COVER SHEET
May 2003

Title of Environmental Review:	Environmental Assessment of a National Marine Fisheries Service Action To Issue an Incidental Take Permit Under Section 10(a)(1)(B) of the Endangered Species Act
Evolutionarily Significant Units	Upper Columbia River (UCR) spring chinook (*Oncorhynchus tshawytscha*) UCR steelhead (*O. mykiss*)
Responsible Agency and Official:	D. Robert Lohn NOAA – National Marine Fisheries Service 7600 Sand Point Way N.E. Seattle, WA 98115
Contacts:	Kristine Petersen Salmon Recovery Division NOAA – National Marine Fisheries Service 525 N.E. Oregon St., Suite 510 Portland, OR 97232-2737 (503) 230-5409
Legal Mandate:	Endangered Species Act of 1973, as amended and implemented 50 CFR Part 223
Location of Proposed Activities:	Upper Columbia River Basin in the State of Washington
Action Considered:	Issuance of Endangered Species Act (ESA) section 10(a)(1)(B) permit 1347 jointly to 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).
Environmental Assessment Conducted by:	Department of Commerce NOAA Fisheries Salmon Recovery Division Propagation, Tributary Fisheries, and Recovery Branch NOAA – National Marine Fisheries Service 525 N.E. Oregon St., Suite 510 Portland, OR 97232-2737

Table of Contents

Page

1.0 Introduction 1
1.1 Background 1
1.2 Description of the Proposed Action 2
1.3 Purpose Of and Need For the Proposed Action 2
1.4 Scope of the Action 3
1.5 Action Area 3

2.0 Alternatives Including the Proposed Action 7
2.1 Alternative One - Do Not Issue Permit (No Action) 7
2.2 Alternative Two - Issue Permit Without Conditions 7
2.3 Alternative Three - Issue Permit With Conditions (Proposed Action) 8
2.3.1 Proposed Artificial Propagation Programs 8
2.3.2 Conservation Plan 12
2.3.3 Special Conditions 15

3.0 Affected Environment 19
3.1 Physical Environment 20
3.2 Biological Environment 21
3.2.1 Fish Species Listed Under the ESA 21
3.2.2 Unlisted Fish Species 23
3.2.3 Terrestrial Organisms 23
3.2.4 Water Quality 23
3.3 Social and Economic Resources 24

4.0 Environmental Consequences 25
4.1 Alternative One (No Action) 26
4.1.1 Effects on the Physical Environment 26
4.1.2 Effects on the Biological Environment 26
4.1.3 Effects on the Social and Economic Resources 27
4.2 Alternative Two (Issue Permit Without Conditions) 27
4.3 Alternative Three (Proposed Action) 28
4.3.1 Effects on the Physical Environment 28
4.3.2 Effects on the Biological Environment 29
4.3.3 Effects on Social and Economic Resources 30
4.3.4 Cumulative Impacts 30

5.0 Agencies Consulted 31

6.0 References 31

7.0 Finding of No Significant Impact 34

1.0 INTRODUCTION

1.1 Background

NOAA Fisheries proposes to issue incidental take permit 1347 pursuant to section 10(a)(1)(B) of the Endangered Species Act (ESA). The permit would authorize take of listed chinook salmon and steelhead incidental to operation of artificial propagation programs rearing and releasing unlisted species. Under section 10(a)(1)(B), non-federal entities may apply for permits from NOAA Fisheries to incidentally take ESA-listed species under the jurisdiction of NOAA Fisheries if such taking is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Section 10(a)(2)(A) defines the requirement for a complete application. Following public comment, a permit shall be issued if the applicant provides a complete conservation plan pursuant to ESA section 10(a)(2)(B) that specifies: (1) the taking will be incidental; (2) the applicant will, to the maximum extent practicable, monitor, minimize, and mitigate the impacts of such taking; (3) the applicant will ensure that adequate funding for the conservation plan will be provided; (4) the taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild; and (5) any other measures that the Secretary may require as being necessary or appropriate will be met.

On December 15, 1999, the WDFW submitted an application in the form of a Conservation Plan (WDFW 1999a) to NOAA Fisheries for an ESA section 10(a)(1)(B) permit for the incidental take of ESA-listed anadromous fish species that may result from operation of artificial propagation programs of unlisted salmon at hatcheries in the UCR region; the application was made available for public comment for 30 days, closing on November 15, 2001. Included with the WDFW permit application were three Hatchery and Genetic Management Plans (HGMPs), which supplemented the Conservation Plan by providing in-depth descriptions of each artificial propagation program, and measures applied to minimize risks of adverse effects on natural fish populations (WDFW 1999b; 1999c; 1999d).

Negotiations were completed on three Habitat Conservation Plans (HCPs) in April 2002; two with Chelan PUD for the operation of Rock Island Dam and Rocky Reach Dam (CPUD 2002a; 2002b), and one with Douglas PUD for the operation of Wells Dam (DPUD 2002). A public comment period closed on the HCPs on July 25, 2002. The HCPs provide for implementation of the artificial propagation programs addressed in this EA, required as mitigation for hydro project operation by the Federal Energy Regulatory Commission (FERC). The HCPs specifically obligate NOAA Fisheries to issue pertinent section 10 permits to the PUDs for operation of the artificial propagation programs they implement.

The proposed permit (1347) would be a mechanism by which NOAA Fisheries can ensure that the PUDs are adequately funding the programs in a manner that minimized any adverse impacts the non ESA-listed artificial propagation programs could have on the protected stocks. It also would help ensure that the programs are operated by WDFW in an effective manner to meet specific program objectives as determined by the agencies responsible for managing the natural fish resources.

Therefore, the proposed section 10(a)(1)(B) permit would be issued jointly to the WDFW, Chelan PUD, and Douglas PUD. Table 1 lists the proposed artificial propagation programs.

Table 1. List of WDFW operated unlisted salmon artificial propagation programs considered in this EA (FH=Fish Hatchery).

Program	Primary Facilities	River
Wenatchee Sockeye	Lake Wenatchee Net Pens, Eastbank FH	Wenatchee
Wenatchee Summer Chinook	Eastbank FH, Dryden Pond	Wenatchee
Methow Summer Chinook	Eastbank FH, Carlton Pond	Methow
Okanogan Summer Chinook	Eastbank FH, Similkameen Pond	Okanogan
Wells Summer Chinook	Wells FH	Columbia River Mainstem
Turtle Rock Summer Chinook	Turtle Rock FH	Columbia River Mainstem
Priest Rapids Fall Chinook	Priest Rapids FH	Columbia River Mainstem

1.2 Description of the Proposed Action

The artificial propagation programs are described in the ESA section 10 incidental take permit application and HGMPs submitted to NOAA Fisheries by the WDFW (WDFW 1999a;1999b; 1999c; 1999d) and summarized below (section 2.3.1). The rationale for, and obligation to implement, these propagation programs is described in the three HCPs (CPUD 2002a; 2002b; DPUD 2002) and summarized here.

The hatcheries produce unlisted summer chinook, fall chinook (*O. tshawytscha*), and sockeye (*O. nerka*) salmon to mitigate for the loss of natural fish production due to hydroelectric project operation in the Columbia River. The operation of these artificial propagation programs would provide unlisted salmon adults to augment harvests in treaty reserved Columbia River tribal fisheries in the Columbia River, and non-Indian fishery harvests in the Columbia River and in Pacific Northwest marine fishing areas. The adult salmon produced by the programs are also intended to supplement naturally spawning populations in the UCR region, helping to preserve those populations commensurate with the operation of hydropower projects impacting salmon survival. The salmon produced for harvest purposes provide economic opportunity and cultural benefits to Columbia River treaty tribes, and economic benefits for local communities through the sale of fish, licences, equipment, and the conduct of other financial transactions related to recreational and commercial fisheries.

1.3 Purpose Of and Need For the Proposed Action

The purpose of and need for the issuance of the section 10(a)(1)(B) permit 1347 is to ensure that the activities covered under the permit have been thoroughly analyzed for adverse impacts to listed species, and are in compliance with the ESA, and to ensure the continuation of the programs and

their implementation. The purpose of this EA is to evaluate the potential environmental effects as a consequence of NOAA Fisheries issuing a permit jointly to the WDFW, Chelan PUD, and Douglas PUD and implementing a conservation plan for the incidental take of ESA-listed anadromous fish associated with the proposed artificial propagation programs.

1.4 Scope of the Action

The scope of the action considered here addresses artificial propagation actions proposed by the WDFW, Chelan PUD, and Douglas PUD in the upper Columbia River region for the ten year period from 2003 to 2013. These actions include collecting adult unlisted summer chinook, fall chinook, and sockeye salmon adults for broodstock through trapping in UCR tributaries or at the hatcheries, propagating resultant progeny in the hatchery environment, releasing juvenile salmon from the hatcheries or from satellite facilities into the natural environment, and conducting scientific research and monitoring activities associated with the hatchery operations. This EA does not address the entire scope of the HCPs. A separate Environmental Impact Statement has been completed (NOAA Fisheries 2002) and has undergone a public comment period which ended in May 2001 (65 FR 82976) . The activities that would occur under the proposed actions considered here are expected to incidentally affect endangered UCR spring chinook salmon and steelhead as a result of broodstock trapping, hatchery facility water withdrawal and effluent discharge practices, and release of juvenile fish. Threatened bull trout (*Salvelinus confluentus*) of the Columbia River distinct population segment may also be affected by the hatchery activities.

1.5 Action Area

The key issues identified during the development of the application and HGMPs for a section 10 permit focused on the effects of the proposed programs on listed endangered spring chinook salmon and steelhead in the UCR ESUs (Figures 1 and 2). The WDFW concluded that the benefits of allowing the programs to occur outweighed the small incidental impacts on listed species.

This EA's action area includes all habitat accessible to anadromous salmon from the vicinity of Priest Rapids Dam on the mainstem Columbia River upstream to the border with Canada, including the mainstem Columbia River, the Wenatchee, Methow, and Okanogan Rivers, and their tributaries. The locations of the WDFW hatchery facilities considered in this EA within this action area are indicated in Figure 3.

