LOWER SNAKE RIVER
FISH AND WILDLIFE COMPENSATION PLAN
FALL CHINOOK INITIATIVES
ENVIRONMENTAL ASSESSMENT

FINAL

U.S. Army Corps of Engineers
Walla Walla District

November 1996

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FIGURES

TABLES

ACRONYMS AND ABBREVIATIONS

BPA	Bonneville Power Administration
CBFWA	Columbia Basin Fish and Wildlife Authority
CEQ	Council on Environmental Quality
Comp Plan	Lower Snake River Fish and Wildlife Compensation Plan
Corps	U.S. Army Corps of Engineers
CRITFC	Columbia River Intertribal Fish Commission
dBA	decibel on A-weighted scale
EA	environmental assessment
EIS	environmental impact statement
ESA	Endangered Species Act
FR	Federal Register
FY	fiscal year
gpm	gallons per minute
HCNRA	Hells Canyon National Recreation Area
IDFG	Idaho Department of Fish and Game
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NPDES	National Pollution Discharge Elimination System
NPPC	Northwest Power Planning Council
ODFW	Oregon Department of Fish and Wildlife
PAC	Production Advisory Committee
PL	Public Law
RASP	Regional Assessment of Supplementation Projects
RM	river mile
SHPO	State Historic Preservation Office
Tribe	Nez Perce Tribe
USFWS	U.S. Fish and Wildlife Service
USFS	U.S. Forest Service
WDFW	Washington Department of Fish and Wildlife
WRDA	Water Resources Development Act

1. PROJECT PURPOSE AND NEED

1.1 INTRODUCTION

This environmental assessment (EA) considers effects of installing and operating juvenile fall chinook salmon acclimation facilities at Big Canyon Creek on the Clearwater River near Peck, Idaho, and at one of two sites (Captain John Rapids or Grain Elevator) on the Snake River upstream from Clarkston, Washington. These facilities would be used to acclimate juvenile fall chinook salmon from the Lyons Ferry Hatchery before releasing them into the Clearwater and Snake Rivers, so these fish would return to the point of release in the rivers to spawn naturally rather than returning to the hatchery. As required by the National Environmental Policy Act (NEPA) of 1969 and subsequent implementing regulations promulgated by the Council on Environmental Quality (CEQ), this EA is prepared to determine whether the action proposed by the U.S. Army Corps of Engineers (Corps) constitutes a "...major Federal action significantly affecting the quality of the human environment..." and whether an environmental impact statement (EIS) is required.

1.2 BACKGROUND

1.2.1 Salmon Status

Columbia River chinook salmon populations, including Snake River fish, were at one time acknowledged to be the largest in the world (Van Hyning, 1968). Before the turn of the century, between 10 million and 16 million salmon annually returned to the Columbia River (Northwest Power Planning Council [NPPC], 1993). Recent records indicate that the runs now total about 2.5 million salmon and steelhead (including fish harvested in the ocean), of which only about 0.5 million are wild fish (Bonneville Power Administration [BPA] et al., 1995). The NPPC estimates that before the arrival of the Euro-Americans, the Snake River basin produced approximately 1.4 million chinook salmon (NPPC, 1986), or about 9 to 14 percent of the Columbia River total. Fall chinook in the Snake River, now listed as threatened under the Endangered Species Act (ESA), are assumed to have made up a significant portion of all chinook in the system.

The Snake River fall chinook salmon population has been in decline for several decades, as a result of loss of spawning habitat and other factors. Access to several hundred miles of

the most-used spawning area was blocked when dams were built upstream from Hells Canyon (between 1910 and 1967), and a lesser amount of spawning area was lost when dams were built on the lower Snake River (between 1961 and 1975 [BPA et al., 1995]). Wild Snake River fall chinook salmon declined from an estimated average of 72,000 fish between 1938 and 1949 to 29,000 fish in the 1950s (Waples et al., 1991), about 1,000 fish in the mid-1970s, and between 100 and 700 fish from 1985 to 1995.

As a result of the decline and listing of Snake River salmon (including spring/summer chinook and sockeye), the National Marine Fisheries Service (NMFS) has developed a Proposed Recovery Plan (NMFS, 1995a) addressing means to restore the salmon populations. Federal, state and tribal fishery agencies, water resource agencies, land managers, and other parties in the Pacific Northwest are actively involved in recovery measures affecting all phases of the salmon life cycle.

1.2.2 History of Project

Since the late 1800s, hatcheries have been important in the Pacific Northwest because they have been used to artificially propagate Pacific salmon, although hatchery operations prior to the 1940s were largely unsuccessful (Independent Scientific Group, 1996). The Lower Snake River Fish and Wildlife Compensation Plan (Comp Plan), which was adopted by the Federal government to mitigate for fish and wildlife losses attributed to the construction of the four lower Snake River dams, provided for development of a number of hatchery facilities to produce salmon and steelhead. The Lyons Ferry Hatchery, the only fall chinook facility developed under the Comp Plan, was intended to produce and release 9,160,000 juvenile fish or 101,800 pounds of fish per year, although these annual production numbers have not been reached.

More recently, regional fishery managers have been evaluating a new concept, termed supplementation, to enhance natural populations. The Regional Assessment of Supplementation Projects (RASP) developed the following definition:

> Supplementation is the use of artificial propagation in the attempt to maintain or increase natural production while maintaining the long term fitness of the target population, and keeping the ecological and genetic impacts on non-target populations within specified biological limits (NMFS, 1995b).

In 1992, the Columbia Basin Fish and Wildlife Authority (CBFWA), which consists of the federal, state and tribal fish and wildlife agencies in the Columbia Basin, established an Ad Hoc Supplementation Group and directed it to develop an implementation approach for supplementation projects. This group prepared documentation on 19 proposed supplementation projects, which it submitted to the NPPC for inclusion in the NPPC's regional Fish and Wildlife Program. Since that time, the 19 supplementation projects have been the subject of extensive deliberations among the various parties involved in managing the region's fisheries resources, but have generally not advanced beyond the planning and design stage. Key entities in these deliberations have been the Anadromous Fish Production Committee of the CBFWA and the Production Advisory Committee (PAC) of the *U.S. vs. Oregon* Settlement Agreement. (The latter agreement guides harvest of Columbia River fish stocks pursuant to litigation of Columbia River Indian treaty fishing rights. It was signed by the parties to the litigation, which include the four Columbia River treaty tribes; the United States government, represented by the Department of Justice; and the states of Oregon and Washington.) PAC has been particularly active in developing plans for supplementation projects, including those addressed in this EA.

In deliberations over the fiscal year (FY) 1995 budget, the U.S. Congress instructed the Corps to construct, under the Comp Plan, final rearing and/or acclimation facilities for fall chinook salmon in the Snake River basin above Lower Granite Dam to complement their activities and efforts in compensating for fish lost due to construction of the lower Snake River dams. The conference report (Senate Report 103-672, p.7) of the joint House-Senate Conference Committee resolving the FY 1995 energy and water appropriations bill (Public Law (PL) 103-316) indicated that $5 million in additional funding was authorized to initiate such hatchery-related construction projects. This "Congressional Add" specifically includes a water treatment facility for Lookinglass Hatchery and final rearing and acclimation facilities to support releases of Snake River fall chinook for the Clearwater, Snake, and lower Grande Ronde Rivers.

The Corps is developing regional consensus on a method of treatment for the supply water at Lookinglass Hatchery, has implemented construction of the Pittsburg Landing acclimation facility in 1996, and is undertaking the NEPA and planning and design process for the Clearwater and Snake River acclimation facilities.

1.3 NEED FOR ACTION

The Corps is responding to an apparent need for supplementation efforts in an attempt to increase natural spawning of fall chinook, thereby possibly maintaining and increasing runs of Snake River fall chinook. The Proposed Recovery Plan for Snake River salmon (NMFS, 1995a) recommends that supplementation be carefully evaluated in areas above Lower Granite Dam to determine if it can assist in recovery. The "Congressional Add" outlines several biological objectives for the Snake River fall chinook salmon relative to the proposed action; these include protecting, maintaining, or enhancing biological diversity of existing wild salmon stocks. The remaining available spawning habitat appears to be in good condition but is underutilized and can support more adults returning to spawn naturally (Corps, 1996). For fall chinook, the state and tribal fishery managers believe that supplementation is required to achieve the desired increase in returning natural spawners, but that acclimation facilities used for supplementation would be phased out once the wild stocks have been expanded. Supplementation must ensure that the gene pool of the wild stock is protected against the characteristics of production hatchery fish, which are subject to different selection pressures that can affect genetic make-up.

The conference report directs the Corps to work with NMFS, the U.S. Fish and Wildlife Service (USFWS), and affected state and tribal hatchery managers to develop projects that involve supplementation. Two alternative actions are being considered to implement juvenile fall chinook supplementation: (1) installing and operating juvenile rearing and acclimation facilities on the Clearwater River and on the Snake River and (2) directly releasing juvenile fall chinook into the rivers without first undergoing any type of acclimation process.

1.4 PROJECT PURPOSES

The wild Snake River fall chinook salmon has been listed as a threatened species by NMFS. The numbers of returning adults for the last 10 years have been near record lows. The population decline cannot be reversed without increasing the numbers of adult fish spawning naturally in the Snake River system. The progeny of naturally spawning hatchery adults would be considered by NMFS to be wild fish listed under ESA. Therefore, the two primary purposes for the proposed acclimation and release of juvenile fall chinook salmon upstream of Lower Granite Dam are: 1) to imprint hatchery-origin salmon to the river reaches where they are released, so they will return to the general vicinity as adult salmon for spawning; and 2) to minimize stress and mortality related to handling and transporting

fish during smoltification or immediately prior to release. The project will also test the use of acclimation facilities, and the supplementation concept in general, as a way to achieve increased numbers of naturally spawning adults. Supplementation may be a potentially helpful recovery measure, but it is unproven and is still considered to be experimental (NMFS, 1995b). Another purpose served by the proposed project will be to allow regional fish managers to develop field-based information on a supplementation effort for Snake River salmon. However, it will be difficult to determine the success of supplementation in producing more natural juveniles or adults, because there are multiple factors that affect population numbers and confound monitoring results.

1.5 AUTHORITY

This project is being initiated under the Lower Snake River Fish and Wildlife Compensation Plan in accordance with Conference Report 103-672, dated August 4, 1994. The Comp Plan was originally authorized by the Water Resources Development Act (WRDA) of 1976, Section 102, PL 94-587, on October 22, 1976, as amended in WRDA 1986. The conference report directed the Corps to work with NMFS, USFWS, and affected state and tribal fishery managers to initiate final rearing and/or juvenile acclimation facilities for the Clearwater and Snake Rivers. The report added the direction that "only projects which will protect, maintain, or enhance biological diversity of existing wild salmon stocks should be pursued." The Corps proposes to undertake the acclimation project under the authority provided by the Comp Plan and the "Congressional Add."

2. ALTERNATIVE ACTIONS

2.1 ALTERNATIVE 1—NO ACTION

The NEPA of 1969 requires that each EA include an existing conditions or "no action" alternative against which the effects of all "action" alternatives are measured. In the context of the fall chinook initiatives, under the No Action Alternative the Corps would not fund, design, and construct the proposed juvenile fall chinook final rearing and/or acclimation facilities at Big Canyon Creek on the Clearwater River and at one of two sites (Captain John Rapids or Grain Elevator) on the Snake River. With no action by the Corps, acclimation and release of juvenile fall chinook at these facilities would not occur beginning in 1997 or 1998, as planned.

There is an agreement between the *U.S. vs. Oregon* parties (the Corps is not a party to the *U.S. vs. Oregon* settlement) to release up to 450,000 juvenile fall chinook salmon above Lower Granite Dam in the spring of 1997. The parties planned to divide the 450,000 fish among three acclimation facilities. Available acclimation facilities at the recently-completed Pittsburg Landing site can accommodate from 100,000 to about 150,000 fish; therefore, the opportunity to acclimate approximately 300,000 to 350,000 fish in the near term would be lost under the No Action Alternative. Without the additional proposed acclimation facilities, the remaining fish would presumably be released from the Lyons Ferry Hatchery, although it is possible that fish would be released directly (without acclimation) at sites above Lower Granite Dam.

If the Corps were to take no action on the proposed acclimation facilities, other supplementation actions and other types of recovery measures associated with Snake River salmon would still occur under ongoing programs. Acclimation and release of between 100,000 and 150,000 juvenile fall chinook salmon at the temporary facilities at Pittsburg Landing would continue as planned in 1997 and 1998. To date the U.S. Forest Service (which administers the Pittsburg Landing site) has agreed to operation at Pittsburg Landing for 2 more years, so arrangements for an alternate acclimation site may be needed after 1998. NMFS would likely continue to coordinate with the Ad Hoc Supplementation Group on the planning, development, and implementation of 19 proposed supplementation projects, 10 of which are considered high-priority proposed actions and are within the Snake River Basin.

The No Action Alternative for this project would also likely involve continued progress under the Nez Perce Tribal Hatchery and Northeast Oregon Hatchery master plans, followed by implementation of those plans. The Nez Perce Tribal Hatchery is to be constructed at a site on the Clearwater River about 20 miles east of Lewiston, and is expected to be completed by 1998. The hatchery would produce spring, summer, and fall chinook salmon for supplementation efforts throughout the Clearwater River drainage. The Northeast Oregon Hatchery program would serve similar objectives, with emphasis on spring chinook, for the Grande Ronde River. Ongoing and planned actions related to hydro system operations, other hatchery operations, salmon harvest, and salmon habitat maintenance would likewise be expected, in accordance with applicable agency policy and current NMFS Biological Opinions for these respective activities and the Recovery Plan, independent of no action on the proposed acclimation project.

2.2 ALTERNATIVE 2—PROPOSED ACTION

The proposed action addressed in this EA is for the Corps to fund and implement development of two additional acclimation facilities to support the release of hatchery-produced juvenile fall chinook in areas upriver from Lower Granite Dam. One of the facilities would be constructed on the lower Clearwater River in Idaho and would begin operation in 1997. The other would be built along the mainstem Snake River above Lower Granite Reservoir in Washington, and would begin operation in 1998. Construction and operation of these two proposed facilities together constitutes Alternative 2, which is described in detail below. While the Corps would be responsible for construction of the facilities, their operation would be the responsibility of the U.S. Fish and Wildlife Service. Section 2.2.1 summarizes how the conceptual plan for this proposed action was developed. Section 2.2.2 describes the site and the facility development proposed for the Clearwater River. Sections 2.2.3 and 2.2.4 address the two sites under consideration for the proposed Snake River acclimation facility. The facility descriptions address all of the elements proposed by the fishery managers for inclusion in the facilities, although Corps authority limitations may prevent the Corps from funding some of the specific items identified.

2.2.1 Development of Alternatives

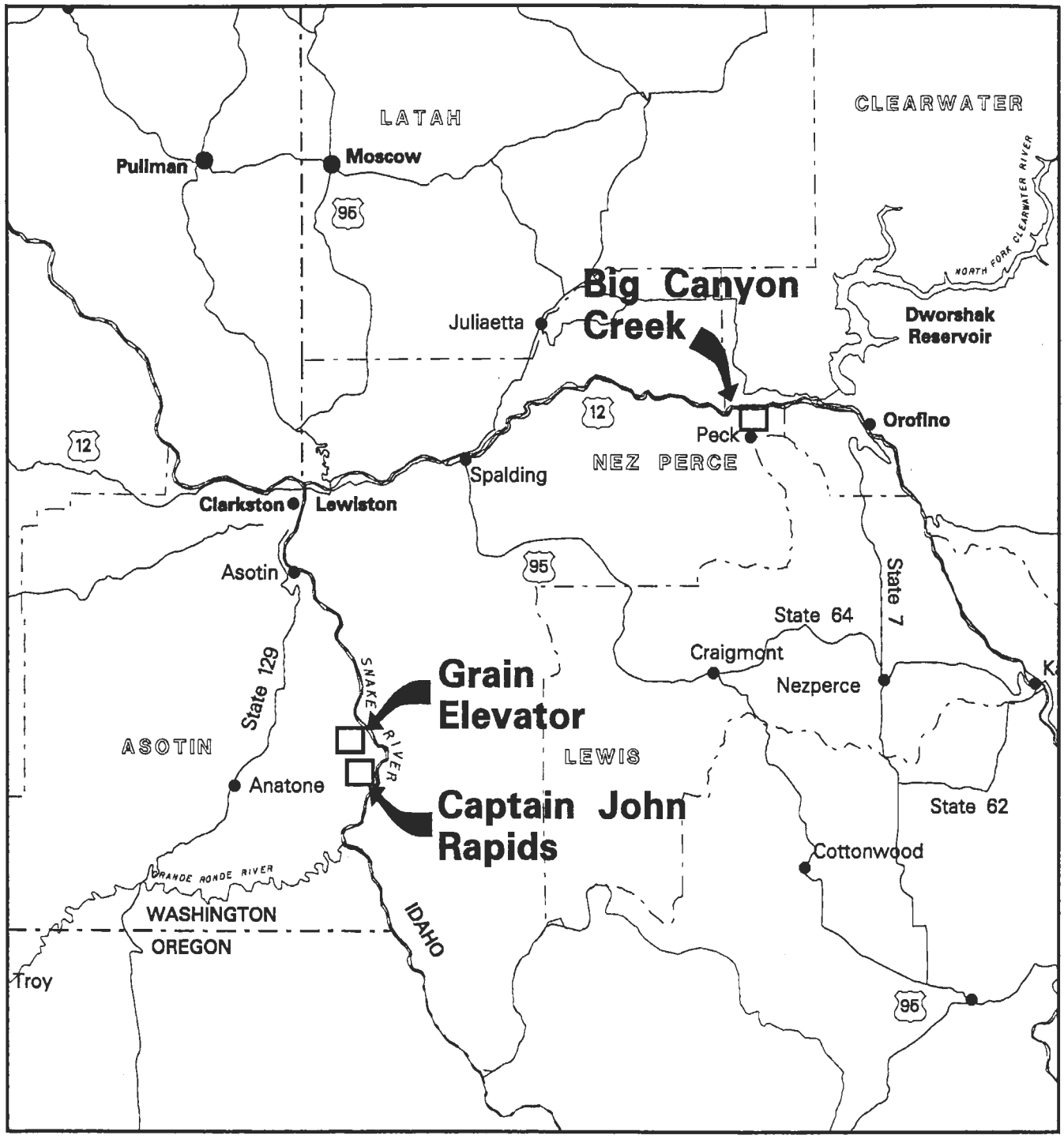
As discussed in Chapter 1, federal, state, and tribal fishery managers have over the years considered a variety of actions to meet the goal of encouraging fall chinook to return to the Clearwater and Snake Rivers to spawn naturally. The Proposed Recovery Plan for Snake River Salmon (NMFS, 1995a) recommends that operation of the Lyons Ferry Hatchery

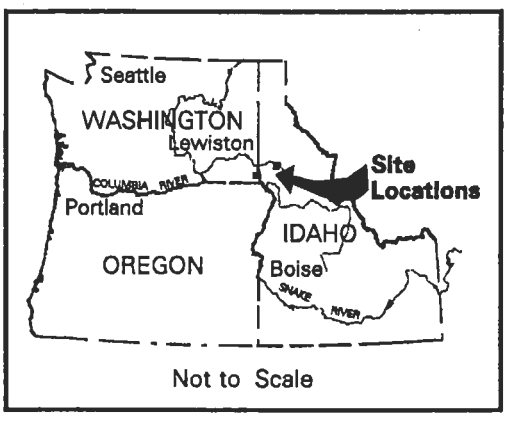
should continue, and that supplementation be carefully evaluated in areas above Lower Granite Dam to determine if it can assist in recovery (Smith, 1996). In addition, the Proposed Recovery Plan recommends that Snake River fall chinook be reintroduced into historical habitat, and that areas in the Snake River below Hells Canyon Dam and in the lower Clearwater River be considered for reintroduction if habitat conditions prove suitable and juvenile fish passage through the lower Snake River and Columbia River dams can be improved (Smith, 1996).

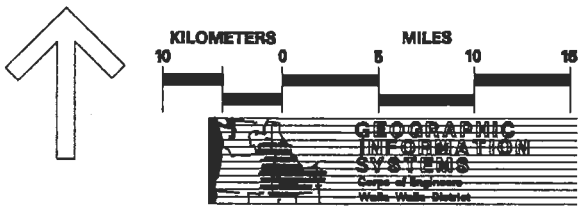
The action presented as Alternative 2 reflects the results of several years of planning and deliberation among the fishery management parties, primarily the Columbia River Intertribal Fish Commission (CRITFC), the Nez Perce Tribe (Tribe), the Washington Department of Fish and Wildlife (WDFW), and the *US vs. Oregon* Production Advisory Committee (PAC). In October 1992, the *US vs. Oregon* parties directed PAC to develop a list of potential sites for outplanting juvenile fall chinook from the Lyons Ferry Hatchery. The parties subsequently involved in PAC agreed that the Tribe would take the lead in developing a list of potential fall chinook acclimation sites (Mendel, 1996).

In April 1993, PAC circulated an assessment of 14 potential acclimation sites on the Clearwater, Selway, Grande Ronde, Imnaha, and mainstem Snake Rivers. The assessment addressed the relationship of the sites to current and historical spawning areas, water supply, short- and long-term acclimation options, and site accessibility. PAC circulated a revised assessment, which included more detailed descriptions for 15 sites, in June 1995. Based on this revised assessment and further discussion by PAC, in August 1995, the Tribe proposed that acclimation facilities be developed at Pittsburg Landing on the Snake River, at Big Canyon Creek on the Clearwater River, and at the mouth of the Grande Ronde River.

WDFW reviewed the mainstem Snake River between Asotin and the Grande Ronde River for additional potential sites. Based on location near existing natural spawning areas, reasonable site access, and relatively flat site conditions to facilitate construction, WDFW identified 14 potential acclimation sites within this reach (Mendel, 1995). Five of these sites were identified as having the highest priority, and were recommended for consideration by PAC and the Corps while the Tribe and WDFW continued to develop specific plans for acclimation projects.







Fall Chinook Acclimation Facilities

PROJECT LOCATION MAP

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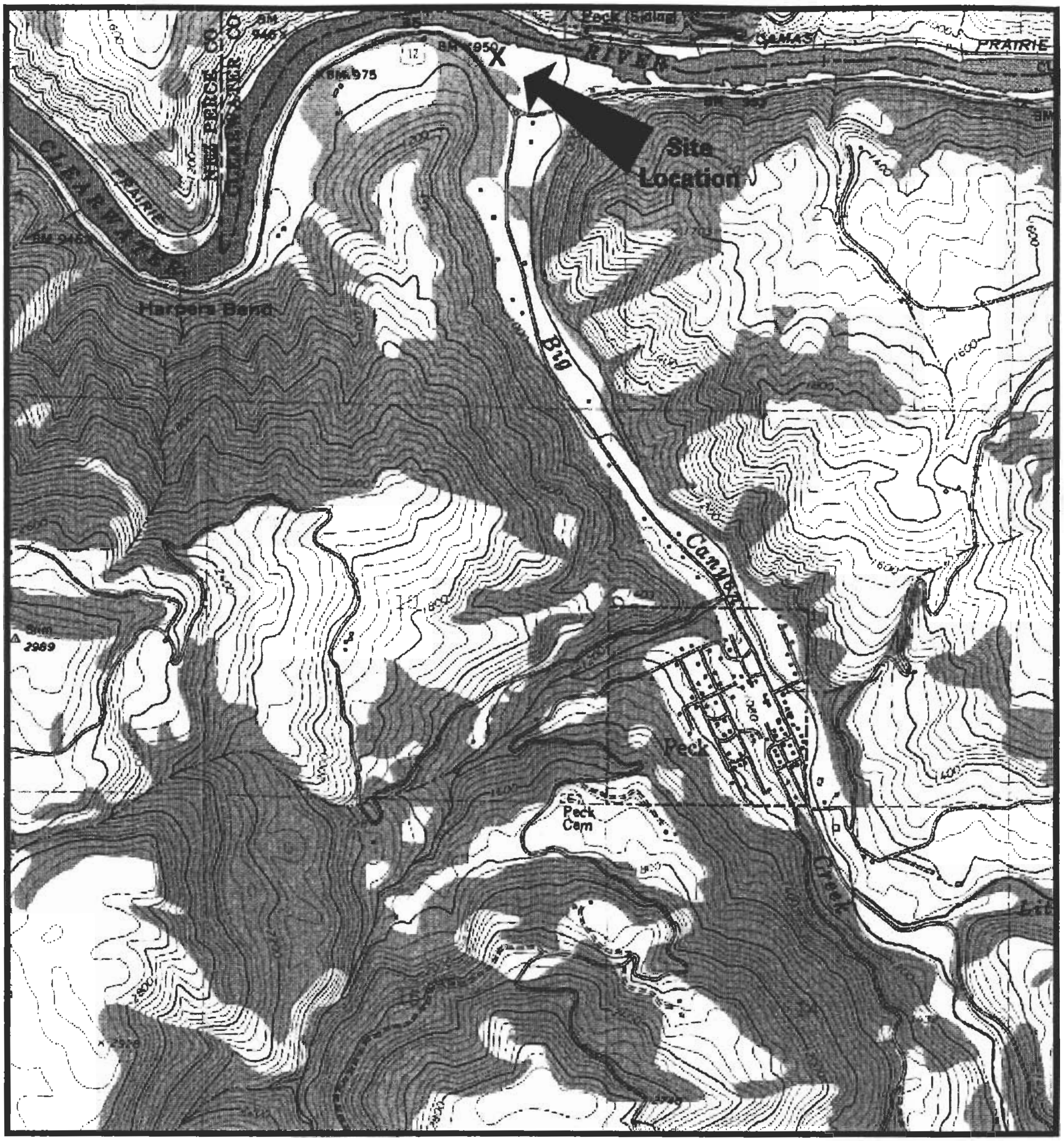
FIGURE 2-1

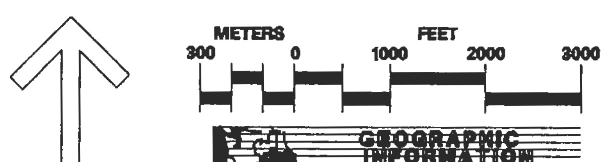
The three specific sites included within Alternative 2 were identified through the scoping process for this EA. During the January 24, 1996 scoping meeting, representatives from the state and federal fishery agencies and the Nez Perce Tribal Fisheries Management Office identified three sites as the proposed candidates for the development of two acclimation facilities. These sites included Big Canyon Creek on the Clearwater River and two sites (the Captain John Rapids and Grain Elevator sites) on the Snake River upstream from Clarkston (see Figure 2-1); only one of the two Snake River sites would be developed under Alternative 2. The three sites reflected the collective judgment of the fishery managers on the most feasible sites for expedited development, considering the various factors (spawning locations, water, accessibility, ownership, and site constraints) addressed in the previous Tribe and WDFW evaluations. A particularly favorable attribute of the Big Canyon Creek site, for example, is that it is on Tribal land that has already been designated for fishery resource use. This will eliminate the need for land acquisition and facilitate development of the site by spring 1997. The Captain John Rapids and Grain Elevator sites both have accessibility advantages over other candidate Snake River sites, and are located close to recent documented areas of natural fall chinook spawning. These sites also offer relative ease of construction, and the owners of both properties have indicated a willingness to negotiate land rights needed for the project.

In addition to site selection, the fishery managers have worked with the Corps to define the construction and operation elements for the proposed facilities. Specific project characteristics resolved through coordination among the parties include the desired types of holding facilities (permanent vs. temporary facilities; aluminum or fiberglass tanks, concrete raceways, ponds, or other options), facility capacity, water supply sources, power sources for water intakes and pumps, site security provisions, fish release methods, fish age class (yearling vs. subyearling), and construction and operation scheduling. The results of these deliberations are presented within the facility descriptions in Sections 2.2.2 and 2.2.3 below.

2.2.2 Big Canyon Creek Site

One element of Alternative 2 is to construct and operate juvenile fall chinook acclimation facilities on the lower Clearwater River near Big Canyon Creek. The Big Canyon Creek site is located on the left bank of the Clearwater at river mile (RM) 35, approximately 25 miles east (upstream) of Lewiston and 7 miles west (downstream) of Orofino in Nez Perce County, Idaho (see Figure 2-2). The legal description is Lot 5, SW 1/4 NE 1/4, Sec. 3, T36N, R1W. Lot 5 includes a total of 53.1 acres; the specific site of interest for the





GEOGRAPHIC INFORMATION SYSTEMS
Corps of Engineers
Walla Walla District

Fall Chinook Acclimation Facility
Proposed Site Location
BIG CANYON CREEK SITE

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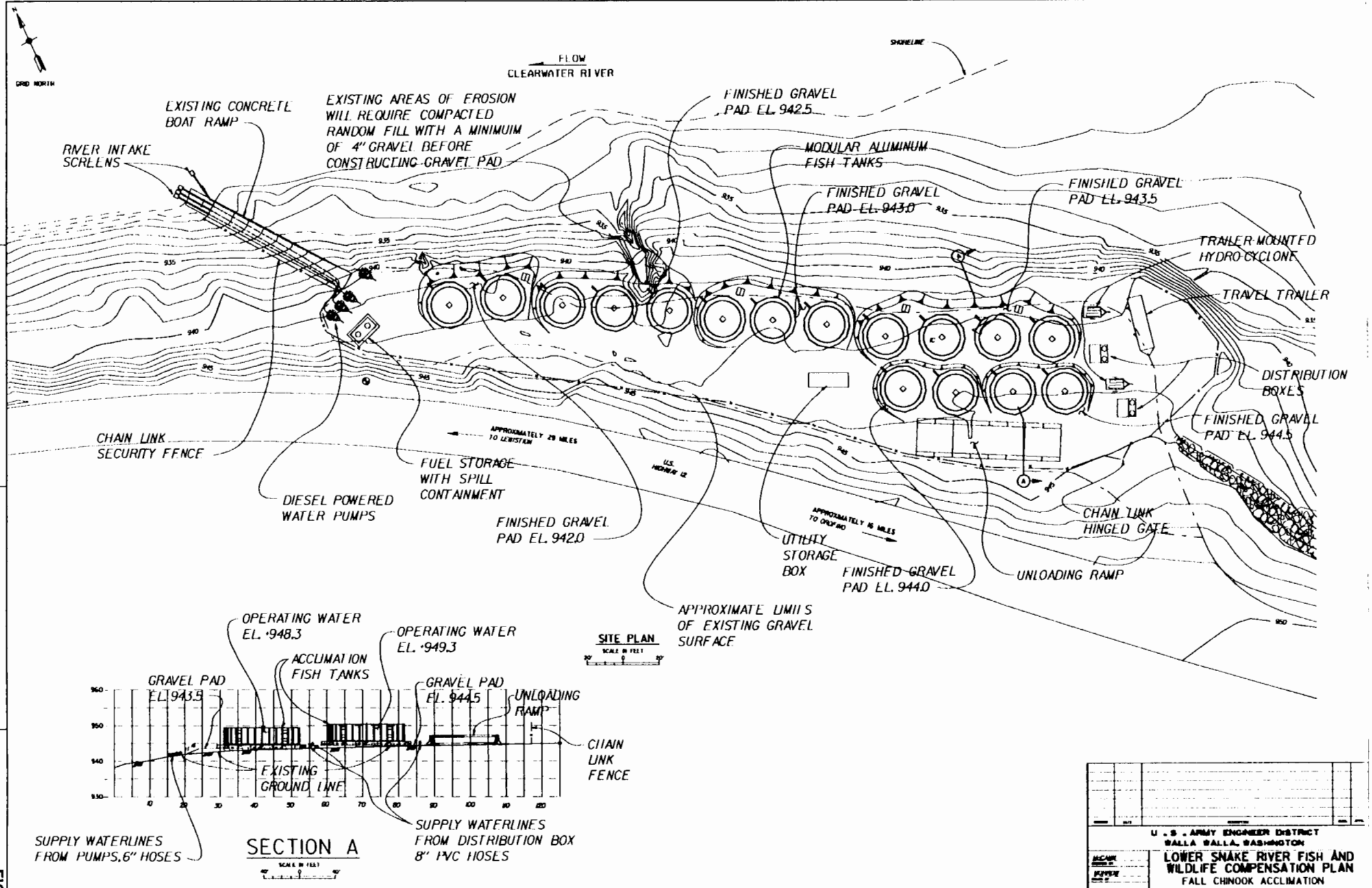
FIGURE 2-2

acclimation facilities constitutes approximately 4 acres at the northwestern corner of an 8-acre field that lies to the west (downstream) of Big Canyon Creek and north of U.S. Highway 12. The site can be accessed by a short graveled spur road off the north shoulder of the highway. The Tribe owns the parcel that includes the Big Canyon Creek site and previously leased the site to the Idaho Fish and Game Department (IDFG) as a sportsman access. A gravel parking area, a concrete boat ramp, and two portable toilets comprise the access facilities currently at the site.

Under Alternative 2, the Corps would develop approximately 1 to 2 acres of the site for juvenile fish acclimation and release facilities. The facilities would consist of tanks for holding fish; pumps, piping, and other ancillary equipment needed for the water circulation system; and support facilities and equipment. Because of authority limitations on the Corps' ability to procure and transfer certain types of items, some of the facility components would be furnished by parties other than the Corps. Sixteen circular tanks would be placed on the gravel parking area along the east end of the site, as close as possible to the tree line that is parallel to the river; the nearest tanks would be about 50 feet from the river (see Figure 2-3). The tanks would be 20 feet in diameter and 4.5 feet deep and constructed of 1/4-inch-thick aluminum. Four screened water intakes would be placed just offshore of the boat ramp near the western end of the site. Four diesel pumps would pump up to 1,800 gallons per minute (gpm) of water (450 gpm per pump) from the river to grit separators mounted on trailers, through nitrogen gas strippers, to distribution boxes. Water would then be distributed to each tank through a series of pipes and circulated through the tanks. Water would leave the tanks through a screened central drain on the bottom of each tank, and each tank would have a separate outfall pipe to allow the tanks to be flushed individually. The water plus any effluent would be released into the river downstream of the intakes. Each tank would be equipped with an emergency oxygen system, consisting of an oxygen bottle connected to ceramic oxygen diffusers on the bottom of the tanks, to maintain sufficient oxygen for the fish in the event the water system failed. A battery-powered alarm system would also be installed to alert workers when the water level in the distribution boxes is too low or when the water level in the fish tanks is too high or too low.

Several support facilities would be moved to the site and would remain on-site during the time the acclimation facilities are operating. These facilities include one or two small camper trailer(s), two metal walk-in storage containers for storing supplies and fish food, an enclosed semi-trailer for transporting and storing equipment, emergency lighting, and a diesel fuel tank with a spill containment system. The camper trailer(s) would house the two



U. S. ARMY ENGINEER DISTRICT
WALLA WALLA, WASHINGTON

LOWER SNAKE RIVER FISH AND WILDLIFE COMPENSATION PLAN

FALL CHINOOK ACCLIMATION FACILITY - BIG CANYON

GENERAL SITE PLAN

COMPUTER AIDED DESIGN & DRAFTING

SCALE AS SHOWN | DIV. NO.

LSG-I-16-57/1

FIGURE 2-3

on-site staff who would be present at all times when the facilities are operating. A septic system or sewage vault would be needed for waste disposal, and a potable water supply would be needed. Emergency lighting would be mounted on trailers and used to illuminate the facilities during nighttime emergencies.

To protect the site and facilities from vandalism, an 8-foot-high chain-link fence would be constructed along U.S. Highway 12 and along the upstream and downstream ends of the site. Because the site would be fenced and used for the fish facility, the IDFG access area and boat ramp would not be available for public use during the seasonal period of assembly and operation. Camouflage netting would cover the tanks to provide shade and to protect the fish from birds, thrown objects, and other hazards.

A construction firm under contract to the Corps would begin construction of the facilities in December 1996 or January 1997. The contractor would haul the components to the site by tractor/trailer or truck and trailer and assemble the components onsite. Each tank would be shipped in two semi-circular pieces, which would be joined at the site; a small crane would be required to lift the tank sections into place. All piping would remain above the ground and the tanks would be mounted on gravel pads. The Corps does not anticipate the need to cut any trees or modify the existing site topography in developing the facilities. Some grading and placement of gravel surfacing and bedding material would be necessary, however, to resurface areas washed out by the 1996 flood event and provide support for the tanks. The tanks would be placed on gravel pads constructed on top of the parking area (see Figure 2-3). The platforms would stair-step down in elevation from the highway toward the river. In addition, a gravel ramp would be constructed to elevate the fish trucks, allowing gravity feed of fish and their holding water into the acclimation tanks.

