Salmon Recovery Division  
NOAA - National Marine Fisheries Service  
525 NE Oregon St., Suite 510  
Portland, OR 97232-2737  
(503) 230-5409

Legal Mandate: Endangered Species Act of 1973, as amended and implemented 50 CRF Part 223

Location of Proposed Activities: Middle and Upper Columbia River Basin in the State of Washington

Action Considered:

1. Issuance of Permit 1395 jointly to the Washington Department of Fish and Wildlife (WDFW), Public Utility District No. 1 of Chelan County (Chelan PUD), and Public Utility District No. 1 of Douglas County (Douglas PUD)
2. Issuance of Permit 1396 to the U.S. Fish and Wildlife Service (USFWS)
3. Issuance of Permit 1412 to the Confederated Tribes of the Colville Reservation (Colville Tribes)

Related Documents: National Marine Fisheries Service Endangered Species Act (ESA) Section 7 Consultation Biological Opinion and Magnuson-Stevens Act Essential Fish Habitat Consultation on Artificial Propagation Research and Enhancement Programs of ESA-listed Upper Columbia River Evolutionarily Significant Unit (ESU) Steelhead  
Number F/NWR/2002/000981

## TABLE OF CONTENTS

	Page
LIST OF TABLES .....	III
LIST OF FIGURES .....	III
1 PURPOSE, SCOPE, AND AREA OF THE PROPOSED ACTION .....	1
1.1 Introduction .....	1
1.2 Background .....	3
1.3 Purpose of and Need for the Proposed Action .....	4
1.4 Scope of Action .....	4
1.5 Action Area .....	5
1.6 Relationships to Other Plans and Policies .....	7
2 ALTERNATIVES INCLUDING THE PROPOSED ACTION .....	8
2.1 Alternative 1 - Do Not Issue the Permits (No Action) .....	8
2.2 Alternative 2 - Issue Permits Without Conditions .....	8
2.3 Alternative 3 - Issue Permits With Conditions (Proposed Action) .....	8
2.3.1 Permit 1395 Proposed Activities .....	9
2.3.1.1 Adult Return Monitoring .....	9
2.3.1.2 Adult Return Management .....	9
2.3.1.3 Artificial Propagation .....	10
2.3.1.4 Research, Monitoring, and Evaluation .....	10
2.3.2 Permit 1395 Terms and Conditions .....	12
2.3.3 Permit 1396 Proposed Artificial Propagation Activities .....	16
2.3.4 Permit 1396 Terms and Conditions .....	16
2.3.5 Permit 1412 Proposed Artificial Propagation Activities .....	16
2.3.6 Permit 1412 Terms and Conditions .....	17
2.3.7 Incidental Take .....	18
3 AFFECTED ENVIRONMENT .....	18
3.1 Physical Environment .....	18
3.1.1 Water Quantity .....	18
3.1.2 Water Quality .....	19
3.1.3 Riparian Habitat .....	19
3.2 Biological Environment .....	19
3.2.1 Anadromous Fish Listed Under the ESA .....	20
3.2.1.1 Upper Columbia River Spring Chinook .....	20
3.2.1.2 Upper Columbia River Steelhead .....	21
3.2.2 Other ESA-listed Fish Species .....	22
3.2.3 Non-listed Fish Species .....	23
3.2.4 Wildlife .....	23
3.3 Socioeconomic Environment .....	24

	Page
4 ENVIRONMENTAL CONSEQUENCES .....	25
4.1 Alternative 1 - Do Not Issue Permits (No Action) .....	25
4.1.1 Effects On the Physical Environment .....	25
4.1.1.1 Water Quantity .....	26
4.1.1.2 Water Quality .....	26
4.1.1.3 Riparian Habitat .....	26
4.1.2 Effects On the Biological Environment .....	26
4.1.2.1 Anadromous Fish Listed Under the ESA .....	26
4.1.2.2 Other ESA-listed Fish Species .....	27
4.1.2.3 Non-ESA-listed Fish Species .....	27
4.1.2.4 Terrestrial Organisms .....	27
4.1.3 Effects On The Socioeconomic Environment .....	27
4.1.4 Environmental Justice .....	28
4.2 Alternative 2 - Issue Permits Without Conditions .....	28
4.2.1 All Resources .....	28
4.3 Alternative 3 - Issue Permits With Conditions (Proposed) .....	28
4.3.1 Effects on the Physical Environment .....	29
4.3.1.1 Water Quantity .....	29
4.3.1.2 Water Quality .....	29
4.3.1.3 Riparian Habitat .....	29
4.3.2 Effects On the Biological Environment .....	30
4.3.2.1 Anadromous Fish Listed Under the ESA .....	30
4.3.2.2 Other ESA-listed Fish Species .....	31
4.3.2.3 Non-listed Fish Species .....	31
4.3.2.4 Terrestrial Organisms .....	31
4.3.3 Effects On The Socioeconomic Environment .....	32
4.3.4 Environmental Justice .....	32
4.4 Cumulative Effects .....	33
5 AGENCIES CONSULTED .....	33
6 REFERENCES .....	34
6.1 Federal Register Notices .....	34
6.2 Literature Cited .....	34
7 FINDING OF NO SIGNIFICANT IMPACT .....	37

**LIST OF TABLES**

	Page
Table 1. Proposed activities that would be conducted if Permits 1395, 1396, and 1412 are issued .....	11
Table 2. Terms and conditions that would be included in Permits 1395, 1396, and 1412 if issued .....	14

**LIST OF FIGURES**

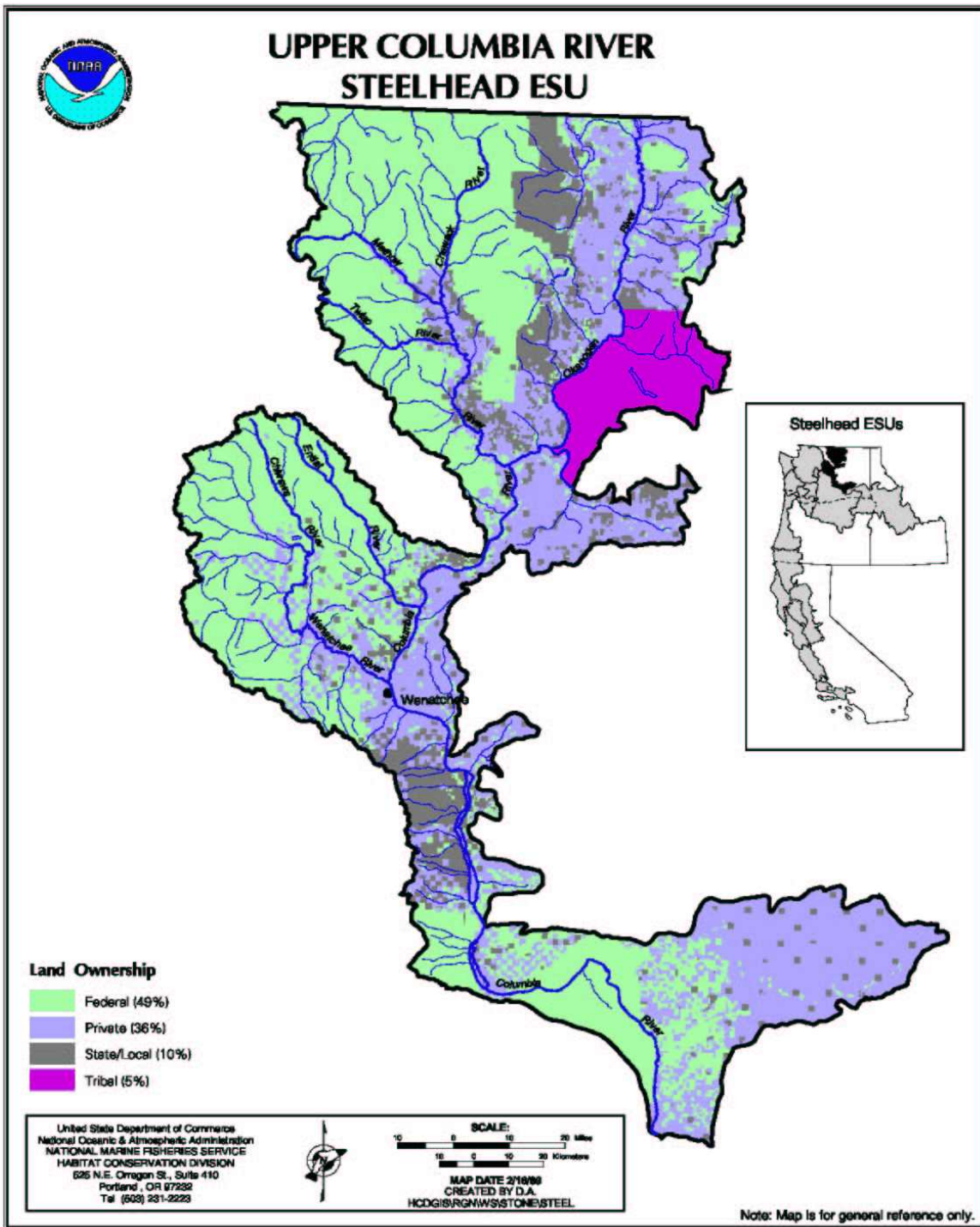
	Page
Figure 1. Upper Columbia River Steelhead ESU .....	2
Figure 2. Location of dams and hatchery facilities that rear ESA-listed steelhead in the upper Columbia River Basin .....	6

# 1 PURPOSE, SCOPE, AND AREA OF THE PROPOSED ACTION

## 1.1 Introduction

The U.S. Department of Commerce, NOAA's National Marine Fisheries Service (NMFS), is evaluating the decision to authorize, in accordance with the Endangered Species Act (ESA), section 10(a)(1)(A) direct take research/enhancement permits, numbers 1395, 1396, and 1412. These three permits would authorize take of listed salmon and steelhead during operation of steelhead artificial propagation programs and associated research activities in the upper Columbia River by the Washington Department of Fish and Wildlife (WDFW), the Public Utility District No. 1 of Chelan County (Chelan PUD), and the Public Utility District No. 1 of Douglas County (Douglas PUD), the U.S. Fish and Wildlife Service (USFWS), and the Confederated Tribes of the Colville Reservation (Colville Tribes) (permit applicants). Of these applicants, the WDFW, the USFWS, the Colville Tribes, in addition to NMFS and the Tribes and Bands of the Yakima Nation, are considered co-managers of the fishery resources in the upper Columbia River Basin.

The Upper Columbia River steelhead (*Oncorhynchus mykiss*) Evolutionarily Significant Unit (ESU) was listed as endangered on August 18, 1997 (62 FR 43937) (Figure 1). Potential environmental effects come as a result of adult monitoring and management of artificially propagated returning adult Upper Columbia River steelhead, the artificial propagation activities, and associated research requested by the permit applicants. These activities include random sampling of returning adult Upper Columbia River steelhead, collecting adult ESA-listed Upper Columbia River steelhead, spawning adults in a hatchery environment, rearing juveniles to the smolt stage, releasing the smolts in the respective basin of origin, conducting propagation program specific scientific research and monitoring activities, and managing the returning adult hatchery steelhead. Initial program implementation is based on continued use, and modification as necessary, of existing hatchery facilities built in the middle and upper Columbia River Region for steelhead production. Progeny derived from the Upper Columbia River steelhead ESU, even when artificially propagated, remain listed under the ESA (April 5, 1993, 58 FR 17573). Permit issuance actions are expected to directly affect only the Upper Columbia River steelhead ESU. However, endangered Upper Columbia River spring chinook salmon (*O. tshawytscha*) and threatened bull trout (*Salvelinus confluentus*) may be indirectly taken during the proposed activities.



**Figure 1.** Upper Columbia River Steelhead ESU.

## 1.2 Background

On June 12, 2002, NMFS received an application for an ESA section 10 permit from the WDFW (WDFW 2002) requesting a multi-year authorization for an annual take of Upper Columbia River steelhead and Upper Columbia River spring chinook salmon associated with proposed steelhead artificial propagation programs intended to enhance the natural production of ESA-listed Upper Columbia River steelhead.