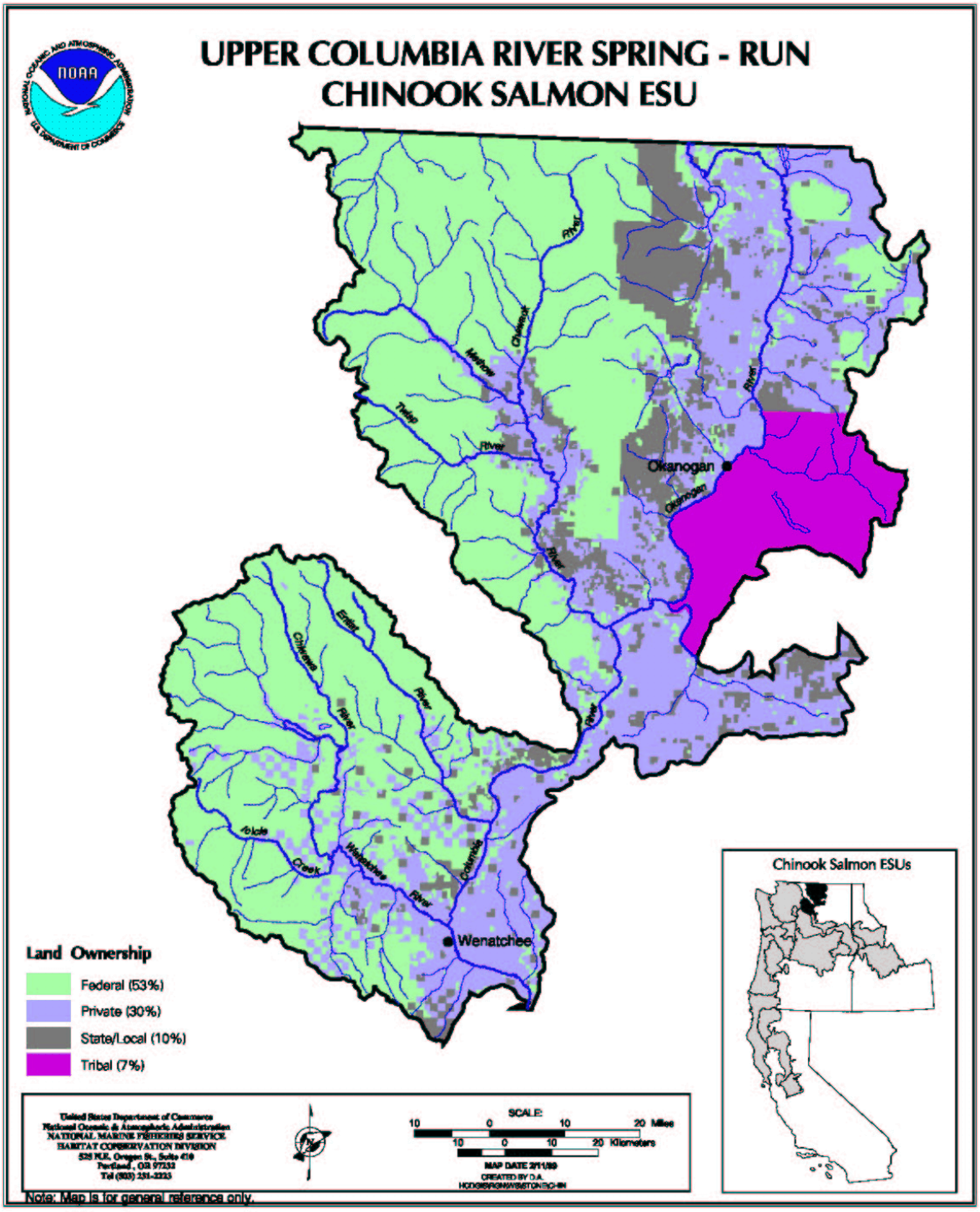

Figure 1. Upper Columbia River spring chinook ESU.

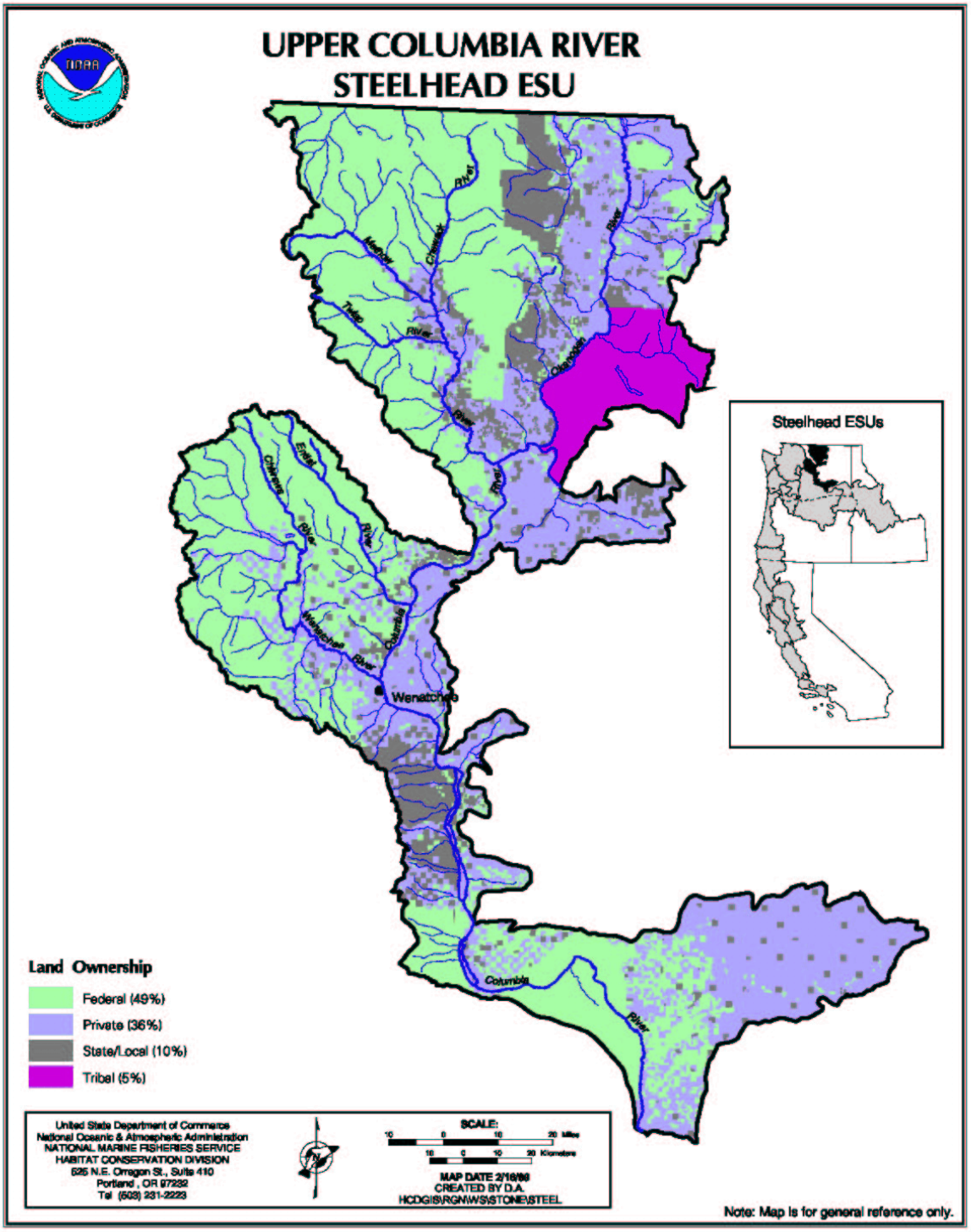

Figure 2. Upper Columbia River steelhead ESU.

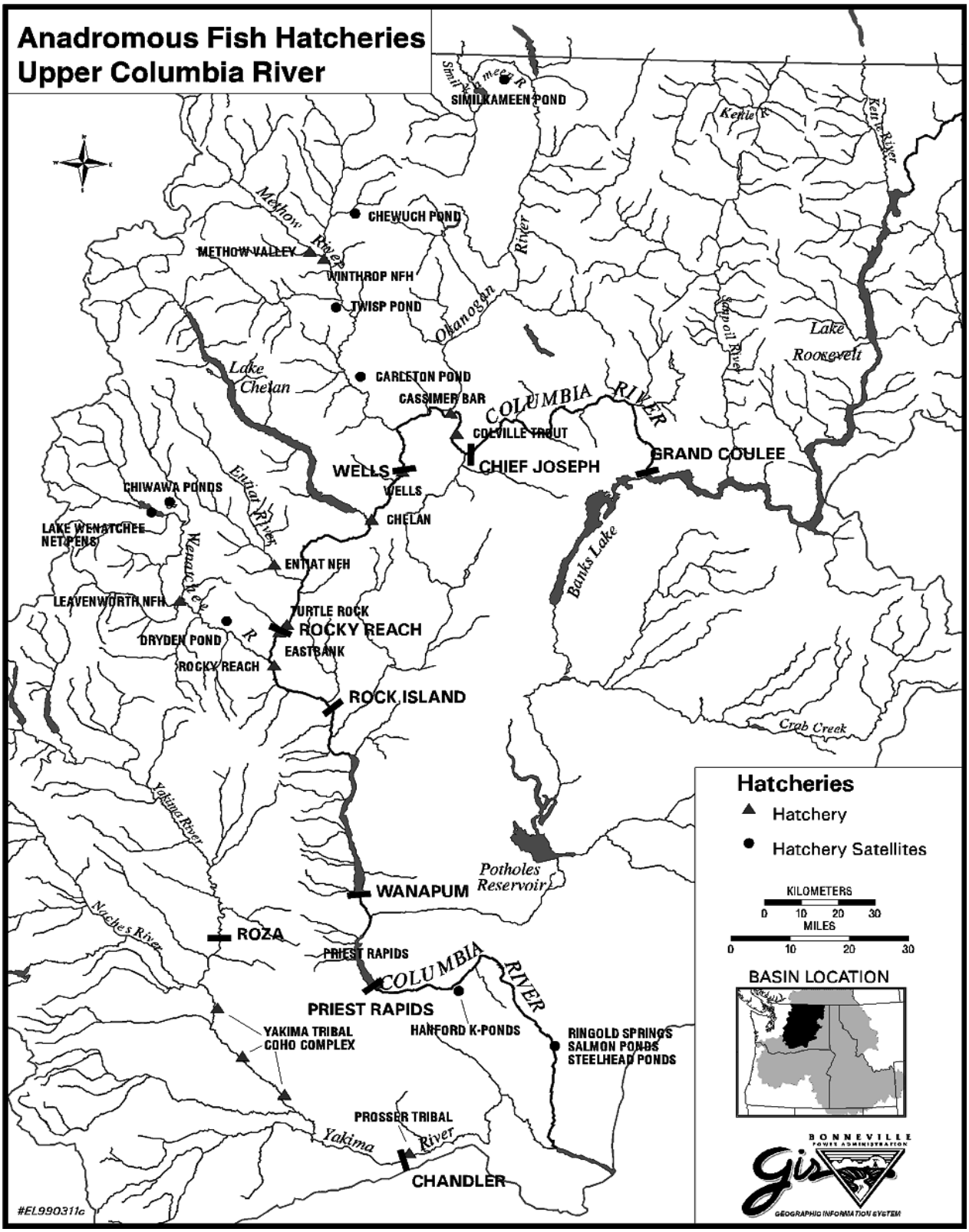

Figure 3. Anadromous salmon hatcheries in the Upper Columbia River Basin.
(Map courtesy of BPA' Geographic Information Systems, 1999.)

