Final Environmental Impact Statement
Nez Perce Tribal Hatchery Program

Bonneville Power Administration

U.S. Department of Energy

Bureau of Indian Affairs

U.S. Department of the Interior

Nez Perce Tribe

July 1997

Final Environmental Impact Statement

Responsible Agencies: U.S. Department of Energy, Bonneville Power Administration (BPA); U.S. Department of the Interior, Bureau of Indian Affairs (BIA); Nez Perce Tribe (NPT).

Title of Proposed Action: Nez Perce Tribal Hatchery Program.

States Involved: Idaho.

Abstract: Bonneville Power Administration, the Bureau of Indian Affairs, and the Nez Perce Tribe propose a supplementation program to restore chinook salmon to the Clearwater River Subbasin in Idaho. The Clearwater River is a tributary to the Snake River, which empties into the Columbia River. The Final EIS includes a new alternative suggested by commentors to the Draft EIS. In the Proposed Action, the Nez Perce Tribe would build and operate two central incubation and rearing hatcheries and six satellite facilities. Spring and fall chinook salmon would be reared and acclimated to different areas in the Subbasin and released at the hatchery and satellite sites or in other watercourses throughout the Subbasin. The supplementation program differs from other hatchery programs because the fish would be released at different sizes and would return to reproduce naturally in the areas where they are released.

The Use of Existing Facilities Alternative proposes using existing production hatcheries and the proposed satellite facilities to meet the need. Facilities at Dworshak National Fish Hatchery, Kooskia National Fish Hatchery, and Hagerman National Fish Hatchery would be used as central incubation and rearing facilities.

The comments received on the Draft EIS and responses to the comments are in Chapter 10. Because of the comments received, summer chinook production proposed as part of the program has been dropped.

The Final EIS looks much the draft. Changes are underlined. Simple editorial changes and large areas related to summer chinook that were deleted are not marked. Additional appendices have been added in the Final EIS to respond to public comments.

BPA expects to issue a Record of Decision (ROD) in August 1997. The ROD will be mailed to agencies, groups, and individuals on the mailing list.

You can comment on the Final EIS by calling or writing to us. Call and leave your comments on a toll-free line, 1-800-622-4519, submit comments to BPA via our Internet address: *comment@bpa.gov,* or write to:

Public Involvement Manager
Bonneville Power Administration
P. O. Box 12999
Portland, Oregon 97212

To request additional copies of the EIS please contact BPA's document request line: 1-800-622-4520.

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For more information on DOE NEPA activities contact:

Carol Borgstrom, Director, Office of NEPA Oversight, EH-42, U.S. Department of Energy, 1000 Independence Avenue, S.W., Washington, DC 20585, 1-800-472-2756 or DOE NEPA WEB site www.eh.doe.gov/nepa/.

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Summary of Changes in the Final EIS

Chapter 1

Updated information has been added.

Chapter 2

The Proposed Action has been changed. The proposed supplementation program no longer includes summer chinook. Summer chinook production was removed because of comments received.

A new subsection of the Proposed Action discusses Adult Returns. The section on Monitoring and Evaluation has been expanded. New information about returns has been used in tables.

A new alternative has been added in response to comments. The Use of Existing Facilities Alternative proposes using existing production hatcheries and the proposed satellite facilities to meet the need. Facilities at Dworshak National Fish Hatchery, Kooskia National Fish Hatchery, and Hagerman National Fish Hatchery would be used as central incubation and rearing facilities.

New information about natural habitat restoration was included in response to comments.

Chapter 3

The background section on the Nez Perce Tribe has been deleted.

Updated resource information has been added in tables and in the text.

Chapter 4

Updated information on impacts has been added, including impacts from the new alternative.

Chapter 5

New information has been added.

Chapter 6

The list of preparers has been updated.

Chapter 7

Additional individuals and organizations have been added to the mailing list.

Chapter 8

Additional references have been included.

Chapter 9

Minor changes to the glossary have been made.