In April 2002, negotiations on the *Anadromous Fish Agreement and Habitat Conservation Plan for Rocky Reach Hydroelectric Project* ( Federal Energy Regulatory Commission (FERC) License Number 2145), the *Anadromous Fish Agreement and Habitat Conservation Plan for Rock Island Hydroelectric Project* (FERC License Number 943), and the *Anadromous Fish Agreement and Habitat Conservation Plan for Wells Hydroelectric Project* (FERC License Number 2149), hereafter referred to as the three HCPs, were completed relating to the re-licensing of Wells Dam with Douglas PUD (DPUD 2002), and Rocky Reach Dam, and Rock Island Dam with Chelan PUD (CPUD 2002a; 2002b). These long-term agreements between NMFS, the PUDs, the WDFW, the USFWS, the Colville Tribes, and other stake holders that elect to sign the agreements, provide Chelan and Douglas PUDs with hydropower project operational certainty into the future in exchange for mitigation in the form of a tributary fund for habitat improvement projects and artificial propagation programs to replace unavoidable losses to natural fish production. The artificial propagation component of each HCP specifies the number and species to be reared. Each of the three HCP agreements specifically require artificial propagation of steelhead as a mitigation action. The HCP agreements stipulate that the Chelan and Douglas PUDs would be issued the ESA permits necessary to implement the artificial propagation programs.

In addition, on June 11, 2002, NMFS received a similar application for an ESA section 10 permit from the USFWS, requesting a multi-year authorization for an annual take of Upper Columbia River steelhead and Upper Columbia River spring chinook salmon associated with a steelhead artificial propagation program in the Methow River Basin (USFWS 2002). This program has long-term stable funding from the Bureau of Reclamation (BOR) with production goals set by the Columbia River Fisheries Management Plan under the *U.S. v. Oregon* decision of 1969. The program would be operated in a manner consistent with enhancing the natural steelhead population.

Lastly, on October 23, 2002, NMFS received an application for a section 10 permit from the Colville Tribes, requesting a multi-year authorization for an annual take of Upper Columbia River steelhead and Upper Columbia River spring chinook salmon associated with a steelhead artificial propagation program in the Okanogan River Basin (CCT 2002). Funding for this program has been allocated through the Pacific Salmon Coastal Recovery Fund administered by NMFS, and is consistent with BOR steelhead recovery efforts ongoing in the Okanogan Basin. The program would be operated in a manner consistent with enhancing the natural steelhead population.

### 1.3 Purpose of and Need for the Proposed Action

NMFS proposes to issue three ESA section 10(a)(1)(A) permits for annual takes of Upper Columbia River spring chinook salmon and Upper Columbia River steelhead: permit 1395 would be issued jointly to the WDFW, Chelan PUD, and Douglas PUD to carry out activities associated with the steelhead artificial propagation programs funded by Chelan and Douglas PUDs and operated by WDFW, permit 1396 would be issued to the USFWS to carry out activities associated with a steelhead artificial propagation program in the Methow River, and permit 1412 would be issued to the Colville Tribes to carry out activities associated with a steelhead artificial propagation program in Omak Creek, a tributary of the Okanogan River.

The purpose of and need for the issuance of these section 10 permits is to ensure the continuation of the programs and their implementation as well as compliance with the ESA. Actions that may affect listed species are reviewed by NMFS through section 7 or section 10 of the ESA. Under section 10 of the ESA, non-federal entities may apply for permits from NMFS to take ESA-listed species under the jurisdiction of NMFS if such taking is for scientific purposes or to enhance the propagation or survival of the affected species.

Issuance of the three permits is needed to fulfill NMFS' obligations outlined in the three HCPs, which include the requirement to use artificial propagation techniques to replace unavoidable steelhead losses associated with operation of Wells Dam, Rocky Reach Dam, and Rock Island Dam, and meet Federal court mandates. Permit conditions would help ensure that the proposed programs are operated to protect and enhance the endangered Upper Columbia River steelhead ESU and remain compliant with the ESA.

### 1.4 Scope of Action

The action considered here includes only issuance of the three section 10 permits to implement the artificial propagation research/enhancement programs as requested and their affect on the environment within the action area. Other activities in the Columbia River Basin, and other harvest activities outside the Columbia River Basin, might have impacts on the abundance and survival of the ESA-listed species. NMFS does not expect that the proposed action would measurably impact listed salmonid populations outside of the action area because artificially propagated steelhead associated with the proposed programs would be in the migration corridor for less than a month, and would entail a small fraction of the total number of artificially propagated anadromous fish released in the Columbia River Basin. In addition, several hatchery reform measures have been implemented to limit interactions between natural and hatchery salmonids while in the migration corridor (NMFS 1999).

NMFS has proposed and evaluated the action of issuing incidental take statements for the three HCPs as its preferred alternative in the *Anadromous Fish Agreements and Habitat Conservation Plans Final Environmental Impact Statement for the Wells, Rocky Reach, and Rock Island Hydroelectric Projects* (NOAA Fisheries 2002).



## 1.5 Action Area

The action area of this EA is within the upper Columbia River Basin and includes areas primarily in Chelan, Douglas, and Okanogan Counties. More specifically, the action area includes the Columbia River at and above Priest Rapids Dam, the Wenatchee River, Methow River, and Okanogan River Basins and artificial propagation facilities along the mainstem Columbia River. Figure 2 identifies the primary hatchery facilities, trap locations, and hydropower projects pertinent to this EA.

The action area in the Wenatchee River Basin includes the Chiwawa River, Nason Creek, Dryden and Tumwater Dams, and all tributaries accessible to anadromous steelhead. The watershed encompasses approximately 1,327 square miles, with 230 miles of major streams and rivers and enters the Columbia River at river mile (RM) 468.

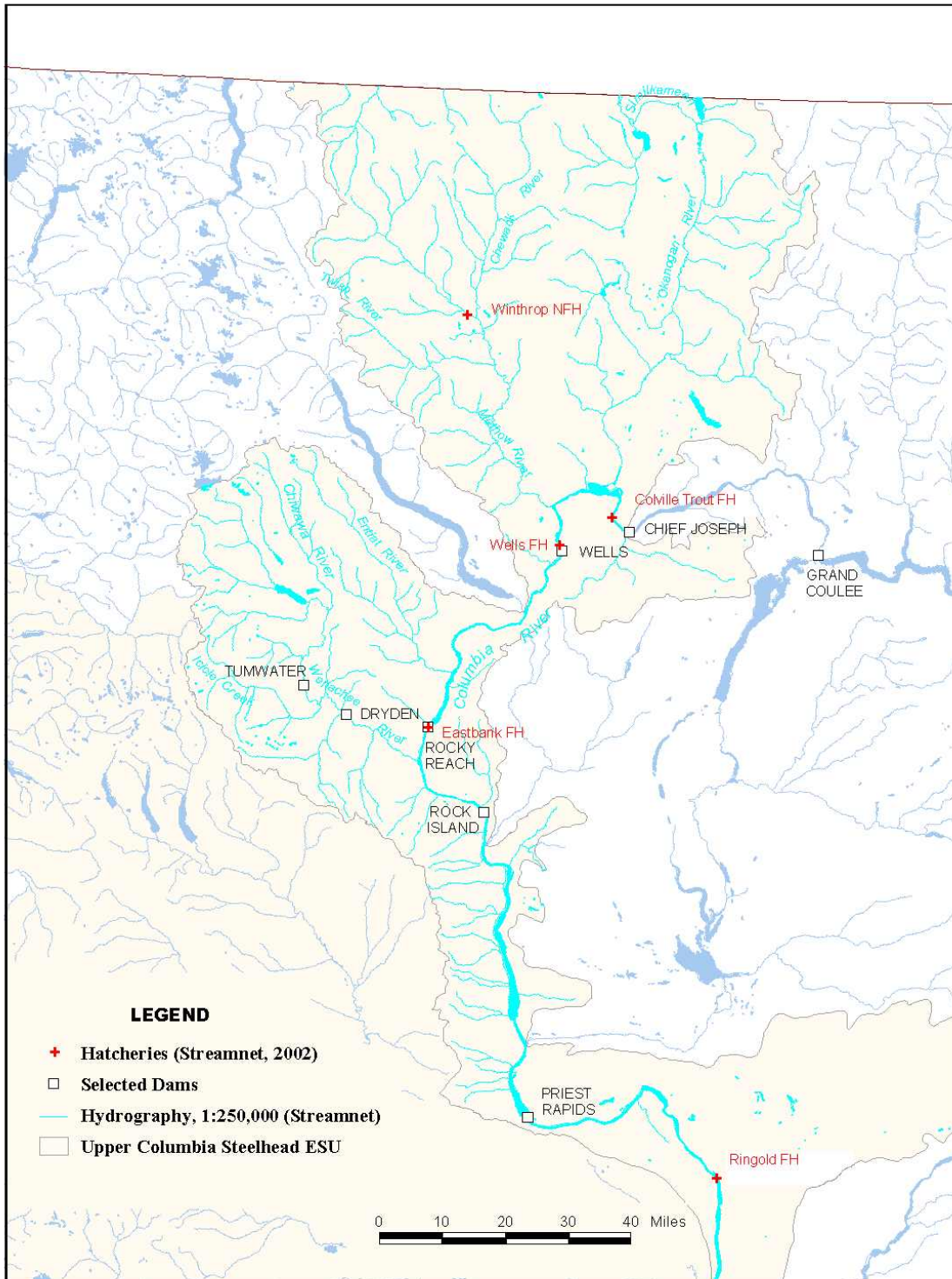
The action area in the Methow River Basin includes the Methow River, Twisp River, Chewuch River, the Methow Fish Hatchery, the Winthrop National Fish Hatchery, and various smaller tributaries that are accessible to steelhead. The Methow River watershed encompasses about 1,800 square miles and enters the Columbia River at RM 524. The Methow Fish Hatchery is located at approximately RM 44 on the Methow River, and the Winthrop National Fish Hatchery is located at about RM 43.5 on the Methow River.

The action area in the Okanogan River Basin includes the Okanogan River, Similkameen River, Omak Creek, and Salmon Creek, and other small tributaries that are accessible to steelhead. The Okanogan River watershed encompasses about 8,900 square miles and is located in north central Washington with its source on the eastern slopes of the Cascade Mountains in Canada, and flows southward to enter the Columbia River at RM 535.

The Wells, Rocky Reach, and Rock Island hydropower projects are part of an 11-dam system on the mainstem Columbia River within the continental United States. Most of the projects on the mainstem Columbia River are federally operated, although local PUDs operate five of the projects in the Mid-Columbia River segment. In addition to the three projects operated by the Chelan and Douglas County PUDs, the PUD No. 2 of Grant County operates the Priest Rapids and Wanapum Dams (Priest Rapids Project).

The Douglas County PUD operates the Wells Project located at RM 516 on the Columbia River, north of the City of Wenatchee. Wells began commercial operations on August 22, 1967, and is operated under a license issued by FERC, which expires in the year 2012.

Chelan County PUD operates the Rocky Reach and Rock Island hydroelectric projects. Rocky Reach Dam is located about 8 miles upstream from the City of Wenatchee, at RM 475. The Federal Power Commission issued the original operating license for Rocky Reach on July 11, 1957. The license expires in 2006. Rock Island, which was the first hydroelectric project to span the Columbia River, is located about 13 miles downstream from the City of Wenatchee at Rock Island began operating in 1933, and its operating license expires in the year 2028.



**Figure 2.** Location of dams and hatchery facilities that rear ESA-listed steelhead in the upper Columbia River Basin.

The project boundaries include the forebay (from the dam to approximately 500 feet upstream), tailrace (from the dam to approximately 1,000 feet downstream), and reservoir associated with each dam. The Wells reservoir extends approximately 30 miles upstream of the dam to the Chief Joseph Dam tailrace, the Rocky Reach reservoir extends approximately 41 miles upstream of the dam to the Wells tailrace, and the Rock Island reservoir extends approximately 20 miles upstream of the dam to the Rocky Reach tailrace. Considering all components of the three projects, the entire project area extends from the tailrace of the Rock Island Dam upstream to the tailrace of Chief Joseph Dam (approximately 92 miles).

Interactions between fish released from the proposed artificial propagation programs and other anadromous species in the Columbia River downstream of the proposed action area were considered by NMFS. Determining the nature of these transient interactions that occur during migration are difficult due to the biological attributes of salmon and steelhead, the dimensions and variability in the Columbia River system, and the cycles in the ocean environment. Based on the large scale of the Columbia River, the level of proposed artificial propagation relative to the artificial propagation programs in the Columbia River Basin, and the limited period of interaction during active migration, NMFS has determined that impacts on anadromous fish below the action area are not likely to occur at a magnitude requiring analysis at the level of this assessment. For example, at the mouth of the Columbia River, artificially propagated steelhead associated with the proposed programs would comprise only about 1.5 percent of artificially propagated anadromous fish released annually (less than 1.1 million steelhead of 71 million total salmonid releases in 2001) and would be expected to be in the estuary for only a few weeks. In addition, several hatchery reform measures have been implemented to limit interactions between natural and hatchery salmonids while in the migration corridor (NMFS 1999).