The facilities would be operational by February 15, 1997 at the latest. (Because of a shortage of trucks from transporting fish, it may be necessary to haul fish to the site in January.) Following acceptance of the constructed facilities, the USFWS would assume ownership of the facilities and would assign operational responsibilities to the Tribe. The Tribe would operate the facility at the Big Canyon Creek site for 1 to 3 years. The acclimation activities would be moved to the new tribal hatchery site at Cherrylane sometime after the new hatchery is completed. The hatchery is expected to be ready for operation in 1998. The tanks could also be moved to the Cherrylane site, or to another site yet to be determined. The acclimation facilities are expected to have an operational life of 20 years.

The facilities would be used to acclimate yearling fall chinook salmon from Lyons Ferry Hatchery on the lower Snake River in Washington. Between 150,000 and 200,000 fish would be hauled by truck from the hatchery and placed in the tanks by March 1997 at the latest. (In future years, scheduling constraints could cause fish to arrive on site as early as November.) The fish would be held in the tanks until mid-April or May, then released into the river. After the fish have been released, the Tribe would disassemble the facilities, load them onto tractor/trailers, and haul them to storage at a Tribal facility. The components would be stored until the following winter when they would be loaded onto trucks and reassembled for use in 1998.

The WDFW and the Tribe would implement the monitoring and evaluation program starting in 1997 and continuing throughout the project life. The USFWS would participate and cooperate in the monitoring program. The WDFW, the Tribe, and USFWS plan to combine the monitoring and evaluation for all three acclimation facilities (Pittsburg Landing, Big Canyon Creek, and Snake River) into one plan. The plan will be similar to the plan used for the Pittsburg Landing facility with the addition of radio-telemetry tracking of adults. Under the program, each fish would be tagged before it is loaded onto the truck at the Lyons Ferry Hatchery and taken to the acclimation facility. The fish would be monitored as they passed tag-detection equipment during their migration through the river system. The objectives of the program would be to:

1. monitor and evaluate pre-release and release conditions of yearling hatchery fall chinook released at outplant sites;

2. monitor post-release behavior, migration timing, and survival through Snake River dams; and

3. monitor and evaluate contribution and distribution of adult returns, and smolt-to-adult survival rates of acclimated salmon outplanted upstream of Lower Granite.

2.2.3 Captain John Rapids Site

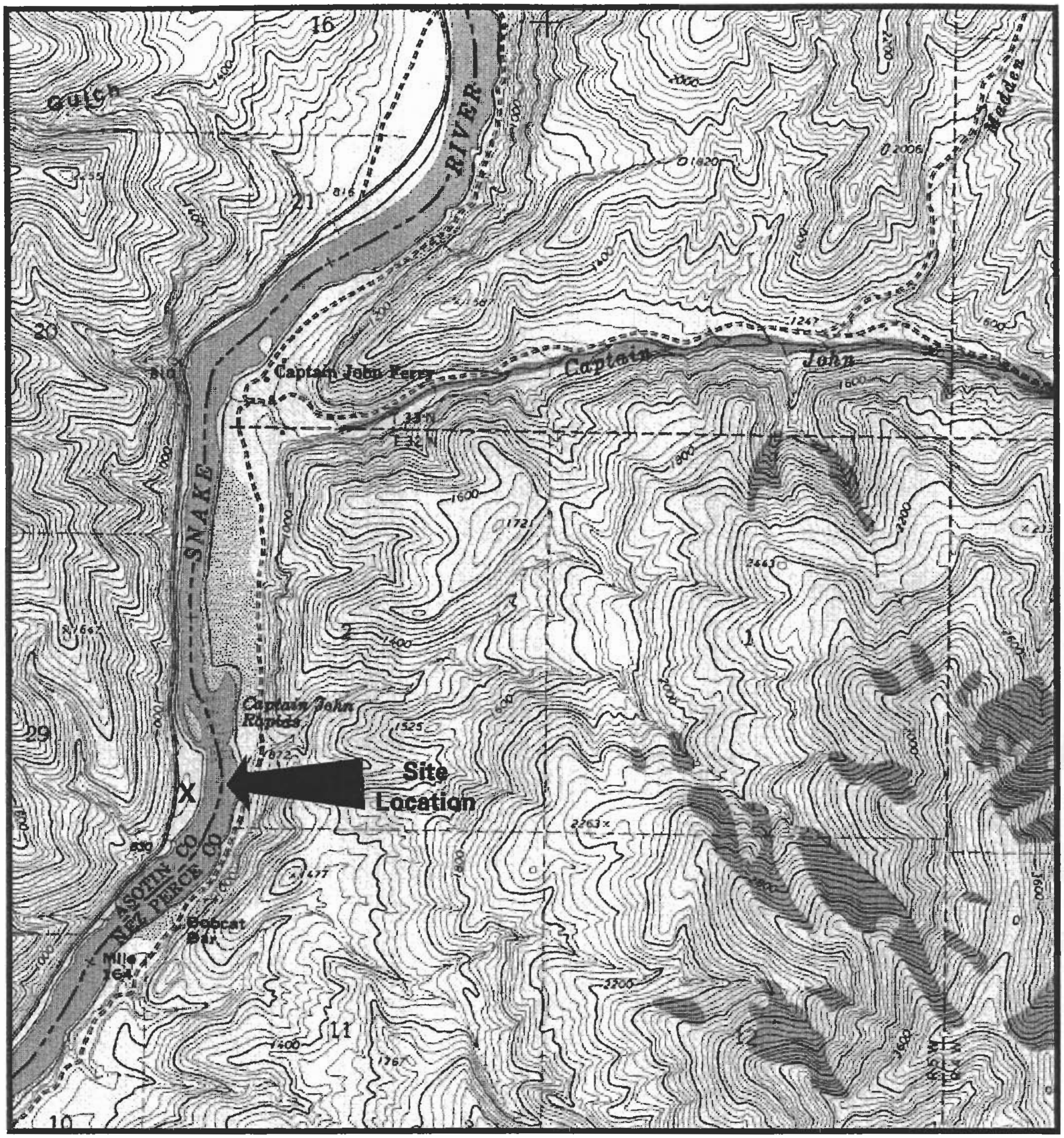
Alternative 2 also includes construction and operation of a second acclimation facility at either the Captain John Rapids site or the Grain Elevator site, both of which are on the Snake River upstream (south) from Lewiston-Clarkston. The Captain John Rapids site is located on the west bank (Washington side) of the Snake River at RM 163.5 approximately 25 miles south of Clarkston (see Figure 2-4). The site is within the southeast quarter of Section 29, T8N, R47E, in Asotin County. The Snake River flows from south to north in

this reach, with Idaho on the opposite (east) side of the river. The site is a river terrace and bar, covering approximately 8 acres, that has formed below a natural eddy in the river. If this site is selected, the Corps would develop 2 to 3 acres near the northern (downstream) end of the bar for the proposed acclimation facility.

Snake River Road provides access to the site and forms the western boundary of the site. In this location, Snake River Road is a well-graded, two-lane gravel road. The northern section of the road from Asotin south is a two-lane blacktop, but the paving ends approximately 3 to 4 miles north of Captain John Rapids. Two short dirt spur roads provide access into the lower (northern/downstream) portion of the site. No roads enter the upper, sandy portion of the site, but vehicles have gained access by driving across the sand from Snake River Road. The site is privately owned land that is currently used for grazing, although evidence of unauthorized recreational use is present.

The Corps recently has started the design for the Snake River acclimation facility, but this facility would not be operational until 1998. Therefore, there is not a specific plan for the Captain John Rapids site, comparable to the Big Canyon Creek site plan included as Figure 2-2. If the Captain John Rapids site were developed, however, the general layout and several of the facility components would be similar to those presented for Big Canyon Creek, as would the operational features (including monitoring and evaluation) and timing. Therefore, much of the description of the proposed construction and operation plans presented in Section 2.2.2 also applies to the Captain John Rapids site, and provides the basis for the assessment of environmental effects at this site.

One key difference for the Snake River facility (whichever site is selected) is that the juvenile fish would be held in a large permanent pond rather than multiple, smaller tanks. Based on a WDFW recommendation, the conceptual plan for the Snake River facility involves a single, earthen, in-ground pond with a gravel and PVC liner, and a concrete trough in the bottom along the length of the pond. Compared to multiple above-ground tanks, the advantages of a single, in-ground pond for the Snake River facility would be: 1) lower construction cost and reduced operation and maintenance cost; 2) more fish delivered per truckload, and reduced conflicts with transporting fish to other sites during late winter or spring; 3) ease of operation for feeding, cleaning, and other needs; and 4) improved fish



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GEOGRAPHIC INFORMATION SYSTEMS
Corps of Engineers
Walla Walla District

Fall Chinook Acclimation Facility Proposed Site Location

CAPTAIN JOHN RAPIDS SITE

PLOTTED: $$$$$BYTIME$$$$$$ 1996
GIS FILE: $FILE$$

FIGURE 2-4

rearing conditions as a result of the larger area. In addition, the large pond might allow for volitional rather than forced releases of fish.

Excavation would be required to construct the pond, which would remain in place year-round along with a chain-link security fence around the perimeter of the pond. The pumps, piping, and other ancillary equipment would be installed for each year's operation, then removed from the site each year following release of the fish.

2.2.4 Grain Elevator Site

The alternative location for the second Snake River acclimation facility is termed the Grain Elevator site, named for the unused grain elevator situated immediately to the north. Some maps refer to this locality as Grahams Landing. The Grain Elevator site is located on the west bank of the Snake River at RM 156.5, approximately 6 miles to the north of the Captain John Rapids site and 19 miles south of Clarkston (see Figure 2-5). The site is within the north half of Section 31, T9N, R47E, in Asotin County. If this site is selected, the Corps would develop 2 to 3 acres of this approximately 13-acre parcel on a river terrace.

Access to the Grain Elevator site is by the Snake River Road, a two-lane blacktop road, and access onto the actual site is a rough gravel road the forms a short loop off the main road. The site is privately owned land that is essentially unused, with the exception of an irrigation intake that is seasonally operated at one point along the shoreline.

The Corps has started, but not completed, design for the Snake River acclimation facility. The construction and operation plans presented in Section 2.2.3 for Captain John Rapids, which incorporate many elements of the Big Canyon Creek plans, also are applicable to development of a facility at the Grain Elevator site, and provide the basis for impact assessment for this site.

2.3 ALTERNATIVE 3—DIRECT RELEASE

Under Alternative 3, the Corps would fund and implement a supplementation program in which juvenile fall chinook would be released directly into the rivers in 1997 (and presumably in subsequent years). Approximately 150,000 to 200,000 juvenile fall chinook would be loaded into trucks, transported to the release site from Lyons Ferry Hatchery, and released directly into the river(s) rather than being held for several weeks in acclimation facilities. However, direct release might involve use of a small tank to hold fish briefly while they recover from being transported, if state and tribal fishery managers concluded this would be beneficial for the fish.

Specific release sites for this action have not been determined, but would likely include the sites described in Section 2.2 as well as other sites considered for acclimation facilities. Key site requirements would be proximity to spawning locations and ease of access to the immediate shoreline area. Publicly owned sites would be preferred, so land rights would not need to be acquired. Each site would receive multiple deliveries, but each delivery would be a brief event. If a small holding tank and associated release structure were employed, they would remain in place temporarily for the duration of the seasonal direct release action.

2.4 ALTERNATIVES NOT CONSIDERED IN DETAIL

The Corps considered a number of other action alternatives during the preparation of this EA. There are many potential alternative ways to attempt to increase numbers of fall chinook returning upstream of Lower Granite Reservoir to spawn naturally, although many of them would not meet the need and purposes identified for this project. Alternative sites, structures, and measures that the Corps decided not to consider in detail for this EA are briefly described below.

2.4.1 Alternative Sites

As discussed in Section 2.2.1, the Tribe and WDFW each identified and evaluated 14 or 15 potential sites in the Snake River Basin for the development of acclimation facilities. The three sites that are included in Alternative 2 represent a collective identification of the most preferred sites. The remaining sites among those studied by the Tribe and WDFW were judged by the fishery managers to be not as advantageous for the proposed project, and are not considered in detail in this EA. While many or all of these sites might prove to be viable in the long run, they generally had potential limitations related to water supply, distance from known spawning areas, access, and/or ownership concerns.

2.4.2 Structural Alternatives

The Corps, in conjunction with the fishery managers, defined the design elements of the proposed facilities. They evaluated the structure and components of the temporary acclimation facility developed in 1996 at the Pittsburg Landing site in Idaho, as well as hatcheries and other facilities in selecting the proposed structural elements for Alternative 2. The Tribe is expecting a 20-year life for the Big Canyon Creek acclimation facilities (although the facilities may be moved to the Tribe's new hatchery site after 1 to 3 years), so

aluminum tanks were selected rather than fiberglass tanks. There also have been technical concerns over the fiberglass tanks used at the Pittsburg Landing site, which were not acceptable as supplied. Other alternative tank designs, such as steel plate tanks with PVC liners, were also considered. Floating raceways or net pens were considered as an alternative to tanks, but were found to be susceptible to damage from high river flows. A permanent pond was preferred over tanks for the Snake River facility because this facility would remain at one site for the 20-year life of the project, and use of a pond would reduce long-term operation and maintenance demands.

2.4.3 Measures Other than Supplementation

There has been much concern across the region about the need for other types of recovery measures addressing salmonid mortality during migration through the hydro system, limited and poor quality habitat, and excess harvest of anadromous fish. The Corps understands that many factors have contributed to the decline of the fall chinook as well as the other salmon species; however, a number of these factors, such as curbing harvest efforts, are not within the authority of the Corps to evaluate the issues or implement programs. NMFS is responsible for making decisions on all elements of recovery, as detailed in the draft Recovery Plan, and the Corps and other agencies are implementing operational measures within the hydro system as outlined in the 1995 Biological Opinion. This EA addresses an action proposed to evaluate the effectiveness of supplementation for increasing the numbers of naturally spawning fall chinook in the Snake and Clearwater Rivers, pursuant to the direction of Congress, and thereby take active steps to contribute to salmon recovery. Other, more broad measures involving hydro system operations, habitat, or harvest would not address the need and purposes defined for this project, and therefore have not been considered in detail in the EA.

2.5 COMPARISON OF ALTERNATIVES

In determining the most appropriate course of action, the Corps will evaluate the proposed action and alternatives on the basis of their environmental effects and the degree to which they would satisfy the project purposes. Section 2.5.1 addresses the expected performance of the alternatives relative to the purposes for considering the supplementation effort. Section 2.5.2 summarizes and compares the environmental effects of the alternatives.

2.5.1 Satisfaction of Project Purposes

Evaluation of the expected performance of the proposed action and alternatives involves the extent to which it is believed they would address the need for action discussed in Section 1.3 and satisfy the project purposes identified in Section 1.4. Briefly, the needs are to use supplementation to increase numbers of natural spawners, as identified by the state and tribal fishery managers, and to evaluate supplementation in areas above Lower Granite Dam as recommended by the NMFS (1195a) draft Recovery Plan. Project purposes are to allow juvenile fish to imprint on the waters of the release areas, minimize stress related to handling and release, and develop field-based information on a fall chinook supplementation effort. In addition, evaluation of the proposed action and alternatives should consider the conference report direction that only projects that would protect, maintain, or enhance biological diversity of existing wild salmon stocks should be pursued. Evaluation of Alternatives 1 through 3 based on these criteria is summarized below.

2.5.1.1 Alternative 1

Alternative 1, No Action, would not provide for specific actions to address the identified needs and would not satisfy the project purposes. Other actions related to salmon recovery that would occur regardless of the Corps' decision on the proposed project would likely contribute to increased numbers of listed salmon. The Nez Perce Tribal Hatchery in particular would support supplementation objectives for fall chinook in the Clearwater River system, although operation of this facility would not begin until 1998 under the current schedule. While some progress toward identified needs would otherwise occur under Alternative 1, no action in this case would represent a lost opportunity for additional acclimation and release of juvenile fall chinook in 1997, and a lost or deferred opportunity for a supplementation effort on the Snake River.

2.5.1.2 Alternative 2

The goal of supplementation is to maintain or increase natural production while maintaining the long-term fitness of the target population, in this case wild Snake River fall chinook in the Snake and Clearwater Rivers. To be successful, the project would have to result in more spawners, and more successful spawning; that is, the outplanted fish that return as adults would need to contribute enough to smolt production that their surviving smolts would return as wild spawners and thereby increase the wild stock population. The direction of the Proposed Recovery Plan is to study the suitability of using supplementation in reaches

above Lower Granite Dam to aid in restoring fall chinook stocks (NMFS, 1995a). The proposed action includes monitoring plans to observe results, using similar methods as those designed for the Pittsburg Landing facility (WDFW et al., 1995).

For 7 of 9 brood years since 1985, adult returns of wild fall chinook to Snake River spawning grounds have been less than 1 per spawner (NMFS, 1995b). A consistent return per spawner rate of less than 1 results in a declining population that would not be able to maintain itself if the trend continued. While the escapement trend has remained fairly constant, ranging from about 100 to 700 fish per year over Lower Granite Dam, it has usually been less than the level recommended by NMFS to reduce demographic and genetic risk to the listed Snake River fall chinook stock. NMFS (1996a) defined the recommended escapement over Lower Granite Dam as 519 adult fish from the listed stock. This level has occurred in only 3 of the last 11 years. Demographic risk is defined as that caused by environmental fluctuations and random events affecting individuals in the population. Genetic risk is characterized as the loss of genetic variability or population fitness through inbreeding and genetic drift. These factors increase rapidly as population size decreases. Effects of low breeding populations are considered cumulative, so that long periods of low population may have adverse genetic effects even if subsequent numbers increase. While the addition of wild spawners through supplementation with Lyons Ferry juveniles would not increase the return per spawner ratio, it would help reduce the demographic and genetic risks if it helped increase the total escapement to the goal of 519 listed spawners over Lower Granite Dam. The prospects of this outcome from the project are uncertain. Based on the work of Miller et al. (1990), the use of a genetically close stock with a short freshwater residence time suggests a relatively high chance of success for the project, while the long distance to the ocean would reduce the prospects for success. Apart from any potential increase in adult numbers through the proposed action, attaining the increased return per spawner ratio needed to ultimately maintain and enhance the stock would require modification of factors in the life cycle that affect overall survival such as harvest, passage, and ocean and freshwater habitat conditions.

Genetic analyses of the stocks in this region suggest that some of the fish that currently spawn naturally are not of Snake River origin (Blankenship and Mendel, 1993). The Lyons Ferry stock is considered to be of the same genetic origin as the original Snake River wild fall chinook stock (see Section 3.1.2.1), although it has been altered somewhat by several generations of hatchery production. Therefore, supplementation with Lyons Ferry stock might enhance the genetic composition of the spawning Snake River stock. However,

without some moderate changes affecting overall survival, supplementation could become a permanent action (i.e., a production measure) in the Snake River. The long-term effects of using production to maintain a wild stock are unknown. However, continued domestication in a hatchery environment is likely to have adverse effects on the genetic viability of the stock.

Fall chinook in the Clearwater and Snake Rivers are considered part of one population (Waples et al., 1991). Supplementation in the Clearwater River might result in a greater portion of the naturally produced fish in the future being of historical Snake River fall chinook stock. The recent past escapement apparently contained a substantial portion of non-Snake River fall chinook stock (Blankenship and Mendel, 1994). In their review of factors affected by supplementation, Steward and Bjornn (1990a) found literature that suggested spawning hatchery-origin fish may produce fewer smolts and returning adults than do wild native-stock spawners. Reisenbichler (1996) also concluded that increasing generations in the hatchery resulted in progressively declining fitness for natural rearing, which in turn would reduce the carrying capacity and productivity for naturally spawning populations. This suggests that the Lyons Ferry fall chinook, even though of native stock origin, could be less viable than naturally spawning native fish. However, the studies cited involved genetic differences between native wild stocks and enhancement stocks that were much greater than the corresponding differences for the Snake and Clearwater River fall chinook supplementation (see Section 3.1.2.1 for further discussion of effects of hatchery spawning fish). If hatchery-origin stocks are similarly or somewhat less viable than native wild stocks, they might still produce viable offspring. This would enhance the future genetic characteristics of naturally spawning fish in the Clearwater River, because they would have genetic characteristics more similar to the native stock than would stray fish from the Columbia River.

The current estimated poor survival of juvenile fish from the lower Clearwater increases the chance that supplementation would become a permanent production operation, with little or no progress developing a wild-spawning stock that can maintain itself without permanent stocking. Current estimates, while preliminary, indicate juvenile downstream survival of naturally produced fall chinook from the Clearwater River is about 23 percent of the survival rate from the Snake River (Smith et al., 1996). This poor survival appears to be related to the cool-water rearing conditions in the Clearwater (personal communication, B. Connor, Fisheries Biologist, USFWS, Ahsahka, Idaho, May 8, 1996). Fish released through the proposed action would not be subject to these conditions, but their offspring

subject to the same water quality conditions and therefore might experience poor survival. As noted above, even with much higher juvenile survival, wild fall chinook from the Snake River have not been able to maintain a recruit-to-spawner ratio consistently over 1. The poor survival of the current wild fall chinook from the Clearwater would have to change dramatically for there to be a reasonable chance that stocking fall chinook would be anything other than a permanent hatchery outplanting operation (which would be considered a production action, and not supplementation).

As indicated previously, NMFS considers both the Snake River and Clearwater River fall chinook to be a single stock; because there is no unique Clearwater stock, enhancement of the wild stock could be done in either the Snake or the Clearwater. Because survival in the Clearwater is expected to be considerably less than in the Snake, implementing a supplementation action on the Clearwater might result in a loss of production that has the potential to affect the entire stock. In addition, to the extent that the Lyons Ferry hatchery stock is important for recovery of wild Snake River fall chinook (through its role as an egg bank), the use of a sizable proportion of its production capacity on a project with uncertain prospects of success might reduce the overall recovery opportunities for the stock.

Because of the poor survival of natural Clearwater fish, and the proposed use of yearling smolts, the Corps has expressed concern to the NMFS that use of these resources for this action might not be in the best interest of the listed stock, and might be a poor use of public funds (Weller, 1996). NMFS replied that, considering all factors, NMFS still supports developing the three acclimation facilities on the Snake and Clearwater Rivers (Smith, 1996). NMFS agreed that supplementation may be less successful in the Clearwater if the adverse conditions persist but reiterated that the Proposed Recovery Plan (NMFS, 1995a) recommended studying supplementation above Lower Granite Dam.

The Corps also has concerns over the monitoring and evaluation program that would be implemented for the proposed action. The fishery agencies and tribes, who are responsible for monitoring and evaluation, have not yet developed a detailed monitoring and evaluation plan for this project. (A written plan is currently expected by late October or early November 1996). Therefore, it is not certain at this time that the appropriate studies of the project will in fact be conducted. In addition, because there are many other factors that also determine Snake River fall chinook numbers at a given time, it may not be possible to isolate the contribution of the supplementation effort regardless of the rigor of the monitoring and evaluation program.

Overall, the preceding discussion identifies both potential benefits and risks associated with Alternative 2. The proposed action could help to reduce the demographic and genetic risk to the wild stock, if it helped to increase total escapement over Lower Granite Dam, and it could enhance the genetic composition of the spawning stock because of the Snake River origin of the Lyons Ferry fish. Attaining both of these potential benefits would be dependent on moderate improvements to conditions affecting other salmon life cycle stages. The potential risks include possible poor survival of juvenile fish produced in the Clearwater River, which could lead to the proposed action becoming an ongoing outplanting effort, and the possibility of adverse effects on wild stock genetics (see Section 3.1.2.1). The balance of the potential benefits and risks is difficult to evaluate, because of the uncertainty involved, and cannot be specifically identified at this time. It should be noted, however, that the specific potential benefits intended from this project could not be realized without taking action, although it is also possible that wild fall chinook numbers could increase as a result of other factors. It should also be noted that NMFS, as part of an agreement with fisheries agencies and tribes, supports the proposed acclimation facilities despite the potential risks.

Based on the evaluation described in this EA, the Corps concludes that operating the fall chinook facility at Big Canyon Creek, and possibly the Snake River facility, could have noticeable impacts, both negative and positive, on the listed Snake River fall chinook salmon stock. However, the Corps defers to the approval of the project by the NMFS because that agency has statutory authority to determine whether or not a proposed project would affect listed salmon stocks.

2.5.1.3 Alternative 3

Survival during migration might be lower for direct-release fish than for those acclimated before release, for a variety of reasons. With direct release, recovery from transport usually occurs in river, and predation can be high; large volumes of fish released in a small area in a short time attract predators, and may also induce downstream migration of other salmonids. Success in imprinting might also be reduced with direct release of juveniles, compared to acclimation, particularly if yearling rather than subyearling fish are outplanted. Therefore, the level of straying by returning adults could be higher. See Section 3.1.3 for a more detailed discussion of the uncertainties associated with this alternative.

2.5.1.4 Comparative Evaluation

Alternative 1 would not address the identified need or satisfy project purposes, and therefore is not a preferred course of action. Alternatives 2 and 3 both have the potential for addressing the supplementation needs. Alternative 2 would help to satisfy the project purposes of fostering imprinting and minimizing stress. While the success of Alternative 2 would be uncertain and it presents some risks, the proposed acclimation and release program could provide demographic and genetic benefits to the target fall chinook stock. Given the potential survival and homing disadvantages associated with direct release, Alternative 3 would likely have lower prospects for success than Alternative 2 at increasing numbers of adult fish returning to spawn naturally in the Clearwater and Snake Rivers. Based on expected performance against project needs and purposes, Alternative 2 is preferred to Alternatives 1 or 3.

2.5.2 Environmental Effects

The expected impacts of Alternatives 1 through 3 are described for each resource area in Chapter 3 of this EA. These impacts, and the corresponding conclusions concerning impact significance, are summarized in Table 2-1 and the following discussion.

Direct and Indirect Effects

The consequences of Alternative 1, No Action, would generally be represented by the continuation of existing conditions for the foreseeable future at the three alternative sites under consideration for the development of juvenile fish acclimation facilities. Given the land ownership and status of the three sites, however, it is possible that uses of these sites could change and result in environmental conditions that differ from the baseline. Under Alternative 1, the Corps would not construct acclimation facilities at Big Canyon Creek and at Captain John Rapids or the Grain Elevator site, and the specific action proposed to increase the numbers of naturally spawning Snake River fall chinook would not occur. Other recovery measures that are ongoing or planned would occur, regardless of the Corps' decision on this proposal.

Implementation of Alternative 2 would result in a variety of short- and long-term adverse effects on the physical, biological, and human environments, although all of these effects are expected to be insignificant. Development of two acclimation facilities as proposed would create construction-related impacts at one site on the Clearwater River and at one of the two candidate sites on the Snake River. These impacts would include conversion of

Table 2-1. Environmental Comparison of Alternatives

Resource Area	Alternative 1 No Action	Alternative 2 Acclimation Facilities	Alternative 3 Direct Release
Fish	Continued depressed conditions for wild Snake River fall chinook, pending success of other planned recovery measures or improved natural conditions Status quo conditions for resident fish and other aquatic resources.	Unlikely disruption of fall chinook spawning by intakes and outfalls. Some risk of genetic effects on wild stocks, but not expected to be significant. Potential effects on wild stocks from increased disease transmission, predation and entrainment, and likely to be insignificant. Minimal disruption of resident fish and aquatic resources from facility construction and operational discharges.	No direct construction or operation effects on anadromous or resident aquatic resources. Genetic and ecological consequences for salmon similar to Alternative 2.
Vegetation and Wildlife	Status quo conditions at three alternative sites; predominantly disturbed vegetative communities at Big Canyon Creek and Captain John Rapids, mixture of native and non-native species at Grain Elevator site.	Insignificant removal or disturbance of vegetation as a result of planned construction methods, small size of facility, and degree of existing disturbance at sites. Insignificant loss of habitat and disturbance or displacement of wildlife. Potential greatest at Grain Elevator site, but effects would be limited in extent and could be intermittent.	Similar to Alternative 1; no construction disturbance at any of the three sites, negligible operations disturbance.
Endangered and Threatened Species	Status quo conditions for listed Snake River salmon species, gray wolf, bald eagle and peregrine falcon.	Construction of facilities not likely to adversely affect listed species. Operation of facilities unlikely to affect listed gray wolf, bald eagle, or peregrine falcon. (Conclusion on salmon pending consultation)	Similar to Alternative 1; no construction disturbance at any of the three sites.
Geology/Soils	Status quo conditions at three alternative sites; continued minor surface disturbance from existing low-intensity uses at Big Canyon Creek and Captain John Rapids.	Minimal or no geologic effects. Insignificant surface disturbance and erosion from clearing and grading to accommodate proposed facilities.	Similar to Alternative 1; no construction disturbance at any of the three sites.

Table 2-1. Environmental Comparison of Alternatives

Resource Area	Alternative 1 No Action	Alternative 2 Acclimation Facilities	Alternative 3 Direct Release
Water Resources	Status quo water quality and quantity conditions.	Minimal short-term adverse effects on Clearwater and Snake River water quality from sediment produced by construction activities. Minimal long-term seasonal effects on water quality from fish waste and excess food discharges during project operations.	Similar to Alternative 1; no construction-related sediment and no operational discharges.
Cultural Resources	Existing cultural site at Big Canyon Creek, high potential for cultural materials at Captain John Rapids, Grain Elevator site within archaeological district; these resources subject to future disturbance from natural causes or actions of current or future landowners.	No adverse effect expected at Big Canyon Creek from placement of above-ground tanks. No adverse effect expected at Captain John Rapids, if excavation for in-ground pond monitored for cultural materials. Archaeological testing needed if in-ground structures selected for Grain Elevator site; impacts dependent on test results and mitigation measures adopted.	Similar to Alternative 1; no disturbance of cultural resources from direct release actions.
Land Use	Future uses of three sites dependent on actions of existing Tribal and private owners; no planned changes in use known.	Approximately 1 to 2 acres at Big Canyon Creek and 2 to 3 acres at either Snake River site converted from existing low-intensity uses to acclimation facility; minimal or no adverse impacts from displacement of existing uses. Minimal or no adverse effects from incompatibility with adjacent uses. Proposed use of sites consistent with applicable local land use plans.	Similar to Alternative 1; no land use conversion or displacement from direct release actions.

Table 2-1. Environmental Comparison of Alternatives

Resource Area	Alternative 1 No Action	Alternative 2 Acclimation Facilities	Alternative 3 Direct Release
Recreation	Uncertain continued use of Big Canyon Creek site as river access site; probable continued informal, unsanctioned use of Captain John Rapids site for recreation.	Seasonal displacement of use of Big Canyon Creek site, partially overlapping with winter steelhead season but following peak use period, to alternate sites several miles upstream or downstream. Seasonal or permanent displacement, depending on facility design, of unsanctioned use from a portion of the Captain John Rapids site; level of impact insignificant. No effect at Grain Elevator site, based on no apparent existing use.	Similar to Alternative 1; negligible intermittent disturbance from direct release operations.
Aesthetics	Future aesthetic conditions dependent upon land use actions of current or future site owners.	Visual contrast of proposed facilities noticeable to motorists and river recreationists at all three sites, and nearby residents at Big Canyon Creek or Grain Elevator sites; level of impact insignificant at all sites. New local noise source and possibly increased noise levels, on a seasonal basis, from operation of pumps. Noise levels approximately equivalent to background levels at nearest receptors, so impact level insignificant at all three sites.	Similar to Alternative 1; minimal transitory visual intrusion from direct release operations.
Socioeconomics	Future local demographic, economic and social conditions based on existing conditions and trends.	Negligible local employment and income effects from construction and operation labor requirements. No effect on local tax base from government purchase of either Snake River site, as a result of Corps payment in lieu of taxes to Asotin County.	Similar to Alternative 1; negligible or no effect on local employment and income from direct release operations.

land use and loss of terrestrial habitat on 1 to 2 acres on the Clearwater and 2 to 3 acres on the Snake River. Clearing and grading during construction would result in minor, short-term, and highly localized soil erosion and sediment discharge, which would have insignificant consequences for water and aquatic resources. Cultural resources would not be affected at the Big Canyon Creek site, based on the assumption that excavation would not be required to accommodate the above-ground aluminum tanks proposed for this site. Construction monitoring protocols for cultural resources would likely be needed for the Snake River facility because development of this facility would require excavation for an in-ground pond.

Operation of the proposed acclimation facilities would involve some potential for adverse effects on the remaining wild Snake River salmon stocks. These potential effects include genetic modification; increased disease transmission, predation, and potential harvest pressure; and entrainment. As discussed in detail in Section 3.1.2, these effects are not expected to be significant, nor are effects on resident fish and aquatic resources from operational discharges. Disturbance effects on local wildlife would be intermittent and very limited in extent. The existing recreational use of the Big Canyon Creek site would be precluded during the annual period of operations, but this effect would be insignificant in view of the timing of the effect and the availability of alternative sites. Recreation effects at the Snake River sites would be minor or nonexistent. Acclimation facilities would create some degree of visual and noise intrusion at any of the three sites, but in all three cases the impact magnitude and duration and the existing aesthetic context would make the impacts insignificant.

Implementation of Alternative 2 entails a choice between the Captain John Rapids and the Grain Elevator sites for the location of the Snake River facility. The analysis conducted for this EA indicates that, while impacts at either site would not likely be significant, impacts would probably be somewhat less if the Captain John Rapids site were selected. This difference in impact levels is primarily because the Grain Elevator site has been less disturbed, is covered largely with native vegetation, and has several residences nearby.

The impacts of Alternative 3 would be very similar to those of Alternative 1, as the direct release of juvenile salmon into the Snake and Clearwater Rivers would cause minimal disturbance of existing environmental conditions. This alternative would essentially involve a trucking operation, with very transitory and localized effects at any given release site and no changes in existing uses. The primary distinction for Alternative 3 is that it too would

create the potential for the genetic and ecological risks for wild salmon stocks that were identified for Alternative 2. Again, these risks would likely be insignificant for a direct release program.

Cumulative Effects

The NEPA and the CEQ implementing regulations require Federal agencies to consider the cumulative impacts of their actions. Cumulative impacts are defined as the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions, regardless of what other agency or person undertakes the other actions. Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time (CFR 1506.7).

In general, past and current uses of lands and waters in the Snake River Basin for intensive agriculture, grazing, timber harvest, recreation, urbanized (residential, commercial, and industrial) development, and multipurpose dam construction have had significant negative effects on native vegetation, wildlife and fish, including Snake River salmon. Current and future efforts by Federal, state, and tribal entities are intended to reverse the decline of wild salmon stocks. The actions proposed by the Corps that are addressed in this EA are intended to help counter the adverse cumulative effects of other past, current, and future actions by increasing the numbers of naturally spawning Snake River fall chinook salmon. The proposed acclimation facilities are hoped to have positive cumulative effects on the wild stocks, in conjunction with other salmon recovery measures undertaken by other parties within the basin.

As summarized in Table 2-1, Alternative 2 in particular could have insignificant effects on physical, biological and human resources that would accumulate with impacts to these resources from other actions. However, the analysis did not identify any such situations that would represent collectively significant impacts.

3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes the environments that would be affected by the proposed actions and the expected environmental consequences of those actions. The primary chapter subheadings are organized to cover the key resource areas of fish, vegetation and wildlife, endangered and threatened species, geology and soils, water resources, cultural resources, land use, recreation, aesthetics, and socioeconomics. The resource discussions are subdivided between affected environment and environmental consequences material; most provide separate discussions for the three individual sites under consideration for acclimation facilities.

The impact assessment conducted for this EA included the effects of no action (Alternative 1) and two action alternatives, construction of two proposed acclimation facilities (Alternative 2) and direct release of juvenile fall chinook (Alternative 3). The No Action Alternative, as described in Section 2.1, involves a wide variety of other ongoing salmon recovery measures within the region in general and probable continuation of existing conditions at the three candidate acclimation sites. The effects of other recovery measures have been addressed in the environmental documentation for the respective programs, and need not be included here. With respect to the specific potential acclimation sites, the consequences of no action on this proposal are represented by the affected environment description provided for each resource area. These conditions are broadly summarized for each resource in Table 2-1, which compares the environmental effects of the alternatives.

The effects of Alternative 2, involving development of juvenile fish acclimation facilities, were assessed on the basis of the facility construction and operation plans presented in Section 2.2 and the existing conditions at the three candidate sites. As noted in Section 2.2, the Corps has been able to develop much more detailed planning and design information for the acclimation facilities proposed for Big Canyon Creek than for the facility under consideration for the selected Snake River site. While the two facilities would differ with respect to the type and configuration of the acclimation structures (above-ground tanks vs. an in-ground pond), the supporting equipment and site layout would be similar. Consequently, the impact assessment for all three sites is largely based on the footprint and equipment and operations description provided for the Big Canyon Creek facility, adjusted as necessary for the Snake River sites to account for the use of a permanent, in-ground

pond. The Big Canyon Creek facilities would be very similar in appearance and configuration to the temporary facilities developed in 1996 at Pittsburg Landing, which are shown in the photograph presented as Figure 3-1.