2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

Three alternatives were identified and considered in this EA: Alternative one (no action) is to not issue an incidental take permit for the artificial propagation activities specified in the permit application, HGMPs, and HCPs; Alternative two is to issue an incidental take permit based on the application, HGMPs, and HCPs without any additional specific conditions; and Alternative three (proposed action) is to issue an incidental take permit jointly to the WDFW, Chelan PUD, and Douglas PUD based on the application, HGMPs, and the HCPs, with additional specific conditions to minimize adverse impacts on the ESA listed salmonids and to enhance conservation efforts. The major aspects of the identified alternatives are described below.

2.1 Alternative One - Do Not Issue Permit (No Action)

Under a No Action alternative, NOAA Fisheries would not issue an ESA section 10(a)(1)(B) permit authorizing incidental takes of ESA-listed species associated with the activities proposed in the Application, HGMPs, and HCPs. The Conservation Plan, HGMPs, and HCPs, would not be implemented.

This alternative would effectively prohibit the incidental take of ESA-listed fish associated with the operation of the unlisted salmon hatchery operations. This alternative would therefore prohibit critical aspects of the artificial propagation programs, including broodstock trapping and juvenile fish releases in the proposed action area, because to do so the WDFW, Chelan PUD, and Douglas PUD would likely be in violation of the ESA. Limitations on application of the take prohibitions under section 4(d) are not available because the UCR spring chinook and UCR steelhead ESUs are listed as Endangered. The Chelan PUD and Douglas PUD would not be able to meet the HCP requirements of implementing artificial propagation programs to compensate for fish losses due to hydro project operations, and would not be able to obtain FERC licenses for operation of Rocky Reach Dam, Rock Island Dam and Wells Dam. To provide the broadest range of effects for the purpose of this analysis, NOAA Fisheries assumes that the programs would be discontinued if the permit was not issued.

2.2 Alternative Two - Issue Permit Without Conditions

Under this alternative, a permit would be issued to the applicant based strictly on the application, HGMPs, and pertinent terms of the HCPs, without additional special conditions to minimize adverse effects on listed salmon and steelhead. The Application, HGMPs, and HCPs include protocols for broodstock collection, artificial propagation, release of unlisted salmon species and mitigation requirements of hydro project operation impacts required in FERC licenses. While permit conditions that might otherwise be imposed would likely encompass and resemble the protocols described in the application, no requirement that the WDFW, Chelan PUD, and Douglas PUD follow those specific implementation and reporting tasks would be imposed under this alternative. With the exception that special conditions would not be imposed by NOAA Fisheries, the description of this alternative mirrors the description of the proposed action (section 2.3, below). The disadvantage of this alternative is that the WDFW, Chelan PUD, and Douglas PUD would not

be required to follow the specific implementation and reporting tasks that would be imposed under Alternative 3. The artificial propagation programs could be altered to increase incidental take of protected UCR spring chinook and UCR steelhead, thereby increasing the likelihood of significant impacts on the protected stocks.

2.3 Alternative Three - Issue Permit With Conditions (Proposed Action)

The proposed action alternative is to issue a permit under section 10(a)(1)(B) of the ESA based on the Application, HGMPs, and HCPs as modified by additional special conditions that NOAA Fisheries may require as being necessary and appropriate. NOAA Fisheries' special conditions would further minimize the risk of annual take of ESA-listed anadromous fish that may occur through the proposed actions. NOAA Fisheries' special conditions would also help to ensure that the annual take would not jeopardize the continued existence of ESA-listed anadromous salmon and steelhead. Issuance of the permit would meet FERC license requirements pertaining to the mitigation for operation of Rocky Reach Dam, Rock Island Dam, and Wells Dam. The permit would expire on December 31, 2013.

2.3.1 Proposed Artificial Propagation Programs

Below are descriptions of unlisted salmon artificial propagation programs proposed by the WDFW in the action area. This information is summarized from the WDFW Conservation Plan (WDFW 1999a), and from three HGMPs (WDFW 1999b; 1999c; 1999d), and HCPs (CPUD 2002a; 2002b; DPUD 2002) submitted to NOAA Fisheries and that would be addressed in the proposed permit.

Specific activities needed to implement the artificial propagation programs may be altered and modifications to program implementation may be made through the Hatchery Committees as described in the HCPs (CPUD 2002a; 2002b; DPUD 002). The Hatchery Committees consist of one representative of each signatory entity for each of the HCPs. NOAA Fisheries will be represented in the Hatchery Committee forum to ensure activities proposed by the Hatchery Committees are consistent with ESA recovery goals and do not operate to the detriment of protected species. The minor adjustments that may be made by the Hatchery Committees are not expected to alter the effects on the human environment.

Eastbank FH Programs

The Eastbank FH began operation in 1989 to mitigate for salmon smolt losses resulting from the operation of Rock Island Dam. The facility is located on the east side of the Columbia River near Rocky Reach Dam at river mile 474, seven miles north of Wenatchee, Washington. The hatchery complex would operate with five satellite facilities, located on five different waters in the action area: Dryden Pond on the Wenatchee River, Chiwawa Pond on the Chiwawa River, Lake Wenatchee Net Pens on Lake Wenatchee, Carlton Pond on the Methow River, and Similkameen Pond on the Similkameen River. The hatchery would be used for incubation and rearing of steelhead, and spring chinook, summer chinook, and sockeye salmon. There would be no on-station releases of fish at Eastbank FH.

Broodstock would be not collected at Eastbank FH. Sockeye and summer chinook salmon propagated at the hatchery originate from broodstock collected in the Wenatchee River (Dryden and Tumwater Dams) and at Wells Dam as described below for each program.

Transfers of fish reared at Eastbank FH to other locations would occur as described below, for the watershed areas where the fish would be released. Production goals for Eastbank FH would be: 864,000 summer chinook for acclimation and release into the Wenatchee River; 200,000 Wenatchee sockeye salmon for acclimation and release into Lake Wenatchee; 400,000 summer chinook for acclimation and release into the Methow River; and 576,000 summer chinook for acclimation and release into the Okanogan River Basin.

Wenatchee Sockeye Salmon Program

The program's purpose is to mitigate for the loss of sockeye salmon attributable to the construction and operation of Rock Island Dam (WDFW 1999d). The program is funded by the Chelan PUD. The Wenatchee sockeye salmon program uses indigenous Wenatchee River Basin sockeye salmon stock returning to the Little Wenatchee and White Rivers as broodstock. Broodstock collection occurs at Tumwater Dam during the annual migration of sockeye adults returning to the Lake Wenatchee Basin generally from mid-July through early August. Specific broodstock collection protocols are developed annually based on run size estimates and river environment conditions. The broodstock collection goal is approximately 260 adults or no more than 10% of the total run.

Sockeye broodstock are transported to the Lake Wenatchee Net Pens for holding through spawning. Eggs and juvenile sockeye salmon are incubated and early reared at the WDFW's Eastbank Fish Hatchery (FH), which is located on the mainstem Columbia River at river mile 474 near Rocky Reach Dam. After four to six months of rearing, the sockeye would be liberated during September, October or November from the net pens into Lake Wenatchee. The hatchery sockeye fingerlings overwinter in the lake, and emigrate to the ocean the following spring as yearling smolts. All Lake Wenatchee Net Pen origin sockeye would be identifiable from natural sockeye salmon by an adipose fin clip and coded wire tag (CWT). The annual production goal for the Wenatchee sockeye salmon program is 200,000 fish.

Wenatchee Summer Chinook Salmon Program - Dryden Pond

The purpose of this summer chinook salmon artificial propagation program in the Wenatchee River Basin is to mitigate for the loss of fish due operation of Rocky Reach and Rock Island Dams. The WDFW's Eastbank FH, located on the mainstem Columbia River, is used for spawning, incubation and early rearing. Pre-smolt summer chinook salmon produced at Eastbank FH would be transferred to acclimation sites in the Wenatchee Basin (primarily Dryden Pond) for acclimation and release.

Broodstock used in the Wenatchee summer chinook salmon artificial propagation program would be taken from native fish returning to the Wenatchee River and its tributaries. The annual broodstock collection goal for the program would be about 492 adults, but an annual broodstock collection protocol would be developed based on run size estimates, run timing, and river environment conditions. Proposed broodstock collection facilities include traps at Dryden (river

mile 16) and Tumwater Dams (river mile 32) on the Wenatchee River and trapping would occur primarily during July and August, but may extend through November in some years for late-arriving summer chinook salmon (WDFW 1999a; NMFS 2001).

Summer chinook salmon collected at the Dryden and Tumwater Dam traps would be transported to Eastbank FH for holding through spawning. The progeny of these broodstock would be reared at Eastbank FH to the pre-smolt stage. Summer chinook salmon would be transferred from Eastbank FH to acclimation sites in the Wenatchee Basin (usually Dryden Pond) for acclimation and release. The fish would be released as migration-ready yearlings at a size of 10 to 12 fish per pound (~6-6.5 inches fork length) in late April or early May. All summer chinook salmon yearlings released in the Wenatchee Basin would be marked with an adipose fin clip and CWT combination for visual identification, and for monitoring and evaluation purposes. The annual production goal would be 864,000 yearling summer chinook salmon for release in the Wenatchee River Basin.

Methow Summer Chinook Salmon Program - Carlton Pond

The purpose of this summer-run chinook salmon artificial propagation program is to mitigate for the loss of summer chinook salmon adults that would have been produced in the Methow River Basin in the absence of the Wells, Rocky Reach, and Rock Island Dams.

Summer chinook salmon presently used in the Methow (Carlton Pond) program would be the progeny of natural or hatchery-origin fish originating from the Methow and Okanogan River watersheds collected at Wells Dam. The Eastbank FH would be used for spawning, incubation and early rearing. Summer chinook salmon juveniles produced at Eastbank FH would be transferred to Carlton Pond on the Methow River for acclimation and release. Carlton Pond is located adjacent to the Methow River at river mile 36 near Twisp, Washington.

Summer chinook salmon adults used for the Carlton Pond program would be trapped by the WDFW at Wells Dam between early July and late August, and held through maturity at the Eastbank FH (WDFW 1999b). The annual broodstock collection goal would be developed annually, and is usually about 556 fish for the Carlton Pond combined with the Similkameen Pond Program (see below), with equal numbers of each sex.

Summer chinook salmon destined for release from Carlton Pond into the Methow River would be incubated and reared to fingerling size at Eastbank FH. Juvenile fish reared at Eastbank FH would be transferred as pre-smolts in early spring to Carlton Pond for continued rearing, and a spring-time release. The annual summer chinook salmon production objective in the Methow River would be 400,000 yearlings at an average size of 10 fish per pound. All summer chinook salmon yearlings would be marked with an adipose fin clip and CWT combination for visual identification and monitoring and evaluation purposes.