## **1.6 Relationships to Other Plans and Policies**

This EA was prepared pursuant to regulations implementing the NEPA (42 USC 4321), and in compliance with federal regulations for preparing an EA (40 CFR 1502). Please refer to the *Anadromous Fish Agreements and Habitat Conservation Plans Final Environmental Impact Statement for the Wells, Rocky Reach, and Rock Island Hydroelectric Projects* (NOAA Fisheries 2002) for an in depth discussion of the other plans and policies that could be affected by the Proposed Actions analyzed in this EA, which would be identical.

## **2 ALTERNATIVES INCLUDING THE PROPOSED ACTION**

The proposed action and two alternatives considered in this EA are: (1) to not issue the permits (no action), (2) to issue the permits without conditions, and (3) to issue the permits with conditions (proposed action). The following describes the alternatives.

### **2.1 Alternative 1 - Do Not Issue the Permits (No Action)**

Under a No Action alternative, NMFS would not issue the ESA section 10(a)(1)(A) permits authorizing direct take of ESA-listed species associated with the requested activities. This alternative would effectively prohibit the sampling of adult steelhead, collection of ESA-listed fish for broodstock, rearing of juvenile steelhead to the smolt stage, release of yearling age smolts, purposeful management of returning propagated adult steelhead for the enhancement of naturally spawning population, and further research on the utility of artificial propagation to enhance and assist in the recovery of the ESA-listed population in the action areas because the activities would likely be in violation of the ESA. Take limit regulations under ESA section 4(d) are not available to the permit applicants because the Upper Columbia River steelhead are listed as Endangered rather than Threatened. The programs could be terminated or altered to rear non-listed species, although neither of these options would satisfy the stated purpose and need as described above because the artificial propagation of steelhead is a specific requirement of the three HCPs and is likely necessary for recovery of the ESA-listed species. For the purpose of this analysis NMFS assumes that the steelhead programs would be discontinued in the absence of these section 10 permits.

### **2.2 Alternative 2 - Issue Permits Without Conditions**

Alternative 2 would encompass the issuance of permits under section 10(a)(1)(A) of the ESA unconditionally based strictly on the applications and the three HCPs submitted. The permits would authorize the take of listed species, but no special conditions would be imposed. The applications and HCPs describe activities for co-manager program oversight, large scale monitoring, program operational detail, and purposeful management of adult artificially propagated steelhead returning to the upper Columbia River Basin. The application reflects the adoption of protocols for artificial propagation of ESA-listed species that are risk-averse and include the most current science on management of hatchery facilities and genetic impacts of artificial propagation. With the exception that special conditions would not be imposed by NMFS, the description of this alternative mirrors the description of the proposed action (Section 2.3, Alternative 3, below) and does meet the ESA section 10 criteria for a permit application.

### **2.3 Alternative 3 - Issue Permits With Conditions (Proposed Action)**

The action proposed is to issue three permits under section 10(a)(1)(A) of the ESA based on the applications and the three HCPs, including attachments, submitted by the WDFW, the Chelan and Douglas PUDs, the USFWS, and the Colville Tribes as modified by the conditions that NMFS may require as being necessary and appropriate. The NMFS conditions would ensure that the annual take of ESA-listed anadromous fish would be for the propagation and enhancement of

the ESA-listed steelhead population, the associated scientific research and monitoring activities, and the purposeful management of adult artificially propagated steelhead returns in excess to natural production needs. The conditions imposed by NMFS would also help to ensure that the annual take would not appreciably reduce the likelihood of the survival and recovery of the species in the wild. Pursuant to section 10, the permit would contain terms and conditions necessary to the propagation or survival of listed steelhead, including reporting requirements for determining whether such terms and conditions are being complied with.

### 2.3.1 Permit 1395 Proposed Activities

The WDFW permit application (WDFW 2002) and the three HCPs (DPUD 2002; CPUD 2002a; 2002b) include activities associated with the management of ESA-listed steelhead artificial propagation programs. These activities are proposed for a 10-year period commencing in 2003. Through these programs, adult steelhead broodstock within the Upper Columbia River ESU would be intentionally taken for the purpose of determining annual run composition, to assist managers in decision making, and for broodstock in order to artificially propagate the progeny to the yearling smolt stage and release them into the Wenatchee, Methow, and Okanogan River Basins for the purpose of enhancing the natural population. The resultant returning adult steelhead would be purposely managed to ensure adequate spawning escapements into each basin with an emphasis on the perpetuation of natural-origin steelhead. The co-managers would develop plans each year for utilizing the returning steelhead, based on desired proportions of artificially propagated fish on natural spawning grounds, using any of a variety of mechanisms for managing the proportions, such as removal at dams or in selective recreational fisheries. Proposals for harvest activities in any year in which they occur would be subject to review and approval by NMFS. Proposed activities that would lead to the take of the ESA-listed species are described below and summarized in Table 1.

#### *2.3.1.1 Adult Return Monitoring*

The WDFW proposes to conduct random sampling of the annual adult steelhead run returning to the Upper Columbia River Basin at Priest Rapids Dam to enable informed decisions to be made concerning the management of ESA-listed Upper Columbia River steelhead. The sampling activities that would affect ESA-listed species are provided in Table 1.

#### *2.3.1.2 Adult Return Management*

The WDFW proposes to purposely manage artificially propagated adult steelhead returning to the upper Columbia River Basin. Based on the monitoring at Priest Rapids Dam recommendations concerning broodstock collection strategies and the potential for other actions to utilize any excess hatchery steelhead would be made each year. Recommendations concerning management of hatchery steelhead proportions on spawning grounds and a means by which to remove excess hatchery steelhead would be made individually for the Wenatchee, Methow, and Okanogan Basins. Activities that would affect ESA-listed species are provided in Table 1.

#### *2.3.1.3 Artificial Propagation*

Two hatchery facility complexes are operated by the WDFW within the middle and upper Columbia River Basin for the propagation of steelhead: Wells Fish Hatchery Complex and Eastbank Fish Hatchery Complex. The proposed artificial propagation programs are funded by Chelan and Douglas PUDs as mitigation for hydropower project operation impacts to the naturally spawning steelhead populations present in the Wenatchee, Methow, and Okanogan River Basins. The Wells Fish Hatchery Complex uses returning steelhead adults collected at Wells Dam on the Columbia River to supplement steelhead populations in the Methow and Okanogan River Basins. The Eastbank Fish Hatchery Complex uses steelhead broodstock collected at Dryden and Tumwater Dams on the Wenatchee River to supplement steelhead populations in the Wenatchee River Basin. Activities that would affect ESA-listed Upper Columbia River steelhead are provided in Table 1.

#### *2.3.1.4 Research, Monitoring, and Evaluation*

Research, monitoring, and evaluation are critical components of the proposed programs. The three HCP agreements specifically require the formation of Hatchery Committees consisting of representatives from each signatory entity to each HCP. These HCP Hatchery Committees are charged with oversight of the artificial propagation programs to ensure that the programs are effective in meeting co-manager defined goals and objectives. The Upper Columbia River steelhead programs are intended to support naturally-spawning steelhead populations and to increase basin-wide steelhead productivity by ensuring adequate spawning escapements of the appropriate localized stocks. Specific research activities would be subject to approval of the HCP Hatchery Committees prior to implementation of the research. A representative from NMFS is on each HCP Hatchery Committee to ensure the activities conducted are consistent with steelhead recovery and do not impose substantial risks to protected species. Studies, either ongoing and currently covered under existing permits, or newly proposed studies may include the investigations provided in Table 1.

Table 1. Proposed activities that would be conducted if Permits 1395, 1396, and 1412 are issued.

Type of Activity	Permit 1395	Permit 1396	Permit 1412
Adult Return Monitoring	Intercept and collect biological data (length, scales, marks, tags, etc.) on 10 percent of run  Externally tag sampled steelhead  Summarize, assess, and report data collected	Not applicable	Not applicable
Adult Return Management	Ensure the run can fully seed the habitat in each basin  Develop broodstock collection protocols  Determine if excess hatchery steelhead should be removed from spawning populations in each basin	Not applicable	Not applicable
Artificial Propagation	Collect up to 442 broodstock fish at Wells Dam on the Columbia River for Methow and Okanogan Basin releases  Collect up to 208 broodstock fish at Dryden and Tumwater Dams for Wenatchee Basin releases  Holding and artificial spawning of broodstock at Wells and Eastbank Fish Hatcheries  Transfer of 125,000 eyed-eggs or fry from Wells Fish Hatchery to Winthrop National Fish Hatchery annually  Transfer up to 225,000 eyed-eggs from Wells Fish Hatchery to WDFW facilities for release from Ringold Springs Rearing Facility annually  Incubation and rearing to smolt  Rear juveniles following routine fish culture methods to an average size of 5 to 8 fish per pound  Externally mark or tag all fish prior to release	Receive up to 125,000 eggs or fry from WDFW annually          Incubation and rearing to smolt  Rear juveniles using routine fish culture methods to an average size of 5 to 8 fish per pound  Adipose fin clip all fish prior to release	Collect up to 16 adult steelhead for broodstock from Omak Creek or Okanogan River    Holding and artificial spawning of broodstock at Colville Trout Hatchery       Incubation and rearing to smolt  Rear juveniles using routine fish culture methods to an average size of 5 to 8 fish per pound  Externally mark or tag all fish prior to release

Type of Activity	Permit 1395	Permit 1396	Permit 1412
	<p>Internally tag some smolts prior to release</p> <p>Release up to 180,000 smolts into the Columbia River from Ringold Springs Rearing Facility</p> <p>Release of 350,000 smolts into the Methow and/or Okanogan Basins annually and release of 400,000 smolts into the Wenatchee Basin annually</p>	<p>Release of up to 100,000 smolts in the Methow River annually</p>	<p>Release of up to 40,000 smolts into the Okanogan Basin annually</p>
Research, Monitoring and Evaluation	<p>Investigate the factors that affect and the extent of residulization of juveniles from release groups</p> <p>Determine the relative success of program steelhead in the natural environment</p> <p>Investigate the efficacy of hatchery programs in rebuilding self-sustaining populations</p> <p>Monitor the affect of artificial propagation on the genetic profile of the stocks</p>		<p>Investigate the efficacy of hatchery programs in rebuilding self-sustaining populations</p> <p>Cap a portion of the redds deposited in Omak Creek to determine spawning success of artificially propagated fish in the natural environment</p> <p>Monitor the affect of artificial propagation on the genetic profile of the stocks</p>



### 2.3.2 Permit 1395 Terms and Conditions

NMFS proposes to issue section 10(a)(1)(A) permit 1395 jointly to the WDFW, the Chelan PUD, and the Douglas PUD with terms and conditions. Specifically, the conditions are designed to minimize ESA-listed fish mortalities and adverse impacts during: the interception and release of Upper Columbia River steelhead adults at Priest Rapids Dam, collection of broodstock from the Columbia River and its tributaries, rearing of juveniles in a hatchery environment, and release of smolts into the Upper Columbia River Basin to enhance the naturally spawning population. Of primary concern in the development of the conditions for the proposed permit is the necessity to take special measures to avoid adverse impacts from artificially propagated returning adult steelhead in years when adequate numbers of natural-origin steelhead escape to the spawning grounds. In years of low natural-origin steelhead returns, the primary objective would be to fully utilize the available habitat while maintaining the genetic integrity of the populations and rebuilding the steelhead resources throughout the ESU. A summary of the terms and conditions that would be placed in the permit is provided in Table 2 (for a complete list of conditions see the draft Permit #1395 and draft Opinion (NOAA Fisheries 2003)).

Table 2. Terms and conditions that would be included in Permits 1395, 1396, and 1412 if issued.