Chapter 10

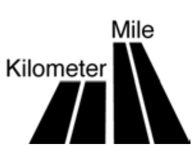
This is a new chapter that contains the comments received on the Draft EIS and responses to those comments.

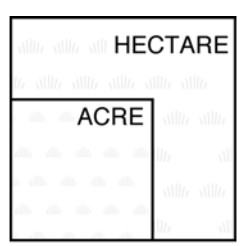
Appendices

Two Biological Assessments are included as appendices. The list of threatened and endangered species has been updated. The Executive Summary of the Monitoring and Evaluation Plan has been included as an appendix. The Decision Tree used in the Monitoring and Evaluation Plan has been added as an appendix.

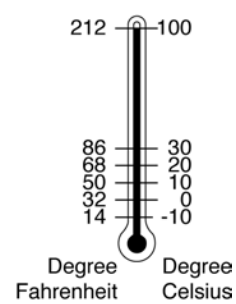
Metric Conversion Chart

Symbol	When You Know the Number of	Multiply by	To Find the Number of	Symbol
in	inches	25.4	millimeters	mm
ft	feet	0.3048	meters	m
mi	miles	1.6093	kilometers	km
ft^2	square feet	0.0929	square meters	m^2
ft^3	cubic feet	0.02832	cubic meters	m^3
ac	acres	0.4046	hectares	ha
lb	pounds (avdp)	0.4535	kilograms	kg
degrees F	degrees Fahrenheit	5/9(after subtracting 32)	degrees Celsius	degrees C
m	meters	3.2808	feet	ft
km	kilometers	0.6213	miles	mi
m^3	cubic meters	263	gallons	gal
m^3	cubic meters	35.3147	cubic feet	ft^3
ha	hectares	2.4710	acres	ac
kg	kilograms	2.2046	pounds (avdp)	lb
degrees C	degrees Celsius	9/5(after adding 32)	degrees Fahrenheit	degrees F





Hectare: about two and one-half acres



Summary

- The Purpose and Need for Action
- Alternatives
- Comparison of Alternatives and Impacts

This summary gives the major points of the Final Environmental Impact Statement (EIS) prepared for the Nez Perce Tribal Hatchery by the Nez Perce Tribe (NPT), the Bonneville Power Administration (BPA), the Bureau of Indian Affairs (BIA), and other interested parties.

Purpose and Need For Action

The Nez Perce Tribal Hatchery program responds directly to a need to mitigate for naturally-reproducing salmon in the Clearwater River Subbasin.

A century ago, as many as 16 million salmon and steelhead returned from the sea to spawn in the Columbia River Basin each year. Now, fewer than 2.5 million salmon and steelhead return annually: most return to hatcheries in the lower Columbia River; few return to spawn in the Clearwater River Subbasin. Naturally-reproducing salmon are critical to the ongoing survival of the species. Though there have been attempts to reestablish salmon runs using traditional hatchery practices, low adult returns indicate new methods are needed to help restore these runs.

Fewer salmon and steelhead return to the Columbia River Basin for many reasons. Natural events such as fire and floods altered the landscape, and streams and rivers used by fish. But human activities such as fishing, road building, mining, logging, land development, farming and ranching have caused the principal change in natural habitat used by fish and other species. Dams on the Columbia and Snake rivers, and their tributaries, including the Clearwater River (see Map 1), created migration barriers for fish and permanently altered the free-flowing nature and environment of the largest Northwest rivers.