Okanogan Summer Chinook Salmon Program - Similkameen Pond

The purpose of the Okanogan summer chinook salmon artificial propagation program is to mitigate for the loss of summer chinook salmon adults that would have been produced in the Okanogan River Basin in the absence of Wells, Rocky Reach, and Rock Island Dams. The Eastbank FH

would be used for spawning, incubation and early rearing. Summer chinook salmon juveniles produced at Eastbank FH would be transferred to acclimation sites in the upper Okanogan River watershed (primarily Similkameen Pond) for acclimation and release. Similkameen Pond is located adjacent to the Similkameen River (a tributary to the Okanogan River) near Oroville, Washington.

Summer chinook salmon presently used in this program would originate from natural or marked hatchery-origin fish collected at the Wells Dam concurrent with broodstock for the Carlton Pond Program described above.

Fish reared at Eastbank FH would be transferred as fingerlings in the fall for overwintering at Similkameen Pond or other acclimation sites in the Okanogan Basin. The fish would be reared to yearling smolt size through the winter for release in the spring to acclimate the chinook to the release site. The annual summer chinook production objective in the Okanogan River Basin would be 576,000 yearlings at an average size of 10 fish per pound. All yearlings released through the program would be marked with an adipose fin clip and CWT combination for visual identification and monitoring and evaluation purposes.

Priest Rapids Fall Chinook Salmon Program

The goal of the Priest Rapids "upriver bright" (URB) chinook salmon program is to mitigate for the loss of fall-run chinook salmon adults that would have been produced in the region in the absence of the Priest Rapids Project (Priest Rapids and Wanapum dams) and John Day Dam. The hatchery facility is located on the mainstem Columbia River at river mile 397. The original stock used at the present Priest Rapids FH location came from late-run URB chinook salmon trapped at Priest Rapids Dam.

Fall chinook salmon would be trapped for use as broodstock from early September through November at the Priest Rapids FH trap, downstream of Priest Rapids Dam. Fall chinook salmon would be collected from the salmon that volunteer into the trap from September through November. Broodstock would be collected across the entire run to ensure that the run timing for the population is maintained. The broodstock collection goal at Priest Rapids FH would usually not exceed 6,102 adults.

The annual production goal would be 6,700,000 fall chinook sub-yearlings for release in June (WDFW 1999c). Fingerlings would be acclimated on river water for release as sub-yearling smolts on-station. Approximately 4% of the total annual release (approximately 268,000 fish) would receive an adipose fin clip and CWT combination to assess brood year fishery contribution and survival rates.

Turtle Rock Summer Chinook Salmon Program

Turtle Rock FH is operated as a mitigation facility for fishery impacts caused by the construction and operation of Rocky Reach Dam. The hatchery is located adjacent to the Columbia River two miles upstream from Rocky Reach Dam at river mile 475 on the Columbia River. The facility includes the old Rocky Reach FH, located just downstream from Rocky Reach Dam and rearing

ponds on Turtle Rock Island located in the Rocky Reach Dam pool. The facility would be used for summer chinook salmon incubation and rearing and steelhead rearing.

Summer chinook salmon broodstock would not be collected at Turtle Rock FH. Broodstock would be provided through collection of summer chinook salmon volunteers to the Wells FH trap. Summer chinook salmon adults collected at Wells FH would be primarily hatchery origin fish with a few natural origin salmon.

The Wells FH volunteer trap would operate from early July through late August. Annual broodstock collection protocols would be developed based on run size estimates and run timing, and would generally be about 1,208 adults for the Wells and Turtle Rock programs (WDFW 1999a; 1999b). The summer chinook broodstock collection effort would be curtailed in late August to minimize inclusion of fall chinook salmon into the summer chinook gene pool. Eggs taken from spawners at Wells FH would be shipped to Turtle Rock FH and for incubation and rearing.

The annual hatchery production goals would generally be 200,000 yearling summer chinook and 1,600,000 sub-yearling summer chinook salmon for release from Turtle Rock FH (WDFW 1999b). Yearlings would be released in April and sub-yearlings would be released in June. All yearling summer chinook released from Turtle Rock FH would be marked with an adipose-clip and CWT combination for visual identification and monitoring and evaluation purposes. All "accelerated" (early release timing at a larger size) sub-yearlings would be marked, but only 200,000 "normal" release timing sub-yearlings would be marked as a survival index group. Summer chinook juveniles destined for release from Turtle Rock FH would be transferred to the island ponds in November for six months of acclimation (April release of yearlings), or in April-May for three months of acclimation (June-July release of sub-yearlings).

Wells Summer Chinook Salmon Program

Wells FH is located on the mainstem Columbia River at river mile 516 just below Wells Dam. The hatchery operates as a mitigation facility for salmon fishery impacts caused by Wells Dam. Summer chinook adults collected as broodstock for the Wells summer chinook program would be trapped at the hatchery volunteer trap concurrent with broodstock for the Turtle Rock Program described above.

The annual on-station release goals would generally be 320,000 summer chinook yearlings released in April and 484,000 accelerated sub-yearlings released in June (WDFW 1999b). Summer chinook salmon yearlings and sub-yearlings produced at Wells FH would be reared entirely at the hatchery. All summer chinook salmon released into the Columbia River at Wells FH would be adipose fin clipped and CWT for visual identification and monitoring and evaluation purposes.

2.3.2 Conservation Plan

The application and HGMPs comprise a comprehensive conservation plan designed to minimize and mitigate for the incidental take of listed steelhead and spring chinook resulting from the unlisted hatchery salmon produced by WDFW in the UCR region. Below are general and specific

aspects of the conservation plan that are designed to minimize and mitigate the effects of the incidental take on listed species for each artificial propagation program. As stated in the Scoping section, all of the key issues identified were related to the listed anadromous salmon species in the region.

General Conservation Measures:
The permit applicants propose to apply the following general measures to minimize effects of the unlisted salmon artificial propagation programs on listed salmon and steelhead:

1. the production and release of smolts through fish culture and release practices, fostering rapid seaward migration with minimal rearing or delay in the rivers;
2. acclimation to release sites of all salmon that are transferred from main production hatcheries to satellite production facilities to minimize straying;
3. adipose fin clip and CWT applied to all hatchery salmon populations to allow for adequate monitoring of migration, fisheries contribution, and survival;
4. continued monitoring and research to investigate the ecological effects of fish culture practices, and to identify salmonid migration timing and behavior;
5. compliance with IHOT (1995) guidelines regarding fish health, genetics, local ecological interactions, hatchery practices, and hatchery operations to maintain healthy hatchery and wild salmonid populations;
6. compliance with all the WDFW fish transfer and disease standards to minimize the risk of disease transference to wild fish;
7. consistent achievement of hatchery effluent and best management practice standards set forth in National Pollutant Discharge Elimination System (NPDES) permits to avoid adverse affects on wild fish and their habitat; and
8. adherence to the annual Basin-wide salmon production ceiling established by NOAA Fisheries (NMFS 1995) to address ecological carrying capacity concerns in the migration corridors, the estuary, and the marine ecosystem, and to minimize over-all density-dependent effects of hatchery production on listed species.

Specific Conservation Measures:
Wenatchee Sockeye Salmon Program and Wenatchee Summer Chinook Salmon Program
The trap used to collect sockeye and summer chinook salmon broodstock at Tumwater Dam would be operated to allow free upstream passage of listed spring chinook salmon and steelhead on the days when the trap is not operated, and during nighttime on the days when trapping occurs. Trap operation to collect sockeye salmon would begin after July 15 each year to allow unobstructed passage of the main portion of the earlier-migrating spring chinook salmon populations. Any listed spring chinook encountered after that date would be passed upstream with minimal delay. Collection of listed steelhead adults is authorized for a conservation artificial propagation program under section 10 permit 1094, issued by NOAA Fisheries to the WDFW on February 4, 1998 (NMFS 1998). Concurrent species broodstock collection protocols, promulgated annually, would be designed to minimize adverse adult trapping impacts on all species normally encountered.

Methow, Okanogan, Turtle Rock, and Wells Summer Chinook Programs
These programs share trapping operations at Wells Dam and Wells FH. All steelhead encountered that would not be retained as broodstock, as authorized by the WDFW's section 10 permit 1094, would move through the Wells Dam traps with no substantial handling or delay. Run timing of spring chinook and summer chinook are quite distinct. No other chinook populations are present in the project area during the July-August summer chinook broodstock collection period. The risk of adverse genetic effects on the population would be diminished by operating the adult collection between late June and late August to exclude spring-run and fall-run chinook from collections. Protected spring chinook which may be incidentally trapped would be distinguished from the recently arriving summer chinook by external coloration and body conformation. Unless needed for authorized recovery program broodstock, listed spring chinook thus identified would be passed upstream with minimal delay.

Adverse effects on the natural summer chinook population, and on listed fish that may be encountered incidentally during trapping, would be minimized through the following measures:

1. The Wells Dam ladder traps would be continuously monitored and operation limited to three days per week during the summer chinook migration (late June through late August). The east ladder trap would be actively manned during trapping and the west ladder trap would be passively operated and checked at least daily when operating, ensuring minimal holding times for fish captured.
2. The Wells FH trap does not use a fish weir to guide fish into the hatchery fish ladder. All fish returning to Wells FH recruit to the trap as volunteers. The trapping program would therefore not be a "run of the river" operation, and captures of other species besides summer chinook salmon that were produced at the hatchery are minimal.
3. To minimize migration delays to fish other than the targeted species, the fish sorting flume in the west ladder trap would be staffed at all times while the fishway is barricaded for the purpose of guiding fish into the trap. Attraction flows from the false weir would be maintained to encourage fish to use the sorting flume.
4. The traps would be operated in a manner to reduce retention time in the holding pools above the fishways accessing the trap.
5. Fish not required for broodstock would be returned into the fishway as they move through the sorting flumes to continue their upstream migration.

Priest Rapids Fall Chinook Salmon Program
Adverse effects on listed fish that may be encountered incidentally during trapping, would be minimized through the following measures:

1. The Priest Rapids FH trap would be monitored and fish removed at least 3 days per week during the hatchery fall chinook migration (September through November).
2. The hatchery trap is located in the hatchery outlet channel ½ mile upstream from its confluence with the Columbia River. A fish weir is not used to guide fish into the hatchery outlet. All fish returning to Priest Rapids FH recruit to the trap as volunteers. The trapping program would therefore not be a "run of the river" operation, and captures of other species besides fall chinook salmon that were produced at the hatchery would be minimal.

3. Other salmonids incidentally trapped would be returned into the outlet channel to continue their migration.

2.3.3 Special Conditions

NOAA Fisheries proposes to issue a section 10(a)(1)(B) permit jointly to the WDFW, Chelan PUD, and Douglas PUD with special conditions. NOAA Fisheries' conditions are designed to minimize ESA-listed fish takes incidental to: the collection and spawning of adult unlisted sockeye, summer chinook, and fall chinook salmon; releases of unlisted salmon juveniles in the respective stream of origin to supplement the naturally spawning populations in the UCR Basin; and the conduct of associated hatchery scientific research and monitoring activities. 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 artificial propagation, including demographic, ecological, and genetic impacts on the ESA-listed species. In addition to compliance with all measures identified in the application, HGMPs, and the HCPs, the permit holders would comply with special conditions that would address the following.