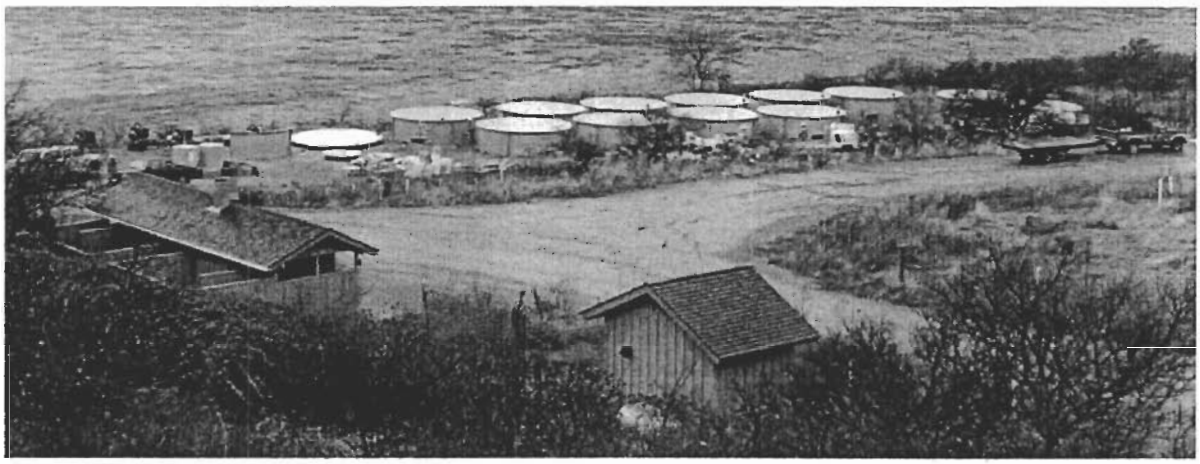

Figure 3-1. Prototype Juvenile Acclimation Facilities (Pittsburg Landing)

Alternative 3, Direct Release, would have no or minimal potential effects for most resources. The physical dimensions of this alternative involve a number of shipments by tanker truck of juvenile fish from the Lyons Ferry Hatchery in southeastern Washington to release sites likely to be located in northern Idaho, northeastern Oregon, and/or southeastern Washington. No development activity would be needed at the release sites. The only potential impact source for this alternative would be the truck traffic to and from the release sites, the presence of the trucks at the release sites for brief periods, and the consequences of outplanting juvenile salmon in the selected upriver areas. Alternative 3 would not disturb or displace vegetation, surface geology, water resources (other than, possibly, aquatic ecosystems), cultural resources, or land use, and would have no effect on regional or local socioeconomics. Depending on location and timing, it is conceivable that the truck traffic and presence could be noticed by wildlife, recreationists, or other viewers. It is unlikely, however, that this effect would cause any significant disturbance to these resources.

Consideration of the potential effects of Alternative 3 indicated that fish and other aquatic resources represented the only subject area for which impacts would warrant specific discussion in Chapter 3. Consequently, the effects of Alternative 3 on fish are addressed

specifically in Section 3.1.3, while the impact conclusions for the other resource areas are simply reported in Table 2-1. The environmental impacts of Alternative 3 are also summarized in Section 2.5.2.

3.1 FISH

3.1.1 Affected Environment

The mainstem Snake River, from Lewiston-Clarkston upstream to Hells Canyon Dam, and the lower Clearwater River support several important game and commercial fish species. Anadromous salmonid fish in both river reaches include spring/summer chinook salmon, fall chinook salmon, and steelhead trout. Additional important species found primarily in or migrating through the Hells Canyon reach of the Snake River include sockeye salmon, white sturgeon, Pacific lamprey and smallmouth bass. These species, except for sockeye salmon, are present in the lowest reaches of the Clearwater River. Other cold- and cool-water species present in the region include rainbow, cutthroat, and bull trout; mountain whitefish; northern squawfish; redside shiners; speckled dace; bridgelip and largescale suckers; channel catfish; brown bullhead; and black crappie. Distribution of cool-water species in the Clearwater River is limited because of cold-water conditions.

Steelhead are currently the most abundant adult anadromous salmonid in the region, and most of the steelhead are hatchery fish. Total escapement of hatchery and wild summer steelhead above Lower Granite Dam has ranged from 35,000 to 116,000 fish from 1985 though 1994 (Oregon Department of Fish and Wildlife [ODFW and WDFW], 1995). Steelhead are present in both the Snake and Clearwater drainages. Wild steelhead juveniles typically rear in tributaries and use the mainstem rivers primarily as migration corridors, although some rearing and occasional residualism occur in the mainstem.

Spring and summer chinook are the next most abundant adult anadromous salmonid in the Snake and Clearwater Rivers, although the number of returning wild adults has been greatly reduced in recent years. Since 1985, total wild spring and summer chinook returns have ranged from about 13,000 to less than 1,000 fish (in 1995) passing Lower Granite Dam. Juvenile spring and summer chinook use the mainstem Snake and Clearwater primarily as a migration corridor, with limited rearing use. The Clearwater River is not considered to contain habitat for listed spring/summer chinook (NMFS, 1996a). However, non-listed spring/summer chinook use both the Middle and South Forks for spawning and rearing (Matthews and Waples, 1991). The major spawning and rearing areas above Lower Granite

Dam for listed spring/summer chinook stocks include the Salmon, Grande Ronde, and Imnaha Rivers (NMFS, 1996a).

Sockeye salmon are the least abundant anadromous salmonid stock regionally. Since 1988, less than 10 sockeye have arrived annually at the only spawning area, Redfish Lake in the Salmon River drainage (NMFS, 1996a). All rearing occurs in Redfish Lake, with juveniles present in the Snake River only during spring smolt migration.

The construction of Hells Canyon Dam and other upstream dams blocked access to major spawning and rearing areas for anadromous fish, particularly for fall chinook. Historically, fall chinook distribution ranged as far upstream as Shoshone Falls, 615 miles above the confluence with the Columbia (Waples et al., 1991). The fall chinook was probably the major salmon stock using the region above Hells Canyon Dam. Historical use of the Clearwater by fall chinook is uncertain. Waples et al. (1991) only considered the lower reaches of the Clearwater to be historical spawning areas. A dam built several miles upstream of the mouth of the Clearwater River at Lewiston blocked all fall chinook access to the Clearwater River above the dam between 1927 and 1972 (NMFS, 1995a). Currently, Snake River fall chinook spawn primarily in the flowing region of the Snake River below Hells Canyon Dam, and to lesser degrees in the lower reaches of the Imnaha, Grande Ronde, Clearwater, and Tucannon Rivers and in a few isolated tailwater areas below some of the lower Snake River dams (Waples et al., 1991; Mendel et al., 1995; Garcia et al., 1994).

Wild adult fall chinook escapement over Lower Granite Dam ranged from 78 to 742 fish between 1985 and 1995 (Figure 3-2). During 1995, 115 total redds were counted in all drainages above Lower Granite Dam (Garcia, 1996), with the Snake and Clearwater Rivers accounting for 71 and 20 redds, respectively. From 1987 to 1993, about 80 percent of all redds counted on the Snake River were located above the two candidate acclimation sites, although up to 60 percent of all spawning redds were within about 12 miles of the proposed sites (Garcia et al., 1994). Fall chinook spawning has been documented to occur within 1 mile upstream and downstream of the Captain John Rapids site, but at greater distance from the Grain Elevator site (Garcia et al., 1994). The proposed Big Canyon Creek site on the Clearwater is upstream of about 80 percent of the spawning redds observed between 1988 and 1995 (personal communication, B. Arnsberg, Department of Fisheries Resources Management, Nez Perce Tribe, Orofino, Idaho, May 20, 1996). One spawning area about 0.5 mile downstream of the proposed Big Canyon Creek acclimation site accounted for 13 of 158 total redds observed during this period.

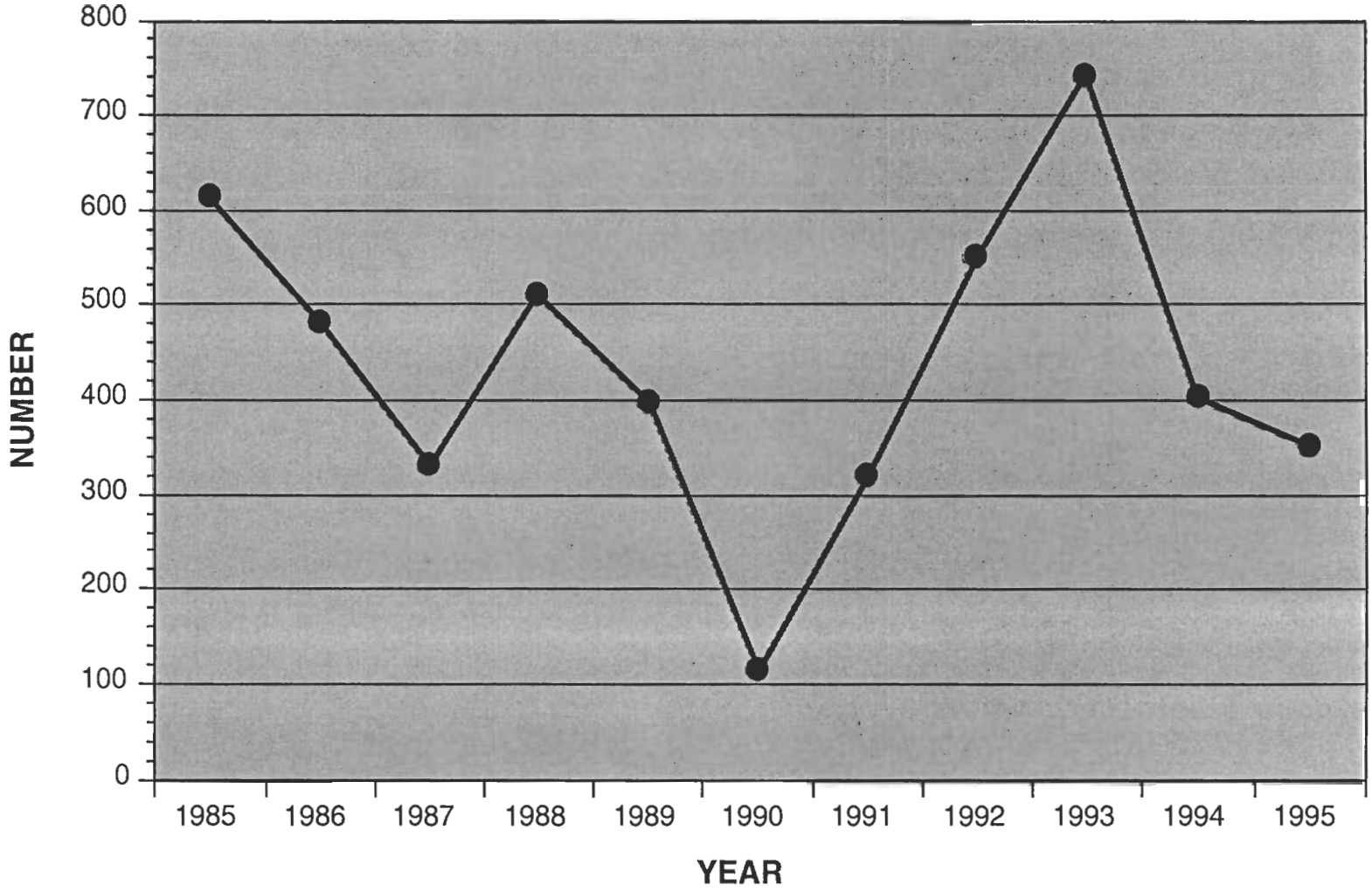

Figure 3-2. Estimated Naturally Produced Adult Fall Chinook Spawners Passing Lower Granite Dam, 1985–1995 (NMFS 1995b; personal communication, L. Lavoy, WDFW, May 23, 1996)

Clearwater and Snake River fall chinook populations are not limited by spawning habitat availability (Connor, 1994). Connor (1994) estimated that approximately 2,100 redds could be located in the Snake River below Hells Canyon Dam without superimposition (one redd being located on top of another). This compares to a maximum observed total redd count of 127 during 1993. Even considering that some redds are missed in the counts, this number indicates that the available spawning habitat is underutilized, and is not a limiting factor in the size of the population. Based on substrate and water velocity characteristics, the estimate of maximum potential Clearwater River redds for chinook is 6,000 (Connor et al., 1994), far more than has been observed.

In the Proposed Recovery Plan for Snake River Salmon, NMFS (1995a) recommended two primary actions relating to the use of hatcheries for the recovery of Snake River fall chinook. NMFS recommended that Lyons Ferry Hatchery continue as a gene bank for fall chinook to ensure maintenance of the gene pool of the native stock. NMFS believes that this hatchery provides adequate stock for supplementation purposes and that captive brood stock development, as recommended by Beven et al. (1994), was not needed at this time. Relating specifically to fall chinook supplementation, NMFS indicated "To determine if supplementation can assist in fall chinook recovery, the management plan for Lyons Ferry Hatchery should call for supplementation and be carefully evaluated in areas above Lower Granite Dam." Supplementation in the Snake River was begun in spring 1996, with the installation of an acclimation facility at Pittsburg Landing, at RM 215 in the Hells Canyon National Recreation Area (HCNRA). From late March through mid-April 1996, 116,000 Lyons Ferry fall chinook yearlings were acclimated at this facility and released into the Snake River. This program is in the process of being evaluated for its success in returning adult spawners from the acclimated fish.

Additionally, the Proposed Recovery Plan recommended other actions relating to the use of artificial propagation for fall chinook enhancement (NMFS, 1995a). The Lyons Ferry Hatchery currently releases primarily yearling fall chinook because of the greatly increased survival-to-adult return compared to the that of subyearling releases. Because of concern that yearling fish may cause some significant change in future fish characteristics compared to the natural wild smolts that migrate as subyearlings, NMFS recommended that the long-term goal of releases should be to mimic the life-history of the natural population, which outmigrate as subyearling smolts. The schedule for this action was left to resource managers to determine, based on the viability of the fall chinook population.

To minimize potential adverse effects, such as competition and predation, from interaction of hatchery fish with wild fish in the system, NMFS (1995b) also imposed a limit on the number of fish to be released from hatcheries in the Columbia River system. From 1995 through 1998, total hatchery releases will not be allowed to exceed 197.4 and 20.2 million fish in the Columbia and Snake River basins, respectively.

Other actions are occurring within and outside of the Snake River system to improve the chance of increasing Snake River fall chinook stock abundance. Actions that were generally recommended in the Proposed Recovery Plan (NMFS, 1995a) include reduced ocean and in-river harvest of fall chinook stocks; increased patrolling to prevent illegal harvest in the river; bounty on the harvest of squawfish, which prey heavily on subyearling fall chinook; modification of dam operations; physical changes in dam fish collection and bypass systems; modification of flows; and increased evaluation of the success of enhancement activities.

3.1.2 Environmental Consequences of Alternative 2

The goal of the proposed project is to use supplementation to help increase the number of wild spawning fall chinook returning to the Clearwater and Snake Rivers. The Proposed Recovery Plan (NMFS, 1995a) directed the use of supplementation for this purpose, indicating the technique was to be carefully evaluated. The need for acclimation ponds to help increase survival of planted fish was strongly recommended by NMFS (Stelle, 1994). The "Congressional Add" directed the Corps to assist in this activity by supplying expertise in engineering to complete the task of installing acclimation facilities.

The proposed actions would not affect the resident fish species within the Snake and Clearwater system. Installation and operation of the proposed acclimation facilities would cause some disruption of local stream environments, but the magnitude and extent of the disruption would be slight. The addition of migratory fish to the proposed project area could slightly increase predation on resident stocks and could also add increased prey base for some fish. However, the numbers of fish added would be relatively small and would not change the resident fish populations within these systems.

The construction and installation of acclimation facilities at any of the three sites would not have significant adverse effects on fisheries resources in the Clearwater or Snake Rivers. Minor ground disturbance from placement of tanks and equipment at any of the three sites might contribute minor amounts of sediment to the rivers (see Sections 3.4 and 3.5). This

might increase local levels of turbidity and sediment. However, the large flow and high current velocity in all areas would rapidly disperse the sediment and turbidity, causing no adverse effects to aquatic resources.

The installation of the water intakes could occur in locations of fall chinook spawning. The Corps (or the facility operators in the second and subsequent years of operation) would identify redd locations near the proposed sites, based on normal spawning surveys conducted in the fall, preceding acclimation facility installation. Through careful intake location, the Corps would attempt to ensure that no effects occur to nearby fall chinook redds at any of the proposed sites on the Clearwater and Snake Rivers. Reinitiation of consultation with NMFS would occur if any redds were found within 100 feet of the water intake or outfall pipes, and the pipes would be shifted to avoid the redds.

Operation of the fall chinook acclimation facilities raises three areas of potential interest or concern, including:

- Genetic risk/benefit
- Ecological effects
- Supplementation goals

The first two areas represent potential effects of the proposed supplementation action on the existing resources, primarily the wild salmon stock, and are discussed in more detail below. The effect of the proposed action on supplementation goals involves the expected effectiveness of the project, and therefore is addressed in Section 2.5.1.

3.1.2.1 Genetic Risk/Benefits

The proposed action of stocking hatchery yearling fall chinook may have genetic benefits, but could also increase the risk to wild fall chinook stocks. The Lyons Ferry Hatchery stock is considered to be a "gene bank" for the remaining wild stock of fall chinook. However, in past years Umatilla Hatchery stock have been unintentionally included in the culture of the Lyons Ferry stock. Efforts have been made to eliminate the Umatilla component in the hatchery stocks. Since 1990, only progeny of known Lyons Ferry x Lyons Ferry cross-origin returning adults were to be used as brood stock for Snake River releases (Blankenship and Mendel, 1994; Schmitten, 1993). This may not have totally eliminated all Umatilla effects on the Lyons Ferry stock, but should greatly have reduced the effects.

The current naturally spawning stock in the Snake River and its tributaries may already have been influenced by stray fall chinook. Electrophoretic studies from 42 fall chinook carcasses collected above Lower Granite Dam in 1992 indicate that a substantial portion of these fish have genetic characteristics more similar to the mid-Columbia River stocks than to Lyons Ferry stock (Blankenship and Mendel, 1994). Because Lyons Ferry genetic stock characteristics are considered most representative of the native wild Snake River stock, this indicates that a substantial portion of the spawning fall chinook above Lower Granite Dam are not of Snake River wild-stock origin. Although less information is specifically known about the Clearwater spawning stock, the proportion of stray Umatilla stock has apparently been greater here than that in the mainstem Snake River, with possibly a greater influence on current spawning stock composition (personal communication, B. Connor, Fisheries Biologist, USFWS, Ahsahka, Idaho, May 8, 1996). Considering that the Lyons Ferry stock is being controlled to maintain the original Snake River stock, stocking these fish in the Snake and Clearwater Rivers could have a beneficial effect on the genetic characteristic of the natural spawning populations in these streams. Returning adult fish of stocked Lyons Ferry smolts might increase the proportion of spawners in these streams that carry the original Snake River stock characteristics. An increased proportion of spawners with the original stock characteristics might be expected to increase the proportion of future returning spawners carrying the Snake River genetic characteristics if natural spawning by hatchery-reared fish contributed significantly to juvenile production and subsequent adult return. If this change occurred, the effect would be to reduce the proportion of non-native fish in these systems.

There are varying degrees of genetic risk associated with supplementation. Long-term monitoring information on supplementation is rare. Miller et al. (1990) evaluated 316 production projects; of those, only 26 were considered supplementation projects, of which 18 were quantitatively evaluated and 14 were ongoing. This evaluation concluded that four general factors appear to correlate with success of supplementation projects: (1) length of freshwater residency; (2) distance to the ocean; (3) distance between stocks used; and (4) rearing type (e.g., lake, river, stream). Based on these criteria, the proposed supplementation project falls in the middle range of likely success. Using a local stock suggests a high chance of success, but the long distance from the ocean suggests a low chance of success.

One area of concern for introduction of hatchery fish to the wild is the potential influence on wild stock genetics. Effects of this type remain primarily conjecture, because few long-term

studies have been conducted (Steward and Bjornn, 1990). However, in some cases hatchery stock reproduction success in the wild has been found to be diminished relative to native wild stocks. Hulett et al. (1996) reported that spawning hatchery winter steelhead ranged from 0 to 17 percent as effective at producing returning adults as natural wild spawning winter steelhead on the Kalama River system. In one case, the escapement of over 200 spawning hatchery adult winter steelhead failed to produce any detectable adult returns. These results follow similar past trends reported for hatchery and wild steelhead on the Kalama River (Chilcote et al., 1986; Lieder et al., 1990). However, these results compare non-native fish to natural wild stocks, which may have influenced the results. Reisenbichler (1996) concluded that increasing generations in the hatchery resulted in progressive declining fitness for natural rearing, which in turn would reduce the carrying capacity and productivity for naturally spawning populations. Another study that compared response of hatchery and wild steelhead of the same genetic stock found negative effects of hatchery actions on stock viability. Berejikian (1995) found that wild steelhead fry avoided predation at a significantly higher rate than hatchery steelhead fry of the same genetic stock.

These results suggest that even stock-specific genetic characteristics may be significantly altered by hatchery practices that lead to adverse survival consequences if these traits were to be carried on to wild fish. Even the best hatchery efforts might alter future genetics. As Waples (1991) suggested in his evaluation of hatchery and wild fish interaction, unless delayed selection (i.e., that which occurs after fish are released into the wild) removes the same genotypes that naturally would have been removed earlier, the cultured fish would not be genetically equivalent to their natural counterparts. The degree to which the hatchery practices at Lyons Ferry may have influenced the future characteristics of this stock is unknown. However, if some adverse characteristics have developed in the Lyons Ferry stock, releasing this fish above Lower Granite Dam could increase transfer of these characteristics to future fall chinook generations. Currens and Busack (1995) imply that if the chance of extinction does not have a very high probability, effects of domestication (i.e., rearing in hatcheries) may pose a greater risk to wild salmon stocks than no action.

The release of yearling instead of subyearling fish might also alter future stock characteristics. The wild stock of the Snake River migrates primarily as subyearlings. The present and proposed Lyons Ferry practice is to release primarily yearling fish to increase survival (about 7 times higher survival to adult return for yearling versus subyearling releases [Mendel et al., 1995]). While this practice increases adult returns, its effect on future stock characteristics is not clear. While Hankin et al. (1993) found that yearling

releases of fall chinook in another region reduced the age of returning fish, Mendel (personal communication, G. Mendel, Fisheries Biologist, Hatcheries Program, Snake River Laboratory, WDFW, Dayton, Washington, May 20, 1996) indicates that age composition of returning adults appears to be similar between yearling and subyearlings release of Lyons Ferry stock. Even so, the number of returning "jack" salmon (premature adults) is high, suggesting some effects of hatchery operation on fish age composition at time of return. Also, Schmitten (1993) stated "It must be assumed that changing from subyearling to yearling release strategy will alter the selective regime experienced by the fish." Current survival estimates (Stelle, 1995) suggest that about 262 returning adult spawners are expected from every 150,000 to 200,000 yearling smolts released into the Snake River, while about 33 would return from the same number of released subyearlings (Stelle, 1995). Similar values may occur for the Clearwater releases. While the returning number of adults from yearling releases is likely to be much higher, the effect on the future genetic characteristic of this action is not clear and could be detrimental over the long term. The Proposed Recovery Plan (NMFS, 1995a) acknowledges this concern by stating that "the long-term goal" is to mimic the life history of the natural population, which would include phasing in subyearling smolt releases. The time frame for this action was not indicated.

The Lyons Ferry Hatchery is the gene pool for the remaining Snake River fall chinook stock. Consequently, shifting smolt releases from Lyons Ferry to upriver areas, and the subsequent additional outmigration mortality from passing two more Snake River dams, might reduce future genetic diversity available at the Lyons Ferry Hatchery. The current plan is to release approximately 150,000 to 200,000 yearling smolts each from the three Clearwater and Snake River facilities. Stelle (1995) assumed a loss of 15 percent from the release site to Lower Granite Dam and another 15 percent to Little Goose Dam tailrace for outmigrants from the Pittsburg Landing facility. This would be a cumulative loss of 28 percent, or about 42,000 smolts. This loss would be in addition to losses incurred from fish that are released from Lyons Ferry Hatchery. The Pittsburg Landing loss estimate would probably apply to fish released in the Clearwater also, because they would be yearling fish. This would equal a reduction of about 112 adult fish for each acclimation site, if these fish had been released from Lyons Ferry instead (assuming smolt-to-adult survival of 0.269 percent; Stelle, 1995). While the number of naturally spawning adults returning to the Snake River could increase, the net effect would be to make fewer adult fish available to the system.

Although the transfer of smolt releases would be limited to those fish not needed to meet the hatchery goal (Mendel et al., 1995), the available genetic pool could be reduced if unexpected low adult returns to the hatchery occur following transfer. Also, one of goals of the proposed action is to increase the diversity of spawning wild stocks, helping to offset negative effects that may occur from hatchery culture. The reduced number of total returning adults (hatchery plus wild fish) to the system could cause some genetic risk, and would not support this diversity goal.

In future years, the survival of offspring from spawning adult hatchery-origin fish might be low, particularly for the Clearwater. Smith et al. (1996) estimated survival of wild subyearling fall chinook (based on recent PIT-tag studies) from the Snake River to the Lower Granite tailwater at 67 percent for fish originating above, and 66 percent for fish originating below the Grande Ronde River. Survival of Clearwater fish to below Lower Granite in 1995 was about 16 percent, which is about 23 percent as high as the survival rate for Snake River stock. While these data are preliminary, they suggest that if these survival values hold in the future and all other factors remain the same, production of fish in the Clearwater might never be self-sustaining and might require continued fish stocking. Long-term effects of continually stocking hatchery fish to add to wild fish numbers are not known, but could be detrimental to the genetic characteristics of this stock.

3.1.2.2 Ecological Effects

Construction and operation of the proposed acclimation facilities has the potential for direct and indirect effects on the aquatic ecosystem, including wild fall chinook, other anadromous fish, resident fish, and other aquatic resources. The potential effects relate to competition for food, transmission of disease, predation, harvest, interference with homing, effluent discharge, and entrainment.

The increased number of yearling fish released into the Snake and Clearwater Rivers would increase competition for available food resources in both systems. These fish would be in addition to the number normally migrating in the Snake and Clearwater Rivers (above the Lyons Ferry Hatchery). However, the fish that would be released from the proposed facilities are accounted for in the limitation on hatchery releases to the Snake River basin (NMFS, 1995b), and should therefore not cause significant adverse effects through competition.

Release of these fish could increase disease transmission from hatcheries into the Snake and Clearwater system. Standard protocols would be used to ensure that the chance of disease transmission would be reduced. Stocking of hatchery fish in the Snake and Clearwater Rivers has already occurred, so there would be no additional effect from the proposed supplementation.

The yearling smolts released into the rivers could potentially prey on wild fall chinook fry. Such predation would probably be limited to the smallest native fall chinook, and the size difference is generally not great enough to allow significant predation on the majority of fall chinook fry by the yearling smolts (Stelle, 1995). The chances of predation might be greater in the Clearwater River where fish growth is slower and native fall chinook are smaller than in the Snake River. However, the stocked fish would also outmigrate rapidly before most wild fry have emerged, and would occupy deeper water than most native stocks, thereby reducing their interaction.

If the proposed supplementation project is successful at increasing Snake River fall chinook salmon population numbers, an effect of the population increase could be to induce fishery harvest managers to allow greater harvest of fall chinook stocks. Fall chinook salmon are currently exploited in commercial and recreational fisheries, and wild Snake River fall chinook could be adversely affected if harvest pressure on the stock increased. Given the depressed condition of this stock, however, the Corps assumes that federal, state, and tribal fishery managers would take appropriate measures to ensure that potential adverse effects from increased harvest of wild fall chinook would be avoided. The Corps notes that the managers of the proposed Nez Perce Tribal Hatchery, which faces a parallel risk of adverse harvest effects if that program is successful, have committed to coordinated harvested management that would protect the wild fall chinook stocks (BPA, 1996).

The location of the Clearwater site just downstream of Big Canyon Creek has little potential to increase homing of returning fish to this creek instead of the river. The water intake would be about 1,200 feet below the creek in a fairly constricted, high-velocity region. This location would allow adequate mixing and dilution of the low flow of the creek water with that of the Clearwater, which should eliminate problems with fish homing on the creek (Walker, 1996).

The acclimation operations would discharge unused fish food and biological waste to the Snake and Clearwater Rivers. These discharges would be for a short duration and would be

highly diluted in both rivers. Consequently, these effluents are not expected to have any adverse effects on aquatic organisms.

Water intake from the rivers could entrain juvenile fish or eggs, including native fall chinook in both rivers and white sturgeon in the Snake River. To prevent entrainment of fish and eggs, water intake velocity would be maintained at less than 0.4 foot per second and fine mesh screen (0.079 inch) would be installed over all openings. Based on the mitigation proposed and the expected low level and chance of impact, potential entrainment is not anticipated to cause significant impacts to the aquatic ecology of the Snake or Clearwater Rivers.

3.1.3 Environmental Consequences of Alternative 3

The ecological effects of the direct release of smolts would be the similar to those of Alternative 2, except as noted below.

No direct construction or installation effects within the affected rivers would occur as a result of direct release.

Survival during migration might be lower for direct-release fish than for those acclimated before release. For example, Fast et al. (1991) found over 4 years of study that survival of spring chinook yearling smolts acclimated in ponds in the upper Yakima River was 47 percent greater than survival of fish released directly to the river without acclimation. However, survival differences might not be as dramatic in the Snake River system. Mendel indicated that downstream migration survival of spring chinook released directly into the Tucannon River was, for some sample groups, higher than those released from acclimation ponds on the Tucannon (personal communication, G. Mendel, Fisheries Biologist, Hatcheries Program, Snake River Laboratory, WDFW, Dayton, Washington, May 20, 1996). Mendel also indicated these data were preliminary, and results appeared to be affected by differing flows at the time of release.

Migration survival and adult return rates under Alternative 3 could also depend on the age of the fish released directly to streams. Current plans for direct release of fall chinook are to use yearling fish, which have a higher rate of survival to adult returns than do subyearling fish (as noted previously), although it is possible that subyearlings would be used in the relatively near future. Direct release of subyearlings might provide greater success in adult returns because the subyearlings would remain in the release streams longer and would

therefore be more likely to imprint on these streams. In contrast, yearlings would outmigrate soon after release and would be less likely to imprint on the target stream.

The level of straying by returning adults could be higher for direct releases compared to acclimated fish. Fish directly released are expected to migrate rapidly downstream. Rapid migration would allow only a short time for fish to develop homing cues to the Snake or Clearwater River release areas. Because the Lyons Ferry Hatchery, where smolts would be raised, is downstream of the release sites on either the Snake or Clearwater Rivers, returning fish might be more inclined to return to the Lyons Ferry Hatchery than the upstream release areas. This would result in fewer fish returning to spawn in the upstream reaches.

Considering that overall survival and homing might be worse with direct release, this alternative would likely have lower success than Alternative 2 in increasing numbers of adult fish returning to spawn naturally in the Clearwater and Snake Rivers.

3.2 VEGETATION AND WILDLIFE

3.2.1 Affected Environment

3.2.1.1 Vegetation

Big Canyon Creek

The Big Canyon Creek site occupies approximately 2 acres of a natural, low river terrace between the Clearwater River and U.S. Highway 12. Most of the site consists of a graveled parking lot, with limited, generally disturbed riparian and grassland vegetation occurring between the parking lot and the river. Vegetation at the site has been disturbed primarily through development of river access and associated recreational activities, but also recently by flooding as evidenced by erosion, exposed cobbles and boulders along the river bank, uprooted trees, and other scattered debris. Trees at the site consist primarily of a narrow line of young ponderosa pines, most of which are 20 to 25 feet tall, that borders the north side of the parking lot; in addition, a few scattered cottonwood and willow trees are located near the shoreline, particularly at the east end of the site toward the mouth of Big Canyon Creek. A band of exposed river gravel (approximately 20 to 30 feet wide on an April 29, 1996 site visit) characterized by a limited amount of grass and riparian vegetation occurs between the ponderosa pines and the river; most of this vegetation consists of introduced grasses and weeds and small willows and cottonwoods.

Vegetation surrounding the site consists of a mixture of grass, shrub, and forest communities. The north canyon wall opposite the site drops steeply to the river and is characterized predominantly by grass, some shrubs, and scattered pine trees intermingled with basalt rock outcroppings. Directly south of the site across U.S. Highway 12 is a low, rounded hill that has recently been burned and/or harvested and replanted within the past few years. The south walls of the main canyon upstream and downstream of the site are generally forested. Tree species typical of forests in the vicinity of the site include grand fir, lodgepole pine, and ponderosa pine (personal communication, R. Oliver, IDFG, Lewiston, Idaho, June 4, 1996).

Captain John Rapids

The Captain John Rapids site is located on a river bar and terrace that occupies approximately 6 acres of land between the Snake River and Snake River Road. (Only a portion of this area would be used for the proposed acclimation facilities.) Vegetation at the site has been disturbed by grazing and informal recreational use. Approximately 65 percent of the site consists of exposed sand with the remainder comprised of disturbed vegetation, including a thin but relatively complete cover of grass with scattered shrubs and a few (primarily hackberry) deciduous trees. Boulders and rock outcrops are scattered throughout the site.

Vegetation surrounding the site is typical of dry Snake River canyon country, and consists primarily of grassy slopes and extensive basalt rock outcroppings along somewhat rounded canyon walls. Shrubs and trees are limited and occur primarily in canyon draws and at the base of canyon walls. Important shrub and shrub-steppe communities, including rimrock steppe vegetation, occur along the slopes above the site (WDFW, 1996). Grasses typical of such slopes include bluebunch wheatgrass and sandberg's bluegrass, with cheatgrass brome occurring in disturbed areas (U.S. Forest Service [USFS], 1996).

Grain Elevator

The Grain Elevator site is located within a triangular-shaped parcel that occupies approximately 13 acres of river terrace between the Snake River and Snake River Road. Vegetation at the site is generally undisturbed and consists primarily of native and introduced grass and shrub cover over river cobble. A few small trees (hackberry and willow) are located at the edge of the river. Riparian shrub vegetation covers at most 10 percent of the shoreline at the site. Plant species identified at the site include needle-and-

threadgrass, Sandberg's bluegrass, cheatgrass, green rabbitbrush, prickly pear, sweet clover, and saxifrage.

Vegetation surrounding the site is typical of dry Snake River canyon country and is similar to that described previously for the Captain John Rapids site, located approximately 6 miles to the south. Important shrub and shrub-steppe communities, including rimrock steppe vegetation, occur along the slopes above the site (WDFW, 1996).

3.2.1.2 Wildlife

Big Canyon Creek

Wildlife species expected to occur in the vicinity of the Big Canyon Creek site are those associated with the primary habitat types present, as described in Section 3.2.1.1. In general, riparian habitat of the Clearwater River provides an important travel, resting, and foraging corridor for various species of wildlife, particularly big game, waterfowl, and songbirds. An osprey was observed foraging in the Clearwater River adjacent to the site during a site visit conducted on April 29, 1996. Other typical species of wildlife known to occur in riparian habitats and/or adjacent upland areas in the vicinity of Peck, and thus expected to occur in the site vicinity, include rattlesnakes, bullsnakes, garter snakes, grouse, bald eagles, various songbirds, beavers, raccoons, coyotes, black bears, bobcats, cougars, white-tailed deer and elk (personal communication, R. Oliver, IDFG, Lewiston, Idaho, June 4, 1996). Moose may occasionally travel through the site vicinity along the riparian corridor. The upland areas surrounding the site provide important wintering habitat for elk and white-tailed deer (personal communication, R. Oliver, IDFG, Lewiston, Idaho, June 4, 1996).

Because most of the Big Canyon Creek site is relatively disturbed by human-related site modifications, wildlife use of the immediate site is likely limited. This disturbance is primarily associated with physical modification of the site for use as a sportsman river access (including a graveled parking area, boat launch ramp, and toilet facilities), which has limited habitat values on the site. In addition, vehicles traveling along U.S. Highway 12 and trains using an active railroad line across the river create ongoing disturbance for wildlife.