Type of Activity	Permit 1395	Permit 1396	Permit 1412
Adult Return Monitoring	<p>Biological sampling of steelhead at Priest Rapids Dam would be conducted on a random sample targeting 10 percent of the total run.</p> <p>ESA-listed fish handled out of water must be anaesthetized and allowed to recover before release</p> <p>External tags may be applied only to adipose fin clipped steelhead sampled after September 9<sup>th</sup></p> <p>Data would be summarized, assessed and reported weekly including direct and indirect mortalities</p>	Not applicable	Not applicable
Adult Return Management	<p>Priority would be given to fully seeding the habitat with natural origin steelhead in each basin</p> <p>Broodstock collection protocols would be developed annually and submitted to NMFS</p> <p>Determination of potential benefits of removing excess hatchery steelhead from the spawning population would be done separately for the Wenatchee, Methow, and Okanogan Basins</p>	Not applicable	Not applicable
Artificial Propagation	<p>The permit holders would reduce potential negative impacts to listed salmon and steelhead in the upper Columbia River Basin from physical operation of their respective artificial propagation facilities, including associated trapping locations</p> <p>Steelhead captured for broodstock would be removed from traps daily</p> <p>Fish not retained for broodstock would be released upstream of the trap immediately after enumeration</p> <p>Artificial propagation production levels would not exceed those in the application documents without further consultation with NMFS</p>	<p>Not applicable</p> <p>Not applicable</p>	<p>Steelhead captured for broodstock would be removed from traps daily</p> <p>Fish not retained for broodstock would be released upstream of the trap immediately after enumeration</p>

Type of Activity	Permit 1395	Permit 1396	Permit 1412
	<p>Incidental mortalities associated with capturing, handling, and transporting broodstock would not exceed 5 percent of the total number of steelhead retained</p> <p>If total eyed egg-to-release mortality exceeds 20 percent or a single mortality event exceeds 10 percent of the population, then NMFS would be notified within 48 hours of the mortality event</p> <p>Steelhead smolts would be released at an average size of 5 to 8 fish per pound with a length coefficient of variation not to exceed 10 percent</p> <p>Juvenile steelhead would be externally marked prior to release (for example adipose fin clip or visual elastomer tag)</p> <p>A portion of the juvenile steelhead may be internally tagged prior to release (for example coded-wire tag (CWT) or passive integrated transponder (PIT) tag)</p> <p>Up to 180,000 smolts would be released into the Columbia River from Ringold Springs Rearing Facility</p> <p>Up to 350,000 smolts would be released into the Methow and/or Okanogan Basins annually</p> <p>Up to 400,000 smolts would be released into the Wenatchee Basin annually</p> <p>Annual reports would be submitted to NMFS that include a summary of artificial propagation program activities including broodstock characteristics (for example natural or hatchery origin, sex, age, length, fecundity, mating strategy), rearing conditions (for example water temperature and sources), biological data collected (for example growth rates, health condition monitoring), numbers and types of external and internal mark and tags, description of studies and/or rearing comparisons, release summaries, and other information pertinent the evaluation of the specific broods year or group artificially propagated at each facility</p>	<p>Not applicable</p> <p>Juvenile steelhead would be adipose fin clipped prior to release</p> <p>Release of up to 100,000 smolts in the Methow River annually</p>	<p>Incidental mortalities associated with capturing, handling, and transporting broodstock would not exceed 5 percent of the total number of steelhead retained</p> <p>Juvenile steelhead would be externally marked prior to release (for example adipose fin clip or visual elastomer tag)</p> <p>Release of up to 40,000 smolts into the Okanogan Basin annually</p>
Research, Monitoring, and Evaluation	<p>The permit holders would monitor and report the contribution of adult salmon from the artificial propagation programs authorized in this permit. Adult return information should include the most recent estimates of the number and proportion of artificially propagated fish on the spawning grounds, and the number and location of artificially propagated adults that were recovered outside the release areas</p>		

Type of Activity	Permit 1395	Permit 1396	Permit 1412
	<p>Visual observation protocols would be used instead of intrusive sampling methods whenever possible</p> <p>Each ESA-listed fish handled out-of-water would be anesthetized when necessary to prevent injury or mortality. Anesthetized fish would be allowed to recover (e.g., in a recovery tank) before being released. Fish that are simply counted would remain in water but would not need to be anesthetized</p> <p>The permit holders would be responsible for any biological samples collected from ESA-listed species as long as they are useful for research purposes. The terms and conditions concerning any samples collected under this authorization would remain in effect as long as the permit holders maintains authority and responsibility of the material taken. The permit holders may not transfer biological samples to any persons, agencies, organizations or any other entity not listed in the application without obtaining prior written approval from NMFS</p>		

### 2.3.3 Permit 1396 Proposed Artificial Propagation Activities

Winthrop National Fish Hatchery is located near Winthrop, Washington on the Methow River, above its confluence with the Columbia River. Total distance from the hatchery to the Pacific Ocean is 568 river miles, and nine hydroelectric dams are located within the migration corridor. Production goals at Winthrop National Fish Hatchery were set by the Columbia River Fisheries Management Plan under *U.S. v. Oregon* (USFWS 2002). The current steelhead program at Winthrop National Fish Hatchery of 100,000 summer steelhead smolts annually started in 1995 with eyed eggs being transferred and fry brought to the station from Wells Fish Hatchery in 1996.

This permit application, proposed for a 10-year period commencing in 2003, addresses listed steelhead artificial propagation at Winthrop National Fish Hatchery. Adult steelhead within the Upper Columbia ESU would be intentionally taken at Wells Fish Hatchery by WDFW and eyed eggs or fry transferred to Winthrop National Fish Hatchery to be reared and released by the USFWS for the purpose of enhancing the population status of the species through artificial propagation at this facility. Activities that would lead to the take of the ESA-listed species are listed in Table 1.

### 2.3.4 Permit 1396 Terms and Conditions

NMFS proposes to issue section 10(a)(1)(A) permit 1396 to the USFWS with conditions. Specifically, NMFS' conditions are designed to minimize ESA-listed fish mortalities incidental to the rearing and release of artificially propagated steelhead smolts into the Methow River to enhance the naturally spawning population, and associated scientific research and monitoring activities. Of primary concern in the development of the conditions for the proposed permit is the necessity to take measures to avoid adverse impacts from artificially propagated returning adult steelhead in years when adequate natural-origin steelhead escape to the spawning grounds in order to preserve the genetic and life history characteristics of the ESA-listed species. A summary of the terms and conditions that would be placed in the permit is in Table 2 (for a complete list of conditions see the draft permit 1396 and Opinion (NOAA Fisheries 2003)).

### 2.3.5 Permit 1412 Proposed Artificial Propagation Activities

NMFS proposes to issue section 10(a)(1)(A) permit 1412 to the Colville Tribes to carry out a artificial propagation program of endangered Upper Columbia River steelhead. The Colville Tribes request a 5-year authorization to utilize artificial propagation techniques to enhance the natural origin Upper Columbia River steelhead in the Okanogan River Basin. Program details were provided in the permit application (CCT 2002) and are summarized in Table 1.

The Colville Tribes propose to install a temporary picket weir in Omak Creek in Mid-March through April 30th annually at approximately RM 0.5 to collect about 16 adult steelhead for broodstock. If the picket weir is not successful, then trap nets or angling would be used to collect

broodstock. The broodstock would be transported approximately 35 miles in a tank truck to the Colville Tribal Trout Hatchery, near Bridgeport, Washington.

Adult steelhead would be spawned and biologically sampled according to standardized fish health practices following fish disease control guidelines developed by Integrated Hatchery Operations Team and the Pacific Northwest Fish Health Protection Committee. Fin tissue, and other biological data would be collected from the broodstock to monitor the program impacts.

Eggs would be incubated and juvenile fish reared at the tribal facility until the yearling smolt stage. Fish health would be monitored routinely, generally on a monthly schedule and the rearing facility would be operated to be in compliance with "Salmonid Disease Control Policy of the Fisheries Co-managers of Washington State" standards (NWIFC and WDFW 1998). Juvenile fish would be biologically sampled in the hatchery facility including collection of fin tissue for genetic monitoring and growth monitoring.

Juvenile steelhead would externally marked with visual implant elastomer tags for identification purposed but not adipose fin-clipped. Juveniles may also receive passive integrated transponder (PIT) tags for identification purposes. Steelhead smolts with a demonstrated preparedness for downstream migration would be released into Omak Creek from a Natural Rearing Enhancement System (NATURES) type acclimation pond, which is in development with a completion target date of spring 2004, or scatter planted from a tank truck in April or May.

### 2.3.6 Permit 1412 Terms and Conditions

NMFS proposes to issue section 10(a)(1)(A) permit 1412 to the Colville Tribes with conditions. Specifically, NMFS' conditions are designed to minimize ESA-listed fish mortalities incidental to the capture, handling, transport, spawning, juvenile rearing, and release of artificially propagated steelhead smolts into Omak Creek to enhance the naturally spawning population, and associated scientific research and monitoring activities. Of primary concern in the development of the conditions for the proposed permit is the necessity to take measures to avoid adverse impacts from artificially propagated returning adult steelhead in years when adequate natural-origin steelhead escape to the spawning grounds in order to preserve the genetic and life history characteristics of the ESA-listed species. A summary of the terms and conditions that would be placed in the permit is in Table 2 (for a complete list of conditions see the draft permit 1412 and Opinion (NOAA Fisheries 2003)).

### 2.3.7 Incidental Take

In addition to direct take, incidental takes of ESA-listed species other than targeted steelhead associated with broodstock collection activities, hatchery operations, and juvenile fish releases from the program would be authorized under the proposed action. Because of the inherent biological attributes of aquatic species such as salmon and steelhead, the dimensions and variability of the Columbia River system and tributaries, and the operational complexities of hatchery actions, determining precise incidental take levels of ESA-listed species attributable to hatchery activities are not possible at present. In the absence of quantitative estimates of incidental take, NMFS would monitor fish release numbers/locations and hatchery operations to assure that incidental takes do not operate to the disadvantage of ESA-listed species. If NMFS determines that incidental take due to the hatchery activities have the potential to operate to the disadvantage of ESA-listed species, the activities that result in the incidental takes must be suspended until a reasonable solution is achieved, the permit is amended, and/or the program is reevaluated under Section 7 of the ESA.

## 3 AFFECTED ENVIRONMENT

The alternatives identified above can potentially affect the physical, biological, and socioeconomic resources within the action area. The following is a summary of the major components of the environment that would be affected by any of the alternatives and the current baseline condition organized by the type of environment. A full discussion of the environmental baseline can be found in the *Anadromous Fish Agreements and Habitat Conservation Plans Final Environmental Impact Statement for the Wells, Rocky Reach, and Rock Island Hydroelectric Projects* (NOAA Fisheries 2002).

### 3.1 Physical Environment

The proposed action of permitting artificial propagation activities can effect the physical environment by impacting the water quantity, water quality, and the riparian habitat.

#### 3.1.1 Water Quantity

Water quantity can be altered by water withdrawals from a river or stream for use in the artificial propagation facility. The Columbia River average annual flow at Rock Island Dam is 117,737 cubic feet per second (cfs). The artificial propagation programs at Wells and Chelan Fish Hatcheries utilize about 24 and 11 cfs from the Columbia River, respectively. The Wenatchee River watershed is the third largest mid-Columbia River tributary and has an annual discharge of 2.3 million acre-feet (NOAA Fisheries 2002). Average annual flow of the Wenatchee River is 3,304 cfs (years 1963 to 2000) measured at Monitor, Washington. A total of 420 cfs have established water rights, with 3 percent utilized by artificial propagation facilities. Average annual flow from the Methow River at Pateros is 1,579 cfs (years 1963 - 2000). The Washington Department of Ecology estimates that irrigation ditches remove about 50 percent of the river flow in late summer and fall, with 90 percent of that withdrawal being utilized for irrigating agricultural land. The USFWS Winthrop National Fish Hatchery uses up 50 cfs of Methow

River water for both the spring chinook and steelhead artificial propagation programs. Average annual flows in the Okanogan River at Malott, Washington is 3,134 cfs (years 1966 -2000).

### 3.1.2 Water Quality

Current water quality classification by the Ecology following water quality standards as defined by Chapter 173-201A of the Washington Administrative Code (WAC), indicates that the Columbia River in the action area is relatively unpolluted and has few sources of wastewater or other pollution. However, based on the Army Corp of Engineers and Ecology monitoring, the middle Columbia River region was placed on the 303(d) list for total dissolved gas, water temperature, pH, and a water column bioassay (NOAA Fisheries 2002). Water quality in the Wenatchee River is generally good; however, the river was placed on the 303(d) list for temperature, pH, and dissolved oxygen. The Methow River water quality is also generally good; however, the river was placed on the 303(d) list for temperature and instream flow. The Okanogan River is on the 303(d) list for dissolved oxygen, temperature, and fecal coliform organisms. A thorough discussion of the water quality of the middle and upper Columbia River and the tributaries are described in Chapter 3 of the *Anadromous Fish Agreements and Habitat Conservation Plans Final Environmental Impact Statement for the Wells, Rocky Reach, and Rock Island Hydroelectric Projects* (NOAA Fisheries 2002).