1. *Wenatchee River Basin* - Wenatchee Summer Chinook and Wenatchee Sockeye Salmon Programs

   a. The annual production of Wenatchee summer chinook for release from Dryden Pond into the Wenatchee River shall be limited to 864,000 yearlings released in April or May. The annual production of sockeye salmon for release from the Lake Wenatchee Net Pens into Lake Wenatchee shall be limited to 200,000 yearlings released in September, October or November.

   b. Monitoring and reporting of the contribution of hatchery-origin summer chinook and sockeye salmon to the naturally spawning populations shall be conducted annually. This information shall be included in the annual report for the program specified below.

   c. To minimize incidental capture of listed spring chinook salmon and steelhead during summer chinook and sockeye salmon trapping at Dryden and Tumwater dams, the annual broodstock collection protocols based on run size estimates, average run timing, and river environment conditions shall be developed and submitted to NOAA Fisheries by April 15th of each collection year. Operation of broodstock traps shall be limited to the following general schedules:
      1. The Dryden Dam traps may be operated seven days per week between July and November. The traps shall be passively operated on the right and left banks, and all fish removed at least daily on days of operation.
      2. The Tumwater Dam trap shall be operated no more than three days per week between mid-July and November. The Tumwater Dam trap would be monitored and all fish removed daily. The trap shall be open to allow

unimpeded passage of salmon, including steelhead, upstream of the trap at night.

d. The retention of adult summer chinook salmon shall be limited to about 492 fish at Dryden Dam subject to minor adjustments as determined in annual broodstock collection protocols to minimize incidental take effects on listed fish. Of the total collection goal, up to 123 summer chinook salmon may be collected after August 15 at Tumwater Dam to augment summer chinook salmon retention at Dryden Dam, as necessary.

e. The retention of adult sockeye salmon shall be limited to 260 mixed-origin or not more than 10% of the total run, whichever is lower, of run-at-large fish at Tumwater Dam, to be collected after the peak of the sockeye run past Rock Island Dam.

f. The WDFW shall monitor the incidence of, and minimize capture, holding, and handling effects on, listed salmon and steelhead encountered during summer chinook and sockeye salmon trapping. The WDFW shall carefully handle and immediately release upstream listed spring chinook salmon and steelhead adults that are not intended for use as broodstock in concurrently operated and previously authorized listed stock recovery programs. The number of listed salmon and steelhead encountered during summer chinook and sockeye salmon trapping, and their general condition at release, shall be included in the annual report for the program specified in section 6 below.

g. The WDFW shall adipose fin clip and CWT all hatchery summer chinook salmon yearlings and sockeye salmon juveniles released into the Wenatchee River Basin.

2. *Methow Summer Chinook Program* - Carlton Pond

a. The annual production of summer chinook salmon into the Methow River shall be limited to 400,000 yearlings released in April or May.

b. To minimize incidental capture of listed spring chinook and steelhead during trapping at Wells Dam, the operation of the east and west ladder traps shall be limited to no more than three days per week between July and August. If both the east and west ladders are utilized, they shall be operated concurrently, operating on the same three days each week. The ladders shall be opened to fish passage at night to allow free passage of listed steelhead.

c. The retention of broodstock for the Methow and Okanogan summer chinook salmon programs at the Wells Dam shall be limited to about 556 Methow/Okanogan river-origin summer chinook salmon subject to minor adjustment as determined through annual broodstock collection protocols to minimize incidental take effects on listed fish.

d. The WDFW shall monitor the incidence of, and minimize capture, holding, and handling effects on, listed salmon and steelhead encountered during trapping. The WDFW shall carefully handle and immediately release upstream incidentally captured listed spring chinook salmon and steelhead adults that are not intended for use as broodstock in concurrently operated and previously authorized listed stock recovery programs. The number of listed salmon and steelhead encountered during trapping, and their general condition at release, shall be included in the annual report for the program specified in section 6.

e. All hatchery summer chinook salmon yearlings released into the Methow River Basin shall have adipose fin clips and CWTs.

3. *Okanogan Summer Chinook Program* - Similkameen Pond

a. The annual production of summer chinook for release into the Similkameen or Okanogan Rivers shall be limited to 576,000 yearlings released in April or May.

b. The retention of broodstock for the Similkameen Pond and Carlton Pond (Methow Basin) programs at the Wells Dam shall be limited to about 556 Methow/Okanogan River-origin summer chinook salmon subject to minor adjustment as determined in annual broodstock collection protocols to minimize incidental take effects on listed fish.

c. The WDFW shall monitor the incidence of, and minimize capture, holding, and handling effects on, listed salmon and steelhead encountered during trapping. The WDFW shall carefully handle and immediately release upstream incidentally captured listed spring chinook salmon and steelhead adults that are not intended for use as broodstock in concurrently operated and previously authorized listed stock recovery programs. The number of listed salmon and steelhead encountered during trapping, and their general condition at release, shall be included in the annual report for the program specified in section 6.

d. All hatchery summer chinook salmon yearlings released into the Okanogan River Basin shall have adipose fin clips and CWTs.

4. *Mainstem Columbia River* - Wells and Turtle Rock Summer Chinook Salmon Programs

a. The annual production of summer chinook for on-station release from Wells Hatchery shall be limited to 320,000 yearlings released in April and 484,000 sub-yearlings released in June.

b. The annual production of summer chinook for on-station release from Turtle Rock Hatchery into the mainstem Columbia River shall be limited to 200,000 yearlings released in April and 1,600,000 sub-yearlings in June.

c. Wells-lineage summer chinook salmon volunteering to the Wells Hatchery trap shall be used as broodstock to effectuate the Wells Hatchery and Turtle Rock artificial propagation programs.

d. The WDFW shall monitor the incidence of, and minimize capture, holding, and handling effects on, listed salmon and steelhead encountered during summer chinook trapping at the hatchery. The WDFW shall carefully handle and immediately release upstream incidentally captured listed spring chinook salmon and steelhead adults that are not intended for use as broodstock in concurrently operated and previously authorized Wells Hatchery listed stock recovery programs. The number of listed salmon and steelhead encountered during summer chinook trapping at the hatchery, and their general condition at release, shall be included in the annual report for the program specified in section 6.

e. All summer chinook salmon yearlings released from the hatcheries shall have adipose fin clips and CWTs to monitor program performance and to allow for monitoring and evaluation of adult salmon contribution levels to other Basin salmon production areas.

f. All sub-yearlings released from Wells Hatchery into the mainstem Columbia River shall have adipose fin clips and CWTs to allow monitoring and evaluation of the artificial propagation program.

g. At least 200,000 of the 1,600,000 sub-yearlings released from Turtle Rock Hatchery (the equivalent of a 12.5% marking rate) shall have adipose fin clips and CWTs. Monitoring and evaluation results shall be included in the annual report.

5. *Mainstem Columbia River* - Priest Rapids Fall Chinook Salmon Program

a. The annual production of fall chinook salmon for on-station release from Priest Rapids Hatchery shall be limited to 6,700,000 sub-yearlings, released in June.

b. Fall chinook salmon adults volunteering to the Priest Rapids Hatchery trap shall be utilized as the primary means for obtaining broodstock for the Priest Rapids artificial propagation program.

c. The WDFW shall monitor the incidence of, and minimize capture, holding, and handling effects on, listed salmon and steelhead encountered during fall chinook adult capture activities at the hatchery. The WDFW shall carefully handle and immediately release upstream incidentally captured listed spring chinook salmon and steelhead adults that are collected at Priest Rapids Hatchery. The number of listed

salmon and steelhead encountered during fall chinook adult capture activities at the hatchery, and their general condition at release, shall be included in the annual report for the program specified in section 6.

d. At least 4% (268,000) of the fall chinook salmon juveniles released from the hatchery each year shall have adipose fin clips and CWTs to allow monitoring and evaluation of the artificial propagation program. Monitoring and evaluation results shall be included in the annual report specified below. The proportion of the total annual fish release from Priest Rapids Hatchery that are marked shall be subject to reevaluation through the comprehensive basinwide fish marking initiative proposed through the FCRPS biological opinion.

e. The WDFW shall monitor and report Priest Rapids Hatchery fall chinook salmon contribution to natural spawning in the Hanford Reach, and straying levels to other Columbia River Basin watersheds, including mainstem river reaches upstream of Wanapum Dam. Information regarding contribution to natural spawning and straying to natural areas shall be included in the annual report specified in section 6.

6. *All Programs* - Monitoring and Reporting

a. Broodstock collection protocols shall be developed for all artificial propagation programs addressed in permit 1347 which shall include scheduled trapping dates, trapping times, and collection goals that minimize potential adverse impacts on listed species and incorporate the special conditions listed above. These protocols shall be submitted to NOAA Fisheries by April 15th each year.

b. An annual report for each artificial propagation program shall be prepared that summarizes broodstock trapping activities including capture and disposition of all ESA protected species, spawning, rearing, and release of propagated salmon. Information regarding contribution to natural spawning and straying to natural areas shall be included in the annual report. An annual report of any recreational fishery in the UCR targeting salmon from the permitted programs shall be prepared including estimates of impacts on UCR spring chinook salmon and UCR steelhead.

c. Prior to modification of or deviation from the proposed actions, the permit holders shall notify NOAA Fisheries, Hatchery and Inland Fisheries Branch.

3.0 AFFECTED ENVIRONMENT

The alternatives identified above can potentially affect the physical, biological, economic, and social environments within the proposed action areas. Below is a summary of the major components of the environment and its current baseline condition.

3.1 Physical Environment

The Columbia River is the fourth largest river in North America. Its basin, including its tributaries, covers 258,500 square miles in seven U.S. states and British Columbia. It is the dominant water system in the Pacific Northwest. The Columbia River originates in the Rocky Mountains in British Columbia, flowing over 1,200 miles to enter the ocean near Astoria, Oregon. Major tributaries of the Columbia River in the U.S. are the Kootenai, Clark Fork-Pend Oreille, Snake, and Willamette Rivers.

The Columbia River serves the Pacific Northwest in a number of ways, including navigation, irrigation and other water supply, and electrical power generation. Detailed information on the importance of the river to the region can be found in the NOAA Fisheries FCRPS biological opinion (NMFS 2000).