Captain John Rapids and Grain Elevator

Wildlife occurring in the vicinity of the Captain John Rapids and Grain Elevator sites are discussed together due to the proximity (approximately 6 miles apart) of the two sites and the similarities in habitat types, as discussed in Section 3.2.1.1. Species of wildlife in the vicinity of these two sites are expected to be similar to those occurring in the HCNRA, located approximately 9 miles south (upstream) of the Captain John Rapids site and 15 miles south of the Grain Elevator site. Approximately 360 species of wildlife are known to occur in the HCNRA (USFS, 1994). The Snake River in particular provides an important migration and travel corridor for a number of wildlife species, particularly waterfowl and big game (USFS, 1996).

The WDFW has identified both the Captain John Rapids and the Grain Elevator sites as being entirely encompassed by priority wildlife habitat (WDFW, 1996). Riparian habitat near the two sites, including open water habitat of the Snake River, is considered important in supporting relatively diverse wildlife such as great blue herons, chukar, and various species of waterfowl, particularly geese (WDFW, 1996). In particular, the two Snake River sites may provide nesting or feeding habitat for migratory birds. Wildlife known to occur in areas characterized by rimrock steppe and shrub-steppe vegetation upland from and adjacent to the riparian corridor near the sites include chukar, Hungarian partridge, quail, and mule deer (WDFW, 1996). Upland areas are particularly important in providing habitat for bighorn sheep and regular large concentrations of wintering mule deer (WDFW, 1996). Other species expected to occur in riparian and/or upland areas of the site vicinity include rattlesnakes, grouse, ravens, hawks, bats, bobcats, and cougars (USFS, 1996). A gopher snake was observed at the Grain Elevator site during an April 29, 1996, site visit.

Because the Captain John Rapids site has limited vegetation and is fairly disturbed by human-related activities (including nearby vehicle traffic, recreational activities, and grazing), wildlife use of this site is likely limited. The Grain Elevator site may support a somewhat greater diversity of wildlife because it is less disturbed than the Captain John Rapids site, although the proximity of Snake River Road and several dwellings also likely limits wildlife use of the immediate site vicinity to some extent.

3.2.2 Environmental Consequences

3.2.2.1 Vegetation

Potential effects of the proposed action on vegetation at the three sites would predominantly be limited to removal or disturbance of vegetation for construction of the proposed facilities. Construction of an acclimation facility at Big Canyon Creek would not significantly affect vegetation at the site because the facility would be located primarily on an existing graveled parking lot, vegetation adjacent to the site has been previously disturbed, and no trees would be removed. Development of an acclimation facility at Captain John Rapids would also not significantly affect vegetation because most (about 65 percent) of the site is located on sand, the vegetation at the site has been disturbed by grazing and thus consists predominantly of introduced grass species, and no trees would be removed. However, some previously disturbed vegetation would be disturbed or removed by project construction, affecting from 2 to 3 acres of land. Project construction at the Grain Elevator site would likely disturb or remove some existing native grass and shrub species on approximately 2 to 3 acres of land. However, native vegetation at this site is intermixed with introduced grass species due to past disturbance activities; thus, although the project would affect some native vegetation, the effects would not be expected to be significant.

3.2.2.2 Wildlife

Potential project effects on wildlife from Alternative 2 would be removal and disturbance of wildlife habitat, and disturbance and displacement of individuals during project construction and operation. Construction and operation of the proposed acclimation facilities at Big Canyon Creek and at the Captain John Rapids or Grain Elevator sites would not likely have any significant effects on wildlife habitat or wildlife occurring in the vicinity of the sites. The facilities would be set up primarily in previously disturbed areas and thus would not be expected to significantly disturb any native vegetation providing potential habitat for wildlife, and no trees are expected to be removed to accommodate the facilities (see Section 3.2.2.1). Some potential disturbance or displacement of wildlife could occur, particularly at the Grain Elevator site, but this effect would likely be limited to the immediate site vicinity and the seasonal period of construction (January through February) and operation (approximately March through early June). Existing wildlife use of the three sites is likely limited to some extent by current and past levels of human-related activities and disturbance; the proposed fish facilities would not be expected to significantly exceed

disturbance levels of existing activities at any of the three sites, with the possible exception of the Grain Elevator site (see Section 3.2.1.2). Effects on the aquatic environment associated with the three sites are discussed in Section 3.1.

3.3 ENDANGERED AND THREATENED SPECIES

3.3.1 Affected Environment

3.3.1.1 Fish

Three species of fish listed under the ESA may occur at the Clearwater and/or Snake River sites addressed in this EA. The three species are all wild Snake River salmon stocks, including the endangered sockeye salmon (*Oncorhyncus nerka*) and the threatened fall chinook and spring/summer chinook salmon (*O. tshawytscha*). The Corps has completed informal consultation with NMFS under Section 7 of the ESA concerning the potential effects of construction of the Big Canyon Creek facilities on the listed species (see Appendix A), and will similarly consult with NMFS prior to development of a Snake River facility. The USFWS and the Tribe, as operators of the proposed facilities, have responsibility for consultation on the effects of the acclimation and release operations. The USFWS/Tribe has completed consultation with NMFS for the operation of the Big Canyon Creek facilities and will similarly consult with NMFS prior to development of a Snake River facility. Based on the prescribed ESA timetables for consultation, NMFS will issue separate Biological Opinions on the likely effects of the proposed facilities prior to the actions on the Snake River acclimation project.

Candidate species have no legal protection under the ESA; however, they are being addressed here to ensure the proposed actions have considered the needs of any known candidate species. One candidate species, the bull trout (*Salvelinus confluentus),* may occur within the geographic area of the proposed Snake River project sites (USFWS letter of May 21, 1996). Additionally, several wild steelhead stocks including wild summer steelhead present in the Snake River Basin were proposed for listing as threatened (FR 61/155) on August 9, 1995. The distribution of wild summer steelhead includes both the lower Snake and Clearwater Rivers in the vicinity of the proposed acclimation sites.

3.3.1.2 Vegetation and Wildlife

No Federally listed species of plants are known or expected to occur in the vicinity of the three sites. One state-sensitive plant species, the Snake Canyon desert-parsley (*Lomatium*

serpentinum), has been documented to occur in the general vicinity of the Captain John Rapids site (WDNR, 1996). This species occurs on open, often rocky slopes in and near the Snake River Canyon (Hitchcock et al., 1990).

Species of concern have no legal protection under the ESA; however, they are being addressed to ensure the proposed actions have considered the needs of any known species of concern. Two species of concern, Jessica's aster (*Aster jessicae*) and broad-fruit mariposa (*Calochortus nitrides*), may occur within the geographic area of the proposed Big Canyon Creek site (USFWS letter of June 11, 1996).

Three Federally listed threatened or endangered species of wildlife may occur in the vicinity of the three sites, including the peregrine falcon, the wintering bald eagle, and gray wolf. The occurrence of these species in the vicinity of the three project sites is discussed in more detail in Appendix A and is summarized below.

The Big Canyon Creek site is within the potential range of a non-essential experimental population of the endangered gray wolf (*Cannes lupus*). Gray wolf sightings, or evidence of gray wolf use, in the general area of the site have not been documented (personal communication, K. Lawrence, Wildlife Biologist, Nez Perce Tribe, June 6, 1996).

The bald eagle (*Haliaeetus leucocephalus*), which is listed as a threatened species under the ESA, is known to occur within the geographic area of all three candidate sites under consideration for the proposed action. Bald eagles are common winter residents in the vicinity of all three sites, but reproduction has not been documented near any and none of the sites provide perching/roosting trees.

The two Snake River sites are within the range of the endangered peregrine falcon (*Falco peregrinus*). Neither of the proposed sites contains potential hack sites for peregrine falcons (personal communications, K. Martin, Wildlife Biologist, USFS, June 5, 1996 and C. Johnson, Fisheries Biologist, U.S. Bureau of Land Management, June 6, 1996).

3.3.2 Environmental Consequences

3.3.2.1 Fish

The Corps has completed an assessment of the potential effects of constructing the proposed Big Canyon Creek facility on the listed salmon stocks (see Appendix A). The Corps concluded that the proposed action would not affect the Snake River sockeye or

spring/summer chinook salmon stocks, because no individuals of these listed stocks would be present in the Clearwater River in the winter of 1996-1997. Based on the timing of spawning activity, fry emergence, and outmigration, and on the nature of the proposed construction activities, the Corps concluded that construction and installation of the acclimation facility at Big Canyon Creek would not likely harm individuals of the listed stocks. NMFS concurred with the Corps' determination that construction of the Big Canyon Creek facilities is not likely to adversely affect listed Snake River fall chinook salmon or their critical habitat.

The Corps will prepare a corresponding assessment addressing construction of an acclimation facility at the selected Snake River site at the appropriate time in the future, once a site has been selected and in accordance with the ESA consultation timetables.

The Tribe prepared a Biological Assessment on operation of the proposed Big Canyon Creek facility and concluded the project may affect but will not adversely affect Snake River spring/summer and fall chinook salmon and Snake River sockeye salmon. NMFS concurred that the operation of the project is not likely to adversely affect the listed species or their critical habitat. The Tribe will also prepare a subsequent assessment for operation of the proposed Snake River facility.

The water intakes for the acclimation facility's pumps would be adequately screened and the currently planned operations are not scheduled to occur during the late summer and fall when bull trout will be spawning. Therefore, no effects on bull trout are expected.

3.3.2.2 Vegetation and Wildlife

Jessica's aster and broad-fruited mariposa do not occur on or directly adjacent to the Big Canyon Creek site; therefore, the project would not affect these species of concern (personal communications D. Davis, Wildlife Biologist, USFS, June 6, 1996 and C. Johnson, Fisheries Biologist, U.S. Bureau of Land Management, June 7, 1996).

Facilities proposed at the Captain John Rapids site are not expected to affect the Snake Canyon desert-parsley because open and rocky slopes providing habitat for this state-sensitive plant species would not be affected by project construction or operation.

A biological assessment prepared by the Corps (Appendix A) has determined that constructing and operating the fish acclimation facilities at the Big Canyon Creek, Captain John Rapids, and/or Grain Elevator sites is not likely to adversely affect peregrine falcon, gray wolf, or bald eagle use of the project area, or the habitats used by these listed species.

With respect to the gray wolf, this conclusion is based on the lack of documented gray wolf use of the project area, the considerable existing human disturbance at and near the Big Canyon Creek site, and the lack of feeding habitat at the site.

Development of an acclimation facility at Big Canyon Creek and at one of the Snake River sites is not expected to reduce the availability of waterfowl, fish, or carrion as prey for bald eagles. Facility operation at Big Canyon Creek could increase the noise, and perhaps the already high human disturbance effects, and thereby possibly causing waterfowl to move away from the site. However, waterfowl would remain available upstream and downstream of the site. Resident waterfowl would adjust to the increased noise levels and probably return to the site after an adjustment period. Wildlife habitat on the north bank would provide raptors with a much higher prey base, better feeding habitats, and less human disturbance than the south-bank site proposed for the facility. Therefore, no effects on the feeding habitat or prey base of bald eagle at Big Canyon Creek are expected to occur (personal communication, D. Davis, Wildlife Biologist, USFS, June 6, 1996 and K. Lawrence, Wildlife Biologist, Nez Perce Tribe, June 6, 1996).

Similar conditions and conclusions apply to bald eagle and peregrine falcon use of the two Snake River sites. Development on an acclimation facility is not expected to reduce the availability of waterfowl, fish, or carrion as prey. Facility operation could increase the noise, and perhaps the existing human disturbance effects, and thereby possibly cause waterfowl to move away from either site. However, waterfowl would remain available upstream and downstream of the sites. Resident waterfowl would adjust to the increased noise levels and probably return to the site after an adjustment period. The east bank, opposite these two west-bank sites, has no public road close to the shoreline and the majority of the land is operated by the IDFG as a portion of the Craig Mountain Wildlife Management Area. The IDFG-managed wildlife habitat on the right bank provides raptors a much higher prey base, better feeding habitats, and less human disturbance than the candidate acclimation sites. Therefore, no effects on the feeding habitat or prey base of peregrine falcon or bald eagle are expected.

3.4 GEOLOGY/SOILS

3.4.1 Affected Environment

3.4.1.1 Geology

The candidate sites for the fall chinook acclimation facilities are all located in the margins of the Columbia Plateau. The dominant geologic feature of the Columbia Plateau is the presence of thick sequences of "flood" basalts, which poured out in great quantities from fissures that generally coincide with the present margins of the plateau. Some of these fissures are near the project sites. The Snake and Clearwater Rivers have incised into these basalts, carving steep, narrow canyons. Because the rivers are incised into bedrock, they have very little floodplain.

The project sites are located on the thin strip of floodplain found along the narrow canyons. The floodplains are actually terraces composed by material deposited during high flood stages. In the case of the Big Canyon Creek site, the Clearwater River floodplain is also part of the Big Canyon Creek floodplain terrace.

3.4.1.2 Soils

The Big Canyon Creek site is located on the alluvium associated with the confluence of Big Canyon Creek and the Clearwater River. Soils forming on the alluvium are very young and highly permeable, being composed primarily of sand and gravel. A portion of the site is composed of fill material placed in the site to create the parking area for the sportsman access.

The Captain John Rapids site is located on an older terrace of the Snake River. The terrace may have been deposited in the Bonneville Flood, approximately 15,000 years ago. Soils are still relatively young and weakly developed. The soils are highly permeable and have few construction limitations. A portion of the terrace consists of eolian (wind-deposited) material that is easily blown by the wind when disturbed.

The Grain Elevator site is similar to the Captain John Rapids site, being located on a river terrace. The underlying material is primarily alluvium (river deposits), ranging from silt-sized particles to cobbles, which are exposed in many places at the surface. The soils of this site are also highly permeable and subject to wind erosion when disturbed.

The Grain Elevator site is similar to the Captain John Rapids site, being located on a river terrace. The underlying material is primarily alluvium (river deposits), ranging from silt-sized particles to cobbles, which are exposed in many places at the surface. The soils of this site are also highly permeable and subject to wind erosion when disturbed.

3.4.2 Environmental Consequences

Effects related to the proposed acclimation facilities can be divided into effects of the project on site geology and soils, and effects of soils and geology on the project; the latter effects, in turn, may affect project operation or other resources. It is anticipated that both types of effects would be negligible.

3.4.2.1 Geology

Geologic effects of both types are expected to be minimal. There are no active or dormant volcanoes in vicinity of the project area, and the project area experiences generally low levels of seismicity. While small rockfalls occasionally emanate from the canyon walls at all three sites, these are typically infrequent and not of a magnitude that would disturb project facilities. In addition, there is some distance at each site between the canyon walls and the project facilities, which would make the impact of any rockfalls unlikely.

The Big Canyon Creek site is on an active alluvial terrace of Big Canyon Creek, as evidenced by scouring that occurred during the winter and spring of 1996. If similar flooding occurs during the project life (estimated at 20 years), project facilities could be damaged. However, the project would not significantly affect deposition or erosion at the alluvial terrace on which it would be located.

3.4.2.2 Soils

The soils at each site do not have characteristics that are adverse for construction. Because the soils are predominantly coarse grained, they are unlikely to exhibit shrinking/swelling or collapse. However, these soils may be eroded by wind if disturbed. Grading during project construction could cause minor amounts of wind erosion. This could be minimized by periodically wetting disturbed soils during the construction phase.

While some loss of productive soils would occur because of the project, the soils at each of the sites are not classified as unique or prime soils. In addition, the soils at the Big Canyon Creek site have been scraped, leveled, and covered by fill through construction of a parking

area. Excavation for construction of a permanent, in-ground pond at either one of the Snake River sites would represent a somewhat more intensive ground disturbance than placement of above-ground tanks at Big Canyon Creek. However, the area disturbed will still be very small and, with use of erosion control measures, surface disturbance impacts would still be insignificant.

3.5 WATER RESOURCES

3.5.1 Affected Environment

The project sites are located adjacent to three water bodies: the Snake River, with an average annual flow of 34,800 cfs (at Anatone, Washington); the Clearwater River, with an average annual flow of 15,800 cfs (at Peck); and Big Canyon Creek, a small tributary to the Clearwater. There are no other perennial streams or other significant water bodies in the vicinity of the three sites. Rivers in this part of the Snake River basin typically experience peak flows in late spring and early summer, and low flows in early fall. The peak flows correspond to the snowmelt period.

The Snake River upstream of the two candidate sites flows through grazing and agricultural areas before entering Hells Canyon. The water quality is poor by the time the river reaches Hells Canyon (USFS, 1994). The water tends to be high in suspended sediment, nutrients, and bacteria. By the time water reaches the project site, water quality may be improved slightly through dilution by the relatively less intensely used Salmon, Imnaha, and Grande Ronde Rivers and smaller tributaries. Upstream from the two Snake River sites, at Pittsburg Landing, dissolved nitrogen levels, in the past, have not been harmful to fish.

The Clearwater River at the Big Canyon Creek site is relatively undeveloped, and has somewhat better water quality than the Snake River. For example, its fecal coliform and hardness levels are about one-tenth that of the Snake River. The Clearwater River is also much cooler than the Snake, particularly during the summer.

3.5.2 Environmental Consequences

Construction and operation of two acclimation facilities, as proposed for Alternative 2, is expected to have minimal impacts to water quality. Disturbance of the soils at any of the three sites could cause minor wind and/or water erosion, but this erosion would be very short-lived, and would be small relative to the volumes of water passing by the sites. Wind

erosion can be avoided by wetting the disturbed soil during construction. Effects of water erosion can be minimized by proper erosion control methods such as seeding, mulching, and installing sediment barriers. Depending on the number and size of fish acclimated at each facility, a National Pollution Discharge Elimination System (NPDES) permit might be required for facility operation. Acclimation of 200,000 fish at one site would approach or reach the permit threshold of 20,000 pounds of fish. If this threshold were to be exceeded, the facility operators would comply with the permitting regulations.

Fish waste and excess food would be flushed seasonally from the tanks into the Snake and Clearwater Rivers. However, the volume of waste and food would be small compared to the volume of flow in the rivers, and would be diluted rapidly to minimal concentrations.

While potential exists for small fuel spills related equipment on site, these would be avoided by proper spill prevention planning, including containment systems.

3.6 CULTURAL RESOURCES

3.6.1 Affected Environment

Between 1889 and 1908, Alice Fletcher and Herbert Spinden made anthropological investigations among the Nez Perce. They found that ethnographic Nez Perce land use patterns in the region involved the use of the lower canyons for winter settlement, fishing, and fall and winter hunting (Fletcher, 1891; Spinden, 1908). Numerous villages were located on the Clearwater River and the lower Snake. Typically, individual villages were located near where intermediate-sized streams meet the major streams. Proximity to flowing water, stream intersections, and reasonably level ground offered inviting habitation areas. More specific characteristics for the three candidate sites are summarized below.

A cultural site exists at the proposed location of facilities at Big Canyon Creek. Recent flood erosion exposed culturally modified lithic material and processed bone fragments, which were covered by the gravel surfacing of the existing sportsman's access parking lot. It is likely that this cultural site was disturbed by construction of the existing parking lot. Remaining cultural deposits may be protected by refilling eroded areas and placing additional fill material to contain and support elements of the proposed facilities. The site falls within the area classified as Village Group 9 by Fletcher (Fletcher, 1891).

The Captain John Rapids site is across the river from an area of archaeological interest noted as the Captain John site (Nelson and Rice, 1969). The proposed facilities would be

constructed in an area of flood deposited sand. Sand dune areas in the region are considered to be high potential areas for the presence of cultural material and have proved to be culturally sensitive in a number of instances. However, the proposed facility site has been greatly disturbed by construction of the Snake River Road and by off-road recreational traffic and other recreational use.

Based on the results of an intensive survey done in the summer of 1964 (Nelson and Rice, 1969), two archaeological districts encompassing the proposed pool of the canceled Asotin Dam were nominated to the National Register of Historic Places. The Snake River Archaeological District was selected for the Register in June 1976. The Grain Elevator site falls within one of eleven site "complexes" or clusters within the boundaries of the District.

3.6.2 Environmental Consequences

The site requirements of the proposed fish facilities demand that they be placed on land forms with a high probability for the presence of cultural or historic properties.

A determination of no adverse effect for the Big Canyon Creek site was forwarded to the Idaho State Historic Preservation Office (SHPO) based on the assumption that no excavation of undisturbed sediments would be necessary to establish the proposed facilities. The SHPO concurred with this finding with the recommendation that any excavation below ground level be monitored by an archaeologist.

Intensive surveys of the specific proposed locations for acclimation facilities at the Captain John Rapids and Grain Elevator sites were done in 1996 by Corps personnel. Those efforts failed to detect any significant cultural material on the surface. A subsurface test program at Captain John Rapids found no eligible cultural properties.

A determination of no effect for the Captain John Rapids site was forwarded to the Washington SHPO based on the recommendation that excavations or grading operations would be monitored by a qualified archaeologist. If cultural material is discovered, work will stop until the find could be evaluated.

If the Grain Elevator site is chosen for development, it is probable that a permanent facility would be constructed. Excavation would be required for the in-ground pond, but no other structures would be placed below ground. A subsurface test program found no eligible cultural properties. A determination of no effect for the Grain Elevator site was forwarded to the Washington SHPO based on the recommendation

that excavations or grading operations would be monitored by a qualified archaeologist. If cultural material is discovered, work will stop until the find could be evaluated.

3.7 LAND USE

3.7.1 Affected Environment

3.7.1.1 Big Canyon Creek Site

The Big Canyon Creek site is located on Nez Perce Tribal land between U.S. Highway 12 and the Clearwater River. In the past, IDFG has negotiated a lease with the Tribe to operate and maintain the boat launch facilities on-site; however, the lease agreement has expired and the Tribe has not yet agreed to a renewal. IDFG has indicated they are currently maintaining the site, but, they will not make repairs or improvements on-site without a lease agreement (personal communication, H. Pollard, IDFG, Boise, Idaho, May 30, 1996). Surrounding land uses consist of undeveloped forest and pasture lands with a small number of commercial and single-family developments. The Canyon Inn Cafe and a few single-family homes are located approximately 800 feet east of the site on the opposite side of U.S. Highway 12. An operating grain elevator is located to the east of Big Canyon Creek and a few single-family homes are perched along the top of the bluff on the opposite side of the Clearwater River. An active railroad line parallels the north bank of the river.

3.7.1.2 Captain John Rapids and Grain Elevator Sites

The Captain John Rapids and Grain Elevator sites are both privately owned properties located on the west bank of the Snake River, along Snake River Road.

The Captain John Rapids site is surrounded by rangeland, with the nearest single-family home being approximately 0.5 mile downstream on the Idaho side of the river. The site is currently being used as pasture land, but also shows evidence of unauthorized day use activities, such as bank fishing, picnicking and camp fires.

The Grain Elevator site is surrounded by agricultural lands, primarily hay fields. There are approximately 8 single-family homes within about a 0.5-mile radius of the site on the Washington side of the river. An unused grain elevator exists immediately downstream from the site. The Grain Elevator site currently does not appear to be actively used, although the presence of a water pump and electric service at the shoreline indicates than an agricultural diversion crosses the site.

Both sides are within the planning, zoning, and shoreline management jurisdiction of Asotin County. Asotin County has not made a land use planning designation for this area, although both sites are located within the conservancy zones identified under the Asotin County's Shoreline Designation Map.

3.7.2 Environmental Consequences

The Corps estimates that approximately 1 to 2 acres of land at Big Canyon Creek and up to 3 acres at a Snake River site would be required to assemble and operate the facility. The Corps would negotiate lease or purchase agreements with property owners as required to obtain land rights for facility construction and operation.

The Big Canyon Creek site is owned by the Tribe; therefore, land use permits would not be required for the project. The predominant land use for the site is recreation (see Section 3.8), and some displacement of current recreation uses would occur during certain periods of the year. Because of the limited time of operation and moderate impacts, the facility is considered compatible with the existing commercial and single-family land uses that occur near the site.

The existing grazing use on a portion (approximately half) of the Captain John Rapids site would be permanently displaced if this site were developed for an acclimation facility. The extent of the effect would be minimal, and the landowner would be compensated for the lost use. The Captain John Rapids site also has some existing recreational uses (see Section 3.8), which would be slightly affected by the proposed facility.

Similarly, a portion of the Grain Elevator site would be occupied by a permanent, in-ground pond if this site were developed, but the site does not have any significant land use displacement issues. The surrounding land uses of single-family homes and agricultural lands could experience some aesthetic effects (see Section 3.9).

The proposed acclimation facilities would be consistent with applicable local land use plans for the two Snake River sites. A shoreline substantial development permit would need to be issued by Asotin County, and approved by the Washington Department of Ecology and WDFW, if either Snake River site were developed (personal communication, K. Riggers, Asotin County Public Works, Asotin, Washington, June 12, 1996).

3.8 RECREATION

3.8.1 Affected Environment

3.8.1.1 Big Canyon Creek Site

The Big Canyon Creek site currently provides an important boat launch facility on the Clearwater River, which includes a boat ramp, parking lot and restroom facilities. The facility is currently open year-round; however, a majority of the use occurs between October 15 and December 1, during the steelhead fishing season (personal communication, H. Pollard, IDFG, Boise, Idaho, May 30, 1996).

The Clearwater River corridor provides a wide variety of outdoor recreation activities. According to *The Clearwater River Recreation Survey* (Krumpe, 1987), steelhead fishing is the most popular recreation activity along the river, with lesser demand for recreational boating, picnicking, camping, swimming and hunting.

3.8.1.2 Captain John Rapids and Grain Elevator Sites

The Captain John Rapids and Grain Elevator sites are both private property; therefore, any public recreation activities currently occurring on-site are unauthorized. The Captain John Rapids site shows evidence of day-use activities such as picnicking and camp fires along the upstream sandy beach and berm area. A dirt road provides access and parking area for bank fishing near the downstream end of the bar.

The Grain Elevator site is currently natural open space. Several goose nesting tubs placed near the shoreline are visible just upstream from the site. No other evidence of recreation-related activities was visible during a site visit on April 29, 1996.

3.8.2 Environmental Consequences

3.8.2.1 Big Canyon Creek Site

Under Alternative 2, the entire Big Canyon Creek site would be fenced and dedicated for use as an acclimation facility from approximately January through May. During this period of assembly and operation of the facility, the existing access area and boat ramp would not be available for public use. The closest alternative boat launch facility along the Clearwater River would be at the Pink House Hole Campground, which is located approximately 7

miles upstream, or the Lenore Boat Launch about 7 miles downstream from Big Canyon Creek. The peak use period for the Big Canyon Creek boat launch is between October 15 and December 1, which coincides with the steelhead fishing season along this section of the river (personal communication, H. Pollard, IDFG, Boise, Idaho, May 30, 1996). Because the facility would be assembled and operated between January and May, a small number of boaters would be forced to use the Pink House or Lenore boat launch facilities rather than the Big Canyon Creek site. Based on the timing and magnitude of this displacement of recreational use, and the availability of alternative sites, this impact would not be considered significant.

3.8.2.2 Captain John Rapids and Grain Elevator Sites

Of the two private properties on the Snake River, the Captain John Rapids site would potentially have the greatest impacts to existing recreation if the property were developed for an acclimation facility. Approximately one-third of the site would be used for the acclimation facility and bank fishing along the downstream shoreline might be limited, depending on design and layout of the facilities. If land rights and space and circulation patterns permitted, it would be possible to provide for authorized recreational access to the shoreline within the site boundaries. The upstream sandy beach and berm area would be accessible for unauthorized recreation use.

The impacts to the Grain Elevator site would be minimal, based on the apparent lack of recreational use at the site. As at Captain John Rapids, it might be feasible to provide for minimal public recreational access.

3.9 AESTHETICS

3.9.1 Affected Environment

3.9.1.1 Big Canyon Creek Site

The Big Canyon Creek site on the Clearwater River is an existing boat launch facility which includes a boat ramp, a gravel parking lot, and two portable toilets. U.S. Highway 12 provides access along the south edge of the site. The upland part of the site has been filled with gravel to create a level bench for the parking area and boat launch access. The site is terraced with the parking area being approximately 6 feet higher than the river and U.S. Highway 12 being approximately 5 feet higher than the parking lot. The river's edge is

natural in character with a flat grass, pine tree, and willow tree-covered bench that is approximately 20 feet wide. Native riparian vegetation exists upstream and downstream from the site. The surrounding landscape consists of steep tree- and grass-covered canyon walls with railroad tracks along the opposite (north bank) shoreline. A few single-family homes are visible on the hilltops on the opposite side of the river.

3.9.1.2 Captain John Rapids and Grain Elevator Sites

The Captain John Rapids site is located on a wide grass- and sand-covered bench adjacent to an undeveloped section of the Snake River. The downstream one-third of the site is a mixture of grasses and boulder outcrops with a few small hackberry and willow trees. The upstream two-thirds of the site consists of a natural sand beach and berm which is nearly void of vegetation and extends from the roadway to the river's edge. The site has rolling topography with approximately 20 feet of elevation change from the roadway to shoreline. The surrounding landscape consists of steep, grass-covered canyon walls which come down to meet the river and roadway's edge. The surrounding landscape appears to be undeveloped with exception to the unimproved, gravel-surfaced Snake River Road on the west side and the unimproved roadway and an overhead low-voltage power line on the opposite side of the river.

The Grain Elevator site is located on a narrow, grass-covered bench adjacent to the Snake River south of Grahams Landing. The bench is relatively flat from the roadway across the site and then slopes down sharply at the river's shoreline. The surrounding landscape consists of single-family homes and farms with a grain elevator immediately downstream from the site. The Snake River Road is paved asphalt along this section of the river. Beyond the developed landscape at the river's edge, steep canyon walls protrude upwards on all sides without any signs of development.

3.9.2 Environmental Consequences

Construction and operation of the proposed acclimation facilities under Alternative 2 could cause aesthetic effects resulting from the visibility of the facilities, the use of emergency lighting, and noise from the diesel pumps.

3.9.2.1 Visual Resources

Big Canyon Creek

The components of the facility proposed for Big Canyon Creek would be highly visible, although the Corps is considering the use of camouflage netting, which would reduce the overall visual impact. Sixteen aluminum fish tanks are proposed. The tanks would be 20 feet diameter by 4.5 feet deep and would be mounted on supports, which would place the top of the tanks about 5.5 feet above ground. The tanks would be painted a light brown color or dark green, which would blend with surrounding vegetation, and may be covered by camouflage netting. The facilities would require numerous distribution and discharge pipes that would be above ground. One or two camper trailer(s) would be parked on-site to provide housing for the on-site staff and allow for 24-hour daily surveillance. The water pumps and fuel tanks would also be visible from the adjacent river or roadway, but the fuel tanks would be painted to match surrounding vegetation and the equipment may be covered with camouflage netting to decrease visual impacts. The distribution boxes would also be readily visible because the boxes themselves would be 9 feet high, with two 5-foot-high nitrogen stripping stacks on top of each box. The boxes and stacks would be painted light brown to make them less noticeable. An 8-foot-high, chain-link fence is proposed to increase security around the facility. The fence would be placed where the project abuts the roadway and it would extend to the river on the upstream and downstream ends of the site.

The emergency lighting for the facility would alter visual quality at night by illuminating a large area with artificial light, in an area where the usual light sources onsite are moonlight, vehicle headlights, and isolated outdoor lights on buildings. However, the facility's emergency lighting would be used only on a short-term, emergency basis and would have no long-lasting effects.

The proposed facilities at the Big Canyon Creek site would be located on the existing gravel parking area and as close as possible to the existing vegetation buffer along the river's shoreline. This buffer would remain undisturbed and serve as a good visual screen to the facilities from the river side. The overall visual quality would remain as a human-made environment. The facilities would be used for just 1 to 3 years and no evidence of their use would be left after that time, so there would be no long-term effect. Because of the existing preservation of the existing vegetation screen along the river shoreline and mitigation treatments proposed to lessen the visual impacts along U.S. Highway 12, the visual effects resulting from the facility would be considered non-significant.

Captain John Rapids and Grain Elevator Sites

Development of permanent acclimation facilities at either the Captain John Rapids or Grain Elevator site would reduce the visual quality experienced by anyone approaching the site, either by boat or vehicle. The existing native grasses and natural landscape would be replaced by the industrial-looking in-ground structures surrounded by a chain-link fence. The facility could be used for a 20-year period, and when no longer in use the landscape could be restored to its pre-construction condition.

The Captain John Rapids site would require substantial grading and terracing to allow the facility to be assembled. The required earthwork would remove existing vegetation, leaving the ground bare for a period.

Development at the Grain Elevator site would have some visual impacts on the single-family homes and farms within visible distance of the site. However, based on the size of the pond and the use of camouflage netting over the facilities, the visual impacts are expected to be insignificant. Because the site is relatively flat, a minimal amount of grading and removal of vegetation would be required.

3.9.2.2 Noise

Operation of the fish facilities would add a new noise source, and possibly increase noise levels, in the surrounding area. Four diesel water pumps would operate 24 hours a day for 2 to 3 months. This would result in a constant noise as opposed to the short-term noise produced by power boats and motor vehicles passing by the site. The noise produced by one of the water pumps would be about 65 decibels on A-weighted scale (dBA) at 50 feet, which is less than 76 dBA produced by a pickup truck, or the 83 dBA produced by a motorcycle, at the same distance. The water pumps would have mufflers to reduce the noise, but the mufflers would not be able to eliminate all of the noise. Based upon sound levels decreasing at a rate of 6 dBA per doubled distance, the following noise levels are expected at the various noise receptors:

- Big Canyon Creek/Canyon Inn 41 dBA
- Big Canyon Creek/bluff-top houses 35 dBA

- Captain John Rapids/surrounding single-family homes 31 dBA
- Grain Elevator/downstream house 34 dBA

The noise levels would be considered non-significant due to the projected pump noise being approximately equivalent to the existing background noise levels. In addition, noise levels experienced inside residences would be much less than indicated above, because the outside walls of structures typically provide a considerable reduction of noise levels. The facility should be in compliance with applicable noise regulations.

The noise levels created by the pumps at the Big Canyon Creek site would likely be noticeable at the nearby residences and the Canyon Inn Cafe. However, considerable noise is already present with the existing railroad and highway adjacent to the site.

The Captain John Rapids site would have minimal impacts from the noise generation due to the undeveloped surroundings, resulting in a lack of potential noise receptors close to the site. The noise levels at the Grain Elevator site would likely be noticeable to the surrounding single-family homes due to their proximity to the site and relative lack of competing noises, but the expected noise at these receptors should be essentially equivalent to background noise and within acceptable levels.

3.10 SOCIOECONOMICS

3.10.1 Affected Environment

3.10.1.1 Big Canyon Creek Site

The Big Canyon Creek site is located within Nez Perce County, Idaho. Nez Perce County is large in area and predominantly rural in character. Population and jobs are predominantly located in Lewiston, approximately 25 miles west of the Big Canyon Creek site. The population of Nez Perce County has increased from 33,200 to 33,754 for a 5.2 percent increase from 1980 to 1990 (compared to Idaho's 12.9 percent increase for the same period). The employment level for the County was 15,295 in 1990, with the manufacturing and wholesale/retail trade industries representing the largest sectors of the local economy (U.S. Bureau of the Census, 1994).

3.10.1.2 Captain John Rapids and Grain Elevator Sites

The Captain John Rapids and Grain Elevator sites are both located within Asotin County, Washington. Asotin County is predominantly rural, with population and economic activity concentrated in and adjacent to Clarkston. Clarkston is across the Snake River from Lewiston, Idaho, and is about 15 and 20 miles north of the two candidate Snake River sites. The population of Asotin County has increased from 16,823 to 17,605 for a 10 percent increase from 1980 to 1990 (compared to Washington's 24.5 percent increase for the same period). The employment level for the County was 7,111 in 1990, and wholesale and retail trade were the largest employment categories (U.S. Bureau of the Census, 1994).

3.10.2 Environmental Consequences

The proposed action would have the potential to create socioeconomic effects through the economic activity associated with acclimation, facility construction and operation, and through acquisition of private land for public purposes.

Alternative 2 involves the construction and operation of two acclimation facilities. One would be built at Big Canyon Creek in 1997, and the second would be built at either the Captain John Rapids or Grain Elevator site in 1998.

The construction requirements to set up and disassemble the acclimation facilities would likely take 8 to 10 people approximately 1 month to complete. The overall economic activity operated from construction activities would therefore be minor. The facility would be in operation 4 to 5 months out of the year and employ 2 part-time employees during its operation. Compared to the size of the local economy, the effect of this activity would be negligible.

Purchase or lease of 2 or 3 acres of private property would be required to operate the facility. If the purchase of private land for public use occurs, the Corps would provide a payment to the affected county in lieu of taxes to ensure no net loss to the local tax base. The overall fiscal impacts are therefore expected to be non-significant.

4. ENVIRONMENTAL REVIEW REQUIREMENTS

The following paragraphs address the principal environmental review and consultation requirements applicable to the Corps' civil works actions, and the compliance of the proposed action with these requirements. Pertinent Federal statutes, executive orders, and executive memorandums are included.