### 3.1.3 Riparian Habitat

The Upper Columbia River Basin flood plain and the foothills of the Cascade Mountains are primarily within the big sagebrush/blue bunch wheat grass or shrub-steppe vegetation zone, which is characteristic of the driest portions of the Columbia Basin physiographic province (NOAA Fisheries 2002). Tributaries in the action area pass through a variety of vegetation zones including forested low-montane zones - dominated ponderosa pine, Douglas fir, and grand fir; and subalpine zones - dominated by lodgepole pine, Engelmann spruce and subalpine fir. Human occupation and land use occur throughout the action area. Riparian habitat may benefit from marine derived nutrients released from decomposing steelhead carcasses that result from artificially propagated steelhead, and their descendants, that spawn and die in the natural environment.

## 3.2 Biological Environment

The biological resources that potentially could be affected by the proposed action include salmon, steelhead, trout, and other aquatic and terrestrial species. A detailed discussion of the biological resources found in the action area is presented in the *Anadromous Fish Agreements and Habitat Conservation Plans Final Environmental Impact Statement for the Wells, Rocky Reach, and Rock Island Hydroelectric Projects* (NOAA Fisheries 2002). The specific resource segments and baseline condition that may be affected by the proposed artificial propagation programs are described below.



### 3.2.1 Anadromous Fish Listed Under the ESA

Since 1991, NMFS has identified twelve populations of Columbia River Basin anadromous salmon and steelhead as requiring protection under the ESA. The biological attributes of salmon and steelhead, the dimensions and variability of the Columbia River system, and the natural cycles in the ocean environment make determination of the effects from the proposed artificial propagation activities downstream of the action area very difficult. Most of the species interact with fish that would be produced by the proposed artificial propagation activities in the migration corridor and the ocean environments. However, as discussed in Section 1.3 (Action Area) artificially propagated steelhead associated with the proposed programs would comprise only about 1.5 percent of artificially propagated anadromous fish released annually (less than 1.1 million steelhead of 71 million total salmonid releases in 2001) and would be expected to be in the estuary for only a few weeks. Therefore, analysis of impacts of these activities on the biological environment will be limited to the two ESUs expected to be impacted by the proposed action. Both of the ESA-listed ESUs include some portion of artificially propagated fish as well as the naturally spawning populations.

#### 3.2.1.1 Upper Columbia River Spring Chinook

The Upper Columbia River spring chinook salmon ESU was listed as endangered on March 24, 1999 (64 FR 14308). This ESU includes stream-type spring chinook salmon populations originating from all areas of the Columbia River basin upstream of Rock Island Dam (Myers *et al.* 1998). Production areas include the Wenatchee, Methow, and Entiat River Basins. The WDF *et al.* (1993) identified nine stocks within this ESU. All stocks, with the exception of the Methow stock, were considered by the WDF *et al.* (1993) to be of native origin, of "wild" production type, and as "depressed" in status. The Methow River spring chinook salmon stock is considered to be "composite" in production type, but of native origin, and depressed in status. When listing the Upper Columbia River spring chinook salmon as endangered, NMFS included six populations which have been artificially propagated in recent years as part of the ESU: Chiwawa River, Methow River, Twisp River, Chewuch River, White River, and Nason Creek. These six artificially propagated populations were considered to be essential for recovery and were therefore listed as part of the ESU. Artificially propagated populations at Winthrop National Fish Hatchery, Entiat National Fish Hatchery, and Leavenworth National Fish Hatchery were not included as part of the ESU because they were derived from Carson National Fish Hatchery spring chinook salmon.

Upper Columbia River spring chinook salmon have a stream-type life history. Spring chinook salmon destined for the Upper Columbia River and tributaries begin entering the Columbia River in late February and early March, with approximately 50 percent passing Priest Rapids Dam by mid-May. Fish enter the Methow River from mid-May through July and primarily use the upper mainstem reaches of the Methow, Chewuch, Lost, and Twisp Rivers. Spawning occurs from late July through mid-September; fry emerge from the gravel in April and May. Juveniles spend the next year in fresh water prior to migrating downstream in the spring. Spring chinook salmon returning to the Wenatchee River have similar run timing with spawning starting about the second week of August and peaking in the first week of September. Spawning time is dependant on water temperature and generally begins when water temperatures are between 42.4°F and

57.5°F (Mullen 1987 in WDW *et al.* 1990a). Fry emerge from the gravel in January to February and rear in freshwater for up to a year prior to outmigrating during the following spring.

Recent year (1990-95) mean escapement for Upper Columbia River spring chinook salmon was estimated to be 4,880 (Myers *et al.* 1998). Estimates of recent annual trends in abundance were found by NMFS to be downward, with eight of the nine spring chinook populations exhibiting rates of decline exceeding 20% per year. Record low returns were experienced in the middle 1990s. For the Upper Columbia River spring chinook salmon ESU as a whole, NMFS estimates that the average population growth rate ( $\lambda$ ) over the base period ranged from 0.87 to 0.78, decreasing as the effectiveness of hatchery fish spawning in the wild increases compared to that of fish of natural origin (Appendix B in McClure *et al.* 2000) (an annual average growth rate above 1.0 represents a population that is not declining). The estimated average population growth rates and the risk of absolute extinction within 24 and 100 years for the three spawning populations identified by Ford *et al.* (2001), using the same range of assumptions about the relative effectiveness of hatchery fish.

Wenatchee River adult spring chinook returns rebounded in 2000 from low returns observed in 1999. In 2000, an estimated 350 redds were counted in the basin, an almost seven-fold increase from the 54 redds observed in 1999. The greatest increases were seen in Nason Creek, Chiwawa River and the upper Wenatchee River. The 2001 return of naturally produced spring chinook to the Wenatchee River was estimated to be between 640 and 1,052 adults with an additional 438-696 hatchery spring chinook returning to the Chiwawa River. The increased returns in 2000 and 2001 are likely the result of favorable out migration conditions and ocean rearing environment.

Factors for decline in the Upper Columbia River Region, include hydropower facilities and habitat destruction as the major causes of population declines, although past over-harvest in fisheries, and some hatchery practices are other factors. To these factors for decline are added poor ocean conditions prior to 2000, that have suppressed fish survival, and vastly increased avian predation in the Columbia River estuary. These latter factors affect all of the Basin's salmon and steelhead populations.

### *3.2.1.2 Upper Columbia River Steelhead*

The Upper Columbia River steelhead ESU was listed as endangered on August 18, 1997 (62 FR 43937). This ESU inhabits the Columbia River and tributaries upstream of the Yakima River. It includes rivers mostly draining the east slope of the Cascade Mountains. This area includes several rivers which originate in Canada, but it is not thought that steelhead ever occurred in Canada in large numbers; this ESU is defined to include only U.S. populations. This entire ESU has been heavily influenced by artificial propagation programs, with a thorough mixing of stocks as a result of the Grand Coulee Fish Maintenance Project beginning in the 1940s (Fish and Hanavan 1948; Mullan *et al.* 1992). Until recently, hatchery releases were composed of a composite of basin stocks. The Wells Fish Hatchery stock is included in the listing because it may retain the genetic resources of the original steelhead populations about Grand Coulee Dam (62 FR 43937) and may be used for recovery purposes. Currently, efforts are underway to develop artificial propagation programs from more locally-adapted stocks, incorporating some natural-origin steelhead into the broodstock. Steelhead juveniles released into the Wenatchee

River have been progeny of broodstock collected from the Wenatchee River exclusively since the 1998 brood (WDFW 2002).

The life history of this ESU is similar to other inland steelhead ESUs. However, smolt ages in this ESU are some of the oldest on the west coast (up to 7 years old), likely as a result of the ubiquitous cold water temperatures (Mullan *et al.* 1992). Adults of this ESU spawn later than most downstream populations. Adults primarily return after one year of ocean residency. Steelhead from this ESU enter the lower Columbia between May and September with fish arriving at Wells Pool in early July. Fish enter the Wenatchee and Methow Rivers in mid-July and peak between mid-September and October. During winter, fish generally return to the warmer Columbia River and re-enter the Methow to begin spawning in mid-March after ice-out. Spawning continues through May and many fish seek out higher reaches in the tributaries. Fry emergence occurs that summer and juveniles rear for two to four years prior to spring downstream migration.

Although runs during the period 1933 through 1959 may have already been affected by fisheries in the lower river, dam counts suggest a pre-fishery run size of more than 5,000 adults above Rock Island Dam. The return of Upper Columbia River natural-origin steelhead to Priest Rapids Dam declined from a 5-year average of 2,700 beginning in 1986 to a 5-year average of 900 beginning in 1994. Recent escapements at Priest Rapids Dam of both hatchery and natural-origin steelhead have shown an increasing trend reaching 11,330 in 2000, a peak of 30,077 in 2001, and an estimated 15,898 in 2002. Natural origin steelhead returns were estimated at 2,341, 5,715, and 3,013 in 2000, 2001, and 2002, respectively.

In the Upper Columbia River Region, hydropower facilities and habitat destruction are the major causes of population declines, although past over-harvest in fisheries and some hatchery practices are other factors. To these factors for decline are added poor ocean conditions prior to 2000 that have suppressed fish survival, and vastly increased avian predation in the Columbia River estuary. These latter factors affect all of the basin's salmon and steelhead populations.

### 3.2.2 Other ESA-listed Fish Species

Another ESA-listed fish species that could be present in the areas where the hatchery activities are proposed to occur is bull trout. Bull trout in the Columbia River basin were listed as threatened on June 10, 1998 (63 FR 31647). The Columbia River population segment encompasses a vast geographic area including portions of Idaho, Montana, Oregon, Washington, and British Columbia. Bull trout are present, and locally common, in most of the habitat occupied by anadromous fish in the upper Columbia River Basin. The WDFW (1997) identified 17 bull trout stocks in the Methow River watershed, most are located in the headwater tributaries. The status of these stocks was listed as unknown except for the Lost River stock which was considered healthy (WDFW 1997). In the Wenatchee River, the WDFW (1997) identified 11 bull trout stocks located in the headwater tributaries, out of these 11 stocks, 4 stocks were identified as being healthy and the remaining seven as unknown.

Bull trout populations are known to exhibit four distinct life history forms: resident, fluvial, adfluvial, and anadromous. Resident bull trout spend their entire life cycle in the same (or nearby) streams in which they were hatched. Fluvial and adfluvial populations spawn in tributary streams where the young rear from 1 to 4 years before migrating to either a lake (adfluvial) system or a river (fluvial) system, where they grow to maturity. Anadromous fish spawn in tributary streams, with major growth and maturation occurring in salt water this form is not present in the Methow and Wenatchee Rivers.

Bull trout spawn from August to November as the water temperatures begin to decline. Depending on water temperature, the fry emerge in 100 to 145 days. Juveniles remain in the substrate for some time after hatching. Fry emerge from the gravel in about April. Bull trout populations are fragmented with many individual populations being isolated in one drainage. The distribution of this species appears to be greatly influenced by habitat components such as water temperature (bull trout prefer colder streams), cover, channel form and stability, substrates and migratory corridors (WDW *et al.* 1990b). Bull trout have complex life stage habitat needs. This species utilize large woody debris, undercut banks, boulders and pools. Altered stream flow can disrupt spawning and channel stability is a large factor in egg survival. It is believed that the migratory bull trout occasionally spawn outside of their own natal area, thus over time the genetics remain stable. Migrating adult bull trout are sometimes encountered at weirs during broodstock collection activities.

### 3.2.3 Non-listed Fish Species

Approximately 60 other species of fish live in the Columbia River and tributaries. About half are native species primarily of the families Salmonidae, Catastomidae, Cyprinidae, and Cottidae. White sturgeon, *Acipenser transmontanus*, occur in the mainstem Columbia River and feed on detritus found on the bottom of the river. They may incur a negligible benefit from juvenile steelhead from the proposed programs that die and sink during the migration. The Columbia River Basin also supports at least 25 introduced species primarily representing Percidae, Centrarchidae, and Ictaluridae. Most of the introduced species are game fish which may be the targets of fisheries that could incidentally take ESA-listed anadromous salmonids.