The Columbia River also has historically produced some of the region's most important and well-known runs of salmon and other anadromous fish. However, it is generally recognized by the scientific community that development – in particular, the construction of hydroelectric projects, including irrigation diversions and urbanization – has radically altered the Columbia River ecosystem to the detriment of Pacific salmon (NRC 1996). Upper Columbia River salmonid populations, including endangered UCR spring chinook salmon and steelhead, have been among the salmon species that have been adversely affected by development. In particular, the construction of Chief Joseph and Grand Coulee Dams prevented thousands of UCR-origin spring chinook salmon and steelhead from reaching their natal streams. Remaining anadromous salmonid populations in the UCR region must traverse at least seven mainstem dams during downstream and upstream migration; Methow River populations must migrate through nine dams. Mortalities occurring at the seven mainstem dams are considered a primary man-caused limiter to spring chinook salmon production (WDF et al. 1993). Local habitat problems related to irrigation diversions, hydroelectric development, urbanization, and livestock grazing also limit the productivity of naturally-produced spring chinook salmon and steelhead in the region (WDFW 1998; NMFS 2000; NMFS 2001). Supplementation and mitigation programs are being implemented because the natural salmonid populations are not replacing themselves. Artificial propagation programs are viewed as an appropriate strategy to mitigate the effects of development and to assist in the recovery of wild fish populations (NMFS 2000).

Artificial propagation actions could temporarily adversely affect water quality through water withdrawals or diversions (from aquifers and streams) to support hatchery facilities. In the long term, some amount of additional fish wastes may enter the streams from rearing and acclimation ponds, but this impact is regulated by existing water quality standards. Effects on water quality related to the presence of salmonid carcasses in the water, as a result of dying after spawning or dying during unsuccessful upstream migration, may occur. The historical amounts of nutrients available to the ecosystem from these carcasses was large, and contributed to the enhancement of many forms of aquatic and terrestrial life, including the organisms juvenile salmon feed upon during rearing. Decomposing carcasses of spawned salmon would have temporary and local effects on water quality as nutrients are dissolved into the stream and taken up by aquatic and terrestrial

flora and fauna. Over-all and long-term effects on water quality resulting from artificial propagation programs are expected to be negligible, and are regulated by existing water quality regulations.

3.2 Biological Environment

The proposed artificial propagation programs are located and implemented within the UCR Basin from the mainstem Columbia River just downstream of Priest Rapids Dam to the extent of anadromous salmon migration in mainstem and tributary areas downstream of Chief Joseph Dam. Biological resources outside of these areas are not likely to be affected.

3.2.1 Fish Species Listed Under the ESA

Since 1991, NOAA Fisheries has identified twelve populations of Columbia River Basin salmon and steelhead as requiring protection under the ESA. Two of the ESA-listed ESUs originate in the UCR Basin. The ESUs expected to be impacted by the artificial propagation programs covered in this EA and their current listing status are described below. Both of the ESA-listed ESUs in the region include natural-origin and artificially propagated components.

UCR Spring-Run Chinook Salmon ESU – listed "endangered" (March 24, 1999, 64 FR 14308). The UCR spring-run chinook salmon 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. WDF et al. (1993) identified nine stocks within this ESU. All stocks, with the exception of the Methow stock, were considered by 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 "composite" in production type, but of native origin, and depressed in status. When listing the UCR spring chinook salmon as endangered, NOAA Fisheries included six hatchery populations as part of the ESU: Chiwawa River, Methow River, Twisp River, Chewuch River, White River, and Nason Creek. These six hatchery populations were considered to be essential for recovery and were therefore included in the listing determination. Hatchery populations at Winthrop NFH, Entiat NFH, and Leavenworth NFH were not included as part of the ESU because they were derived from Carson NFH spring chinook salmon.

Spring chinook salmon destined for the UCR and tributaries begin entering the Columbia River in late February and early March. Their abundance downstream from Bonneville Dam peaks in April and early May. Upper Columbia River spring chinook salmon have a stream-type life history. Adults return to the Wenatchee River from late March to early May, and from late March to June in the Entiat and Methow Rivers. Most adults return after spending two years in the ocean, while 20-40 percent return after three years at sea. Peak spawning for all three populations occurs from August to September. Smolts typically spend one year in freshwater before migrating downstream. This ESU has slight genetic differences from other ESUs containing stream-type fish, but more importantly it has ecological differences in spawning and rearing habitats that were used to define the ESU boundary (Myers et al. 1998). The Grand Coulee Fish Maintenance Project (1939-1943)

was also a major influence on this ESU because fish from multiple populations were mixed into one relatively homogenous group and redistributed into streams throughout the UCR Region.

Upper Columbia River Steelhead ESU – listed "endangered" (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 considered 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 very recently, hatchery releases composed of a composite of basin stocks continued. The Wells Hatchery stock is included in the listing. Currently, efforts are underway to develop artificial propagation programs from more locally-adapted stocks, using naturally-spawning fish.

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 of Wenatchee and Entiat River populations return after 1 year in the ocean, of the Methow River primarily after 2 years of ocean life. Adults remain in fresh water up to a year before spawning. Steelhead counts at the dams above Bonneville Dam surge as mainstem water temperatures decline in the fall. Counts peak at the UCR dams in August and September. During years of above average September-October flows and lower temperatures, steelhead move readily past the dams on the Columbia River during the summer/fall counting period (July-October).

Bull Trout - Another ESA-listed fish species that could be present in the areas where the hatchery activities are proposed to occur is bull trout. The Columbia River population segment of bull trout was listed as threatened by the U.S. Fish and Wildlife Service in 1997 (June 10, 1998, 63 FR 31647). 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.

Migratory bull trout have been restricted or eliminated due to stream habitat alterations, including seasonal or permanent obstructions, detrimental changes in water quality, increased temperatures, and the alteration of natural stream flow patterns. The disruption of migratory corridors, if severe enough, would result in the loss of migratory life history types and isolate resident forms from interacting with the metapopulation. 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 UCR Basin.

3.2.2 Unlisted 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. Unlisted white sturgeon, *Acipenser transmontanus,* occur within the action area in the mainstem Columbia River. 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. No measurable positive or negative affects are anticipated on unlisted fish species.

3.2.3 Terrestrial Organisms

Impacts on terrestrial organisms such as beavers, river otters, and other piscivores and scavengers, ESA-listed or unlisted, as a result of the proposed programs are not anticipated to be substantial. The scale of the proposed artificial propagation programs is relatively small given the geographic region, and because the programs make use of existing hatchery facilities for the hatching and rearing stages, and no substantial impact to the riparian habitat is anticipated. Long-term benefits accruing to terrestrial piscivores and scavengers may be important if the projects are successful, with commensurate habitat restoration and fisheries harvest management actions outside the scope of this assessment, in restoring salmon populations to historic abundance levels. Nutrients derived from carcasses of naturally spawning, or out-planted, hatchery-origin salmon would be added to regional watersheds. These carcasses and their nutrients would be utilized naturally, benefitting terrestrial organisms within the watersheds where the artificial propagation programs are located. However, such effects are not expected to be of substantial benefit for some years to come.

3.2.4 Water Quality

Hatchery-related impacts on water quality may potentially occur through activities directly related to holding and spawning of adult salmon, egg incubation, rearing of juvenile salmon, and release of salmon smolts. Section 303(d) of the Federal Clean Water Act administered by the Environmental Protection Agency (EPA) requires states to monitor water quality and prepare a list of waterbodies that fall outside the surface water quality standards set by the EPA. In the UCR basin, the Columbia, Wenatchee, Methow, and Okanogan Rivers, along with various tributaries of those rivers, are on the 1998 303(d) list because water temperatures were above the standard set on at least more than one sampling occasion. The water temperature standard was calculated based on biological tolerances of salmon (*http://www.ecy.wa.gov/programs/wq/swqs/index.html*, as of November 12, 2002). Additionally, low instream flows in the Wenatchee and Methow Basins placed these rivers on the 1998 303(d) list. The Okanogan River Basin also repeatedly exceeded fecal coliform and toxic substance (arsenic and polychlorinated biphenyls) limits when tested in 1988.

3.3 Social and Economic Resources

Salmon are culturally, economically, and symbolically important in the Pacific Northwest. Natural and hatchery-origin salmon continue to play an important role for Native American cultural, religious, subsistence, and commercial purposes in the action area. The current depleted 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. There has been a 90% decrease in tribal harvest throughout the Pacific Northwest from about 5 million salmon in 1986 to about 500,000 in 1999 (Frank 2002). Historically, the salmon resources in the UCR basin were critical in the life of the Colville Tribes. The Colville Reservation is bordered by the Columbia River for more miles than any other Indian Reservation in the basin. However, due to endangered stocks and areas blocked by federally-owned hydroelectric projects, and the location of the Reservation at the upper end of adult salmon return migration, fishing opportunities for the members of the Confederated Tribes of Colville Reservation are at best severely limited (CCT 2002).

The poor status of the listed populations has also curtailed economic and cultural benefits for non-Indian recreational fisheries that the salmon resource formerly supported. Columbia River chinook salmon populations were at one time acknowledged to be the largest in the world. Early traders, trappers, and settlers began arriving around 1800. These early immigrants began taking salmon for their own use and consumption, often trading for fish with local Indian tribes. Early attempts at commercial taking of salmon began in 1829, with salmon harvest as a commercial industry beginning in earnest by the mid-1880s. The first cannery on the Columbia River produced its first pack of canned salmon in 1866. By 1887, the number of canneries in the basin peaked at 39. Salting, mild-curing, and other methods of salmon preparation were also taking place, and Columbia River salmon were becoming well-known internationally. The total production of canned, mild-cured, and frozen salmon and steelhead in the Columbia River Basin rose from 272,000 pounds in 1886 to annual productions between 20 and 50 million pounds from 1874 through 1936.

The gear used to fish commercially for Columbia River salmon included gill nets, purse seines, traps, dip nets, fish wheels, and a variety of other methods (Craig and Hacker 1940). The combined gear types were landing an average of nearly 24.5 million pounds of salmon and steelhead annually between 1927 and 1934. The increased use of gasoline engines on boats enhanced the development of trolling as a commercial salmon harvest method after about 1905, predominantly for chinook and coho salmon. Between 1926 and 1934, the average annual troll catch of Columbia River salmon was 894,000 pounds of chinook and 2.6 million pounds of coho salmon. 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.

In the early 1900s, increased agriculture, industry, and land development began to reduce the amount of suitable habitat for salmon spawning and rearing. In that period, the annual catch of chinook salmon fluctuated widely. As chinook salmon abundances began to decline, starting around 1911, the focus of commercial harvest operations began to shift more to other species. As

total salmonid abundances in Columbia River fisheries continued to decline, concerns for the continued health of salmonid stocks increased. Management actions began to be developed and implemented to slow the decline of salmon abundances, including the elimination of fish wheels and purse seines on the Columbia River, and reduced commercial gillnet seasons.

The current status of the salmon populations has also required land and water use restrictions, which have adversely affected uses of local resources by landowners and local industries within the action area. For example, in the Methow River basin irrigation water withdraws have been shut down to protect listed fish. In recent years, with severely reduced salmonid numbers due primarily to habitat degradation and hydropower development in the mainstem river, commercial and recreational fisheries have been considerably curtailed from earlier levels.