4.1 FEDERAL STATUTES

1) National Historic Preservation Act, As Amended; Executive Order 11593, Protection and Enhancement of the Cultural Environment, May 31, 1971.

   As stated in Section 3.6, constructing and operating the proposed facilities at Big Canyon Creek would have no effect on cultural resources if excavation work were avoided. Having addressed these issues, this project would be in compliance with the Act and the Executive Order.

   Construction of permanent facilities at Captain John Rapids or the Grain Elevator site would require archaeological monitoring of all excavation work.

2) Clean Air Act, As Amended

   Pursuant to Section 176(C) and 309 of the Act, this environmental assessment will be provided to the U.S. Environmental Protection Agency.

3) Clean Water Act

   This project would not result in the discharge of fill material below the line of ordinary high water; therefore, a 404(b)(1) evaluation does not need to be prepared. Effluent discharged from the fish tanks might exceed the threshold (20,000 pounds of fish per year) listed in 40 CFR 122.24; if so, an NPDES permit under Section 402 would be required, and the USFWS or Tribe (as facility operator) would undertake the permit process.

4) Endangered Species Act of 1973, As Amended

   See Section 3.3.2 above and Appendix A (Biological Assessment)

5) Fish and Wildlife Coordination Act

Selection of project sites, facility design, and biological concerns have been coordinated directly with the USFWS and the state fish and wildlife agencies. A Coordination Act report was being prepared to meet regulations under the Fish and Wildlife Coordination Act. In the report, the USFWS recommended placing netting over the tanks to deter birds, surveying the sites for several sensitive birds and plants, screening the intakes, and preventing pollution from entering either the Clearwater or Snake Rivers.

6) National Environmental Policy Act

This environmental assessment was prepared and circulated to agencies and the public for review and comment pursuant to requirements of NEPA. Full compliance with NEPA will be achieved when the Finding of No Significant Impact, which has been determined to be applicable, is signed.

7) Wild and Scenic Rivers Act

The affected segments of the Clearwater and Snake Rivers are not included on the inventory of wild and scenic rivers, and are not under consideration for inclusion in the wild and scenic river system.

8) Northwest Electric Power Planning and Conservation Act

The project would not conflict with the requirements of the Act or the Columbia Basin Fish and Wildlife Program which was developed in response to the Act. This project may help achieve the fish survival goal of the fish and wildlife program.

4.2 EXECUTIVE ORDERS AND MEMORANDA

1) Executive Order 11988, Flood Plain Management, May 24, 1977

The Executive Order objective is the avoidance, to the extent possible, of long- and short-term adverse impacts associated with the occupancy and modification of the base flood plain and the avoidance of direct and indirect support of development in the base flood plain wherever there is a practicable alternative. Because of the necessity to locate the fish facilities adjacent to the river for water supply purposes and fish release, construction would be in the base flood plain. However, this action would not support further development of the flood plain and is not considered to have significant adverse effects on flood plain natural and beneficial values.

2) Executive Order 11990, Protection of Wetlands, May 24, 1977

No wetlands would be affected by the proposed action.

3) CEQ Memorandum, August 10, 1980, Interagency Consultation to Avoid or Mitigate Adverse Effects on Rivers in the Nationwide Inventory.

See item 7 under Section 4.1 above.

4.3 STATE, TRIBAL, AND LOCAL REQUIREMENTS

1) Washington State Shoreline Management Act

A shoreline substantial development permit or conditional use permit from Asotin County could be required if an acclimation facility were to be developed at either of the Snake River sites.

2) Water Rights

The Washington Department of Ecology has indicated that a State water right might be required for use of river water at the proposed Snake River acclimation facility. If it is determined that a water right is required, the facility operators (USFWS and/or the Tribe) would be responsible for obtaining the permit.

3) Washington State Hydraulic Project Approval

An Hydraulic Project Approval (HPA) from the Washington Department of Fish and Wildlife could be required for the placement of the water intakes and the water discharge for the selected Snake River site.

5. CONSULTATION AND COORDINATION

5.1 PUBLIC INVOLVEMENT

The Corps held a scoping meeting at the Walla Walla District Headquarters on January 24, 1996. The purpose of the meeting was to address issues, primarily scope, issues and alternatives for this EA, to be considered in the NEPA process concerning action proposed by the Corps pursuant to Congressional direction associated with the energy and water development appropriations bill for FY 1995. The meeting was open to the public and the Corps specifically invited agencies or groups who were likely to have an interest in the projects.

The Corps circulated the draft EA and allowed 30 days for public review and comment. The Corps considered public comments on the draft EA and modified the text as appropriate for this final EA. Comments on the draft EA primarily consisted of letters from the Nez Perce Tribe and WDFW.

5.2 AGENCY COORDINATION

Fishery managers from USFWS, the Nez Perce Tribe, CRITFC, WDFW, ODFW, and the Confederated Tribes of the Umatilla Indian Reservation attended the January 24 meeting and provided scoping input on the project alternatives, design, and issues. The Corps continued to coordinate with the fishery managers at subsequent meetings to refine project construction and operation details.

6. LITERATURE CITED

Berejikian, B.A. 1995. The effects of hatchery and wild ancestry and experience on the relative ability of steelhead trout fry *(Oncorhynchus mykiss)* to avoid a benthic predator. Canadian Journal of Fisheries and Aquatic Science 52:2476-2482.

Bevan, D., J. Harville, P. Bergman, T. Bjornn, J. Crutchfield, P. Klingement, and J. Litchfield. 1994. Snake River Salmon Recovery Team: Final Recommendations to National Marine Fisheries Service. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Northwest Region. Seattle, Washington. May 1994.

Blankenship, H.L. and G.W. Mendel (eds.). 1993. Upstream Passage, Spawning, and Stock Identification of Fall Chinook Salmon in the Snake River, 1992. Prepared for the U.S. Department of Energy, Bonneville Power Administration, Portland, Oregon. December 1993.

Blankenship, H.L., L. LaVoy, C., Knudsen, A. Marshall, D. Thompson, J. Sneva. 1993. Stock identification of Snake River fall Chinook salmon, Chapter 2, pp. 61-73. *In*: Upstream Passage, Spawning, and Stock Identification for Fall Chinook Salmon in the Snake River, 1992, H.L. Blankenship and G.W. Mendel (eds.). Prepared for Bonneville Power Administration, Portland, Oregon. December 1993.

BPA. 1996. Draft Environmetnal Impact Statement, Nez Perce Tribal Hatchery Program. DDE/BP-2885. U.S. Department of Energy, Bonneville Power Administration. Portland, Oregon.

BPA, Interior, and Corps (Bonneville Power Administration, U.S. Department of the Interior, and the U.S. Army Corps of Engineers). 1995. System Operation Review Final Environmental Impact Statement. DOE/EIS-0170. Portland, Oregon. November 1995.

Chilcote, M.W., S.A. Leider, and J.J. Loch. 1986. Differential reproductive success of hatchery and wild summer-run steelhead under natural conditions. Transactions of the American Fishery Society 155:726-735.

Connor, W.P. 1994. Letter from W.P. Connor, U.S. Fish and Wildlife Service, Ahsahka, Idaho, to Chris Toole, National Marine Fishery Service, Portland, Oregon, December 7, 1994.

Connor, W.P., H.L. Burge, D. Steele, C. Eaton, and R. Bowen. 1994. Rearing and emigration of naturally produced Snake River fall chinook salmon juveniles, Chapter 3. *In*: D.W. Rondorf and K.F. Tiffan (preparers). Identification of the Spawning, Rearing, and Migratory Requirements of Fall Chinook Salmon in the Columbia River Basin. Annual Report–1993. Prepared for U.S. Department of Energy, Bonneville Power Administration, Portland, Oregon. December 1994.

Corps (U.S. Army Corps of Engineers). 1995. Temporary Fall Chinook Acclimation Facility - Pittsburg Landing, Environmental Assessment. U.S. Army Corps of Engineers, Walla Walla District, Walla Walla, Washington.

Corps (U.S. Army Corps of Engineers). 1996. Interim Report: Supplement to Special Report—Lower Snake River Fish and Wildlife Compensation Plan, Lower Snake River, Washington and Idaho, June 1975. U.S. Army Corps of Engineers, Walla Walla District, Walla Walla, Washington. April 1996.

Currens, K.P. and C.A. Busack. 1995. A framework for assessing genetic vulnerability. Fisheries 20(12):24-31.

Fast, D., J. Hubble, M. Kohn, and B. Watson. 1991. Yakima River Spring Chinook Enhancement Study: Final Report. Prepared by the Yakima Indian Nation Fisheries Resource Management for Bonneville Power Administration, Portland, Oregon. May 1991.

Fletcher, Alice C. 1891. The Nez Perce Country. Ms. on file, Bureau of American Ethnology, No. 4558 (Smithsonian Institution), Washington, D.C.

Garcia, A. 1996. Memorandum from A. Garcia, Fisheries Biologist, Idaho Fishery Resource Office, USFWS, Ahsahka, Idaho, March 16, 1996.

Garcia, A.P., W.P. Connor, and R.H. Taylor. 1994. Fall chinook salmon spawning ground surveys in the Snake River, Chapter 1. *In*: D.W. Rondorf and K.F. Tiffan (preparers). Identification of the Spawning, Rearing, and Migratory Requirements of Fall Chinook Salmon in the Columbia River Basin. Annual Report–1993. Prepared for the U.S.

Department of Energy, Bonneville Power Administration, Portland, Oregon. December 1994.

Hankin, D.G., J.W. Nicholas, and T.W. Downey. 1993. Evidence for inheritance of age of maturity in chinook salmon (*Oncorhynchus tshawytscha*). Canadian Journal of Fisheries and Aquatic Science 50:347-358.

Hitchcock, C.L., A. Cronquist, M. Ownbey, and J.W. Thompson. 1990. Vascular Plants of the Pacific Northwest. University of Washington Press, Seattle, Washington.

Hulett, P.L. C.W. Wagemann, and S.A. Leider. 1996. Studies of Hatchery and Wild Steelhead in the Lower Columbia Region: Progress Report for Fiscal Year 1995. Report No. RAD 96-01. Washington Department of Fish and Wildlife, Fish Management Program, Olympia, Washington.

Independent Scientific Group. 1996. Return to the River: Restoration of Salmonid Fishes in the Columbia River Ecosystem. Prepared for the Northwest Power Planning Council. Portland, Oregon.

Krumpe, E.E. 1987. Clearwater River Recreation Survey. Department of Wildland Recreation Management, College of Forestry, Wildlife and Range Sciences. University of Idaho.

Leider, S.A, P.L. Hulett, J.J. Loch, and M.W. Chilcote. 1990. Electrophoretic comparison of the reproductive success of naturally spawning transplanted and wild steelhead trout through the returning adult stage. Aquaculture 88:239-252.

Matthews G.M. and R.S. Waples. 1991. Status Review for Snake River Spring and Summer Chinook Salmon. NOAA NMFS F/NWC-200.

Mendel, G. 1995. Memorandum from G. Mendel, Fisheries Biologist, Hatcheries Program, Snake River Laboratory, WDFW, Dayton, Washington, September 11, 1995, to Bob Foster, Columbia River Program Coordinator, WDFW, Olympia, Washington.

Mendel, G. 1996. Memorandum from G. Mendel, Fisheries Biologist, Hatcheries Program, Snake River Laboratory, WDFW, Dayton, Washington, March 14, 1995, to Sandy Simmons, Corps, Walla Walla District, Walla Walla, Washington.

Mendel, G., J. Bumgarner, D. Milks, L. Ross, and J. Dedloff. 1995. Lyons Ferry Hatchery Evaluation: Fall Chinook, 1994 Annual Report. Hatcheries Report No. H95-07.

Prepared by Washington Department of Fish and Wildlife, Olympia Washington for U.S. Fish and Wildlife Service, Boise, Idaho. October 1995.

Miller, W. H., T.C. Coley, H.L. Burge, and T.T. Kisanuki. 1990. Analysis of salmon and steelhead supplementation: Emphasis on unpublished reports and present programs, Part 1, pp. 1-46. *In*: Analysis of Salmon and Steelhead Supplementation, Technical Report 1990, W.H. Miller (preparer). Prepared for U.S. Department of Energy, Bonneville Power Administration, Portland, Oregon. September 1990.

Nelson, C.M. and D.G. Rice. 1969. Archaeological Study and Test, Asotin Dam Area, Southeastern Washington. Report to National Park Service, San Francisco. Department of Anthropology, Washington State University, Pullman, Washington.

NMFS (National Marine Fisheries Service). 1995a. Proposed Recovery Plan for Snake River Salmon. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Northwest Region, Seattle, Washington. March 1995.

NMFS (National Marine Fisheries Service). 1995b. Report to Congress: A Case-By-Case Review of the Supplementation and Terminal Fishery Experiments Proposed by the Columbia Basin Fish and Wildlife Authority and the Production Advisory Committee. U.S. Department of Commerce, National Oceanic and Atmospheric Administration. April 1995.

NMFS (National Marine Fisheries Service). 1996a. Listed Species, Critical habitat, Biological Requirements, and Status under Environmental Baseline in 1995. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Northwest Region, Seattle, Washington. March 1996.

NMFS (National Marine Fisheries Service). 1996b. Biological Opinion for 1995 to 1998 Hatchery Operations in the Columbia River Basin. Section 7 Consultations with National Marine Fisheries Service, U.S. Army Corps of Engineers, Bonneville Power Administration, and U.S. Bureau of Indian Affairs. April 5, 1995.

NPPC (Northwest Power Planning Council). 1986. Compilation of Information on Salmon and Steelhead Losses in the Columbia River Basin. Portland, Oregon. 252 pp.

NPPC (Northwest Power Planning Council). 1993. Columbia River Basin Fish and Wildlife Program. NPPC 93-6. Portland, Oregon.

ODFW and WDFW (Oregon Department of Fish and Game and Washington Department of Fish and Game). 1995. Status Report: Columbia River Fish Runs and Fisheries, 1938-94. Portland, Oregon. August 1995.

Reisenbichler, R. 1996. Alternative Hypothesis for the Benefits and Risks Posed by Hatchery Supplementation of Naturally Spawning Populations of Steelhead. U.S. Department of the Interior, National Biological Service, Northwest Biological Science Center. Seattle, Washington.

Schmitten, R.A. 1993. Memorandum from R.A. Schmitten, NMFS, Seattle, Washington, June 28, 1993, to M.H. Schiewe, NMFS, Seattle, Washington.

Smith, S. 1996. Letter from S. Smith, Chief, Harvest/Hatchery Branch, NMFS, Portland, Oregon, to Lt. Colonel J.S. Weller, District Commander, Corps, Walla Walla District, Walla Walla, Washington, May 3, 1996.

Smith, S.G., Muir, W.D., Hockersmith, E.E., Eppard, M.B. and Connor, W.P. 1996. (Draft) Passage Survival of Natural and Hatchery Subyearling Fall Chinook Salmon to Lower Granite, Little Goose, and Lower Monumental Dams. *In:* Fall Chinook Salmon Survival and Supplementation Studies in the Snake River and Lower Snake River Reservoirs, Annual Report 1995, J.G. Williams and T.C. Bjornn, eds. Prepared for Bonneville Power Administration, Portland, Oregon and U.S. Army Corps of Engineers, Walla Walla, Washington.

Spinden, H.J. 1908. The Nez Perce Indians. Memoirs of the American Anthropological Association 2 (3).

Stelle, Jr., W. 1994. Letter from W. Stelle, Jr., Regional Director, NMFS, Seattle, Washington, September 22, 1994, to T. Strong, Executive Director, CRITFC, Portland, Oregon.

Stelle, Jr., W. 1995. Letter from W. Stelle, Jr., Regional Director, NMFS, Seattle, Washington, to W. F. Shake, USFWS, Portland, Oregon, November 6, 1995.

Steward C.R. and T.C. Bjornn. 1990. Supplementation of salmon and steelhead stocks with hatchery fish: A synthesis of published literature. *In*: Analysis of Salmon and Steelhead Supplementation, Technical Report 1990, W.H. Miller (preparer). Prepared for U.S. Department of Energy, Bonneville Power Administration, Portland, Oregon. September 1990.

U.S. Bureau of the Census. 1994. County and City Data Book. U.S. Department of Commerce, Bureau of the Census. U.S. Government Printing Office. Washington, D.C.

USFS (U.S. Forest Service). 1994. Environmental Impact Statement, Wild and Scenic Snake River Recreation Management Plan, Hells Canyon National Recreation Area. Wallowa-Whitman National Forest, Baker City, Oregon.

USFS (U.S. Forest Service). 1996. Draft Environmental Impact Statement, Hells Canyon National Recreation Area Comprehensive Management Plan, Wallowa-Whitman National Forest. U.S. Forest Service, Pacific Northwest Region, Wallowa-Whitman National Forest, Baker City, Oregon.

Van Hyning, J. 1968. Factors Affecting the Abundance of Fall Chinook in the Columbia River. Oregon State University, Research Reports of the Fish Commission of Oregon. Volume 4(1). 87 pp.

Walker, G. 1996. Memorandum from G. Walker, Manager, Nez Perce Tribal Hatcheries, Lapwai, Idaho, May 10, 1996, to C. Hyland, Study Manager, Corps, Walla Walla District, Walla Walla, Washington; G. Mendel, Fisheries Biologist, Hatcheries Program, Snake River Laboratory, WDFW, Dayton, Washington; and B. Connor, Fisheries Biologist, USFWS, Ahsahka, Idaho.

Waples, R.S. 1991. Genetic interactions between hatchery and wild salmonids: Lessons from the Pacific Northwest. Canadian Journal of Fisheries and Aquatic Science 48(Supple. 1): 124-133.

Waples, R.S., R. P. Jones, Jr., B.R. Beckman, and G.A. Swan. 1991. Status Review for Snake River Fall Chinook Salmon. NOAA Technical Memorandum NMFS F/NWC-201. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Northwest Region. Seattle, Washington. June 1991.

WDFW (Washington Department of Fish and Wildlife). 1996. Letter from Lori Adkins, Priority Habitats and Species Division, Washington Department of Fish and Wildlife, Olympia, Washington, May 24, 1996.

WDFW, USFWS, and Nez Perce Tribe (Washington Department of Fish and Game, U.S. Fish and Wildlife Service, and Nez Perce Tribe). 1995. Monitoring and Evaluation

of Snake River Fall Chinook Salmon Outplanted Upstream of Lower Granite Dam (FY 1996-2004). Dayton, Washington. August 10, 1995.

WDNR (Washington Department of Natural Resources). 1996. Letter from Sandy Swope Moody, Washington Natural Heritage Program, Division of Forest Resources, Washington Department of Natural Resources, Olympia, Washington, June 5, 1996.

Weller, J. 1996. Letter from Lt. Colonel J.S. Weller, District Commander, Corps, Walla Walla District, Walla Walla, Washington, March 28, 1996, to W. Stelle, Jr., Regional Director, NMFS, Seattle, Washington.

APPENDIX A

ENDANGERED SPECIES ACT COORDINATION

DEPARTMENT OF THE ARMY
WALLA WALLA DISTRICT, CORPS OF ENGINEERS
201 NORTH THIRD AVENUE
WALLA WALLA, WASHINGTON 99362-1876

Reply To
Attention Of:

July 23, 1996

Planning Division

Jacqueline V. Wyland, Division Chief
National Marine Fisheries Service
Environmental and Technical Services Division
525 N.E. Oregon, Suite 500
Portland, Oregon 97232

Dear Dr. Wyland:

This letter is a request for informal consultation under Section 7 of the Endangered Species Act (ESA). We propose to construct and install a set of 16 temporary acclimation tanks and associated facilities for juvenile fall chinook salmon on the left bank of the Clearwater River, just below the confluence of Big Canyon Creek. The installation would be at approximately River Mile 35, in Nez Perce County, Idaho, in December 1996, January, and possibly February 1997 (see Figure 1). This site is on land owned by the Nez Perce Tribe and is currently used as a parking lot for a boat launching area. We recognize that Snake River fall chinook salmon, listed as endangered under the ESA, may have the potential to be affected by the proposed action. Please note that we are not consulting on the potential for harm to listed stocks as the result of the operation of the facility. The operation of the facility in 1997 and beyond will be the responsibility of the U.S. Fish and Wildlife Service (FWS), and the Nez Perce Tribe.

Description of the proposed action

In the 1995 Fiscal Year Budget, the U.S. Congress provided additional funds to the Corps under the Lower Snake River Fish and Wildlife Compensation Plan (LSRFWCP), in part, to construct final rearing and/or acclimation facilities for fall chinook salmon in the Snake River drainage. The LSRFWCP is a program to compensate for fish and wildlife lost due to the construction of the lower Snake River dams. We have been directed by Congress to work with the U.S. Fish and Wildlife Service (USFWS), the National Marine Fisheries Service (NMFS), and the affected state and tribal hatchery managers to develop this project, which is intended to aid wild Snake River fall chinook stocks through supplementation. The first fall chinook acclimation site was at Pittsburg Landing on the Snake River, where approximately 120,000 fish were acclimated and released in late winter and early spring of 1996.

The Big Canyon Creek site was chosen as the second acclimation facility by the fisheries agencies and tribes, although rearing conditions in the Clearwater River for wild juvenile fall chinook salmon may be suboptimal (Smith 1996).

As noted above, the operation of the facility will not be the responsibility of the Corps of Engineers, however, we understand that approximately 150,000 to 200,000 yearling fall chinook salmon will be obtained from the Washington Department of Fish and Wildlife (WDFW) and held in these ponds from March through mid-April or May of 1997. All or a majority of these fish are to be released from the tanks at the end of this period, although some may be volitionally released to the Clearwater River.

Construction. All construction of the tanks and associated equipment will occur off-site, and the parts and equipment trucked to the site.

Installation. Our plans for the site are diagrammed in Figure 2. Significant features already on site include a gravel parking area, boat ramp, and two portable toilets. The facility will consist of 16 circular aluminum tanks, each 20 feet in diameter; four diesel pumps; four water intakes with screens and pipes; four grit separators; two distribution boxes with packed columns for stripping dissolved gas from river water; and eight release pipes. All tanks and associated equipment will be installed or placed on the existing gravel parking lot. Gravel platforms will be placed on the parking lot to provide support for the tanks.

The staging area, where equipment, fuel, and other supplies would be stored during installation, would also be located on the parking lot. The installation contractor will be required to take measures to minimize spills of fuel, oil, hydraulic fluid, etc., and will be required to clean up any spills that may occur. Any storage tanks for fuel, oil, hydraulic fluids, etc. that would be placed on site would be surrounded by a containment or absorbent barrier, to prevent contaminants from reaching the Clearwater River in the event of a spill.

No excavation would occur during installation, and the only in-water work necessary should be the placement of the intake and outlet pipes, which may occur from an existing boat ramp. No heavy equipment will enter the water to complete this work. The water intake will be screened to produce an intake velocity of 0.4 feet per second or less.

Our contractor will be required to test the operation of the pumps, etc. to ensure that the equipment functions correctly, but this operation should be brief, and prior to delivery of the hatchery salmon.

Potential to affect listed stocks by on-site activities

The proposed action would not affect the Snake River sockeye or spring/summer chinook salmon stocks, because no individuals of these stocks would be present in the Clearwater River in the winter of 1996-7. No anadromous sockeye salmon are present in the Clearwater River drainage, and the spring/summer chinook salmon in the drainage are not listed under the ESA.

No adult individuals of the Snake River fall chinook salmon stock should be present at Big Canyon Creek in late December 1996, or January and February 1997. This is because these fish migrate to the Clearwater River from late summer to early winter, and all spawning activity should be completed by mid-December. Juvenile Snake River fall chinook salmon are spawned and rear in the Clearwater River both above and below the proposed acclimation facility site (Personal communication, Bill Arnsberg, Nez Perce Fisheries, June 18, 1996). Because fall chinook salmon in the Clearwater River emerge from redds in late May and early June (Arnsberg et al. 1992, *in* Conner et al. 1994), the proposed work in December 1996 and January/February 1997 should have no effect on emergent fry.

Wild Snake River fall chinook salmon typically outmigrate as subyearlings, that is, in the spring and summer of their emergence year. In this case, juvenile fall chinook salmon spawned in the fall of 1995 would emerge in the spring of 1996, rear in the Clearwater River for a period of weeks or months, and then outmigrate to the Snake River and downstream to the ocean. Based on the typical Snake River fall chinook salmon outmigration pattern, few or no juvenile chinook salmon should be present in the Clearwater River during the installation period of December 1996-February 1997.

On the other hand, PIT-tag detections of 1993-5 brood year fall chinook salmon from the Clearwater River were recorded in the springs of 1994-6 at some lower Snake River dams (Personal communication, Bill Arnsberg, Nez Perce Fisheries, June 18, 1996). It is unknown whether these fish overwintered in the free-flowing Clearwater River or in one or more of the lower Snake reservoirs. More PIT-tagged chinook outmigrants were detected in the spring of 1994 and 1995 than in the previous summer/fall, while the trend was reversed with the 1994 brood year. It is apparent from these detections that some Clearwater River fall chinook salmon migrate to the ocean as yearlings, rather than as subyearlings. We are unaware of information on the extent of overwintering of juvenile fall chinook in the Clearwater River, but have no reason to believe that overwintering in the area of the proposed construction is a common occurrence.

It is possible that eggs and/or sac fry of the Snake River fall chinook salmon stock may occur at or near the site of proposed acclimation facility. Aerial surveys from 1988-95 have detected redds approximately one-half mile upstream and downstream of the confluence of Big Canyon Creek, but none at the acclimation facility site itself. Nevertheless, the potential exists for redds to be constructed near the acclimation facility. If redds are constructed at the site, then it may be possible for the installation of the intake and/or release or overflow pipes to affect these redds through disturbance of substrate and/or changes in flow patterns. The Nez Perce Tribe performs aerial redd surveys of the lower Clearwater River. If the 1996 survey detects redds within 100 feet of the proposed intake/release/overflow pipe sites in the fall of 1996, the Corps will reinitiate consultation, although we believe that this type of equipment would have to be in direct contact with a redd to have the potential to adversely affect the pre-emergent salmon. As no excavation or sedimentation should occur due to installation of the facility, there is no avenue for adverse effects to critical habitat.

Conclusions

In summary, we believe that construction and installation of the acclimation facility at Big Canyon Creek would not likely harm individuals of the listed stocks. Few individuals of listed stocks would likely occur in the area during the proposed activity period, and the activities themselves should be harmless.

We request informal consultation with the NMFS under Section 7 of the ESA for this proposed action. We believe that the proposed actions would not likely adversely affect listed salmon stocks and seek the NMFS's concurrence in this assessment.

Please contact me or our Planning Division's salmon ESA coordinator, Mr. Dan Kenney at 509-527-7278 if you have any questions. Mr. Jim Athearn at 503-326-2835 remains the North Pacific Division's ESA coordinator.

Sincerely,

\signed\

Donald R. Curtis, Jr.
Lieutenant Colonel, Corps of Engineers
District Engineer

Enclosures

Copy Furnished:

CENPD-PE-ER (Athearn)
CENPW-OP-PO (Hurson)
Litigation Files (Harrison)

Literature Cited

Connor, W.P., H.L. Burge, and W.H. Miller. 1994. Rearing and emigration of naturally produced Snake River fall chinook salmon juveniles. Chapter 5 *in* D.W. Rondorf and W.H. Miller, editors. Identification of the spawning, rearing, and migratory requirements of fall chinook salmon in the Columbia River basin. Annual report - 1992. Prepared for U.S. Department of Energy, Bonneville Power Administration by the National Biological Survey, Cook, Washington, and the U.S. Fish and Wildlife Service, Ahsahka, Idaho.

Smith, S. 1996. Letter from S. Smith, NMFS, to LTC J.S. Weller, COE, dated May 3, 1996, regarding siting of fall chinook acclimation facilities.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Northwest Region
7600 Sand Point Way, N.E.
Bin C15700, Bldg. 1
Seattle, Washington 98115-0070

OCT - 1 1996

F/NW

Lt. Colonel Donald R. Curtis, Jr.
U.S. Army Corps of Engineers
Walla Walla District
201 North Third Avenue
Walla Walla, Washington 99362-1876

Re: Construction and installation of Big Canyon fall chinook temporary acclimation site, Consultation Number [652]

Dear Colonel Curtis:

This responds to your July 23, 1996, letter addressed to Dr. Jacqueline V. Wyland, National Marine Fisheries Service (NMFS), requesting informal consultation on construction and installation of a temporary acclimation facility for juvenile fall chinook salmon at Big Canyon on the Clearwater River (river mile 35), Nez Perce County, Idaho. In the July 23, 1996, letter, the U.S. Army Corps of Engineers (COE) determined that the construction of the proposed acclimation facility was not likely to adversely affect the listed Snake River salmon. This consultation is undertaken under section 7(a)(2) of the Endangered Species Act (ESA) and its implementing regulations, 50 CFR Part 402.

One species listed under NMFS ESA jurisdiction, Snake River fall chinook salmon (*Oncorhynchus tshawytscha*), is likely to occur in the action area during the proposed action. The potential impact was considered during this consultation. The proposed action is within the designated critical habitat for the listed Snake River salmon (December 28, 1993, 58 FR 68543).

The NMFS reviewed the following information during this consultation:

(1) A July 23, 1996, letter and Biological Assessment from Donald R. Curtis, COE, to Jacqueline V. Wyland, NMFS (Curtis 1996);

(2) Information presented at a fall chinook initiatives meeting held on March 15, 1996 at COE Walla Walla District (COE 1996a);

(3) Biological Opinion for 1995 to 1998 Hatchery Operations in the Columbia River Basin (NMFS 1995a);

(4) NOAA/NMFS Proposed Recovery Plan for Snake River salmon, March 1995 (Schmitten et al. 1995);

(5) Listed species, critical habitat, biological requirements, and status under environmental baseline in 1995, NOAA/NMFS Northwest Region, May 1995 (NMFS 1995b);

(6) 1996-1998 Management Agreement for Upper Columbia River Fall Chinook (CRITFC 1996);

(7) A 1995 informal consultation between COE and NMFS on construction and installation of the Pittsburg Landing temporary acclimation site for fall chinook (Weller 1995, Stelle 1995a);

(8) A 1995 informal consultation between USFWS and NMFS on operation of the Pittsburg Landing temporary acclimation site for fall chinook (Shake 1995, USFWS/NPT 1995, Stelle 1995b).

I. Proposed Action

The July 23, 1996, letter and Biological Assessment provide a complete description of the proposed action (Curtis 1996). The COE proposes to construct and install a set of sixteen temporary acclimation tanks and associated facilities for juvenile fall chinook salmon on the left bank of the Clearwater River just

below the confluence of Big Canyon Creek, at river mile 35 of the Clearwater River, in Nez Perce County, Idaho. Construction of the tanks would occur off-site, and installation would take place from December 1996 through February 1997.

The Big Canyon site was selected because of the proximity of fall chinook salmon spawning habitat for adults returning to the Clearwater River and because of good road access. The site is on land owned by the Nez Perce Tribe. It consists of a gravel parking lot and boat ramp for public access to the Clearwater River. In addition to the sixteen aluminum 20' circular tanks, the facility will also include four screened water intake pipes, eight release pipes, four diesel-powered pumps, gravel platforms to support the tanks, and other equipment. The installation contractor would provide safe fuel storage facilities, including a double-walled tank, and a containment barrier and liner to prevent contamination in case of a spill. No excavation will occur, and the only in-river work will be the installation of intake and outflow pipes. Water intakes will be covered with fine mesh screen (0.079 in), with an intake velocity of 0.4 ft/sec or less, to minimize the likelihood of entrainment of fish and eggs (COE 1996b).

This consultation addresses the construction and installation of these facilities only. The U.S. Fish and Wildlife Service (USFWS), in cooperation with the Nez Perce Tribe (NPT), has initiated ESA Section 7 informal consultation on operation of the Big Canyon acclimation facility from 1997 through 1999 (Shake 1996, USFWS/NPT 1996). Current plans schedule the transfer of up to 150,000 yearling fall chinook salmon from Washington Department of Fish and Wildlife (WDFW) Lyons Ferry Hatchery in March, 1997. The yearlings will be acclimated in the temporary facility for several weeks before release into the Clearwater River in April, 1997. Similar operation in 1998 and 1999 is expected as well.

II. Related Consultations

The proposed action was not considered in the April 5, 1995, Biological Opinion for 1995-1998 Hatchery Operations in the Columbia River Basin (NMFS 1995a), because consultation on this

action had not yet been initiated at that time. However, the proposed action is consistent with the Biological Opinion.

The Proposed Recovery Plan for Snake River Salmon (Schmitten et al. 1995) specifically recommends supplementation of Lyons Ferry fall chinook salmon above Lower Granite Dam, along with careful evaluation (Task 4.1.d). The Plan also recommends the experimental use of acclimation ponds and volitional release strategies to improve smolt quality (Task 4.4.c). Therefore, this project is consistent with the Proposed Recovery Plan.

The Big Canyon site is the second of three facilities planned for acclimation of Lyons Ferry fall chinook salmon in the Snake River Basin (COE 1996a, USFWS/NPT 1996). A similar facility at Pittsburg Landing, in Hells Canyon on the Snake River, was constructed and began operation in 1996. Construction and installation of the Pittsburg Landing facility was considered in an ESA Section 7 informal consultation between COE and NMFS (Weller 1995, Stelle 1995a). Operation and maintenance, along with monitoring and evaluation, of the Pittsburg Landing facility was considered in an ESA Section 7 informal consultation between USFWS and NMFS (Shake 1995, USFWS/NPT 1995, Stelle 1995b). A third site on the Snake River near Asotin, Washington is being considered for implementation in 1998 (COE 1996a, USFWS/NPT 1996).

The proposed action is consistent with a recent fall chinook management agreement drafted by federal, state, and tribal salmon co-managers under the Columbia River Fish Management Plan (CRITFC 1996). The draft management plan states that:
"With respect to the Lyons Ferry Hatchery 1996-1998 fall chinook broods, the parties agree to an on-station release of up to 450,000 yearlings. Additional production will be used for off-station release of up to 450,000 yearlings above Lower Granite Reservoir."

III. Analysis of potential effects on listed species

A. Snake River sockeye salmon

Listed Snake River sockeye salmon do not occur in the Clearwater

River, so there are no expected potential effects on this species as a result of the proposed action, and they are not considered in this consultation.

B. Snake River spring/summer chinook salmon

The natural and hatchery populations of spring chinook salmon now present in the Clearwater River Basin are not considered part of the listed Snake River spring/summer chinook salmon Evolutionarily Significant Unit (ESU) (Matthews and Waples 1991). Listed Snake River spring/summer chinook salmon would be present in the action area only if they strayed from elsewhere within the Snake River Basin. Therefore, it is assumed that listed Snake River spring/summer chinook will not be present in the action area, and they are not considered in this consultation.

C. Snake River fall chinook salmon

Adult fall chinook salmon enter the Clearwater River from late summer to early winter, and spawning is typically completed by mid-December. Therefore, installation activities will begin at approximately the same time that the fall chinook spawning season ends. Adult fall chinook salmon are not expected to be present while installation activities are in progress.

Snake River fall chinook salmon fry typically emerge from redds between early March and late June while juveniles typically migrate seaward during the summer as subyearlings (NMFS 1995b). Consequently, juveniles and emergent fry are not expected to be present during the proposed construction activities in January and February. However, evidence from PIT-tag detections at the lower Snake River dams suggests that some fall chinook in the Clearwater River may migrate as yearlings instead of subyearlings (Curtis 1996). This may be the result of cooler water temperatures and slower growth in the Clearwater River (COE 1996a). Although the extent of overwintering of juvenile fall chinook in the Clearwater River is unknown, there is no reason to expect that it commonly occurs in the immediate vicinity of the Big Canyon site. If overwintering juvenile fall chinook are present, it is expected that the fine-mesh screening (0.079 in) and low flow velocity (0.4 ft/sec) of the intake pipes will

prevent any potential adverse effects (COE 1996b, Fredericks pers. comm.).

Because spawning is known to occur in the vicinity of the Big Canyon site, it is possible that redds containing eggs and/or alevins will be present in the action area during January and February. If a redd is located in direct proximity to the intake, release, and overflow pipes, there is potential for the redd to be affected by disturbance of substrate and altered flow. This portion of the Clearwater River will be surveyed for redds in the fall of 1996. If any are found within 100 feet of the proposed locations of the pipes, potential adverse effects can be averted by shifting the location of the pipes so they are not in direct proximity to the redd(s).

Because the proposed action involves no excavation, stream channel modification, or in-river use of construction equipment, there are no expected effects to critical habitat as a result of sedimentation or disturbance. Therefore, the proposed action is not likely to adversely affect listed Snake River fall chinook salmon or their critical habitat in the Clearwater River.