### 3.2.4 Wildlife

Wildlife that inhabit and utilize riparian areas include birds, terrestrial mammals, amphibians, and reptiles. A complete discussion of the species present and their habitat utilization is presented in the *Anadromous Fish Agreements and Habitat Conservation Plans Final Environmental Impact Statement for the Wells, Rocky Reach, and Rock Island Hydroelectric Projects* (NOAA Fisheries 2002).

In the upper reaches of the Wenatchee, Entiat, Methow, and Okanogan Rivers, and in the tributaries of these rivers, faster flowing, small streams bordered by riparian forest are present. These upper reaches provide habitat for a variety of riparian forest and stream associated wildlife, such as American dippers (*Cinclus mexicanus*), Steller's jays (*Cyanocitta stelleri*), ruby-crowned kinglets (*Regulus calendula*), and tailed frogs (*Ascaphus truei*). Bald eagles (*Haliaeetus*

*leucocephalus*) use these watersheds during winter and early spring months. The tributaries of the Wenatchee, Entiat, Methow, and Okanogan Rivers extend into remote areas where species such as bobcats (*Lynx rufus*) and mountain lions (*Felis concolor*) are expected to be more common than in developed areas. These species may feed minimally during limited times of the year on juvenile steelhead after release or on decomposing carcasses of spawned adult steelhead.

### **3.3 Socioeconomic Environment**

A full discussion of the socioeconomic environment can be found in the *Anadromous Fish Agreements and Habitat Conservation Plans Final Environmental Impact Statement for the Wells, Rocky Reach, and Rock Island Hydroelectric Projects* (NOAA Fisheries 2002). In general, Chelan, Douglas, and Okanogan Counties are largely rural with relatively small population. Together, the three counties contain just 2.4 percent of the State population while covering 10,010 square miles, or 15 percent of the State. The demographics of Native Americans that fish in the Columbia River include the Colville Tribes, Confederated Tribes and Bands of the Yakama Indian Nation, Confederated Tribes of the Umatilla Indian Reservation, Confederated Tribes of the Warm Springs Reservation, and the Nez Perce Tribe. Of these reservations, only the Colville Tribes Reservation is located within the action area.

Historically, natural resources have been the mainstay of the economies of the Native Americans in the Columbia Basin. Hunting, fishing, and gathering are activities that have been important to Tribes for thousands of years. These activities not only continue to be important economically, but also for subsistence and ceremonial purposes. Today, the natural resource portion of the affected Tribal economies, which constitutes 8 percent of the total employment, is made up of fishing, agriculture, food processing, forestry/timber production and wood processing, livestock grazing, and power production. Fishing is the main Tribal industry that would be most affected by the proposed activities.

In 2000, the various Tribes landed 52,419 chinook salmon, 15,540 steelhead, 6,299 coho salmon, and 3,447 sturgeon during the commercial fishing season in the lower Columbia River (Joint Columbia River Management Staff 2001). The commercial fishery represents an important part of the economies of the five Tribes. Estimates of the Tribal salmon fishery in Washington were valued at almost \$7 million in 1997 (Tiller and Chase 1999). However, over time, there has been a substantial decline in salmon stocks, and this decline has affected the economies of the project area Tribes. The subsistence fish harvest for the four Treaty Tribes includes the fish species listed above and also includes sockeye and spring- and summer run chinook salmon. In 2000, the Treaty Tribes caught 14,635 fall-run, 11,250 spring-run, and 280 summer-run chinook salmon, 6,628 steelhead, 2,765 sockeye salmon, 1,884 coho salmon, and 324 sturgeon, for subsistence or ceremonial purposes (NOAA Fisheries 2002).

In recent years, with salmonid numbers severely reduced due primarily to habitat degradation and hydropower development in the mainstem river, commercial and recreational fisheries have been considerably curtailed from earlier levels. Currently, harvest is not considered to be as great a source of salmonid population decrease as habitat degradation and hydropower projects. Harvest

rates are managed at conservative levels until improvements in other sectors of the environment are able to take effect.

Numerous jobs are indirectly (for example, commercial fishers and retailers) and directly (for example, fish culturalists and fish managers/regulators) associated with or affected by the proposed artificial propagation programs and the listing of the species under the ESA. In addition to their role in maintaining the viability of salmonid populations, the artificial propagation programs contribute fish to recreational, commercial, and tribal fisheries throughout the Columbia River Basin.

Natural and hatchery-origin steelhead continue to play an important role for Native American cultural, religious, subsistence, and commercial purposes in the action area. The current depressed status of listed spring chinook salmon and steelhead populations has severely limited many of the cultural practices and subsistence uses of salmon by the local tribes. The poor status of the listed populations has also curtailed economic and cultural benefits for non-Indian recreational fisheries that the steelhead resource formerly supported.

#### **4 ENVIRONMENTAL CONSEQUENCES**

The proposed action can potentially affect the physical, biological, social, and economic resources within the action area. The following is an analysis of the potential environmental consequences on the major components of the environment based on the current baseline condition described in Section 3 (Affected Environment), above, organized by the alternatives considered in Section 2 (Alternatives Including the Proposed Action). Please see the *Anadromous Fish Agreements and Habitat Conservation Plans Final Environmental Impact Statement for the Wells, Rocky Reach, and Rock Island Hydroelectric Projects* (NOAA Fisheries 2002) for more detail of the environmental consequences of the three HCPs.

##### **4.1 Alternative 1 - Do Not Issue Permits (No Action)**

Under this alternative, the artificial propagation programs would not be operated as described.

###### **4.1.1 Effects On the Physical Environment**

The No Action alternative would not substantially change the magnitude or type of effects on the physical environment. The cessation of the proposed ESA-listed steelhead artificial propagation programs would not necessarily decrease impacts on the physical environment because the activities of artificially propagating unlisted salmon would continue and potentially be increased. The cessation of the steelhead program could result in loss of beneficial nutrient flow into the upper tributaries and spawning grounds. Specific considerations of effects on water quality, water quantity, and riparian habitat are described below.

#### *4.1.1.1 Water Quantity*

Production capacity at hatchery facilities would most likely be used to rear non-listed salmon species or listed spring chinook salmon. If this occurred, surface water withdrawals are likely to not change from the existing level. Water diversions at trapping facilities are minimal and trapping periods for other propagated species overlap (i.e., summer chinook and coho) much of the steelhead trapping period. Therefore it is unlikely a substantial change, either positive or negative would occur.

#### *4.1.1.2 Water Quality*

As described above, the total artificial production capacity of the hatchery facilities would likely not change. An increase in production of unlisted salmon would likely occur to fill the vacancy created by the cessation of the steelhead programs. Therefore, the impacts under this alternative would not be expected to result in any change from current baseline conditions.

#### *4.1.1.3 Riparian Habitat*

Small localized impacts at trapping sites might be reduced from the current level because steelhead broodstock collections would be discontinued at the remote locations, but because trapping periods of other propagated species overlap much of the steelhead trapping period, the reduced impacts would likely be negligible. The discontinuation of steelhead smolt releases from tank trucks could result in minor reductions of impacts at the release sites. The reduction in steelhead returns may result in negative impacts to the environment by decreasing the amount of marine derived nutrients that would have been released into the watershed from artificially propagated carcasses.

### 4.1.2 Effects On the Biological Environment

The biological environment considered in this EA includes ESA-listed anadromous fish species, other ESA-listed fish species, non-listed fish species, and wildlife.

#### *4.1.2.1 Anadromous Fish Listed Under the ESA*

Under the No Action alternative, annual takes of endangered Upper Columbia River steelhead associated with artificial propagation programs would not be authorized. To meet production goals in the Wenatchee, Methow, and Okanogan Rivers artificial propagation programs, under the proposed alternative, about 650 adult ESA-listed steelhead are needed for broodstock. If the program is discontinued, the 650 steelhead that would have been collected would be allowed to spawn naturally during the initial few years without hatchery production.

NMFS has concluded that the Upper Columbia River steelhead species is at risk of extinction (62 FR 43937). The risk of extinction and the hazard of the loss of genetic diversity is increased by the extremely low numbers of natural-origin parents in each generation. In years of low survival of natural-origin steelhead, the artificially propagated steelhead would be allowed to spawn naturally and assist in fully seeding the habitat, providing a benefit to the ESU. The benefits of artificially propagated steelhead spawning in the ESU when the natural population is at very low levels include preservation of genetic diversity, and persistence of the species. The long term implications of the cessation of the program would likely include the continued decline of the

species, particularly in the Methow and Okanogan Basins where the current populations are likely heavily represented by artificially propagated steelhead.

Under the No Action alternative, ESA-listed Upper Columbia River spring chinook would not benefit from the restored productivity and increased forage supply that could be provided by a restored steelhead population. Any reduced risk from lack of trapping activities would be negligible since steelhead and spring chinook salmon adult migrations occur during different times of the year. However, impacts may be similar or increased if another non-listed species was produced to replace the production capacity lost under this alternative.

#### *4.1.2.2 Other ESA-listed Fish Species*

The discontinuation of the listed steelhead artificial propagation would not likely reduce effects on bull trout. Steelhead trapping generally occurs at locations and times when bull trout are rarely present. Release of effluent and water withdrawal impacts would likely not change from the baseline condition if other species are reared at the hatchery to replace the discontinued steelhead program.

#### *4.1.2.3 Non-ESA-listed Fish Species*

The discontinuation of the ESA-listed steelhead artificial propagation program would not be expected to have any impacts on non-ESA-listed fish species because the hatchery facilities would likely increase production of non-ESA-listed species, and the overall impact of hatchery program operation would likely remain consistent with the baseline conditions.

#### *4.1.2.4 Terrestrial Organisms*

Without the annual input of artificially propagated steelhead adults and their carcasses in the river environment, terrestrial organisms that feed on live-caught or spawned-out carcasses may be adversely impacted such as bears, river otters, and other terrestrial scavengers. The extent of adverse impacts would be localized in the tributaries, and considering the entire scope of the action area, would likely be minor.

### 4.1.3 Effects On The Socioeconomic Environment

The No Action alternative would likely result in a decrease in the Upper Columbia River steelhead ESU population size. The risk of extinction or loss of important genetic material would continue or would increase. No fish would be available for treaty tribal ceremonial and subsistence use or for recreational fishing opportunities. Loss of these fishery opportunities would not fulfill tribal trust responsibilities and would potentially negatively impact the local economy because of lost income from local steelhead fisheries in the Upper Columbia River basin. Should the Upper Columbia River steelhead become extinct, the existence value of the species would also be lost. If Upper Columbia River steelhead continue to decline, it would be expected that more restrictions could occur in other areas that affect the species. These additional restrictions could impact water withdrawals for domestic and agricultural uses, grazing, mining, timber harvest, and development within the watersheds.



#### 4.1.4 Environmental Justice

Executive Order 12898 (59 FR 7629) directs federal agencies to identify and address, as appropriate, any disproportionately high and adverse human health or environmental effects on minority populations and low-income populations. The No Action alternative would not be expected affect human health of any population located in the action area.

Under the No Action alternative recreational harvest opportunities for all population segments could be reduced. Tribal harvest and subsistence fishing opportunities, and potential fishing opportunities for low-income persons could be reduced as well, but would not be disproportionately affected under the No Action alternative.

### **4.2 Alternative 2 - Issue Permits Without Conditions**

#### 4.2.1 All Resources

The purpose of permit conditions is to prescribe requirements and/or restrictions that are expressly designed to minimize impacts to ESA-listed fish. Issuing permits and/or permit modifications without conditions would result in many of the same environmental impacts described under the No Action alternative because, as previously described, the proposed ESA-listed steelhead artificial propagation programs would likely be replaced by non-ESA-listed propagation programs. The impacts would likely also be similar to the impacts under the proposed alternative described below in Section 4.3 (Alternative 3 - Issue Permits With Conditions) because many of the techniques that result in permit conditions are provided as proposed strategies in permit applications. However, not imposing conditions in permits could potentially result in unexpected environmental impacts if impact minimization strategies are substantially altered or are not implemented by the permit holders. Establishing conditions in permits ensures that measures would be implemented by the permit holders to minimize adverse impacts to ESA-listed fish and that the actions of the agencies and tribes would not appreciably reduce the survival and recovery of ESA-listed species. In addition, NMFS' conditions may serve to further limit activities in such a way as to enhance the proposed conservation efforts. The effects of this alternative on the human environment would nominally be the same as under the proposed action, but the certainty of these actions would be unpredictable.