Numerous jobs are indirectly (e.g., commercial fishers and retailers) and directly (e.g., fish culturists and fish managers/regulators) associated with or affected by the proposed unlisted salmon artificial propagation programs and the listing of the species under the ESA. Historically, artificial propagation efforts have had a substantial impact on salmon populations in the UCR region. These efforts included hatchery-based enhancement and the extensive trapping and transportation activities associated with the Grand Coulee Fish Maintenance Project (1939-1943), which was intended to mitigate the effects of dam construction and habitat loss by aiding depressed salmon stocks. Many artificial propagation efforts now focus on enhancing naturally spawning salmonid populations to encourage stock recovery and sustainability. In addition to their role in maintaining the viability of salmonid populations, the unlisted salmon artificial propagation programs provide equitable access of all citizens to recreational, commercial, and tribal fisheries throughout the Columbia River Basin in high adult return years.

Similar to rural areas across the country, the local economy of the UCR region has experienced a downturn brought on by many factors. The reductions of fishing opportunities has added to the economic slowdown in the local economy. It was estimated that salmon and steelhead recreational fishing in 1986 had an average value of $34 per trip (USACE). The average number of angler trips to the UCR region was estimated at between 1,500 and 3,000 annually, therefore the economic impact may be about $51,000 to $102,000 annually (1986 dollars).

4.0 ENVIRONMENTAL CONSEQUENCES

This section of the assessment evaluates the potential effects of the alternatives (including the proposed action) on biological, physical, social, and economic resources. NOAA Fisheries' approval or denial of the permit for the unlisted salmon artificial propagation programs could indirectly affect a variety of natural and human resources. Because many of the conditions described in the proposed action were addressed in the Conservation Plan and the HGMPs submitted for the artificial propagation programs, environmental consequences are expected to be similar for Alternatives 2 and 3. However, the environmental consequences resulting from Alternative 1 (No Action) are expected to differ somewhat from the proposed action.

4.1 Alternative One (No Action)

If permit 1347 is not issued, then none of the proposed artificial propagation programs that take listed species would be implemented. The environmental impacts related to the No Action alternative based on this assumption are identified in the following sections.

4.1.1 Effects on the Physical Environment

Termination of the artificial propagation programs would not have much effect on the physical environment in the action area. Riparian areas that may serve as access point to traps and juvenile fish release sites would still be utilized for artificial propagation programs of ESA-listed spring chinook and steelhead (authorized under permits 1196, 1248, 1300). While hatchery effluent would not be released from some of the facilities that rear only the unlisted species, other facilities would release effluent associated with ESA-listed species propagation authorized under other permits. The Wenatchee, Methow, Okanogan, and Columbia Rivers have temperatures above the optimal conditions for salmon as indicated by their inclusion on the EPA's 1998 303(b) list and this would not change due to curtailment of these programs.

4.1.2 Effects on the Biological Environment

Effects on ESA-listed Anadromous Fish
Under the "No Action" alternative, ESA-listed anadromous fish would not be exposed to risks of injury or mortality as a result of broodstock collection, juvenile fish release, or research and monitoring and evaluation actions occurring through the unlisted salmon artificial propagation programs. The complete curtailment of the unlisted salmon artificial propagation programs in the UCR region may result in a slight increase in escapements for listed salmonid populations. The amount of increase would be equal to or slightly less than the number of adults dying, debilitated, or otherwise rendered unable to spawn as a result of handling during broodstock collection activities. The potential increase in escapements is nearly impossible to estimate and the gain from such an action would not measurably benefit the conservation of ESA-listed salmon and steelhead.

Under the "No Action" alternative, the impacts on listed bull trout would be the same as under Alternatives 2 and 3. The artificial propagation programs are implemented in areas where bull trout are either not encountered, or occur at such low numbers that effects would be negligible.

Effects on Non-listed Target Anadromous Fish Species
The propagation programs considered in the proposed permit are designed to enhance the natural populations by returning adults to the spawning grounds. If the unlisted salmon artificial propagation programs are not implemented, beneficial prey sources (juvenile hatchery fish) and nutrients (hatchery-origin salmon carcasses) made available by the programs to natural population of the target species would no longer exist, though other prey and nutrients sources are present.

Effects on Non-listed Non-Target Anadromous Fish Species
No substantial effects of the No Action alternative are anticipated to occur on fish species not

targets of the artificial propagation program or listed under the ESA. If the unlisted salmon artificial propagation programs are not implemented, beneficial prey sources (juvenile hatchery fish) and nutrients (hatchery-origin salmon carcasses) made available by the programs to non-listed fish species in the region would no longer exist, though other prey and nutrients sources are present.

Effects on Terrestrial Organisms
No substantial effects of the No Action alternative are anticipated to occur on listed or unlisted terrestrial organisms. If the unlisted salmon artificial propagation programs are not implemented, beneficial prey sources (juvenile and adult hatchery fish) and nutrients (hatchery-origin salmon carcasses) made available by the programs to terrestrial species in the region would no longer exist. This is probably a negligible source of nutrition for terrestrial organisms.

4.1.3 Effects on the Social and Economic Resources

The "No Action" alternative would result in economic losses to local fishermen and communities, and in reductions in opportunities for Native American subsistence and cultural uses of salmon, within the UCR Basin. Surplus unlisted salmon produced by the programs for harvest in Native American and non-Indian fisheries would no longer be available. Fishery closures to protect ESA-listed anadromous salmonids from harvest have already occurred to a considerable extent, affecting commercial, recreational, and tribal fishers. Eliminating unlisted salmon production in the action area would also likely lead to curtailment of the last anadromous salmon fishery opportunities in this area. It was estimated that salmon and steelhead sport fishing in 1986 had an average value of $34 per trip (USACE 1999). During the summer chinook salmon season, between 1,500 and 3,000 angler trips may occur in the UCR Basin, therefore the economic impact could be the loss of about $51,000 to $102,000 annually (1986 dollars) to the local UCR region. Annual salmon harvest activities throughout the Columbia River basin are negotiated annually to minimize adverse effects on listed fish while still

providing fishery harvest opportunity. This alternative would also reduce local public support of conservation and recovery efforts because of the loss of local fishery benefits.

4.2 Alternative Two (Issue Permit Without Conditions)

The purpose of permit conditions is to prescribe requirements and/or restrictions that are expressly designed to minimize impacts on ESA-listed fish. Issuing permits and permit modifications to agencies without conditions would result in many of the same environmental impacts described in the proposed action alternative below 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 strategies designed to minimize adverse impacts are significantly altered by the Permit Holder. Establishing conditions in permits ensures that measures would be implemented by the Permit Holder to minimize adverse impacts on ESA-listed fish and that agency actions would not appreciably reduce the survival and recovery of ESA-listed species. In addition, NOAA Fisheries' conditions may serve to further limit the proposed activities in such a way as to enhance the proposed conservation

efforts, as described in section 4.3, below.

4.3 Alternative Three (Proposed Action)

If permit 1347 is issued, then actions described in the conservation plan, HGMPs, and HCPs would be implemented with specific conservation recommendations, limits and reporting requirements.

4.3.1 Effects on the Physical Environment

The effects on the physical environment resulting from implementation of the proposed artificial propagation programs would include impacts on small areas of riparian vegetation and habitat during the operation of unlisted broodstock trapping, fish rearing, and fish acclimation and release facilities. The hatchery facilities, traps, and acclimation ponds are already in place and their operation would result in small effects on the physical environment. Possible impacts include walking through riparian areas to access traps and release juvenile fish. Such impacts would be minimal and short lived. Water quantity and quality could be minimally adversely affected. To limit impacts on water quantity, the action agencies would comply with water right permits established for each hatchery to prevent over-appropriation of surface water and/or rely on ground water withdrawal.

Water quality is minimally affected by effluent from the hatcheries, which would be monitored to ensure compliance with NPDES water quality standards. The water source for many of the hatchery facilities is pathogen-free well water. The water quality of hatchery effluent from a well water source is likely to be higher than many of the rivers the effluent is released into. Facilities that utilize surface water would apply measures such as settling ponds to remove settleable solids to ensure effluent does not exceed NPDES standards. Hatchery effluent from facilities that utilize well water would be released at a lower temperature than the ambient river temperature during summer and early fall months when the ambient river temperature exceeds EPA section 303(b) standards; therefore, if any impact is realized it would be a positive impact. Considering that the effluent produced from the hatchery facilities often originates from pathogen-, and contaminant-free well water, complies with EPA standards, and comprises a 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 and any impact is likely to be minimal.

Impacts on Habitat
Impact of these activities on the habitat of the ESA-listed species is expected to be minor or non-existent. The WDFW, or the Chelan PUD and Douglas PUD funding the operations, retain water withdrawal permits issued by Washington Department of Ecology for ground and surface water used in the hatchery operations. Compliance with permit requirements ensures that the artificial propagation programs do not over-appropriate surface water to the detriment of adjacent water courses serving as aquatic habitat. Hatchery effluents currently meet NPDES permit requirements and would continue to do so, minimizing the likelihood of adverse effects on listed salmon and steelhead in the upper Columbia tributary areas. Dilution factors in the UCR mainstem migration corridor further reduce the likelihood of any adverse effects on listed salmon and steelhead

populations in the mainstem river.

4.3.2 Effects on the Biological Environment

Effects on ESA-listed Fish
Impacts on listed UCR fish species resulting from the proposed unlisted salmon artificial propagation programs may result from incidental capture and handling of adult fish during broodstock collection operations, and incidental injury or mortality resulting from encounters with liberated juvenile hatchery fish in the natural environment. The precise level of incidental take of listed salmon and steelhead resulting from and juvenile salmon releases in the mid and upper-Columbia River regions is unknown. Quantification of mortality levels of juvenile listed salmon and steelhead is not possible, due to the inherent biological characteristics of the listed fish, the scale and variability of the Columbia Basin river systems, and the operational complexity of the subject hatchery actions. The WDFW believes that the minimization actions directed towards wild salmon and steelhead protection implemented in upper-river major hatchery operations, including release practices and smolt-only releases, will lead to insignificant levels of incidental take. Broodstock collection activities are likely to encounter few ESA-listed spring chinook SALMON BECAUSE OF MIGRATION TIMING DIFFERENCES BETWEEN THE SPECIES. STEELHEAD ENCOUNTERED DURING UNLISTED SPECIES BROODSTOCK COLLECTION ACTIVITIES ARE REGULARLY RETAINED AS BROODSTOCK FOR ESA-LISTED ARTIFICIAL PROPAGATION PROGRAMS.

Effects on Unlisted Fish Species
The proposed artificial propagation programs would be implemented to supplement natural salmon populations in the UCR region. The WDFW applies appropriate broodstock collection, mating, and juvenile fish production procedures to ensure that adult fish produced through the programs are representative of the target natural-origin populations. The programs are designed to preserve the ecological and genetic characteristics of the supplemented populations, while increasing the abundance of adult returns to the region.