IV. Conclusion

Based on the available information, NMFS has determined that the subject action would have no more than a negligible potential to adversely affect the listed Snake River salmon. NMFS concurs with COE's determination that construction of the Big Canyon acclimation facilities is not likely to adversely affect listed Snake River fall chinook salmon, or their critical habitat. In summary, NMFS' decision is based on:

(1) The proposed action is consistent with the Proposed Recovery Plan (Schmitten et al. 1995) and 1995-1998 Hatchery Operations Biological Opinion (NMFS 1995a);

(2) Listed Snake River fall chinook salmon adults and juveniles are not likely to be present during the proposed action;

(3) If overwintering juvenile fall chinook salmon are present, potential adverse effects will be minimized by screening and

low flow velocity (0.4 ft/sec) of the intake pipes.

(4) If fall chinook salmon redds are found within the action area, potential adverse effects to eggs can be averted by locating the pipes so that they are not in direct proximity with the redds;

(5) There are no expected effects to critical habitat as a result of sedimentation or disturbance because the proposed action involves no excavation, stream channel modification, or in-river use of construction equipment;

(6) Fuel storage facilities will include a containment barrier and liner to prevent contamination if spillage occurs.

This concludes informal consultation on this action in accordance with 50 CFR 402.14(b)(1). The action agency must reinitiate this ESA consultation if new information becomes available or circumstances occur that may affect listed species or their critical habitat in a manner or to an extent not previously considered, or a new species is listed or critical habitat is designated that may be affected by the action. If you have any questions please contact Moe Nelson, of my staff, at (503) 231-2178.

Sincerely,

William Stelle, Jr.
Regional Director

cc:
COE - D. Kenney, S. Simmons
USFWS - J. Krakker, B. Connor
NPT - G. Walker, E. Larson
WDFW - B. Foster, G. Mendel
CRITFC - P. Lumley
IDFG - T. Rogers

REFERENCES

COE. 1996a. Proceedings of a fall chinook initiatives meeting, U.S. Army Corps of Engineers, Walla Walla District, March 15, 1996.

COE. 1996b. Draft Lower Snake River Fish and Wildlife Compensation Plan Fall Chinook Initiatives Environmental Assessment. U.S. Army Corps of Engineers, Walla Walla District, July 1996.

CRITFC. 1996. 1996-1998 Management Agreement for Upper Columbia River Fall Chinook. Columbia River Inter-Tribal Fish Commission, August 2, 1996.

Curtis, D.R. 1996. Letter from D.R. Curtis, COE, to J.V. Wyland, NMFS, dated July 23, 1996, containing a biological assessment and request for informal consultation on construction of Big Canyon fall chinook acclimation site.

Fredericks, G., NOAA NMFS F/NWO3, Portland, Oregon. Personal communication, September 1996.

Matthews, G.M., and R.S. Waples. 1991. Status review for Snake River spring and summer chinook salmon. NOAA Tech. Memo. NMFS F/NWC-200.

NMFS. 1995a. Biological Opinion for 1995 to 1998 hatchery operations in the Columbia River basin. NOAA/NMFS, April 5, 1995, 82 p.

NMFS. 1995b. Listed species, critical habitat, biological requirements, and status under environmental baseline in 1995. NOAA/NMFS Northwest Region, Seattle, WA, May 1995, 27 p.

Schmitten, R., W. Stelle, Jr., and R.P. Jones, Jr. 1995. Proposed recovery plan for Snake River salmon. NOAA/NMFS, March 1995.

Shake, W.F. 1995. Letter from W.F. Shake, USFWS, to W. Stelle, NMFS, dated October 6, 1995, transmitting a biological assessment and request for informal consultation on

operation of Pittsburg Landing fall chinook acclimation site.

Shake, W.F. 1996. Letter from W.F. Shake, USFWS, to W. Stelle, NMFS, dated July 26, 1996, transmitting a biological assessment and request for informal consultation on operation of Big Canyon fall chinook acclimation site.

Smith, S.H. 1996. Letter from S.H. Smith, NMFS, to J.S. Weller, COE, dated May 3, 1996, regarding siting of fall chinook acclimation facilities.

Stelle, W. 1995a. Informal consultation letter from W. Stelle, NMFS, to J.S. Weller, COE, dated August 10, 1996, on construction of Pittsburg Landing acclimation site.

Stelle, W. 1995b. Informal consultation letter from W. Stelle, NMFS, to W. Shake, USFWS, dated November 6, 1995, on operation of Pittsburg Landing acclimation facility.

USFWS/NPT. 1995. Biological Assessment of fall chinook smolt releases. Nez Perce Tribe and U.S. Fish and Wildlife Service, October 1995.

USFWS/NPT. 1996. Biological Assessment of fall chinook smolt releases. Nez Perce Tribe and U.S. Fish and Wildlife Service, July 1996.

Waples, R.S., R.P. Jones, Jr., B.R. Beckman, and G.A. Swan. 1991. Status review for Snake River fall chinook salmon. NOAA Tech. Memo. NMFS F/NWC-201.

Weller, J.S. 1995. Letter from J.S. Weller, COE, to J.V. Wyland, NMFS, dated July 12, 1995, containing a biological assessment and request for informal consultation on construction of Pittsburg Landing acclimation site.

Weller, J.S. 1996. Letter from J.S. Weller, COE, to W. Stelle, NMFS, dated March 28, 1996, requesting guidance on siting of fall chinook acclimation facilities.

BIOLOGICAL ASSESSMENT
OF
FALL CHINOOK SMOLT RELEASES

PROPOSED BY

NEZ PERCE TRIBE AND
U.S. FISH & WILDLIFE SERVICE
JULY, 1996

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INTRODUCTION

This Biological Assessment (BA) was developed to assess the Nez Perce Tribe/Lower Snake River Compensation Plan (LSRCP) proposal to modify the existing Lyons Ferry Fall Chinook Salmon Program. The proposed action is to take up to 150,000 fall chinook salmon annually from the existing Lyons Ferry Fall Chinook Salmon Program to rear, acclimate, and release in a portable acclimation facility located on the Clearwater River at Big Canyon Creek . The proposed action uses existing fall chinook salmon production described in the Programmatic BA for the 1995-99 LSRCP Program at Lyons Ferry Hatchery (LSRCP, 1994) and the National Marine Fisheries Service (NMFS) Biological Opinion (BO) for 1995-98 Hatchery Operations in the Columbia river Basin (NMFS, 1995a) and does not propose to increase production for that program. This BA covers only the proposed changes for fall chinook salmon identified for the Big Canyon site and does not change the LSRCP BA previously submitted for the remaining fall chinook reared and released at Lyons Ferry Hatchery and at Pittsburg Landing.

To meet the requirements of the Endangered Species Act (ESA) the LSRCP Office requested that the Nez Perce Tribe assist in the development of the following BA to evaluate whether the proposed action will adversely affect or jeopardize the continued existence of listed Snake River salmon. The BA covers a three year period from 1997-1999 and includes the rearing, acclimation, release, and monitoring/evaluation for fall chinook salmon at the Big Canyon facility. Construction and installation of the Big Canyon facility will be addressed in an informal ESA consultation between the Corp. of Engineers and NMFS.

This consultation process is initiated by the US Fish and Wildlife Service as trustee for the Nez Perce Tribe and conducted with the National Marine Fisheries Service.

BACKGROUND

Natural production of fall chinook salmon has been severely limited throughout the Snake River Basin, consequently, Snake River fall chinook salmon were listed under the ESA in April 1992 (57 F.R.). The LSRCP Program is currently propagating Snake River fall chinook salmon at Lyons Ferry Hatchery that NMFS believes to be a part of the Evolutionary Significant Unit (ESU) of the biological species (NMFS 1995b). The proposed Recovery Plan and NMFS BO for Hatchery Operations recommends phasing in a sub-yearling supplementation program using Lyons Ferry hatchery fall chinook salmon production to minimize or avoid adverse effects to listed naturally reproducing fall chinook salmon and to assist, not replace their recovery. The recommendation further states that supplementation should be carefully evaluated in areas above Lower Granite Dam. The proposed action was proposed by LSRCP co-managers to initiate

releases of juvenile Lyons Ferry hatchery fall chinook salmon above Lower Granite Dam to assess their contribution to natural production through returning adults and recovery of the stock. While the proposed releases are not sub-yearlings they are intended to take advantage of the higher hatchery survival rates for juvenile fall chinook salmon and to evaluate the use of acclimation methods to return adults to appropriate areas for natural reproduction.

The lower Clearwater River is a part of the designated critical habitat for Snake River fall chinook. The Proposed Recovery Plan for Snake River Salmon (Schmitten et al. 1995) recommends that Snake River fall chinook be reintroduced into historic habitat, and that areas in the Snake River below Hells Canyon Dam, and in the Lower Clearwater River be considered for reintroduction if habitat conditions prove suitable and juvenile fish passage can be accommodated. Aerial redd surveys have been conducted on the Lower Clearwater River for fall chinook redds each year since 1988 (Arnsberg, 1996). Results indicate that a total of 158 fall chinook redds have been counted in the Clearwater River since 1988 representing about 25% of all redds counted from aerial redd surveys above Lower Granite Dam since surveys began.

This will be the second of three facilities for the acclimation and release of fall chinook yearlings. The first facility at Pittsburg Landing on the Snake River acclimated and released 114,000 fall chinook yearlings in April 1996. The goal for all three facilities will be to acclimate and release 150,000 fall chinook yearlings each. The third facility will be constructed in 1997 and operated in 1998 at one of two sites on the Snake River approximately 11 or 18 miles upstream of Asotin, WA.

I. PROPOSED ACTION

In 1997, up to 150,000 Snake River fall chinook salmon, approximately 12/lb, from Lyons Ferry Hatchery will be transported to the Big Canyon facility for final rearing and acclimation. Lyons Ferry Hatchery stock has been identified as a part of the ESU of the biological species (LSRCP, 1994). In 1998 and 1999 managers plan to outplant 150,000 each year from this facility. The fish will be held on the river bank in sixteen 20'x4.5' circular tanks at a rearing density of .10 to .18 lbs/cu.ft./in., and released at approximately 10/lb into the Clearwater River directly from the tanks. The release should coincide with an ascending hydrograph to assist smolt outmigration.

Broodstock

The fall chinook stock currently held at Lyons Ferry Hatchery originated from adults captured at the face of Hell's Canyon Dam upon its completion. The hatchery stock is genetically indistinguishable from existing wild stocks within the Clearwater River. (NMFS, 1995b)

Release Strategies

Fall chinook smolts will be released directly from the tanks through four discharge pipes into the Clearwater River at Big Canyon. Releases will be in the late afternoon or evening to minimize immediate post release predation near the discharge pipes. The smolts will be released in mid-April coinciding with, or slightly preceding, smolt releases from Lyons Ferry Hatchery.

Monitoring and Evaluation

The monitoring and evaluation of Lyons Ferry Hatchery fall chinook salmon yearlings acclimated and released at the Big Canyon facility in April 1997 will be a cooperative effort between the Nez Perce Tribe, Washington Department of Fish and Wildlife, and the U.S. Fish and Wildlife Service. Monitoring and evaluation of these releases will be as similar as possible to that of Pittsburg Landing releases of 1996.

Post release dispersal, migration timing, and release group survival between Big Canyon, Pittsburg and Lyons Ferry releases will be evaluated through the use of PIT tags, radio tags, and assessing physiology at release and during migration. We will estimate and compare smolt-to-adult survival between Big Canyon releases, Pittsburg releases, and yearling on-station releases at Lyons Ferry Hatchery. The foremost monitoring and evaluation goal will be to assess adult escapement from the Big Canyon releases back to the spawning grounds and the contribution to natural production. This will require a longer monitoring time of adult returns to the spawning grounds and determining the spawning population contribution by identifying marked yearlings released at Big Canyon.

Plans, in addition to Pittsburg Landing M&E, are being developed for monitoring and evaluation. For reference, the Pittsburg Landing M&E Plan is included as Appendix 1.

II. ANALYSIS OF EFFECTS

The analysis of effects address the categories of impacts described in Section IV. Project Effects, A. General Effects of Proposed Actions of the Biological Opinion for 1995 to 1998 Hatchery Operations in the Columbia River Basin (Schmitten et al. 1995). Very brief descriptions are given of general category of effects, as they have been more fully described in that document and in the Proposed Recovery Plan for Snake River Salmon, March 1995.

1. Density Dependent Effects.

The mainstem and estuarine ecology of the Columbia River Basin has profoundly changed from the time when it supported healthy anadromous salmonid populations (Schmitten et al. 1995). Dams have blocked major production areas and have dramatically altered the ecology of a free flowing riverine environment into a series of lakes. The present understanding of the quantity of the change in terms of carrying capacity for a migratory organism is unknown. However, it is known that the number of hatchery fish introduced into the river habitat has been ever increasing. Considerable speculation, but little scientific information, is available conceming the overall effects to listed Snake River salmon from the combined number of hatchery fish in the Snake/Columbia River migration corridor (Schmitten et al. 1995). Because there is such uncertainty on definitive impacts, a cap on hatchery production has been recommended by NMFS. Lyons Ferry Hatchery stock is a part of the biological ESU and releases of this stock are covered under the LSRCP BA and NMFS BO. We assume that the level set by the cap is consistent with recovering the species and that releasing hatchery fish in numbers which do not surpass that cap will not prevent or effect recovery of the species. Hatchery releases for 1997 will be far below the threshold set by the cap. Consequently, density dependent effects should not occur. Releases of fish that are part of the biological ESU for recovery purposes are not subject to the hatchery production cap.

a.) Competition in Rearing Habitats.

Direct competition for food and space between hatchery and listed fish may occur in spawning and/or rearing areas. These impacts are assumed to be greatest at points of release and to diminish as hatchery smolts disperse (Schmitten et al. 1995). Fish from the Big Canyon facility will be released in the rearing habitat of endangered fall chinook salmon fry. However, competitive effects are expected to be negligible because the lower Clearwater River is vastly underseeded with anadromous fish (Arnsberg et al. 1992). The Big Canyon fish will be yearling age, which will put them in a different size category than the wild fish, making it unlikely that they will compete for the same size food particles. The larger size yearling fish are also expected to migrate quickly, making the potential for interaction short lived.

b) Competition in Migration Corridor/Ocean.

Direct competition for food and space between hatchery and listed fish may occur in the migratory corridor, and ocean habitat (Schmitten et al. 1995). Fish from Big Canyon have the potential to interact with migrating endangered sockeye salmon, spring/summer, and fall chinook salmon. Interactions are not anticipated to be detrimental because the total hatchery release in the Snake

River during 1997 will be far below carrying capacity and will not surpass the threshold established in the Recovery Plan.

2. Operation of Hatchery Facilities.

Clearwater River water use by the facility will not exceed 3.6 cfs (1,600 gpm), from a total river flow between 5,000 to 40,000 cfs representing 0.07% to 0.009% of total flow. The four pump intakes (400 gpm each) will be screened to prevent fry and fingerling mortality. Effluent from the facility will be pumped directly into the river, however because low water temperatures (<5 deg. C) will dictate low feeding rates, effluent water quality will be quite high. Consequently, all state and federal water quality standards will be met.

3. Disease.

Disease concerns have already been addressed in the LSRCP BA, eg. "Current hatchery practices include measures to control pathogens at all life stages in the hatchery.", and, "At this time we have no evidence that horizontal transmission of disease from hatchery releases to listed species in the free-flowing river occurs or has a measurable adverse affect." (LSRCP, 1994) A standard pre-release disease assessment will be made and standard fish health protocols will be followed in accordance with IHOT guidelines (IHOT, 1995). Appropriate transport permits from Washington and Idaho will be secured prior to fish transport. Coordination issues have been and will continue to be addressed through the Production Advisory Committee of U.S. v Oregon.

Hatchery populations are considered to be reservoirs of disease pathogens because of the high rearing densities and resultant stress (Schmitten et al. 1995). Rearing densities at the Big Canyon facility will be the same or less than at Lyons Ferry Hatchery. It is assumed that fish raised at the Big Canyon facility will have the same potential for transmitting disease to their wild counterparts as will fish raised and released from Lyons Ferry or other salmon hatcheries.

4. Predation.

Hatchery fish may prey upon listed fish and due to their location, size and time of emergence, newly emerged chinook salmon fry are likely to be most vulnerable to predation (Schmitten et al. 1995). Fall chinook yearlings acclimated and released at Big Canyon will migrate through the habitat occupied by endangered Snake River fall chinook fry, and therefore some predation by the yearlings may occur. Impacts are expected to be minimal because in the lower Clearwater River naturally produced fry do not emerge from the substrate until May (Amsberg et al. 1992). The yearling fish will

be actively migrating after release in mid-April, making the duration for interaction unlikely. Migration of yearlings released April 12 to April 15, 1996 at Pittsburg Landing was very rapid to at least Lower Granite Dam. Ninety three percent of the detected PIT tagged fish (~4,000) passed the dam by May 1, 1996.

5. Residualism.

Fall chinook smolts have a potential to residualize and prey upon chinook fry however this has not been documented.

Resident trout and hatchery steelhead released into Clearwater River chinook salmon spawning and nursery areas, which residualize may prey upon chinook fry (Schmitten et al. 1995). Residualism behavior has not warranted concern for chinook and its effects are expected to be negligible.

6. Broodstock collection.

Potential adverse effects to adults from operation of fish barriers or weirs used to trap adults for broodstock include delaying upstream migration, displaced spawning, falling back downstream after passing upstream of the weir, being injured or killed as adults attempt to jump the barrier, and inducing stress by handling (Schmitten et al. 1995). Adult returns from fish released from the Big Canyon facility will be allowed to spawn naturally, consequently no adverse effect is expected as a result of the proposed action.

7. Genetic Introgression.

The straying of non-native hatchery stocks causes concerns from the cumulative effects of unidirectional gene flow into the listed populations (Schmitten et al. 1995). Fish used for release at the Big Canyon facility are from Lyons Ferry Hatchery, and recent evidence (Blankenship and Mendel, 1993) suggests that they are genetically indistinguishable from the Snake River population and should be considered in efforts to rebuild the endangered run. Therefore, Lyons Ferry fish are considered a native stock and part of the eggbank program for Snake River fall chinook. Consequently, no effect of genetic introgression is expected.

III. ASSESSMENT of EFFECTS

Under the ESA, Federal agencies are required to ensure that their programs do not jeopardize the continued existence or result in the destruction of adverse modification of critical habitat. The purpose of this analysis is to determine if the indirect takes associated with the operation of the Big Canyon facility will adversely affect threatened Snake River spring/summer and fall chinook salmon and endangered sockeye salmon.

Spring/Summer Chinook Salmon

We have concluded that the operation of the Big Canyon facility may affect listed spring/summer chinook salmon, however, the proposed action will not adversely affect listed spring/summer chinook salmon. There is little evidence to date that the facility may incidentally take a small number of spring/summer chinook salmon. Although we believe the potential for effects are negligible, we will continue to monitor our actions on the listed spring/summer chinook salmon populations in the basin.

Fall Chinook Salmon

We have concluded that the operation of the Big Canyon facility may affect listed fall chinook salmon, however, the proposed action will not adversely affect listed fall chinook salmon. While the operation of the facility has the potential to incidentally take listed fall chinook salmon, we believe the potential is extremely low based on the low numbers of naturally produced fall chinook in the Clearwater River, later emergence timing, and because yearling fish released from the facility should migrate rapidly through the system. Although we believe the potential for effects are negligible, we will continue to monitor our actions on the listed fall chinook salmon populations in the basin.

Sockeye Salmon

We have concluded that the operation of the Big Canyon facility may affect listed sockeye salmon, however, the proposed action will not adversely affect listed sockeye salmon. There is little evidence to date that the facility may incidentally take listed sockeye salmon. Although we believe the potential for effects are negligible, we will continue to monitor our actions on the listed sockeye salmon populations in the basin.

REFERENCES:

57 FR. Endangered and Threatened Species; Threatened Status for Snake River Spring/Summer Chinook Salmon, Threatened Status for Snake River Fall Chinook Salmon. Final Rule. Federal Register, Vol. 57, No. 78. 4/22/92. U.S. Dept. of Commerce, NOAA, 50 CFR Part 277. 14653-14663.

Arnsberg, Bill, etal. Mainstem Clearwater River Study: Assessment for Salmonid Spawning, Incubation, and Rearing. 1992. Final Report. Prepared for U.S. Department of Energy Bonneville Power Administration Division of Fish and Wildlife, Portland, OR. Project No. 88-15.

Arnsberg, Bill. 1996. Meeting notes from Fall Chinook Coordination Meeting, March 8, 1996.

Blankenship, H.L. and G.W. Mendel. 1993. Upstream Passage, Spawning, and Stock Identification of Fall Chinook Salmon in the Snake River, 1992. Annual Report FY 92-93. Prepared for U.S. Department of Energy Bonneville Power Administration Division of Fish and Wildlife, Portland, OR. Project No. 92-046

IHOT. 1995. Integrated Hatchery Operations Team, Policies and Procedures for Columbia Basin Anadromous Salmonid Hatcheries, Bonneville Power Administration Project Report 92-043, Portland, OR.

LSRCP. 1994. Programmatic Biological Assessment for 1995 to 1999 Lower Snake River Compensation Plan Program at Lyons Ferry Hatchery, Dated August 1, 1994.

NMFS. 1995b. Listed species, critical habitat, biological requirements, and status under environmental baseline in 1995.

NMFS. 1995a. Biological Opinion for 1995 to 1998 Hatchery Operations in the Columbia River Basin. Section 7 Consultations with: National Marine Fisheries Service, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, Bonneville Power Administration, and U.S. Bureau of Indian Affairs. Consultation conducted by National Marine Fisheries Service, Dated April 5, 1995.

Schmitten, R., W. Stelle, Jr., and R.P. Jones, Jr. 1995. Proposed recovery plan for Snake river salmon. NOAA/NMFS, March 1995.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
ENVIRONMENTAL & TECHNICAL SERVICES DIVISION
525 NE Oregon Street
PORTLAND, OREGON 97232-2737
503/230-5400 FAX 503/230-5435

F/NWO3

NOV 7 1996

Mr. William F. Shake
U.S. Fish and Wildlife Service
911 NE 11th Avenue
Portland, Oregon 97232-4181

Re: Operation of Big Canyon fall chinook salmon acclimation facility 1997-1999, Consultation Number [649]

Dear Mr. Shake:

This responds to your July 26, 1996, letter addressed to Mr. William W. Stelle, Jr., National Marine Fisheries Service (NMFS), requesting informal consultation on operation of a temporary acclimation facility for juvenile fall chinook salmon at Big Canyon on the Clearwater River (River Mile 35), Nez Perce County, Idaho. In the July 26, 1996, letter and Biological Assessment (BA), the U.S. Fish and Wildlife Service (USFWS) determined that the rearing, acclimation, release, and monitoring/evaluation of fall chinook salmon at the Big Canyon facility was not likely to adversely affect the listed Snake River salmon. This consultation is undertaken under section 7(a)(2) of the Endangered Species Act (ESA) and its implementing regulations, 50 CFR Part 402.

Three species listed under NMFS' ESA jurisdiction, Snake River fall chinook salmon (*Oncorhynchus tshawytscha*), Snake River spring/summer chinook salmon (*Oncorhynchus tshawytscha*), and Snake River sockeye salmon (*Oncorhynchus nerka*) are likely to occur in the action area during the proposed action and were considered during this consultation. The proposed action is within the designated critical habitat for the listed Snake River salmon (December 28, 1993, 58 FR 68543).

NMFS reviewed the following information during this consultation:
(1) A July 26, 1996 letter from William F. Shake, USFWS, to William W. Stelle, NMFS (Shake 1996), transmitting the Biological Assessment;
(2) Biological Assessment of Fall Chinook Smolt Releases Proposed by Nez Perce Tribe (NPT) and U.S. Fish and Wildlife Service, July 1996 (USFWS/NPT 1996);
(3) Information presented at a fall chinook initiatives meeting held on March 15, 1996 at the U.S. Army Corps of Engineers' (COE) Walla Walla District (COE 1996a);
(4) Biological Opinion for 1995 to 1998 Hatchery Operations in the Columbia River Basin (NMFS 1995a);

(5) Proposed Recovery Plan for Snake River Salmon, March 1995 (Schmitten et al. 1995);
(6) Listed Species, Critical Habitat, Biological Requirements, and Status under Environmental Baseline in 1995, NMFS Northwest Region, May 1995 (NMFS 1995b);
(7) Programmatic Biological Assessment of the Proposed 1995-99 Lower Snake River Compensation Plan (LSRCP) Program (USFWS 1994);
(8) Biological Assessment of Washington Department of Fish and Wildlife's (WDFW) LSRCP Program (fall chinook salmon) (Bugert 1994);
(9) Memorandum from M.H. Schiewe, NMFS, to R.A. Schmitten, NMFS, dated June 28, 1993, regarding ESA status of Snake River chinook salmon hatchery populations (Schiewe 1993);
(10) A Biological Assessment and letter requesting informal consultation on construction and installation of Big Canyon temporary acclimation site, from D.R. Curtis, U.S. Army Corps Of Engineers (COE), to J.V. Wyland, NMFS, dated July 23, 1996 (Curtis 1996);
(11) Monitoring and Evaluation of Snake River Fall Chinook Salmon Outplanted Upstream of Lower Granite Dam (FY 1996-2004) (WDFW et al. 1995);
(12) 1996-1998 Management Agreement for Upper Columbia River Fall Chinook (CRITFC 1996);
(13) A 1995 informal consultation between COE and NMFS on construction and installation of the Pittsburg Landing temporary acclimation site for fall chinook (Weller 1995, Stelle 1995a);
(14) A 1995 informal consultation between USFWS and NMFS on operation of the Pittsburg Landing temporary acclimation site for fall chinook (Shake 1995, USFWS/NPT 1995, Stelle 1995b);
(15) A letter from W. Stelle, NMFS, to R. Hardy, BPA, dated March 12, 1996, regarding approval of 15 hatchery production projects (Stelle 1996);
(16) A letter from S.H. Smith, NMFS, to J.S. Weller, COE, dated May 3, 1996, regarding siting of fall chinook acclimation facilities (Smith 1996);
(17) A memorandum from M.H. Schiewe, NOAA F/NWC1, to J.V. Wyland, NOAA F/NWO3, dated October 7, 1996, with comments on operation of Big Canyon fall chinook acclimation facility (Schiewe 1996).

I. Proposed Action

The July 26, 1996, letter and Biological Assessment describe the proposed action (USFWS/NPT 1996). A thorough description of the construction and installation of the facilities is provided in Curtis (1996). The overall purpose of this project is to increase the numbers of native Snake River fall chinook salmon returning to appropriate habitat above Lower Granite Dam for natural spawning. Thus, this project would be considered true "supplementation" as defined by Miller et al. (1990): "Planting all life stages of hatchery fish to enhance wild/natural stocks

of anadromous salmonids." The USFWS proposes to transfer juvenile fall chinook salmon from the existing WDFW Lyons Ferry Hatchery program to rear, acclimate, and release at temporary acclimation facilities at Big Canyon. The Lyons Ferry Hatchery stock was derived from native fall chinook salmon captured in the Snake River upon completion of the Hells Canyon Dam in the 1970s (USFWS/NPT 1996). The fall chinook are proposed for release as yearling smolts because of the higher smolt-to-adult survival relative to sub-yearling releases. The Big Canyon site was selected because of the proximity of spawning habitat for returning adults and because of good road access. Fall chinook salmon are known to successfully spawn and rear in this portion of the Clearwater River (Curtis 1996).

Up to 150,000 yearling fall chinook salmon will be transferred from Lyons Ferry Hatchery in March, 1997, at a size of approximately 12 fish per pound (fpp). The fish will be reared in sixteen 20' aluminum tanks located on a gravel parking lot near the river bank. Clearwater River water will be pumped at a rate of up to 3.6 cubic feet per second (cfs), or 1600 gallons per minute (gpm), into the tanks and discharged back into the river. The fish will be reared and acclimated in the temporary facility for four to six weeks before release into the Clearwater River in late April, 1997, at a size of approximately 10 fpp, or 160-170 mm fork length (FL). Releases will occur during rising stream flow conditions, at the same time or slightly preceding fall chinook salmon releases at Lyons Ferry Hatchery, and at night to minimize predation by birds or other fish. Similar operations are planned for 1998 and 1999.

The USFWS, WDFW, and NPT have proposed a series of cooperative monitoring and evaluation studies to assess the success of the project (WDFW et al. 1995). These activities are in conjunction with ongoing monitoring and evaluation studies at Lyons Ferry Hatchery, and they are intended to achieve a set of six specific scientific objectives:

1) Estimate the contribution of Big Canyon releases to escapement and natural spawning above Lower Granite Dam;
2) Estimate and compare smolt-to-adult survival of Big Canyon, Pittsburg Landing, and Lyons Ferry Hatchery releases;
3) Monitor post-release dispersal, migration timing, and survival;
4) Monitor movement of yearling smolts through the Snake River migration corridor;
5) Evaluate juvenile survival and adult returns and progress toward escapement goals;
6) Cooperatively prepare annual reports and share information.

This consultation addresses the operation and maintenance of the Big Canyon acclimation facilities from 1997 through 1999. The

proposed action is a cooperative effort of USFWS, NPT, and WDFW, and is funded by USFWS through the Lower Snake River Compensation Plan (LSRCP).

II. Related Consultations

The COE has initiated ESA Section 7 informal consultation with NMFS on construction and installation of the Big Canyon acclimation facilities from December 1996 to February 1997 (Curtis 1996). The NMFS expects that this consultation will be completed by the end of September, 1996.

The proposed action was not considered in the April 5, 1995, Biological Opinion for 1995-1998 Hatchery Operations in the Columbia River Basin (NMFS 1995a), because consultation on this action had not yet been initiated at that time. However, the fish being reared are part of the existing Lyons Ferry Hatchery fall chinook salmon program, described in the Biological Assessment of the Proposed 1995-99 LSRCP Program (USFWS 1994, Bugert 1994). Therefore, the propagation and release of these fish is already addressed in the existing Biological Opinion (NMFS 1995a), and additional consultation is necessary only for their movement to the new release site, and for operation and maintenance of the temporary acclimation facilities. The Biological Opinion (Terms and Conditions 3.f) recommends that "USFWS and BPA shall allow Lyons Ferry Hatchery fall chinook salmon adults to escape above Lower Granite Dam," i.e., for natural spawning (NMFS 1995a). It also includes a Conservation Recommendation that:"...USFWS should include a schedule for phasing in a sub-yearling release program at Lyons Ferry Hatchery (phase out yearling releases)" (NMFS 1995a). However, fall chinook are proposed for release at Big Canyon as yearling smolts because of the increased smolt-to-adult survival relative to sub-yearling releases.

The Proposed Recovery Plan for Snake River Salmon (Schmitten et al. 1995) specifically recommends supplementation of Lyons Ferry fall chinook salmon above Lower Granite Dam, along with careful evaluation (Task 4.1.d). In addition, the experimental use of acclimation ponds and volitional release strategies to improve smolt quality are also recommended (Task 4.4.c). However, the Proposed Recovery Plan also recommends that a Lyons Ferry Hatchery fall chinook salmon management plan be developed that includes ". . . a schedule for phasing in a sub-yearling release program (phasing out yearling releases) based on sub-yearling program effects and status (viability) of the population (Task 4.1.d)" (Schmitten et al. 1995). Fall chinook are proposed for release at Big Canyon as yearling smolts because of much higher

smolt-to-adult survival compared to sub-yearling releases. The phasing in of sub-yearling releases is intended as a long-term goal, not an immediate requirement.

The Big Canyon site is the second of three facilities planned for acclimation of Lyons Ferry fall chinook salmon in the Snake River Basin (COE 1996a, USFWS/NPT 1996). A similar facility at Pittsburg Landing, in Hells Canyon on the Snake River, was constructed and began operation in 1996. Construction and installation of the Pittsburg Landing facility was considered in an ESA Section 7 informal consultation between COE and NMFS (Weller 1995, Stelle 1995a). Operation and maintenence, along with monitoring and evaluation, of the Pittsburg Landing facility was considered in an ESA Section 7 informal consultation between USFWS and NMFS (Shake 1995, USFWS/NPT 1995, Stelle 1995b). A third site on the Snake River near Asotin, Washington is being considered for implementation in 1998 (COE 1996a, USFWS/NPT 1996). If the third site is developed in 1998, ESA consultation could probably proceed as it has for the Pittsburg Landing and Big Canyon sites.

The proposed action is consistent with a recent fall chinook management agreement drafted by federal, state, and tribal salmon co-managers under the Columbia River Fish Management Plan (CRITFC 1996). This agreement also addresses the allocation of Lyons Ferry fall chinook between the yearling and subyearling release strategies. The draft management plan states that:

> With respect to the Lyons Ferry Hatchery 1996-1998 fall chinook broods, the parties agree to an on-station release of up to 450,000 yearlings. Additional production will be used for off-station release of up to 450,000 yearlings above Lower Granite Reservoir. If additional subyearling production is available beyond the full yearling program, then all subyearlings shall be released off-station . . .

Development of the Big Canyon site is one of fifteen proposed hatchery production projects that have been reviewed and approved by NMFS and the U.S. v. Oregon Policy Committee. In addition, this project is one of six that is considered "critical to recovery of ESA-listed salmon" (Stelle 1996a).

III. Analysis of potential effects on listed species

A. Proximity to listed species and their critical habitat

1. Snake River sockeye salmon

Listed Snake River sockeye salmon do not occur in the Clearwater River, and would not be present in the immediate action area

unless they strayed from elsewhere within the Snake River Basin. However, they may be present in the Snake and Columbia River migration corridor downstream from the confluence of the Salmon and Snake Rivers near river mile 190. Adult sockeye salmon are expected to be migrating upstream in August and September, and smolts are expected to be migrating seaward in April and May (NMFS 1995b).

2. Snake River spring/summer chinook salmon

The natural and hatchery populations of spring chinook salmon now present in the Clearwater River Basin are not considered part of the listed Snake River spring/summer chinook salmon Evolutionarily Significant Unit (ESU) (Matthews and Waples 1991). Therefore, listed spring/summer chinook salmon would not be present in the immediate action area unless they strayed from elsewhere in the Snake River Basin. However, listed Snake River spring/summer chinook salmon would be present in the Snake and Columbia River migration corridor. Juveniles would be expected to migrate seaward as yearling smolts in April, at a size of approximately 120 mm (NMFS 1995b). Adults would be migrating upstream in May or later.

3. Snake River fall chinook salmon

Listed Snake River fall chinook salmon are known to spawn in the Clearwater River both upstream and downstream of the Big Canyon site, and adults, eggs, fry, and juveniles are likely to be present in the action area (Curtis 1996). Adults migrate to this area from late summer through early winter, and spawning is generally completed by mid-December. Fry emerge from redds in March through June, and juveniles migrate seaward during the summer as sub-yearlings (NMFS 1995b). Therefore, emergent juvenile fall chinook salmon are likely to be present in the action area at the same time that yearling fall chinook are being released at Big Canyon.

Because spawning is known to occur in the vicinity of the Big Canyon site, it is possible that redds containing eggs and/or alevins will be present in the action area during construction, installation, and/or operation of the acclimation facilities. If a redd is located in direct proximity to the intake, release, and overflow pipes, there is potential for the redd to be affected by disturbance of substrate and altered flow. This portion of the Clearwater River will be surveyed for redds in the fall of 1996, and if any are found within 100 feet of the proposed locations of the pipes, potential adverse effects can be averted by shifting the location of the pipes so they are not in direct proximity to the redd(s) (Stelle 1996b).

There is evidence from PIT-tag detections at the lower Snake River dams to suggest that some fall chinook in the Clearwater River may migrate as yearlings instead of subyearlings (Curtis 1996). This may be the result of cooler water temperatures and slower growth in the Clearwater River (COE 1996a). Although the extent of overwintering of juvenile fall chinook in the Clearwater River is unknown, there is no reason to expect that they are prevalent in the immediate vicinity of the Big Canyon site.

B. General effects of proposed action

The Biological Opinion for 1995-1998 Hatchery Operations in the Columbia River Basin (NMFS 1995a) identifies eight general types of potential adverse effects of hatchery operations and production on natural fish populations. These are:
1) Density-dependent effects of hatchery production;
2) Operation of hatchery facilities;
3) Disease;
4) Competition;
5) Predation;
6) Residualism;
7) Migration corridor/ocean;
8) Genetic introgression.

The potential for each of these types of effects from the proposed action on listed Snake River salmon species are assessed below.