### **4.3 Alternative 3 - Issue Permits With Conditions (Proposed)**

Under this alternative the proposed artificial propagation programs of ESA-listed Upper Columbia River steelhead would be operated as previously described in Section 2.3 (Alternative 3 - Issue Permits with Conditions) and subject to terms and conditions as required under section 10 of the ESA. The possible impacts to the physical, biological, and socioeconomic environments are described in this section. Please see the *Anadromous Fish Agreements and Habitat Conservation Plans Final Environmental Impact Statement for the Wells, Rocky Reach, and Rock Island Hydroelectric Projects* (NOAA Fisheries 2002) for an in depth discussion of the ramifications of implementing the three HCP agreements.

### 4.3.1 Effects on the Physical Environment

The effects on the physical environment resulting from implementation of the proposed artificial propagation program could include impacts on water quantity, water quality, and riparian habitat. However, any impact would likely be minimal, occur in a small areas within the entire action area, and would not be substantial. Specific considerations of potential impacts on the physical environment by the proposed action are described below.

#### 4.3.1.1 *Water Quantity*

To limit impacts on water quantity, the permit holders would comply with water right permits established for each hatchery to prevent over-appropriation of surface water. The hatchery facilities considered in this EA utilize a small portion of the total water allocation in each affected river (3 percent of the total water allocation in the Wenatchee River, and about 3 percent of the total average flow in the Methow River); furthermore, the steelhead programs use only a portion of the total water allocation for each facility. No change of the amount of available water would be expected. Water would be returned to the river of origin near the withdrawal point. All impacts would be similar to those described under the No Action alternative.

#### 4.3.1.2 *Water Quality*

While water quality may be effected by effluent from the artificial propagation activities, all the hatchery facilities would be required to operate under National Pollutant Discharge Elimination System (NPDES) permits issued by the Washington Department of Ecology. Hatchery effluent standards and point source discharge criteria are set forth in the permit to protect aquatic life and the habitat in the area below the discharge points. To monitor water quality and the impacts of hatchery effluent, the facility operators monitor total suspended solids, settleable solids, upstream and downstream temperatures, and upstream and downstream dissolved oxygen. Considering that the effluent produced from the hatchery facilities complies with Environmental Protection Agency standards, coupled with the low percentage of effluent to discharge (dilution factor), there is a low possibility that effluent produced at these facilities would negatively impact the physical environment regardless of species of fish is being reared. Under the proposed alternative in which ESA-listed steelhead are propagated, the impact would not be expected to be different than the impacts described under the No Action alternative.

#### 4.3.1.3 *Riparian Habitat*

Small localized impacts at trapping sites might be incurred because steelhead broodstock would be collected at the remote locations, but because trapping periods of other propagated species (i.e., summer chinook and coho) overlap much of the steelhead trapping period, the additional impacts would likely be negligible. The release of steelhead smolts from tank trucks could result in minor, short-term impacts at the release sites. Some additional marine derived nutrients may result from the hatchery carcasses, however, in the near-term the nutrient input would be negligible.

Possible impacts on riparian habitat and associated vegetation would occur primarily through activities directly related to the facilities used for trapping and rearing ESA-listed fish and the maintenance and repair of existing facilities. Existing hatchery facilities and traps would be

utilized to carry out the proposed activities. Therefore, effects are not likely to differ substantially from those under the No Action alternative.

#### 4.3.2 Effects On the Biological Environment

The biological resources that may be affected include both ESA-listed and unlisted anadromous fish species, freshwater fish species, and terrestrial organisms. Impacts on these resources are described in the following section.

##### 4.3.2.1 Anadromous Fish Listed Under the ESA

The expected impacts on anadromous ESA-listed fish species in the Upper Columbia River Basin from the proposed artificial propagation program would mainly be limited to steelhead in the Wenatchee, Methow, and Okanogan River drainages. The other anadromous ESA-listed fish species expected to occur in the action area is Upper Columbia River spring chinook salmon.

Upper Columbia River Steelhead: Compared to the No Action alternative, the Proposed Action alternative has the potential to contribute to the long term persistence of ESA-listed Upper Columbia River steelhead. The steelhead artificial propagation programs may be responsible in large part for sustaining the natural production component in the Methow and Okanogan Basins within the ESU (62 FR 43937). Continuation of these programs is likely to continue to contribute to the persistence of the steelhead stock. In carrying out the programs up to 650 adults steelhead would be removed from the run annually compared to the No Action alternative. However, the long-term impacts to the ESA-listed stock would be expected to be an increase in the ESA-listed population. Under this alternative special conditions to ensure the programs are operated to the benefit of the ESA-listed species would occur. Annual limits would be placed on the number of listed steelhead allowed to be collected based on the run composition. Run attributes that would be considered include age at return, sex ratio, and natural-to-hatchery origin ratio. Annual broodstock collection protocols would be developed and approved by NMFS prior to steelhead retention to ensure that the activities do not pose a substantial risk to the recovery of the ESU. While the proposed artificial propagation program has the potential to cause deleterious direct and indirect effects on the ESA-listed species, such as maladaptive genetic, physiological, or behavioral changes in donor or target populations (Hard *et al.* 1992), the program would likely be necessary to prevent the extinction of the ESU until habitat conditions that limit the productivity of naturally-produced steelhead in the region can be improved. Therefore, the program includes elements designed to minimize adverse impacts.

Measures designed to minimize impacts on the ESA-listed species include the use of more than one artificial propagation strategy, annual consideration of run size and composition, measures to purposely manage returning artificially propagated adult steelhead, and long-term monitoring and evaluation of the efficacy of the programs and a means to modify the programs through the HCP Hatchery Committees. When implemented, these measures would help to minimize the risk of genetic and/or ecological hazards to the ESA-listed species.

The proposed programs would collect no more than 650 mixed origin (natural and artificially propagated) adult steelhead annual. In some years, the total broodstock collection goal is likely

to be less, because run composition as determined at Priest Rapids Dam would be considered, and in years of high survival of steelhead that spent two years in the ocean the collection number would be adjusted downward in consideration of the high fecundity of the older fish. The proportion of natural origin steelhead for broodstock would be determined annually, again taking into account the total run composition as determined at Priest Rapids Dam.

Spring chinook: Listed spring chinook return to the Upper Columbia River from April through early July, while steelhead typically return in July through November. The temporal separation reduces the potential for negative impacts to occur. Program operation, such as trapping directed at steelhead would not take place when most of the spring chinook run is present. Native steelhead co-evolved with native spring chinook salmon and would be expected to suffer no negative impacts from the restoration of the steelhead population. ESA-listed steelhead and the ESA-listed salmon population would both be expected to benefit from the recycled marine nutrients added to the ecosystem by natural spawning hatchery fish. The impacts of the Proposed Action alternative would likely be less than the No Action alternative because the No Action alternative could result in an increase of artificial production of other species that could potential interact more directly with ESA-listed spring chinook salmon.

#### *4.3.2.2 Other ESA-listed Fish Species*

Bull trout may be present in the waters where the proposed hatchery activities would take place. However, the impacts on threatened bull trout are expected to be negligible and similar to impacts under the No Action alternative. Bull trout are rarely seen in the broodstock collection traps used for steelhead. The WDFW has established specific procedures for handling bull trout when they are encountered, with bull trout being enumerated and released unharmed back into the river. No mortalities are expected under the Proposed Action alternative. Bull trout co-evolved with steelhead, and restoring the fully functional ecosystem would not be expected to have a negative impact. Bull trout are piscivorous and may utilize the additional steelhead eggs, fry, and parr as a forage resource. Bull trout would also be expected to benefit from the recycled marine nutrients added to the ecosystem by natural spawning artificially propagated steelhead.

#### *4.3.2.3 Non-listed Fish Species*

Non-listed fish species may be encountered during the operation of the collection traps, and affected by the hatchery effluent and the withdrawal of water. Impacts would be expected to be very small, only slightly greater than under the No Action alternative. Non-listed species that would be encountered during hatchery operations would be released unharmed, and no mortalities would be expected. Non-listed fish species may be affected by hatchery effluent but these effects are limited to the point of release and so would be transitory. Resident fish species would be expected to benefit from the nutrient enrichment and the ecosystem restoration impacts that would occur concurrently with the recovery of the steelhead populations.

#### *4.3.2.4 Terrestrial Organisms*

Similar to the No Action alternative, the scale of the proposed artificial propagation program would be relatively small given the geographic region and because it makes use of existing hatchery facilities for the hatching and rearing stages, additional impacts on terrestrial organisms, ESA-listed or unlisted, are not anticipated to be substantial or long-lasting. Additional carcasses

from artificially propagated but naturally spawning steelhead would be added to the environment but, at the level considered here, they would not likely be an important source of nutrients or food for terrestrial organisms.

#### 4.3.3 Effects On The Socioeconomic Environment

The principal impact of the proposed Upper Columbia River steelhead artificial propagation programs would be to restore the opportunity for non-consumptive observation of spawning steelhead and the existence value of the species. Real and sustained increases in salmonid numbers are uncertain, but are not likely to be great over the near-term. The artificial propagation program would be expected to continue into the future as mitigation for the operation of the hydropower projects whose impacts cannot be entirely minimized through design and operational changes.

In years of substantial natural-origin steelhead adult return, the availability of artificially propagated steelhead for ceremonial and subsistence uses by the treaty Indian tribes would increase. In years of low returns of natural-origin steelhead, the artificially propagated steelhead would be allowed to spawn naturally to fully seed the habitat and contribute to the recovery of the listed ESU. In years of high returns of naturally produced steelhead, the artificially propagated steelhead may contribute to tribal and recreational fisheries.

Recreational fishing provides income and employment opportunities in remote, rural communities located in the Columbia River Basin. In 2001, a very high return year in which a limited steelhead harvest on artificially propagated adipose fin-clipped fish was opened, an estimated 2,855 angler trips occurred (memo from H. Bartlett, WDFW, December 9, 2002). It has been estimated that the average angler spends about \$34 per trip for salmon and steelhead. This resulted in an estimated benefit of \$97,000 to the local economy during the 2001 steelhead fishery. Future local economic benefits could be expected to be similar, but would be widely variable, based on run sizes, and would be considered a positive impact compared to the No Action alternative.

#### 4.3.4 Environmental Justice

Executive Order 12898 (59 FR 7629) directs federal agencies to identify and address, as appropriate, any disproportionately high and adverse human health or environmental effects on minority populations and low-income populations. As under the No Action alternative, the Proposed Action alternative would not be expected to affect human health of any population located in the action area.

Under the Proposed Action alternative increased fishing opportunities may result compared to the No Action alternative for all population segments. Tribal harvest and subsistence fishing opportunities, and potential fishing opportunities for low-income persons could increase, but would not be disproportionately affected.

#### **4.4 Cumulative Effects**

Cumulative impacts from NMFS' proposed issuance of the section 10(a)(1)(A) permits, including terms and conditions as described, would be minor if at all measurable. Incremental impacts on the environment are included in the discussion above. NMFS' permitting of the described activities would be only one element of a large suite of regulations and environmental factors that may influence the overall management of artificial propagation actions in the affected environment, and that may impact the health of listed salmon populations and their habitat. For example water quality is monitored and managed through permits from the Washington Department of Ecology. Those programs that meet the requirements of section 10 and its implementing regulations would include monitoring and adaptive management measures so that basin co-managers can respond to changes in the status of affected listed salmon and steelhead. Monitoring and adaptive management would help ensure that the affected ESUs are adequately protected and help counter-balance any negative cumulative impacts.

Other federal, state, and tribal actions are expected to occur within the action area that would increase natural fish populations in the upper Columbia River Basin. Federal actions for salmon recovery in the Columbia Basin currently underway include initiatives by the Northwest Power Planning Council, the Federal Caucus basinwide recovery strategy, and others (NOAA Fisheries 2002). State initiatives include recently passed legislative measures to facilitate the recovery of listed species and their habitats, as well as the overall health of watersheds and ecosystems. Regional programs are being developed that designated priority watersheds and facilitate the development of watershed management plans. Tribes have developed a joint restoration plan for anadromous fish in the Columbia River basin, known as the *Wy-Kan-Ush-Mi Wa-Kish-Wit* or *Spirit of the Salmon* plan. Please see the *Anadromous Fish Agreements and Habitat Conservation Plans Final Environmental Impact Statement for the Wells, Rocky Reach, and Rock Island Hydroelectric Projects* (NOAA Fisheries 2002) for further discussion of anticipated actions in the Columbia River Basin. The cumulative impacts of implementing recovery programs in the upper Columbia River Basin in addition to the three permits reviewed in the EA are expected to increase the production and survival of natural fish in the four tributary basins associated with the proposed programs.