Unlisted fish species in the action area would be expected to benefit from nutrient enrichment provided by hatchery fish carcasses in stream reaches used by the species. The potential to utilize the marine-based nutrients that are imported to freshwater ecosystems in the carcasses of hatchery returns may be of value for stimulating ecosystem recovery. Experiments have shown that carcasses of hatchery-produced salmon can be an important source of nutrients for juvenile salmon rearing in streams (Bilby *et al.* 1998). Juvenile fish released by the hatcheries also are likely to benefit unlisted fish species as prey.

Adverse ecological effects on unlisted fish are minimized through the release of actively smolting fish from the artificial propagation programs. The hatchery smolts migrate seaward rapidly after release, limiting the duration of interaction, and opportunity for adverse ecological effects, on co-occurring unlisted fish species. The Wenatchee sockeye salmon are released during the fall and rear through the winter months in the lake. Winter activity is expected to be low because of reduced metabolic rates associated with low water temperatures.

Effects on Terrestrial Organisms
Juvenile fish releases and adult salmon returns resulting from the programs would make additional fish (live or as carcasses) available for use by terrestrial organisms. The potential to utilize the marine-based nutrients that are imported to freshwater ecosystems in the carcasses of hatchery returns may be of value for stimulating ecosystem recovery. Hatchery carcasses may replace some of the nutrient deficit in riparian plant and terrestrial wildlife communities where naturally produced spawners are lacking (Bilby *et al.* 1998). In the context of the entire geographic area, the nutrient input that would occur is small and limited by actions outside the scope of this EA, such as habitat improvement and restoration projects.

4.3.3 Effects on Social and Economic Resources

This alternative would likely result in beneficial effects on local communities. If a permit is issued authorizing the proposed unlisted salmon artificial propagation programs, economic, cultural, and aesthetic benefits would accrue to the human population within the UCR region. The programs would help contribute to self-sustaining salmon populations, and to the availability of fish for harvest in Native American and non-Indian fisheries. The availability of salmon for ceremonial and subsistence and commercial uses by the treaty Indian tribes would increase.

Non-Indian commercial and recreational fisheries accessing adult fish production from the hatcheries provide substantial income and important employment opportunities in remote, rural communities located in the Columbia River Basin. Revenue would be generated from the sale of adult salmon, fishing licenses, fishing equipment, lodging and food. It was estimated that salmon and steelhead sport fishing in 1986 had an average value of $34 per trip (USACE 1999). During the summer chinook season between 1,500 and 3,000 angler trips may occur in the UCR Basin, therefore the economic impact may be about $51,000 to $102,000 annually (1986 dollars). By assisting in increasing abundances of adult unlisted salmon, this alternative would also maintain local public support of salmon and steelhead recovery efforts because of the local economic benefits associated with these programs. The potential benefits of the proposed activities would be accessible to all citizens and not pose a disproportionate adverse impact on minority or low-income populations.

4.3.4 Cumulative Impacts

Cumulative impacts from NOAA Fisheries' proposed issuance of a section 10(a)(1)(B) permit, including additional special conditions as described, will be minor if at all measurable. Incremental impacts on the environment are included in the discussion above. NOAA Fisheries' permitting of the described activities is 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. Those programs that meet the requirements of section 10 and its implementing regulations will include monitoring and adaptive management measures so that basin co-managers can respond to changes in the status of affected listed salmon. Monitoring and adaptive management will help ensure that

the affected ESUs are adequately protected and help counter-balance any negative cumulative impacts.

5.0 AGENCIES CONSULTED

NOAA Fisheries (National Marine Fisheries Service)
Washington Department of Fish and Wildlife

6.0 REFERENCES

Bilby, R.E., B.R. Fransen, P.A. Bisson, and J.K. Walter. 1998. Response of juvenile coho salmon (Oncorhynchus kisutch) and steelhead (Oncorhynchus mykiss) to the addition of salmon carcasses to two streams in southwestern Washington, U.S.A. Can. J. Fish. Aquat. Sci. 55:1,909-1,918.

CCT (Confederated Tribes of the Colville Reservation). 2002. Biological Assessment for the 2002 – 2012 Chief Joseph Dam Tailrace Fishery for Colville Tribal Members and the Incidental Impacts on Salmon and Steelhead Species Listed Under the Endangered Species Act. Nespelem, Washington.

CPUD (Chelan Public Utility District). 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.

Craig, J.A., and R.L. Hacker. 1940. The history and development of the fisheries of the Columbia River. U.S. Dept. of the Interior, Bureau of Fisheries. Bulletin 32.

DPUD (Douglas Public Utility District). 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 Wildl. Serv. Spec. Sci. Rep. 55.

Frank, B., Jr. 2002. A statement from Billy Frank J., Northwest Indian Fisheries Commission (NWIFC) Chairman. *http://www/nwifc.wa.gov/esa/start2.asp*

IHOT (Integrated Hatchery Operations Team). 1995. Policies and procedures for Columbia Basin anadromous salmonid hatcheries. Annual Report 1994. BPA, Portland, Oregon. Project No. 92-043, January 1995. 115p.

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 assessment for the 1994-1998 operation of hatcheries funded by the National Marine Fisheries Service under the Columbia River Fisheries Development Program. Copy available National Marine Fisheries Service, 525 N.E. Oregon St., Suite 510, Portland, Oregon 97232. 17p., plus attachments.

NMFS. 1998. Biological opinion on the issuance of two section 10 permits for takes of threatened and endangered species associated with Upper Columbia River ESU steelhead hatchery supplementation programs. National Marine Fisheries Service, Northwest Region. Seattle, Washington. 26p. February 4, 1998.

NMFS. 2000. Endangered species act - section 7 consultation biological opinion - reinitiation of consultation on operation of the Federal Columbia River Power System (FCRPS), including the juvenile fish transportation program, and 19 Bureau of Reclamation projects in the Columbia Basin. National Marine Fisheries Service, Northwest Region. Seattle, Washington. December 21, 2000.

NMFS. 2001. Biological opinion on artificial propagation in the upper Columbia River Basin: incidental take of listed salmon and steelhead from Federal and non-Federal hatchery programs that collect, rear, and release unlisted salmon species. National Marine Fisheries Service, Northwest Region. Portland, Oregon. 286p. + appendix. Draft.

NRC (National Research Council). 1996. Upstream: salmon and society in the Pacific Northwest. NRC, Report of the Committee on Protection and Management of the Pacific Northwest Anadromous Salmonids, Board on Environmental Studies and Toxicology, and Commission on Life Sciences. National Academy Press. Washington, D.C.

USACE (U.S. Army Corp of Engineers). 1999. Draft Lower Snake River Juvenile Salmon Migration Feasibility Report/Environmental Impact Statement. Walla Walla District. Walla Walla, Washington.

WDF (Washington Department of Fisheries), WDW (Washington Department of Wildlife), and WWTIT (Western Washington Treaty Indian Tribes). 1993. 1992 Washington State salmon and steelhead stock inventory (SASSI). Wash. Dept. Fish. Wildlife, Olympia, 212p. and 5 regional volumes.

WDFW (Washington Department of Fish and Wildlife). 1998. Application for a permit to enhance the propagation or survival of endangered or threatened species under the Endangered Species Act of 1973 – the UCR spring chinook salmon hatchery supplementation program. Fish Program, Washington Department of Fish and Wildlife. Olympia, Washington. December 4, 1998.

WDFW. 1999a. Section 10 incidental take permit application- application and conservation plan for a permit for scientific purposes under the Endangered Species Act of 1973. Incidental take of listed salmon and steelhead from Washington Department of Fish and Wildlife hatchery programs that collect, rear and release unlisted fish species in the upper Columbia River basin. Fish Program, Washington Department of Fish and Wildlife, Olympia, Washington. 33p. + appendices. December 15, 1999.

WDFW. 1999b. Hatchery and genetic management plan - Upper Columbia River region summer chinook salmon hatchery programs. Fish Program, Washington Department of Fish and Wildlife. Olympia, Washington.

WDFW. 1999c. Hatchery and genetic management plan - Priest Rapids Hatchery fall chinook salmon hatchery program. Fish Program, Washington Department of Fish and Wildlife. Olympia, Washington.

WDFW. 1999d. Hatchery and genetic management plan - Lake Wenatchee sockeye salmon supplementation program. Fish Program, Washington Department of Fish and Wildlife. Olympia, Washington.

7.0 FINDING OF NO SIGNIFICANT IMPACT

Summary

The National Marine Fisheries Service (NOAA Fisheries) Northwest Region (NWR) has prepared an Environmental Assessment (EA) of its proposed issuance of a permit pursuant to section 10(a)(1)(B) of the Endangered Species Act (ESA). The permit (#1347) would be issued 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) for annual take of ESA-listed Upper Columbia River (UCR) spring chinook and UCR steelhead incidental to operation of the artificial propagation programs rearing unlisted species in the Upper Columbia River. The permit would expire December 31, 2013.

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

> Alternative 1 - No Action: Do not issue the permit, which would likely require WDFW, Chelan PUD, and Douglas PUD 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 permit 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 salmonid species and provide fishery opportunity while still remaining consistent with recovery of ESA listed endangered UCR spring chinook salmon and 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 (the Conservation Plan, three Hatchery Genetic Management Plans, and three Habitat Conservation Plans).

Issuance of the permit 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.
- 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, steelhead, and bull trout.

- Benefits to listed fish and other resident species from recycled marine nutrients added to the ecosystem.
- Restoration of non-consumptive observation of spawning salmon and existence values.
- Mitigation for continued impacts from the hydro-power system where impacts cannot be minimized through design and operational changes.
- Increased availability of salmon for ceremonial and subsistence uses by treaty tribes and the opportunity for recreational fisheries.

These are fully described in the EA.

In the EA, NOAA Fisheries 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, NOAA Fisheries 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 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 low level of adverse impact on 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 NOAA Fisheries 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 to provide fish for harvest and enhance natural production while still ensuring conservation of protected populations that NOAA Fisheries has considered and authorized.

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. ESA-listed endangered UCR spring chinook salmon and steelhead will be adversely affected by the proposed action. However, based on NOAA Fisheries' evaluation, the proposed action will have only relatively small impacts on non-target species.

8. 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 by 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 and low-income populations by the proposed action.

References:

NOAA Fisheries. 2002. Environmental Assessment of NOAA Fisheries' Issuance of Permit #1347 under Section 10(a)(1)(B) of the Endangered Species Act. NOAA Fisheries, Portland, Oregon.

Determination

Based on the analysis in the EA, I conclude that the proposed action to issue permit #1347 with specific conditions to WDFW, Chelan PUD, and Douglas PUD pursuant to section 10(a)(1)(B) 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.

Rebecca Lent

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

5/30/03
Date