1. Density-dependent effects of hatchery production

In order to address the question of carrying capacity of the Snake River, Columbia River, estuarine, and marine ecosystems, and to minimize overall density-dependent effects of hatchery production on listed species, NMFS has recommended that an annual production ceiling be established (Schmitten et al. 1995). The Biological Opinion (NMFS 1995a) states that: "Beginning in 1995, the action agencies . . . should limit annual releases of anadromous fishes (for purposes other than Snake River salmon recovery) from Columbia River hatcheries to 1994 levels of approximately 197.4 million total, of which no more than 20.2 million fish may be produced in the Snake River basin."

To evaluate 1995 and 1996 hatchery releases by all action agencies in relation to the production ceiling, NMFS compiled a data base of all proposed releases (NMFS 1996), calculated totals by basin, and determined that the total production addressed in the Biological Opinion remained within and did not exceed the proposed production ceiling in both 1995 and 1996 (NMFS 1996). Similarly, in 1997 and subsequent years all action agencies

"shall update and provide to NMFS by January 31 . . . the projected releases for the coming year" for evaluation with respect to the production ceiling (NMFS 1995a).

The existing Lyons Ferry Hatchery fall chinook salmon program was included in the LSRCP Biological Assessment (USFWS 1994) and the 1995-1998 Hatchery Operations Biological Opinion (NMFS 1995a). The annual production goal of this program is 900,000 fall chinook salmon smolts, although only 350,000 were released in 1995 (NMFS 1996). A total of 550,000 were released in 1996, of which approximately 116,000 were at Pittsburg Landing, and the remainder (approximately 440,000) at Lyons Ferry Hatchery (J. Krakker, pers. comm.). Because the proposed action does not represent additional production for 1997 to 1999, but a relocation of the release site, potential density-dependent effects of the proposed action downstream from Lyons Ferry Hatchery are already addressed in the existing consultation, as long as total Lyons Ferry Hatchery production remains within the established program of 900,000 fall chinook salmon.

The Biological Opinion also states that "Production releases necessary to support recovery, as defined in the Proposed Recovery Plan, are exempt from this ceiling" (NMFS 1995a). The Proposed Recovery Plan states that "Production to support recovery (currently 1.24 million fish) is exempt from this limit" (Schmitten et al. 1995). This exemption is based on the propagation and release of 1.24 million fish from listed sockeye and spring/summer chinook salmon populations (NMFS 1996). Although the Lyons Ferry hatchery population is not considered listed under the ESA (NMFS 1994), it is considered part of the Snake River fall chinook salmon Evolutionarily Significant Unit (ESU) (Blankenship and Mendel 1993, Schiewe 1993). Therefore, the Lyons Ferry Hatchery fall chinook program, along with the Pittsburg Landing and Big Canyon acclimation sites, should be considered "production to support recovery."

2. Operation of hatchery facilities

Potential adverse effects due to the physical operation of hatchery facilities include impacts from water withdrawal and release of hatchery effluent. The level of impact on fish survival is usually unknown, but is presumed to be small and usually localized at outfall areas, as effluent is diluted downstream (NMFS 1995a). Effects from the operation of the Big Canyon acclimation facility on listed Snake River salmon and critical habitat are expected to be negligible because:

- Total water use will be up to 3.6 cfs (1,600 gpm) taken directly from the Clearwater River, which represents at most only 0.07% of the Clearwater River expected total flow of 5,000 to 40,000 cfs.

• If overwintering juvenile fall chinook are present, the fine-mesh screening (0.079 in) and low flow velocity (0.4 ft/sec, 400 gpm) of the four intake pipes should minimize potential adverse effects of entrainment (Stelle 1996b, Fredericks pers. comm.). However, there could still be mortality of impinged juvenile fish (Schiewe 1996).
• Low water temperatures (<5°C) will require low feeding rates and outfalls of dissolved and solid fish wastes will be low;
• Effluent water quality will be monitored to ensure that all Federal and state standards will be met;
• If fall chinook salmon redds are found within the action area, potential adverse effects can be averted by locating the intake and outflow pipes so that they are not in direct proximity with the redds (Curtis 1996);
• There are no expected effects to critical habitat as a result of sedimentation or disturbance because the proposed action involves no excavation, stream channel modification, or in-river use of construction equipment (Curtis 1996).

3. Disease

Potential for disease transmission from the Lyons Ferry Hatchery program, located within the Snake River basin, was addressed in the existing comprehensive Biological Opinion (USFWS 1994, NMFS 1995a). The proposed action is not likely to adversely affect other listed or unlisted fish populations within the Snake River basin as a result of disease transfer, because:
• Rearing densities at Big Canyon will be equal to or less than those at Lyons Ferry Hatchery (USFWS/NPT 1996);
• A standard pre-release disease inspection and certification will be administered prior to release (USFWS/NPT 1996);
• Standard fish health protocols will be followed in accordance with Integrated Hatchery Operations Team (IHOT) guidelines (IHOT 1995);
• All necessary export/import permits will be secured from the States of Washington and Idaho prior to fish transport from Lyons Ferry Hatchery to Big Canyon (USFWS/NPT 1996) and issuance of these permits requires thorough disease inspection.

4. Competition

When yearling fall chinook are released into the Clearwater River, a potential exists for intraspecific competition with juvenile listed fall chinook salmon. These potential effects are likely to be greatest near the point of release and to diminish as the hatchery smolts disperse and migrate seaward. However, adverse competitive effects are expected to be negligible because:
• The release will occur during high-flow spring conditions;

- The yearling fall chinook salmon are expected to begin migrating seaward immediately after release;
- The released yearling fall chinook salmon will be much larger than the emergent fry, and the two size classes will probably not share the same forage base.

5. Predation

There is potential for the fall chinook salmon released from the Big Canyon site to prey on emergent juvenile listed fall chinook salmon in the Clearwater River. Piscivorous salmonids are generally known to consume prey one-third their size or less (NMFS 1995a, USFWS 1994). The fall chinook yearlings are expected to be 140 to 170 mm in April and May (USFWS/NPT 1996), whereas emergent fall chinook fry are expected to be 60 to 100 mm (Connor et al. 1994). Therefore, the smallest of the emergent fry would be most vulnerable to predation by the largest of the yearling smolts.

It is likely that the yearling smolts will readily migrate downstream immediately after release (Bugert 1994). Migrating smolts tend to remain in the main current during the spring high flow conditions, whereas emergent juveniles would remain primarily near the bottom substrate, along the channel edges and out of the main current. These phenomena would result in spatial segregation between the yearling smolts and the emergent fry in the mainstem Clearwater River. In addition, natural-origin fall chinook fry in the Clearwater River are thought to emerge in early May, after the yearling smolts would have emigrated (Arnsberg et al. 1992). Therefore, there is likely to be both spatial and temporal segregation between the emigrating smolts and emergent fry, diminishing the potential for predation.

The potential for predation of emergent wild fall chinook by yearling chinook smolts should also be compared with the potential predation by other salmonid smolts migrating through this portion of the Clearwater River in the spring. Estimated hatchery releases within the Clearwater River Basin in 1996 are summarized in Table 1 below (NMFS 1996). The USFWS operates Dworshak and Kooskia Hatcheries, and IDFG operates Clearwater Hatchery and satellite facilities. Spring chinook and summer steelhead are the primary species reared and released. These ongoing hatchery programs were considered in the existing Biological Opinion (NMFS 1995a).

Table 1. 1996 Hatchery Releases in the Clearwater River Basin (NMFS 1996). Size is in fish per pound (fpp), and weight is in pounds.

Hatchery	Species	Location	Month	Number	Size	Weight
Clearwater	spring chinook	Red R.	Apr	24,000	20	1,200
Clearwater	spring chinook	Powell R.	Apr	237,000	20	11,850
Clearwater	summer steelhead	Clear Cr.	Apr	300,000	6	50,000
Clearwater	summer steelhead	Clwtr. R.	Apr	485,500	6	80,917
Dworshak	spring chinook	Clwtr. R.	Apr	100,000	16	6,250
Dworshak	summer steelhead	SF Clwtr.	Apr	600,000	6	100,000
Dworshak	summer steelhead	Clear Cr.	Apr	350,000	7	50,000
Dworshak	summer steelhead	Clwtr. R.	Apr	1,200,000	7	171,429
Dworshak	summer steelhead	Clwtr. R.	Apr	150,000	6	25,000
Kooskia	spring chinook	Clear Cr.	Apr	330,000	20	16,500

Total smolts = 3,776,500
Total weight = 513,146 pounds
Total spring chinook smolts = 691,000
Total summer steelhead smolts = 3,085,500

Although there is potential for predation of juvenile fall chinook by the 150,000 yearling chinook smolts @ 10 fpp, it is probably small compared to the potential predation resulting from other hatchery releases in the Clearwater River already authorized by the existing Biological Opinion (NMFS 1995a).

In summary, potential adverse effects due to predation are expected to be minor because:
- The release will occur during high-flow spring conditions;
- The yearling fall chinook salmon are expected to begin migrating seaward immediately after release;
- The migrating yearling smolts and emergent fry are expected to occupy different habitat within the river channel;
- The potential for predation as a result of this hatchery release is relatively small when compared with other releases of anadromous salmonids in the Clearwater River Basin.

6. Residualism

Yearling chinook salmon are not known to residualize as are some other anadromous salmonid species, especially steelhead (*Oncorhynchus mykiss*). The yearling fall chinook salmon are expected to begin migrating seaward immediately after release from the Big Canyon acclimation facility. When yearling fall chinook were released at the Pittsburg Landing site in April 1996, 93% of the PIT-tagged fish had been detected at McNary Dam by May 1st, suggesting fast downstream migration (USFWS/NPT 1996). Therefore, there are no expected effects of the proposed action as a result of residualization of the yearling smolts.

7. Migration corridor/ocean

Potential migration corridor and ocean effects are addressed above in III.B.1, Density-dependent effects of hatchery production.

8. Genetic introgression

The Lyons Ferry Hatchery stock was derived from native fall chinook salmon captured in the Snake River upon completion of the Hells Canyon Dam in the 1970s (USFWS/NPT 1996) and is considered a "gene bank" program to maintain the original Snake River stock. The Proposed Recovery Plan for Snake River Salmon (Schmitten et al. 1995) specifically recommends supplementation of Lyons Ferry fall chinook salmon above Lower Granite Dam, along with careful monitoring and evaluation (Task 4.1.d, page V-4-22). In addition, the 1995-1998 Hatchery Biological Opinion (Terms and Conditions 3.f) recommends that "USFWS and BPA shall allow Lyons Ferry Hatchery fall chinook salmon adults to escape above Lower Granite Dam," i.e., for natural spawning (NMFS 1995a). Although the hatchery stock is considered part of the Snake River fall chinook salmon ESU (Schiewe 1993, Blankenship and Mendel 1993), it is not considered listed under the ESA because of its captive rearing history at the time of listing (NMFS 1994).

The Proposed Recovery Plan (Schmitten et al. 1995) also recommends the experimental use of acclimation ponds and volitional release strategies to improve smolt quality (Task 4.4.c, page V-4-35). The extended acclimation at the Big Canyon site will provide natal homing of adults to appropriate Clearwater River spawning habitat and diminish the likelihood that Lyons Ferry Hatchery fall chinook will stray into other Columbia basin populations.

The overall purpose of the proposed action is to increase the numbers of native Snake River fall chinook salmon returning to appropriate habitat above Lower Granite Dam for natural spawning. It is intended that adult fall chinook salmon returning from the Big Canyon releases will spawn naturally along with natural-origin Snake River fall chinook in the Clearwater River. Because the Lyons Ferry Hatchery stock and the listed natural-origin fall chinook are considered to be within the same ESU, there are no expected adverse effects to the listed population as a result of genetic introgression from non-native stocks.

It is expected that up to 263 adult fall chinook salmon may return above Lower Granite Dam as a result of these annual releases, based on a Lyons Ferry Hatchery yearling-to-adult survival rate of 0.269% (J. Krakker, pers. comm., G. Mendel, pers. comm.). Sub-yearling releases from the Lyons Ferry

Hatchery program have resulted in juvenile-to-adult survival rates of only 0.0364% (G. Mendel, pers. comm.). If sub-yearlings were acclimated and released at the Big Canyon site, expected adult returns might be only 35 adults passing above Lower Granite Dam in 1999-2000. Thus, adult returns from yearling releases may be approximately eight times greater than returns from sub-yearling releases. Although there is a substantial survival differential between the two release strategies, the age structure of returning jacks and adults have been generally similar for the two groups (G. Mendel, pers. comm.).

The yearling smolts are much larger and have different migratory characteristics than the natural-origin sub-yearling smolts, which may be responsible for their higher survival. An inevitable consequence is that the yearling and sub-yearling smolts will experience very different selective regimes, at least in the early life stages and perhaps later as well (Schiewe 1995). Thus, it is possible that adults returning from yearling releases will differ genetically from adults returning from sub-yearling releases. The nature and extent of these genetic changes are uncertain, as are their effects on the natural population. As a result, the Proposed Recovery Plan recommends that a sub-yearling release program be phased in to mimic the life history of the natural population (Schmitten et al. 1995). However, unless sub-yearling-to-adult survival can be increased by improved mainstem passage or other means, it is unknown whether survival will be high enough for such a program to be successful. Since the Lyons Ferry Hatchery program has primarily utilized yearling releases, it is possible that these life history effects have already occurred within the Lyons Ferry Hatchery population.

The recent Columbia River fall chinook management agreement states that if additional Lyons Ferry fall chinook 1996-1998 brood production is available above the full yearling program of 900,000, then these fish shall be released off-station as subyearlings (CRITFC 1996). Therefore, a strategy should be developed for incorporating releases of subyearling fall chinook salmon into the existing programs. This strategy should be implemented as soon as is feasible because of the uncertainty regarding genetic and ecological consequences of supplementing natural production with the yearling life-history variant. These releases could be phased in at the facilities, so that fall chinook salmon of both life-history types could be differentially marked and released from the same facility. This approach would provide a direct comparison of the two culture tactics at a single facility, replicated over at least two brood years (Schiewe 1996).

IV. Conclusion

Based on the available information, NMFS has determined that the subject action would have no more than a negligible potential to adversely affect the listed Snake River salmon. The NMFS concurs with USFWS' determination that the rearing, acclimation, and release of Lyons Ferry Hatchery fall chinook salmon at the Big Canyon acclimation site on the Clearwater River in 1997, 1998, and 1999, is not likely to adversely affect listed Snake River sockeye salmon, Snake River spring/summer chinook salmon, Snake River fall chinook salmon, or their critical habitat. In summary, NMFS' decision is based on:

(1) The proposed action is consistent with the Proposed Recovery Plan (Schmitten et al. 1995) and 1995-1998 Hatchery Operations Biological Opinion (NMFS 1995a);

(2) The COE and NMFS have determined that construction and installation of the facilities are not likely to adversely affect listed Snake River salmon (Curtis 1996, Stelle 1996b);

(3) The proposed action is part of an existing hatchery program already considered within the Columbia and Snake basin production ceiling established in the Biological Opinion (NMFS 1995a);

(4) Listed Snake River sockeye salmon are not present in the immediate action area;

(5) Listed Snake River spring/summer chinook salmon are not present in the immediate action area;

(6) The proposed action is not likely to adversely affect listed fall chinook salmon as a result of hatchery operations or disease transmission;

(7) The proposed action is not likely to adversely affect listed fall chinook salmon as a result of intra-specific competition at the release site;

(8) The yearling fall chinook salmon are expected to begin migrating seaward immediately after release, and there are no expected adverse effects as a result of residualism;

(9) The migrating yearling smolts and emergent fall chinook fry are expected to occupy different habitat within the river channel;

(10) The potential for predation as a result of this hatchery release is relatively small when compared with other releases in the Clearwater River;

(11) Potential effects within the migration corridor are already considered in the existing Biological Opinion (NMFS 1995a);

(12) Lyons Ferry Hatchery fall chinook salmon are derived from the original Snake River stock, and there are no expected adverse effects as a result of genetic introgression from non-native stocks;

(13) Although acclimation and release of sub-yearlings would better mimic the life history of natural-origin fall chinook, the use of yearling smolts is more likely to result in substantial numbers of adults returning to appropriate spawning habitat.

This concludes informal consultation on this action in accordance with 50 CFR 402.14(b)(1). The action agency must reinitiate this ESA consultation if new information becomes available or circumstances occur that may affect listed species or their critical habitat in a manner or to an extent not previously considered, or a new species is listed or critical habitat is designated that may be affected by the action. If you have any questions please contact Moe Nelson, of my staff, at (503) 231-2178.

Sincerely,

Stephen H. Smith

Stephen H. Smith, Chief
Hatcheries and Harvest Branch

cc:
USFWS - J. Krakker, B. Connor
COE - D. Kenney, S. Simmons
NPT - G. Walker, E. Larson
WDFW - B. Foster, G. Mendel
CRITFC - P. Lumley
IDFG - T. Rogers

REFERENCES

Blankenship, H.L., and G.W. Mendel. 1993. Upstream passage, spawning, and stock identification of fall chinook salmon in the Snake River. Annual Report FY 92-93, December 1993. BPA Project No. 92-046. DOE/BP-60415-1.

Bugert, R. 1994. Biological Assessment of Washington Department of Fish and Wildlife's Lower Snake River Compensation Plan Program (Fall Chinook Salmon). Appendix 1B *in* USFWS (1994), Programmatic Biological Assessment of the Proposed 1995-99 LSRCP Program. WDFW, Olympia, WA. 18 p.

Busby, P.J., T.C. Wainwright, G.J. Bryant, L. Lierheimer, R.S. Waples, F.W. Waknitz, and I.V. Lagomarsino. 1996. Status review of west coast steelhead from Washington, Idaho, Oregon, and California. NOAA Tech. Memo. NMFS-NWFSC-27, 261 p.

Connor, W.P., H.L. Burge, and W.H. Miller. 1994. Rearing and emigration of naturally produced Snake River fall chinook salmon juveniles. Chapter Five *in* Rondorf, D.W., and W.H. Miller, Identification of the spawning, rearing, and migratory requirements of fall chinook salmon in the Columbia River basin, Annual Report 1992. BPA Project No. 92-029. DOE/BP-21708-2.

COE. 1996a. Proceedings of a fall chinook initiatives meeting, U.S. Army Corps of Engineers, Walla Walla District, March 15, 1996.

COE. 1996b. Draft Lower Snake River Fish and Wildlife Compensation Plan Fall Chinook Inititatives Environmental Assessment. U.S. Army Corps of Engineers, Walla Walla District, July 1996.

CRITFC. 1996. 1996-1998 Management Agreement for Upper Columbia River Fall Chinook. Columbia River Inter-Tribal Fish Commission, August 2, 1996.

Curtis, D.R. 1996. Letter from D.R. Curtis, COE, to J.V. Wyland, NMFS, dated July 23, 1996, containing a biological assessment and request for informal consultation on construction of Big Canyon fall chinook acclimation site.

Fredericks, G. NOAA NMFS F/NWO3, Portland, Oregon. Personal communication, September 1996.

Hard, J.J., R.P. Jones, R., M.R. Delarm, and R.S. Waples. 1992. Pacific salmon and artificial propagation under the Endangered Species Act. NOAA Tech. Memo. NMFS-NWFSC-2.

IHOT (Integrated Hatchery Operations Team). 1995. Policies and procedures for Columbia basin anadromous salmonid hatcheries, Annual Report 1994. Bonneville Power Administration, Project No. 92-043, January 1995. DOE/BP-60629. 115 p.

Krakker, J., USFWS, personal communication, October 1995.

Mendel, G., WDFW, personal communication, October 1995.

Matthews, G.M., and R.S. Waples. 1991. Status review for Snake River spring and summer chinook salmon. NOAA Tech. Memo. NMFS F/NWC-200.

NMFS. 1994. Endangered and Threatened Species; Status of Snake River spring/summer and fall chinook salmon. Federal Register 59(248): 66784-66787.

NMFS. 1995a. Biological Opinion for 1995 to 1998 hatchery operations in the Columbia River basin. NOAA/NMFS, April 5, 1995, 82 p. Consultation No. [383].

NMFS. 1995b. Listed species, critical habitat, biological requirements, and status under environmental baseline in 1995. NOAA/NMFS Northwest Region, Seattle, WA, May 1995, 27 p.

NMFS. 1996. Microcomputer data base of hatchery releases in the Columbia River Basin, 1994-1996, maintained by D.M. Nelson, NMFS F/NWO3, Portland, OR.

NOAA. 1996. Endangered and Threatened Species: Proposed Endangered Status for Five ESUs of Steelhead and Proposed Threatened Status for Five ESUs of Steelhead in Washington, Oregon, Idaho, and California. Federal Register 61(155):41541-41561.

Schiewe, M.H. 1993. Memorandum from M.H. Schiewe, NOAA F/NWC1, to R.A. Schmitten, NOAA F/NW, dated June 28, 1993, regarding ESA status of Snake River chinook salmon hatchery populations.

Schiewe, M.H. 1995. Memorandum from M.H. Schiewe, NOAA F/NWC1, to J.V. Wyland, NOAA F/NWO3, dated October 24, 1995, with comments on Pittsburg Landing acclimation facility.

Schiewe, M.H. 1996. Memorandum from M.H. Schiewe, NOAA F/NWC1, to J.V. Wyland, NOAA F/NWO3, dated October 7, 1996, with comments on operation of Big Canyon fall chinook acclimation facility.

Schmitten, R., W. Stelle, Jr., and R.P. Jones, Jr. 1995. Proposed recovery plan for Snake River salmon. NOAA/NMFS, March 1995.

Shake, W.F. 1995. Letter from W.F. Shake, USFWS, to W. Stelle, NMFS, dated October 6, 1995, transmitting a biological assessment and request for informal consultation on operation of Pittsburg Landing fall chinook acclimation site.

Shake, W.F. 1996. Letter from W.F. Shake, USFWS, to W. Stelle, NMFS, dated July 26, 1996, transmitting a biological assessment and request for informal consultation on operation of Big Canyon fall chinook acclimation site.

Smith, S.H. 1996. Letter from S.H. Smith, NMFS, to J.S. Weller, COE, dated May 3, 1996, regarding siting of fall chinook acclimation facilities.

Stelle, W. 1995a. Informaal consultation letter from W. Stelle, NMFS, to J.S. Weller, COE, dated August 10, 1996 on construction of Pittsburg Landing acclimation site, Consultation Number [463].

Stelle, W. 1995b. Informal consultation letter from W. Stelle, NMFS, to W. Shake, USFWS, dated November 6, 1995, on operation of Pittsburg Landing acclimation facility, Consultation Number [505].

Stelle, W. 1996a. Letter from W. Stelle, NMFS, to R. Hardy, BPA, dated March 12, 1996, indicating approval of 15 hatchery production projects.

Stelle, W. 1996b. Informal consultation letter from W. Stelle, NMFS, to Lt.C. D.R. Curtis, COE, dated October 1, 1996, on construction of Big Canyon acclimation site, Consultation Number [652].

USFWS. 1994. Programmatic Biological Assessment of the Proposed 1995-99 LSRCP Program. U.S. Fish and Wildlife Service, Lower Snake River Compensation Plan. 43 p.

USFWS/NPT. 1995. Biological Assessment of fall chinook smolt releases. Nez Perce Tribe and U.S. Fish and Wildlife Service, October 1995.

USFWS/NPT. 1996. Biological Assessment of fall chinook smolt releases. Nez Perce Tribe and U.S. Fish and Wildlife Service, July 1996.

Waples, R.S. 1991. Definition of "species" under the Endangered Species Act: Application to Pacific salmon. NOAA Tech. Memo. NMFS F/NWC-194.

Waples, R.S., R.P. Jones, Jr., B.R. Beckman, and G.A. Swan. 1991. Status review for Snake River fall chinook salmon. NOAA Tech. Memo. NMFS F/NWC-201.

WDFW, USFWS, and NPT. 1995. Monitoring and Evaluation of Snake River Fall Chinook Salmon Outplanted Upstream of Lower Granite Dam (FY 1996-2004). August 10, 1995. Appendix 1 *in* Biological Assessment of fall chinook smolt releases proposed by Nez Perce Tribe and U.S. Fish and Wildlife Service, September 1995.

Weller, J.S. 1995. Letter from J.S. Weller, COE, to J.V. Wyland, NMFS, dated July 12, 1995, containing a biological assessment and request for informal consultation on construction of Pittsburg Landing acclimation site.

Weller, J.S. 1996. Letter from J.S. Weller, COE, to W. Stelle, NMFS, dated March 28, 1996, requesting guidance on siting of fall chinook acclimation facilities.

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Snake River Basin Office, Columbia River Basin Ecoregion
4696 Overland Road, Room 576
Boise, Idaho 83705

June 11, 1996

Lieutenant Colonel James Weller
District Engineer
Department of the Army
Corps of Engineers
Walla Walla District
(Attention: Lonnie Mettler)
201 North Third Avenue
Walla Walla, Washington 99362-1876

Subject: Species List for Fall Chinook Acclimation Facility at Big Canyon Creek
SP #1-4-96-SP-199 File #351.6040

Dear Colonel Weller:

The U.S. Fish and Wildlife Service (Service) is providing you with a list of endangered, threatened, candidate, and/or proposed species which may be present in the area of the Fall Chinook Acclimation Facility at Big Canyon Creek. You requested this species list in a letter dated May 16, 1996 received by this office on May 20, 1996. The list fulfills requirements for a species list under Section 7(c) of the Endangered Species Act of 1973 (Act), as amended. The requirements for Federal agency compliance under the Act are outlined in Enclosure 2. If the project is not started within 180 days of this letter, regulations require that you request an updated list. Please refer to the number shown on the list (Enclosure 1) in all correspondence and reports.

Section 7 of the Act requires Federal agencies to assure that their actions are not likely to jeopardize the continued existence of endangered or threatened species. Federal funding, permitting, or land use management decisions are considered to be Federal actions subject to Section 7. If the proposed action involves a major construction activity that may affect a listed species, Federal agencies are required to prepare a Biological Assessment (BA). It would be prudent for you to consult informally with the Service in development of BAs. If the determination of that BA is that a listed species is likely to be affected adversely by the proposed project, the Act calls for formal Section 7 consultation through this office. If a proposed species is likely to be jeopardized by a Federal action, regulations require a conference between the Federal agency and the Service.

Candidate species that appear on Enclosure 1 have no protection under the Act, but are included for your early planning consideration. Candidate species could be proposed or listed during the project planning period, and would then be covered under Section 7 of the Act. The Service advises an evaluation of potential effects on proposed and/or candidate species that may occur in the project area.

The list we are providing you reflects the Candidate Notice of Review published in the February 28, 1996 Federal Register. You will note that the Service is no longer categorizing candidates as C1, C2, and C3. Beginning with the referenced Notice, candidate species are those formerly identified as category 1, plants and animals for which the Service has sufficient information to support issuing a proposed rule for listing under the Endangered Species Act (Act). Species that do not meet that information standard are no longer regarded as candidates and do not appear in the Notice of Review. Further, you will note that several Idaho species that were listed as C1 in previous Notices do not appear on this most recent list. In preparing the Notice, the Service evaluated all species and revised the list to include only those that met the aforementioned information requirements. Candidates that appear in the Notice for Idaho are the bull trout, Northern Idaho ground squirrel, the Great Basin population of spotted frog, and Christ's paintbrush. The list of threatened and endangered species remains unchanged.

The Snake River Basin Office continues to have interest in a number of plants and animals that are not designated as endangered, threatened, or candidate species under the Act. We are concerned about their population status and threats to their long-term viability. In your efforts toward ecosystem-level management, we suggest that you consider these species and their habitats in project planning and review. The Service will continue to provide you with information that we have about those species. Any concerns we raise about those species will be in context with the National Environmental Policy Act, Fish and Wildlife Coordination Act, Migratory Bird Treaty Act, and other authorities.

If you need any further information, please contact Rachel Strach of this office at (208) 334-1931. Thank you for your continued interest in endangered species conservation.

Sincerely,

Robert D. Russell

Supervisor, Snake River Basin Office

Enclosures

cc: IDFG, Lewiston

ENCLOSURE 1

LISTED AND PROPOSED ENDANGERED AND THREATENED SPECIES, AND CANDIDATE SPECIES, THAT MAY OCCUR WITHIN THE AREA OF THE FALL CHINOOK ACCLIMATION FACILITY AT BIG CANYON CREEK
FWS-1-4-96-SP-198

LISTED SPECIES	*COMMENTS*
Mammals	
Gray wolf (LE;XN) (*Canis lupus*)	Experimental/ Non-essential population
Birds	
Bald eagle (LT) (*Haliaeetus leucocephalus*)	Wintering area Nesting area
Fish	
Fall chinook salmon (LT) *(Oncorhynchus tshawytscha)*	
Spring and Summer chinook salmon (LT) *(Oncorhynchus tshawytscha)*	

PROPOSED SPECIES

None

CANDIDATE SPECIES

None

The Fish and Wildlife Service has concerns about the following plants and animals. Although these species have no status under the Endangered Species Act, we are concerned about their population status and threats to their long-term viability. In context with ecosystem-level management, we suggest that you consider these species and their habitats in project planning and review.

Plants

Jessica's aster
(Aster jessicae)

Broad-fruit mariposa
(Calochortus nitidus)

GENERAL COMMENTS

GRAY WOLF -- Since the translocation of wolves from Canada, the population in Idaho south of Interstate Highway 90 is considered "experimental, non-essential" under Section 10(j) of the Endangered Species Act. Under these circumstances, Federal action agencies are required to confer with the Service if their actions are likely to jeopardize the continued existence of gray wolves (see 50 CFR 17.83). Of course, you may opt to confer with the Service regardless of your determination.

ENCLOSURE 2

RESPONSIBILITY UNDER SECTIONS 7(a) AND (c) OF THE ENDANGERED SPECIES ACT

SECTION 7(a) - Consultation/Conference

Requires: 1) Federal agencies to utilize their authorities to carry out programs to conserve endangered and threatened species;

2) Consultation with FWS when a Federal action may affect a listed endangered or threatened species to insure that any action authorized, funded or carried out by a Federal agency is not likely to jeopardize the continued existence of listed species; or result in destruction or adverse modification of critical habitat. The process is initiated by the Federal agency after determining the action may affect a listed species; and

3) Conference with FWS when a Federal action is likely to jeopardize the continued existence of a proposed species or result in destruction or adverse modification of proposed critical habitat.

SECTION 7(c) - Biological Assessment for Major Construction Activities [1/]

Requires Federal agencies or their designees to prepare Biological Assessment (BA) for major construction activities. The BA analyzes the effects of the action[2/] on listed and proposed species. The process begins with a Federal agency in requesting from FWS a list of proposed and listed threatened and endangered species (list attached). If the BA is not initiated within 90 days of receipt of the species list, the accuracy of the species list should be informally verified with our Service. The BA should be completed within 180 days after its initiation (or within such a time period as is mutually agreeable). No irreversible commitment of resources is to be made during the BA process which would foreclose reasonable and prudent alternatives to protect endangered species. Planning, design, and administrative actions may be taken; however, no construction may begin.

We recommend the following for inclusion in the BA; an onsite inspection of the area to be affected by the proposal which may include a detailed survey of the area to determine if the species are present; a review of literature and scientific data to determine species' distribution, habitat needs, and other biological requirements; interviews with experts, including those within FWS, State conservation departments, universities and others who may have data not yet published in scientific literature; an analysis of the effects of the proposal on the species in terms of individuals and populations, including consideration of cumulative effects of the proposal on the species and its habitat; an analysis of alternative actions considered. The BA should document the results, including a discussion of study methods used, any problems encountered, and other relevant information. The BA should conclude whether or not a listed or proposed species will be affected. Upon completion, the BA should be forwarded to our office.

[1/] A major construction activity is a construction project (or other undertaking having similar physical impacts) which is a major action significantly affecting the quality of human environment as referred to in the NEPA (42 U.S.C. 4332 (2)(c).

[2/] "Effects of the action" refers to the direct and indirect effects on an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action.

DEPARTMENT OF THE ARMY
WALLA WALLA DISTRICT, CORPS OF ENGINEERS
201 NORTH THIRD AVENUE
WALLA WALLA, WASHINGTON 99362-1876

Reply To
Attention Of:

June 18, 1996

Planning Division

Mr. Robert G. Ruesink, Supervisor
U.S. Fish and Wildlife Service
Snake River Basin Office
4696 Overland Road, Room 576
Boise, Idaho 83705

Dear Mr. Ruesink:

Pursuant to Section 7(c) of the Endangered Species Act, we request your review of the proposed project as described below and concurrence on our *"Not Likely To Adversely Effect"* determination for listed species under your jurisdiction.

Project Title

Fall Chinook Acclimation Facility on the Clearwater River in Idaho

History of Fall Chinook Acclimation Facilities

The Lower Snake River Fish and Wildlife Compensation Plan, Lower Snake River, Washington and Idaho, (Comp Plan) was originally authorized by the Water Resources Development Act (WRDA) of 1976, Section 102, Public Law (PL) 94-587 (October 22, 1976). The Comp Plan's land acquisition procedures were subsequently modified by the WRDA of 1986, Section 856, PL 99-662 (November 17, 1986). A "Congressional Add" to the Comp Plan was included in a conference report and directed implementation of additional Comp Plan hatchery construction programs (accompanying PL 103-316, House Resolution 4506, August 26, 1994). The additional projects to be initiated included adult trapping and juvenile acclimation facilities for the upper Grande Ronde River and Catherine Creek, a water treatment facility for Lookingglass Hatchery, and final rearing and /or acclimation facilities for the Clearwater, Snake, and lower Grande Ronde Rivers. The first "Congressional Add" juvenile fall chinook acclimation facility (facility) was installed during 1996 on U.S. Forest Service (USFS) controlled property in Hells Canyon National Recreation Area on the Snake River

at Pittsburg Landing, Idaho. This site is located in Section 32, Township 27 North, Range 1 West, Grave Point quadrangle, Idaho-Oregon. Facility components and systems are designed to be portable, so the use location can potentially be changed from one year to the next. The length of use at a given site will be adjusted by the involved fisheries management personnel. The next facility, the subject of this biological assessment, would be operational in 1997, and will be at Big Canyon Creek, Clearwater River, in Section 3, Township 36 North, Range 1 West, Peck quadrangle, Idaho (see Figure 1). The third facility will be developed in Washington at one of the two Snake River sites presently being evaluated. This third facility would be operational in 1998.

Facility Design and Operation

The facility would be fenced, with temporary eight-foot tall chain-link fencing, for safety and security reasons. This fence will remain in place while the acclimation mission of the site is being conducted, it will then be removed. Water piping and support structures, at a facility, would be designed to be removable /transportable. The facility would be setup, operated, and closed down each year that fall chinook are acclimated at the site. The initial season of use would be scheduled to occur between January 1 and June 1. The U.S. Fish and Wildlife Service (Service), Washington Department of Fish and Wildlife (WDFW), and the Nez Perce Tribe (Tribe) could adjust the season of use to meet their fisheries goals. The juvenile fall chinook to be acclimated are Snake River fall chinook from the WDFW's Lyons Ferry Fish Hatchery, near Starbuck, Washington. Electrical power may be provided at the facility.

The largest component of the Facilities are the fish-holding tanks (tanks). Tanks would be constructed of aluminum or fiberglass and would be 20 feet in diameter and four to five feet deep. Each facility would have from 16 to 24 of these tanks. Tanks are normally operated in groups of up to eight interconnected tanks. Facility development would consist of modification of the ground contour to establish a base for the tanks, pumps, and support structures. Gravel would then be utilized as placement pads for removable tanks, pumps, and support structures. Netting would be placed over the tanks to provide shade, reduce water temperature, and prevent predation of the fall chinook by birds. The arrangement of tanks on the ground surface would be controlled by a site's shape and slope; therefore, the footprint of Facilities would vary from as small as one acre to as large as five acres. The number of tanks at a specific site could vary from year to year to meet an adjusted number of fall chinook being acclimated at that location.

Four portable diesel pumps, each having approximately 450 gallons-per-minute (gpm) capacity, would be used to draw water from the river upstream of the Facilities discharge/outfall pipes. The pumps' water intakes would be screened and the screen slot size (0.079 inch) and water velocity through the screen (0.4 feet-per-second) would comply with National Marine Fisheries Service (NMFS) guidelines. Excess nitrogen, gravel, sand, and other sediment would be removed from the pumped water. The water would then gravity flow through the interconnecting groups of tanks and back into the river downstream of the intake pipes. The acclimated fall chinook would be directly released into the river. Facility support structures would include diesel-fuel tank(s), storage building(s), diesel-powered emergency generator(s), and two camper trailers. During facility operation the sites would be manned 24 hours per day. Human sewage would be held in the camper-trailer holding tanks and periodically removed from the site for proper disposal. This site occurs on a gravel parking lot. At the conclusion of the program any site restoration would be coordinated by the Service and Tribe.