#### **5 AGENCIES CONSULTED**

The following agencies and entities were consulted during the development of this environmental assessment.

NOAA's National Marine Fisheries Service  
U.S. Fish and Wildlife Service  
Washington Department of Fish and Wildlife  
Colville Confederated Tribes  
Public Utility District No. 1 of Douglas County  
Public Utility District No. 1 of Chelan County

## **6 REFERENCES**

### **6.1 Federal Register Notices**

58 FR 17573. April 5, 1993. Endangered and threatened species: Interim policy on artificial propagation of pacific salmon under the Endangered Species Act. Federal Register 58(63): 17573-17576.

59 FR 7629. February 16, 1994. Title 3- Executive Order 12898 of February 11, 1994 To Address Environmental Justice in Minority Populations and Low-Income Populations. Federal Register 59(32):7629.

62 FR 43937. August 18, 1997. Final Rule, Endangered and threatened species: Listing of several evolutionary significant units (ESUs) of west coast steelhead. Federal Register 62(159): 43937-43954.

63 FR 31647. June 10, 1998. Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the Klamath River and Columbia River Distinct Population Segments of Bull Trout. Federal Register 63(111): 31647-31674.

64 FR 14308. March 24, 1999. Final Rule, Endangered and Threatened Species: Threatened status for three chinook salmon evolutionarily significant units (ESUs) in Washington and Oregon, and endangered status for one chinook salmon ESU in Washington. Federal Register 64(56): 14308-14328.

### **6.2 Literature Cited**

CCT (Confederated Tribes of the Colville Reservation). 2002. Okanogan Basin Summer Steelhead Integrated Recovery Program Hatchery and Genetic Management Plan. Nespalem, Washington.

CPUD (Public Utility District No. 1 of Chelan County). 2002a. Habitat Conservation Plan for the Operation of Rocky Reach Dam. Wenatchee, Washington.

CPUD. 2002b. Habitat Conservation Plan for the Operation of Rock Island Dam. Wenatchee, Washington.

DPUD (Public Utility District No. 2 of Douglas County). 2002. Habitat Conservation Plan for the Operation of Wells Dam. East Wenatchee, Washington.

Fish, F.F., and M.G. Hanavan. 1948. A report on the Grand Coulee Fish Maintenance Project 1939-1947. U.S. Fish Wildlife Service Special Scientific Report No. 55.

- Hard, J.J., R.P. Jones, Jr., M.R. Delarm, and R.S. Waples. 1992. Pacific salmon and artificial propagation under the Endangered Species Act. NOAA Tech. Memo. NMFS F/NWC-2, 56p.
- Joint Columbia River Management Staff. 2001. Joint staff report concerning the 2001 in-river commercial harvest of Columbia River fall chinook salmon, summer steelhead, coho salmon, and sturgeon. Oregon Department of fish and wildlife, Salem, Oregon, and Washington Department of Fish and Wildlife, Olympia, Washington.
- Mullan, J.W., K.R. Williams, G. Rhodus, T.W. Hillman, and J.D. McIntyre. 1992. Production and habitat of salmonids in mid-Columbia River tributary streams. Monograph I, U.S. Fish and Wildlife Service. 489p.
- Myers, J.M., and 10 co-authors. 1998. Status review of chinook salmon from Washington, Idaho, Oregon, and California. U.S. Dept. Commer., NOAA Tech. Memo. NMFS-NWFSC-35. 443p.
- NMFS (National Marine Fisheries Service). 1995. Biological Opinion for 1995 to 1998 hatchery operations in the Columbia River Basin. NOAA/NMFS, ETSD, Portland, Oregon.
- NMFS. 1999. Biological Opinion On Artificial Propagation in the Columbia River Basin. Incidental Take of Listed Salmon and Steelhead from Federal and Non-Federal Hatchery Programs that Collect, Rear and Release Unlisted Fish Species. March 29, 1999. NMFS, Portland, Oregon.
- NOAA (National Oceanic Atmospheric Administration) Fisheries. 2002. Final Environmental Impact Statement for the Wells, Rocky Reach, and Rock Island Hydroelectric Projects. December 2002. Portland, Oregon.
- NOAA Fisheries. 2003. Draft National Oceanic Atmospheric Administration (NOAA) Fisheries Endangered Species Act (ESA) Section 7 Consultation Biological Opinion and Magnuson-Stevens Act Essential Fish Habitat Consultation. February 2003. Portland, Oregon.
- Tiller, V., and R. Chase. 1999. Economic contributions of Indian Tribes to the economy of Washington State. Tiller Research Inc., Albuquerque, New Mexico and Chase Economics, Tacoma, Washington.
- WDF (Washington Department of Fisheries), Washington Department of Wildlife (WDW), and Western Washington Treaty Indian Tribes (WWTIT). 1993. 1992 Washington State salmon and steelhead stock inventory (SASSI). Wash. Dept. Fish. Wildlife, Olympia, Washington. 212 p. and 5 regional volumes.
- WDFW (Washington Department of Fish and Wildlife). 2002. Application for a Permit to Enhance the Propagation or Survival of Endangered or threatened Species Under the



Endangered Species Act of 1973 - Upper Columbia River Steelhead. June 12, 2002. WDFW, Olympia, Washington.

WDFW. 1997. Washington salmonid stock inventory (SaSI): Bull trout and Dolly Varden. Olympia, Washington.

WDW (Washington Department of Wildlife), Confederated Tribes and Bands of the Yakima Indian Nation (YN), Confederated Tribes of the Colville Indian Reservation (CCT) and Washington Department of Fisheries (WDF). 1990a. Methow and Okanogan Rivers Subbasin Salmon and Steelhead Production Plan. September 1, 1990. Olympia, Washington.

WDW, YN, CCT, and WDF. 1990b. Wenatchee River Subbasin Salmon and Steelhead Production Plan. September 1, 1990. Olympia, Washington.

USFWS (U.S. Fish and Wildlife Service). 2002. Application for a Permit to Enhance the Propagation or Survival of Endangered or Threatened Species Under the Endangered Species Act of 1973 - the Upper Columbia River Steelhead Program at the Winthrop National Fish Hatchery. June 11, 2002. Portland, Oregon.

## 7 Finding of No Significant Impact

### Summary

NOAA's National Marine Fisheries Service (NMFS) Northwest Region (NWR) has prepared an Environmental Assessment (EA) of its proposed action to issue three permits pursuant to section 10(a)(1)(A) of the Endangered Species Act (ESA) (NOAA Fisheries 2003):

1. Permit 1395 would be issued jointly to the Washington Department of Fish and Wildlife (WDFW), Public Utility District No. 1 of Chelan County, and Public Utility District No. 1 of Douglas County,
2. Permit 1396 would be issued to the U.S. Fish and Wildlife Service (USFWS),
3. Permit 1412 would be issued to the Confederated Tribes of the Colville Reservation (Colville Tribes).

These permits would authorize direct take of listed Upper Columbia River (UCR) steelhead during operation of artificial propagation research/enhancement programs in the UCR Basin. These program are experimental and are designed to determine whether hatcheries can assist in recovering endangered steelhead UCR streams. Permit 1395 provides mechanisms, including recreational harvest, to manage surplus adult hatchery steelhead in specific areas of the basin, and transport of surplus adult hatchery steelhead collected at Ringold Springs Rearing Facility to landlocked ponds and lakes, where they could provide additional harvest opportunity. Permit 1395 would expire on December 31, 2013, and permits 1396 and 1412 would expire on December 31, 2008.

NMFS considered and analyzed the following alternatives, all of which are discussed in detail in the EA:

Alternative 1 - No Action: Do not issue the permits, which would likely require the program operators to cease, or drastically reduce the scope of, the programs.

Alternative 2 - Issue the permit based on the application without any additional specific conditions.

Alternative 3 - Proposed Action: Issue the permits based on the application with additional specific conditions to minimize adverse impacts on the ESA listed salmonids and to enhance conservation efforts.

The proposed action would allow the permit holders to implement artificial production programs that are designed to enhance natural production of ESA-listed UCR steelhead in the Wenatchee, Methow, and Okanogan River Basins in the state of Washington. The programs are fully described in the EA and in the permit application documents.

Issuance of the permits with additional special conditions would be expected to result in the following environmental, social, and economic effects:

- Small, localized, and transitory adverse effects on water quantity and water quality from water withdrawals and hatchery effluent.
- Benefits to the survival and persistence of endangered UCR steelhead.
- Benefits to the knowledge base of artificial propagation as a tool for recovery of depressed and/or threatened and endangered species.
- Potential deleterious effects from artificial propagation such as maladaptive genetic, physiological and behavioral changes, disease transmission and reduction in the number of adults spawning in the wild.
- Few, if any, effects on other ESA-listed species through trapping activities that have the potential to handle listed spring chinook, and bull trout.
- Benefits to listed fish and other resident species from recycled marine nutrients added to the ecosystem.
- Mitigation for continued impacts from the hydro-power system where impacts cannot be minimized through design and operational changes.
- Potential increase in the availability of steelhead for ceremonial and subsistence uses by treaty tribes and the opportunity for recreational fisheries.

These are fully described in the EA.

In the EA, NMFS considered the context and intensity of the factors identified in NOAA NAO 216-6 section 6.01b, as well as short and long term effects of the proposed action. Based on the analysis in the EA, NMFS finds that:

1. Public health and safety will be minimally affected by the preferred alternative. Any degradation of water quality will be restricted to the areas immediately adjacent to hatchery facility water discharges, and any adverse effects will be localized and temporary.
2. The proposed action alternative effects on the human environment are not likely to be highly controversial, based on information provided during the public comment period and the potential benefits to socioeconomic resources expected (as described in the EA).
3. This action does not establish a precedent for future actions with significant effects nor does it represent a decision in principle about a future consideration because NMFS has analyzed many comparable programs and issued many comparable permits.
4. This action is of limited context and intensity, with limited environmental effects, individually or cumulatively.
5. The effects of this action are relatively certain and do not involve unique or unknown risks because this artificial propagation program is similar to other artificial propagation programs designed for research and enhancement of natural production as a means of conservation and recovery of protected populations.

6. The proposed action will not adversely affect areas listed in or eligible for listing in the National Register of Historic Places, or cause loss or destruction of significant scientific, cultural or historic resources.

7. The proposed action will not adversely modify or destroy designated critical habitat as defined by the ESA or designated essential fish habitat (EFH) as defined by the Magnuson-Stevens Act. The artificial propagation programs that are the subject of the proposed action will affect habitat features such as water quality, water quantity, adult passage impediment, predation, competition, and exchange of disease organisms. As discussed in the EA, any adverse effects will be minimal, localized and temporary. The proposed permit conditions and operating procedures are designed to minimize the adverse effects.

9. The proposed action does not threaten a violation of federal, state, or local law requirements imposed for the protection of the environment. To comply with water quality standards, hatchery operators must obtain National Pollutant Discharge Elimination System (NPDES) permits; this requirement is included in the application.

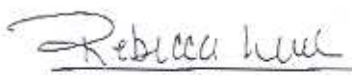
Environmental Justice: Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. The analysis of the impacts in the EA indicates that there will be no disproportionately high and adverse environmental impacts, as described in the executive order, on minority or low-income populations by the proposed action.

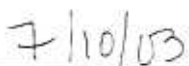
#### References:

NOAA Fisheries. 2003. Environmental assessment of a National Marine Fisheries Service action to issue three research and enhancement permits under section 10(a)(1)(A) of the Endangered Species Act for artificial propagation of ESA-listed Upper Columbia River steelhead. NOAA Fisheries, Portland, Oregon.

#### Determination

Based on the analysis in the EA, I conclude that the proposed action to issue permits 1395, 1396, and 1412 with specific conditions pursuant to section 10(a)(1)(A) of the ESA does not constitute a major Federal action significantly affecting the quality of the human environment within the meaning of section 102(2)(c) of the National Environmental Policy Act of 1969 (as amended). Therefore, an environmental impact statement is not required.

  
for William T. Hogarth, Ph.D.  
Assistant Administrator for Fisheries  
National Oceanic and Atmospheric Administration

  
Date