Project Location

The Big Canyon Creek site is located on the left bank of the Clearwater River just downstream of the confluence of Big Canyon Creek, on Nez Perce Tribal Allotment No. 992T, Lot 5, SW1/4, NE1/4, Section 3, Township 36 North, Range 1 West, Peck quadrangle, Idaho (see Figure 1). This site consists of a gravel parking lot and a concrete boat ramp. The tribe formerly leased the site to the Idaho Department of Fish and Game for a fishing access site. Some woody vegetation is beginning to reestablish itself between the parking lot and the river.

Listed Species

This site is within the potential range of a "non-essential experimental population" of the "Endangered" gray wolf (*Canis lupus*). Bald eagle *(Haliaeetus leucocephalus)*, listed as "Threatened" under the Endangered Species Act, has its historical range within the geographic area of this site. Two anadromous-fish species listed as "Threatened" also have their historical range within the geographic area of this site. These anadromous-fish species are Fall chinook salmon (*Oncorhynchus tshawytscha*) and Spring and Summer chinook salmon (*O. t.*). These data were provided in the Service's list of threatened and endangered species, 1-4-96-SP-199, June 11, 1996.

Gray wolf sightings, or evidence of gray wolf use, in the general area of the Facilities site have not been documented (personal communication, Mr. Keith Lawrence, Wildlife Biologist, Nez Perce Tribe, June 6, 1996). This evidence, the large amount of human disturbance in the general area, and the parking lot not providing feeding habitat indicates that a facility, at this site, will not impact the continued existence of this experimental gray wolf population.

Bald eagle is a common winter resident in the project area, but reproduction has not been documented in the local area. Perching/roosting trees do not occur on this site. Development of the facility is not expected to reduce the availability of waterfowl, fish, or carrion as prey. Facility operation could increase the noise, and perhaps the already high human disturbance effects, and thereby possibly cause waterfowl to move away from the facility site; however, waterfowl will remain available upstream and downstream of the site. Resident waterfowl will adjust to the increased noise levels and probably return to the facility site after an adjustment period. Wildlife habitat on the right bank will provide raptors a much higher prey base, better feeding habitats, and less human disturbance than the left-bank site proposed for the facility; therefore, no impacts to the feeding habitat or prey base of bald eagle are expected to occur (personal communications, Mr. Danny Davis, Wildlife Biologist, U.S. Forest Service, June 6, 1996 and Mr. Keith Lawrence, Wildlife Biologist, Nez Perce Tribe, June 6, 1996).

The assessment of impacts to anadromous fish species, Fall chinook salmon and Spring and Summer chinook salmon, will be conducted with the NMFS.

Species of Concern

"Species of concern" have no legal protection under the Endangered Species Act; however, they are being addressed here to ensure the proposed actions have taken into consideration the needs of any known species of concern. Two species of concern, Jessica's aster (*Aster jessicae*) and broad-fruit mariposa (*Calochortus nitidus*), are known to potentially occur within the geographic area of the proposed project (Service, list of threatened and endangered species, 1-4-96-SP-199, June 11, 1996). These species do not occur on or directly adjacent to the site being utilized for a facility; therefore, the project will not impact these species of concern (personal communications, Mr. Danny Davis, Wildlife Biologist, U.S. Forest Service, June 6, 1996 and Mr. Craig Johnson, Fisheries Biologist, Bureau of Land Management, June 7, 1996).

Conclusion

Based on the lack of anticipated negative impacts it is determined that the proposed project is "Not Likely To Adversely Affect" gray wolf or bald eagle use of the area, or their habitats. Regarding the sensitive species, Jessica's aster and broad-fruit mariposa, they do not occur on the Facilities site.

If you have any questions or require additional information about this project or the biological evaluation, please contact Mr. Clark H. Derdeyn at 509-527-7272.

Sincerely,

\signed\

Carl J. Christianson
Chief, Environmental Resources Branch

Enclosure: Location of Project Site

Copy Furnished:

U.S. Fish and Wildlife Service
ATTN: Philip Laumeyer, Supervisor
Upper Columbia River Field Office
11103 East Montgomery, Suite No. 2
Spokane, Washington 99206

CENPW-PL-ER (Simmons)

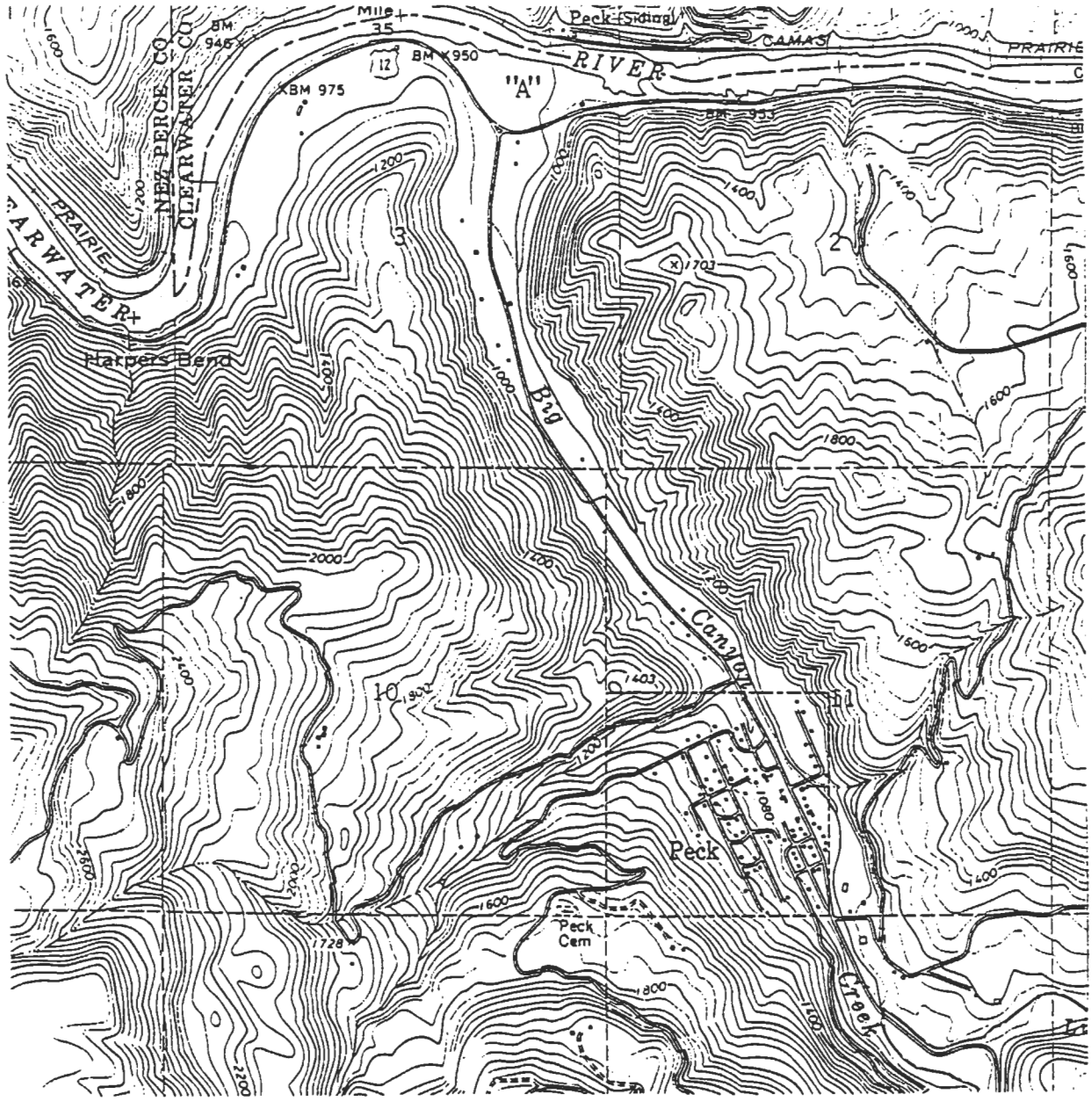

Figure 1. Location of Big Canyon Creek fall chinook acclimation facility is shown as "A" above.

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Snake River Basin Office, Columbia River Basin Ecoregion
4696 Overland Road, Room 576
Boise, Idaho 83705

July 15, 1996

Lieutenant Colonel Donald R. Curtis, Jr.
U.S. Army Corps of Engineers
Walla Walla District
(Attention: Carl J. Christianson)
201 North 3rd Avenue
Walla Walla, Washington 99362-1876

Subject: Endangered Species Act §7 Consultation for Snake River Fall Chinook Acclimation Facilities on the Clearwater River
File # 351.6040 1-4-96-I-95

Dear Colonel Curtis:

The U.S. Fish and Wildlife Service (Service) is responding to your June 18, 1996 request for informal consultation under §7 of the Endangered Species Act (Act) regarding the proposed chinook acclimation facility on the Clearwater River. Your biological assessment provides analysis of effects on threatened bald eagles as well as the experimental, nonessential population of wolves introduced to Idaho under §10(j) of the Act. The Service appreciates your interest in protecting threatened and endangered species, and concurs with the determination that the project will not impact the continued existence of the experimental/nonessential population of the gray wolf, and may affect, but is not likely to adversely affect gray wolves or bald eagles.

Proposed Action - The acclimation facility is proposed for construction in 1997 on a site called Big Canyon, located on the Clearwater River in Idaho. The site is presently used as a boat launch and parking area. It is not anticipated that the proposed construction and operation of the acclimation facility will disturb a significant amount of wildlife habitat, as habitat has already been replaced by existing development. The Big Canyon site will be leveled, and aluminum temporary tanks or permanent aluminum and concrete tanks will be placed on site. Clearwater River water will be pumped through the tanks to acclimate juvenile fall chinook to river water conditions. Access and a mobile trailer for housing staff will also be placed on site.

Gray Wolves - Because of the developed condition of the site, the Service agrees it is unlikely that wolves are using the area. The construction and operation of the facility will not increase human-wolf interactions that are likely to result in harm to wolves, and the wolves' prey base will not be affected by this action. Therefore the effects of this project to wolves are minimal, and are

not likely to result in adverse impacts to the species and are not likely to jeopardize the continued existence of the experimental/nonessential population of the gray wolf.

Bald Eagles - The general area of the proposed facility is known to be used by wintering bald eagles, but is not known or suspected to be used for nesting. Although some temporary displacement of waterfowl may occur, it is not expected that the construction and operation of the facility will reduce carrion supply, fish or waterfowl density, and thus will not affect the food supply of bald eagles. The construction and operation of the facility will not likely disturb bald eagles from nesting, roosting, or foraging. Therefore, the effects of this project to bald eagles are expected to be small, and temporary, and are not likely to result in adverse impacts to the species.

Species of Concern - The Service appreciates your attention to Jessica's aster and broad-fruit mariposa. Your including discussion of these species in your biological assessment indicates the thoroughness of your evaluation of the effects of the project. If you have not already, please pass on the results of your survey for species of concern to the State of Idaho's Conservation Data Center.

Conclusion - The Service concurs with your determination that the project may affect, but is not likely to affect bald eagles or gray wolves. If the project changes in design, timing, scope or location, you should evaluate potential changes in impacts from the project, and communicate these changes to the Service. If you determine that potential effects on eagles and wolves are different because of changes in the project, we recommend that you request reinitiation of consultation with this office.

If you have questions or comments, please contact Rachel Strach of this office at 208/334-1931.

Sincerely,

Supervisor, Snake River Basin Office

cc: CE, Walla Walla (Mettler)
Lower Snake Compliance Office
Dworshak Complex

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Upper Columbia River Basin Field Office
11103 E. Montgomery Drive, Suite #2
Spokane, WA 99206

May 21, 1996

Lonnie E. Mettler, Acting Chief
Environmental Resources Branch
Corps of Engineers
201 North Third Ave.
Walla Walla, WA 99362-1876

FWS Reference: 1-9-96-SP-159 (1355.4000)

Dear Mr. Mettler:

This is in response to your letter of May 16, 1996. Enclosed is a list of listed threatened and endangered species, and candidate species (Enclosure A), that may be present within the area of the proposed sites for the Fall Chinook Acclimation Facility in Asotin County, Washington. The list fulfills the requirements of the Fish and Wildlife Service (Service) under Section 7(c) of the Endangered Species Act of 1973, as amended (Act). We have also enclosed a copy of the requirements for Corps of Engineers (COE) compliance under the Act (Enclosure B).

Should the biological assessment determine that a listed species is likely to be affected (adversely or beneficially) by the project, the COE should request Section 7 consultation through this office. If the biological assessment determines that the proposed action is "not likely to adversely affect" a listed species, the COE should request Service concurrence with that determination through the informal consultation process. Even if the biological assessment shows a "no effect" situation, we would appreciate receiving a copy for our information.

Candidate species are included simply as advance notice to federal agencies of species which may be proposed and listed in the future. However, protection provided to candidate species now may preclude possible listing in the future. If early evaluation of your project indicates that it is likely to adversely impact a candidate species, the COE may wish to request technical assistance from this office.

The Service has revised its list of candidate species, published in the February 28, 1996, Federal Register. Under the new system, only those species for which the Service has enough information to support a listing proposal will be called

"candidates". The list of candidates comprises some of the former Category 1 species. The other Category 1 species and the former Category 2 species remain as species of concern to the Service. The Service anticipates that Federal agencies will remain committed to the concept of addressing conservation needs of both the current list of candidate species and other species of concern. For your information, we have included a list of the species of concern that may occur in the vicinity of your project.

There may be other federally listed species that may occur in the vicinity of your project which are under the jurisdiction of the National Marine Fisheries Service (NMFS). Please contact NMFS at (503) 230-5430 to request a species list.

In addition, please be advised that state regulations may require permits in areas where wetlands are identified. You should contact the Washington State Department of Ecology for state permit requirements.

Thank you for your efforts to protect our threatened species and their habitats.

If you have additional questions regarding your responsibilities under the Act, please contact Linda Hallock or Michelle Eames at 509-921-0160.

Sincerely,

Robert J Hallock

for Philip Laumeyer
Field Supervisor

Enclosures

FWS 1-9-96-SP-159

c: WDFW, Region 1
WNHP, Olympia

ENCLOSURE A

**LISTED AND PROPOSED ENDANGERED AND THREATENED SPECIES
CANDIDATE SPECIES AND SPECIES OF CONCERN
WHICH MAY OCCUR
IN THE VICINITY OF
THE PROPOSED SITES FOR THE
FALL CHINOOK ACCLIMATION FACILITY
ON THE SNAKE RIVER
IN ASOTIN COUNTY, WASHINGTON
T08N R47E S29 & T09N R47E S31**

FWS Reference: 1-9-96-SP-159

LISTED

Endangered

Peregrine falcon *(Falco peregrinus)* - peregrine falcon nesting territories have been reported in the vicinity of the project

Threatened

Bald eagle (*Haliaeetus leucocephalus*) - wintering bald eagles may occur in the vicinity of the project from October 31 through March 31.

Major concerns that should be addressed in your biological assessment of project impacts to these listed species are:

1. Level of use of the project area by listed species.

2. Effect of the project on listed species' primary food stocks and foraging areas in all areas influenced by the project.

3. Impacts from project construction and implementation (e.g. increased noise levels, increased human activity and/or access, loss or degradation of habitat) which may result in disturbance to listed species and/or their avoidance of the project area.

PROPOSED

None

CANDIDATE

The following candidate species may occur in the vicinity of the project:

Bull trout *(Salvelinus confluentus)*

SPECIES OF CONCERN

The following species of concern to the US Fish and Wildlife Service may occur in the vicinity of the project:

California floater (mussel) *(Anodonta californiensis (*Lea, 1852*))*
Columbia pebblesnail (Fluminicola (=Lithoglyphus) columbianus (Hemphill in Pilsbry, 1899)) [great Columbia River spire snail]
Ferruginous hawk *(Buteo regalis)*
Fringed myotis (bat) *(Myotis thysanodes)*
Loggerhead shrike *(Lanius ludovicianus)*
Northern goshawk *(Accipiter gentilis)*
Northern sagebrush lizard *(Sceloporus graciosus graciosus)*
Pacific lamprey *(Lampetra tridentata)*
Pale Townsend's (= western) big-eared bat *(Plecotus townsendii pallescens)*
Small-footed myotis (bat) *(Myotis ciliolabrum)*
Western burrowing owl *(Athene cunicularia hypugea)*
Westslope cutthroat trout *(Oncorhynchus (= Salmo) clarki lewisi)*
Yuma myotis (bat) *(Myotis yumanensis)*

ENCLOSURE B

FEDERAL AGENCIES' RESPONSIBILITIES UNDER SECTIONS 7(a) AND 7(c) OF THE ENDANGERED SPECIES ACT OF 1973, AS AMENDED

SECTION 7(a) - Consultation/Conference

Requires:

1. Federal agencies to utilize their authorities to carry out programs to conserve endangered and threatened species;

2. Consultation with FWS when a Federal action may affect a listed endangered or threatened species to ensure that any action authorized, funded, or carried out by a Federal agency is not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat. The process is initiated by the Federal agency after it has determined that its action may affect (adversely or beneficially) a listed species; and

3. Conference with FWS when a Federal action is likely to jeopardize the continued existence of a proposed species or result in destruction or adverse modification of proposed critical habitat.

SECTION 7(c) - Biological Assessment for Construction Projects[1]

Requires Federal agencies or their designees to prepare a Biological Assessment (BA) for major construction projects. The BA analyzes the effects of the action, including indirect effects and effects of interrelated or interdepenent actions, on listed and proposed species. The process is initiated by a Federal agency requesting a list of proposed and listed threatened and endangered species. The BA should be completed within 180 days of initiation, or a time period that is mutually agreeable. If the BA is not initiated within 90 days of receipt of the species list, the current accuracy of the list must be verified with the FWS. No irreversible commitment of resources is to be made during the BA process which would foreclose reasonable and prudent alternatives to protect the species. Planning, design, and administrative actions may be taken; however, no construction may begin.

To complete the BA, your agency or its designee should: (1) conduct an onsite inspection of the area to be affected by the proposal, which may include a detailed survey of the area to determine if the species is present and whether suitable habitat exists; (2) review literature and scientific data to determine species distribution, habitat needs, and other biological requirements; (3) interview experts including those within the FWS, state conservation department, universities, and others who may have data not yet published in scientific literature; (4) review and analyze the effects of the proposal on the species in terms of individuals and populations, including consideration of cumulative effects of the proposal on the species and its habitat; (5) analyze alternative actions that may provide conservation measures; and (6) prepare a report documenting the results, including a discussion of study methods used, any problems encountered, and other relevant information. The completed BA should be forwarded to this office.

1." Major construction project" means any major federal action which significantly affects the quality of the human environment (requiring an EIS), designed primarily to result in the building or erection of human-made structures such as dams, buildings, roads, pipelines, channels, and the like. This includes federal action such as permits, grants, licenses, or other forms of federal authorization or approval which may result in construction.

DEPARTMENT OF THE ARMY
WALLA WALLA DISTRICT, CORPS OF ENGINEERS
201 NORTH THIRD AVENUE
WALLA WALLA, WASHINGTON 99362-1876

Reply To
Attention Of:

June 13, 1996

Planning Division

Mr. Philip Laumeyer, Supervisor
Upper Columbia River Field Office
U.S. Fish and Wildlife Service
11103 East Montgomery, Suite No. 2
Spokane, Washington 99206

Dear Mr. Laumeyer:

Pursuant to Section 7(c) of the Endangered Species Act, we request your review of the proposed project as described below and concurrence on our *"Not Likely To Adversely Effect"* determination for listed species under your jurisdiction.

Project Title

Fall Chinook Acclimation Facility on the Snake River in Washington

History of Fall Chinook Acclimation Facilities

The Lower Snake River Fish and Wildlife Compensation Plan, Lower Snake River, Washington and Idaho, (Comp Plan) was originally authorized by the Water Resources Development Act (WRDA) of 1976, Section 102, Public Law (PL) 94-587 (October 22, 1976). The Comp Plan's land acquisition procedures were subsequently modified by the WRDA of 1986, Section 856, PL 99-662 (November 17, 1986). A "Congressional Add" to the Comp Plan was included in a conference report and directed implementation of additional Comp Plan hatchery construction programs (accompanying PL 103-316, House Resolution 4506, August 26, 1994). The additional projects to be initiated included adult trapping and juvenile acclimation facilities for the upper Grande Ronde River and Catherine Creek, a water treatment facility for Lookingglass Hatchery, and final rearing and /or acclimation facilities for the Clearwater, Snake, and lower Grande Ronde Rivers. The first "Congressional Add" juvenile fall chinook acclimation facility (Facility) was installed during 1996 on U.S. Forest Service (USFS) controlled property in Hells Canyon National Recreation Area on the Snake River at Pittsburg Landing, Idaho. This site is located in Section 32, Township 27 North, Range 1 West, Grave Point quadrangle, Idaho-Oregon. Facility components and

systems are designed to be portable, so the use location can potentially be changed from one year to the next. The length of use at a given site will be adjusted by the involved fisheries management personnel. The next Facility will be operational in 1997, and will be at Big Canyon Creek, Clearwater River, in Section 3, Township 36 North, Range 1 West, Peck quadrangle, Idaho. The third Facility will be developed in Washington at one of the two Snake River sites described below. This third Facility is to be operational in 1998.

Facility Design and Operation

The Facility would be fenced, with temporary eight-foot tall chain-link fencing, for safety and security reasons. This fence will remain in place while the acclimation mission of the site is being conducted, it will then be removed. Water piping and support structures, at a Facility, would be designed to be removable/transportable. The Facility would be setup, operated, and closed down each year that fall chinook are acclimated at the site. The initial season of use would be scheduled to occur between January 1 and June 1. The U.S. Fish and Wildlife Service (Service), Washington Department of Fish and Wildlife (WDFW), and the Nez Perce Tribe (Tribe) could adjust the season of use to meet their fisheries goals. The juvenile fall chinook to be acclimated are Snake River fall chinook from the WDFW's Lyons Ferry Fish Hatchery, near Starbuck, Washington. Electrical power may be provided at the Facility.

The largest component of the Facilities are the fish holding tanks (tanks). Tanks would be constructed of aluminum, concrete, or fiberglass and would be 20 feet in diameter and four to five feet deep. Tanks would either be installed on the soil surface, for annual removal, or installed on or below the existing soil surface/grade for a more long-term installation. The amount of burial within the soil would vary to obtain the correct drainage, but the maximum depth of soil disturbance would be approximately six feet. Each Facility would have from 16 to 24 of these tanks. Tanks are normally operated in groups of up to eight interconnected tanks. Facility development would consist of modification of the ground contour to establish a base for the tanks, pumps, and support structures. Gravel would be utilized as placement pads for removable tanks, pumps, and support structures. Netting would be placed over the tanks to provide shade, reduce water temperature, and prevent predation of the fall chinook by birds. The arrangement of tanks on the ground surface would be controlled by a site's shape and slope; therefore, the footprint of Facilities would vary from as small as one acre to as large as five acres. The number of tanks at a specific site could vary from year to year to meet an adjusted number of fall chinook being acclimated at that location.

Four portable-diesel pumps, each having approximately 450 gallons-per-minute (gpm) capacity, would be used to draw water from the river upstream of the Facilities discharge/outfall pipes. The pumps' water intakes would be screened and the screen slot size (0.079 inch) and water velocity through the screen (0.4 feet-per-second) would comply with National Marine Fisheries Service (NMFS) guidelines. Excess nitrogen, gravel, sand, and other sediment would be removed from the pumped water. The water would then gravity flow through the interconnecting groups of tanks and back into the river downstream of the intake pipes. The acclimated fall chinook would be directly released into the river. Facility support structures would include diesel-fuel tank(s), storage building(s), diesel-powered emergency generator(s), and two camper trailers. During Facility operation the sites would be manned 24 hours per day. Human sewage would be held in the camper-trailer holding tanks and periodically removed from the site for proper disposal. At the conclusion of the program any site restoration would be coordinated by the Service, WDFW, and Tribe.

Project Location

Two potential sites, in Washington, are being considered for acquisition for the third Facility. These potential sites occur approximately 5.5 miles apart on the left bank of the Snake River and adjacent to the Snake River Road. The two sites are described as the Captain John Rapids site (left bank of the Snake River, Lots 2 and 3, NE1/4, SE1/4, Section 29, Township 8 North, Range 47 East, Captain John Rapids quadrangle, see Figure 1) and the Grain Elevator site (left bank of the Snake River, East side, N1/2, Section 31, Township 9 North, Range 47 East, Captain John Rapids quadrangle, see Figure 2). Both sites are very narrow. The Captain John Rapids site has very little ground cover. It is mainly disturbed sand with a few hackberry trees and some grass cover at the downstream end. The site receives year-round use for boat launching, boat beaching, picnicking, overnight camping, shoreline and wading types of fishing, and off-road vehicle operation. The Grain Elevator site has a community of native grass adjacent to the road and some hackberry and herbaceous vegetation occurs on the river's shoreline. There are several permanent residences across the road from the site. The site is used year-round for boat beaching and fishing. These activities and overnight camping occur just downstream of the site, on the land around the grain elevator.

Listed Species

Peregrine falcon (*Falco peregrinus*), listed as "Endangered" and bald eagle *(Haliaeetus leucocephalus)*, listed as "Threatened" under the Endangered Species Act occur in the geographic area of this project (Service, list of threatened and endangered

species, 1-9-96-SP-159, May 21, 1996). Neither of the proposed sites contain potential hack sites for peregrine falcon (personal communications, Kevin Martin, USFS, June 5, 1996 and Craig Johnson, Bureau of Land Management, June 6, 1996).

The bald eagle is a common winter resident in the project area, but reproduction has not been documented in the local area. Perching/roosting trees do not occur on either site. Development of the Facility is not expected to reduce the availability of waterfowl, fish, or carrion as prey. Facility operation could increase the noise, and perhaps the already high human disturbance effects, and thereby possibly cause waterfowl to move away from the Facility site; however, waterfowl will remain available upstream and downstream of the site. Resident waterfowl will adjust to the increased noise levels and probably return to the Facility site after an adjustment period. The right bank, opposite these two left-bank sites, has no public road closely adjacent to the shoreline and the majority of the land is operated by the Idaho Department of Fish and Game (IDFG) as a portion of the Craig Mountain Wildlife Management Area. The IDFG-managed wildlife habitat on the right bank provides raptors a much higher prey base, better feeding habitats, and much less human disturbance than the sites proposed for a Facility; therefore, no impacts to the feeding habitat or prey base of peregrine falcon or bald eagle are expected to occur.

Candidate Species

"Candidate" species have no legal protection under the Endangered Species Act; however, they are being addressed here to ensure the proposed actions have taken into consideration the needs of any known candidate species. One candidate species, bull trout (*Salvelinus confluentus),* is known to potentially occur within the geographic area of the proposed project (Service, list of threatened and endangered species, 1-9-96-SP-159, May 21, 1996). The water intakes for the Facilities pumps will be adequately screened and the facilities presently planned operations are not scheduled to occur during the late summer and fall when bull trout will be spawning. Therefore, no impacts to bull trout are expected to occur.

Conclusion

Based on the lack of anticipated negative impacts it is determined that the proposed project is "Not Likely To Adversely Affect" peregrine falcon or bald eagle use of the area, or their habitats. For the candidate species bull trout, the timing of operations will avoid causing any impact to its fall spawning efforts.

If you have any questions or require additional information about this project or the biological evaluation , please contact Mr. Clark H. Derdeyn at 509-527-7272.

Sincerely,

\signed\

Carl J. Christianson
Chief, Environmental Resources Branch

Enclosure: Locations of Project Sites

Copy Furnished:

U.S. Fish and Wildlife Service
ATTN: Robert G. Ruesink, Supervisor
Snake River Basin Office
4696 Overland Road, Room 576
Boise, Idaho 83705

CENPW-PL-ER (Simmons)

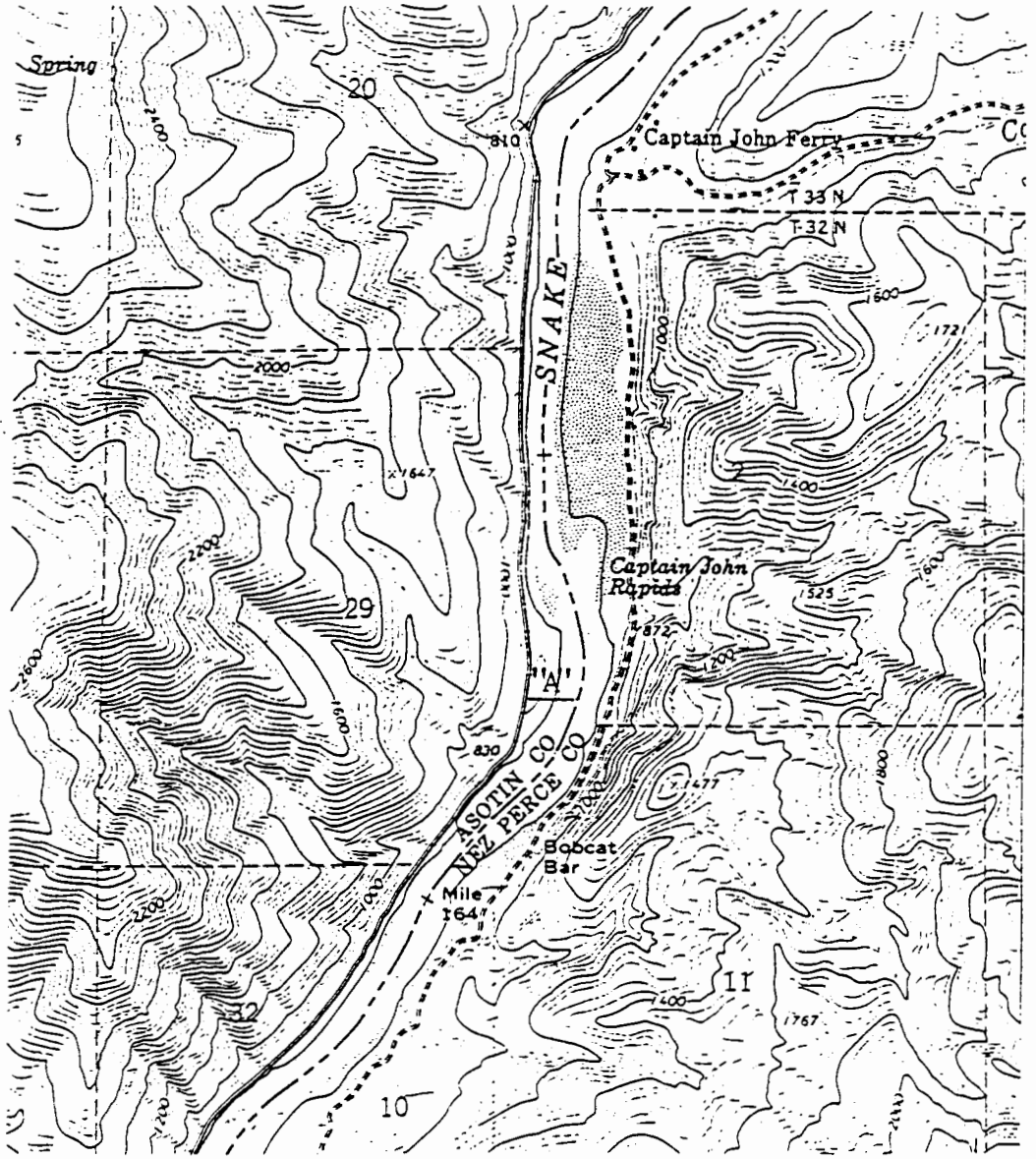

Figure 1. Location of Captain John Rapids fall chinook acclimation facility is shown as "A" above.

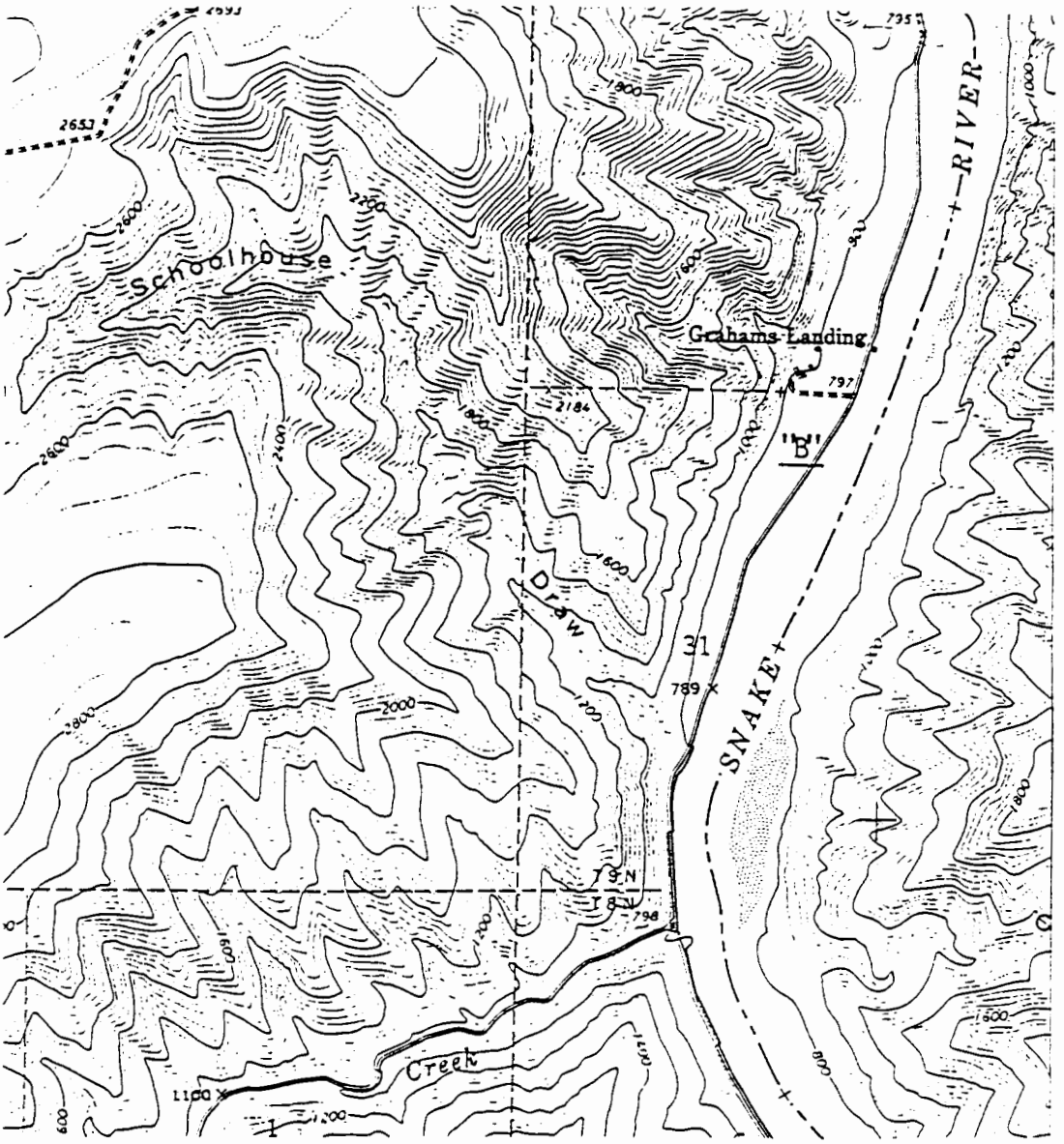

Figure 2. Location of Grain Elevator fall chinook acclimation facility is shown as "B" above.

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Upper Columbia River Basin Field Office
11103 E. Montgomery Drive, Suite #2
Spokane, WA 99206

July 8, 1996

Carl J. Christianson
Chief, Environmental Resources Branch
Walla Walla District, Corps of Engineers
201 N Third Ave.
Walla Walla, WA 99362

FWS Reference 1-9-96-I-092 (1355.4000)

Dear Mr. Christianson:

This letter is in response to your request for informal consultation on the Fall Chinook Acclimation Facility on the Snake River, in Asotin County, Washington. Your letter with an attached biological evaluation was dated June 13, 1996.

The U.S. Fish and Wildlife Service (Service) concurs that the proposed project as described in the biological evaluation, is not likely to adversely affect the peregrine falcon or the bald eagle.

This concludes informal consultation pursuant to Section 7(a)(2) of the Endangered Species Act of 1973, as amended (Act). This project should be re-analyzed if new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not considered in this consultation; if the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this consultation; and/or, if a new species is listed or critical habitat is designated that may be affected by this project.

If you have further questions about this letter or your responsibilities under the Act, please contact Michelle Eames or Linda Hallock of this office at 509-921-0160.

Sincerely,

Philip Laumeyer
Field Supervisor

c: WDFW, Region 1