Hydroelectric and flood control dams eliminated most of the Clearwater River salmon. In 1910, the Harpster Dam was built on the South Fork of the Clearwater River at Harpster. In 1927, Lewiston Dam was built at the mouth of the mainstem of the Clearwater River. Lewiston Dam prevented passage of spring, summer and fall chinook from at least 1927 to 1940, although steelhead were evidently able to pass. Passage facilities were upgraded in the 1950s, but counts of chinook salmon between

➲ For Your Information

Words and acronyms in bold and italics are defined in Chapter 9,* ***Glossary and Acronyms**. Some are also defined in sidebars.*

Naturally-reproducing *salmon are adult fish that spawn in a stream or river.*
Wild *salmon are defined in this document as fish that have not spent any part of their life history in an artificial environment, and are the progeny of naturally-reproducing salmon regardless of parentage. For example, the progeny of hatchery fish that have been raised in the wild are considered wild. This distinction is made so that spring chinook in the Clearwater can be defined as wild.*

1950 and 1957 ranged from only 7 to 63 fish, indicating that the indigenous run was probably eliminated by then. Harpster Dam was removed in 1963, which reopened the South Fork Clearwater. But Dworshak Dam was built at the mouth of the North Fork Clearwater River in 1974 and it blocked fish passage from that large river. Lewiston Dam was eventually removed in the winter of 1972-73, making most of the Clearwater River once again a free-flowing system.

Other human-caused and natural events such as fire, mining, agriculture, timber harvest, and road construction have shaped the character of the Clearwater River Subbasin. Activities have caused high runoffs, altered streamflows, increased sediments and nutrients and reduced the amount of riparian habitat in the lower mainstem and its tributaries.

The Clearwater River Fish Community

There exists a biological need to restore <u>salmon</u>, a vital component of the Pacific Northwest ecosystem, back into the Clearwater Subbasin's rivers and streams.

Historically, salmonids, sculpins, dace, and suckers dominated the Clearwater River fish community. Because of their physical size and prolific nature, salmon and steelhead were the most abundant and visible aquatic residents. They, along with older bull and cutthroat trout, dominated the fish community from the mouth of the mainstem Clearwater River up into its upper tributaries. Salmon and steelhead would go as far into the tributaries as possible while resident fish, like smaller cutthroat and bull trout, would live above the log jams and waterfalls, deep within the myriad of smaller streams. Suckers, dace and sculpins were most abundant in the lower mainstem reaches and their tributaries.

The Clearwater River today has lost the diversity that was part of the historic fish community. Most notably, indigenous chinook salmon populations are gone from the Clearwater River. Cutthroat and bull trout populations are in decline. Formerly abundant, Pacific lamprey now return in very low numbers. Steelhead, which managed to hang on during the dam building era, are no longer abundant nor distributed as widely. In addition, non-native brook trout, non-native rainbow and cutthroat trout have been introduced in headwater streams to establish sport fisheries and have altered the fish community through competition, predation, and reproduction. In the lower mainstem, non-native predators such as bass are present.

Hatchery Fish Production in the Clearwater River Subbasin

Many attempts have been made to increase the populations of salmon and steelhead in the Clearwater River Subbasin. Although reintroduction attempts met with some success, runs continued to decline after stocking ceased.

Conventional hatcheries focus on harvest augmentation. Adults are available to be harvested in the mainstem river corridors and ocean when forecasted adult returns exceed hatchery broodstock needs. Such hatchery operations do not emphasize rearing or spawning in the natural environment. Conventional hatchery practices have not been an effective means of restoring runs into the natural environment.

There exists a need for new technology to increase runs of naturally-reproducing salmon with the aid of hatcheries.

The Nez Perce Tribe

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The Nez Perce fished for salmon along the Columbia River and in the Clearwater River Subbasin.

They occupied a territory of over 5 million hectares (13 million acres) that included what is today north central Idaho, southeastern Washington and northeastern Oregon. The Nez Perce Tribe is a federally-recognized tribe with sovereign status over its lands, people and resources. The Tribe's governmental rights and authorities extend to any natural resources which are reserved or protected in treaties, executive orders and federal statutes. The United States has a trust obligation toward the Nez Perce Tribe to protect these rights and authorities.

Salmon and other migratory fish species are an invaluable food resource and an integral part of the Nez Perce Tribe's culture. Anadromous fish have always made up the bulk of the Nez Perce tribal diet and this dependence on salmon was recognized in the treaties made with the Tribe by the United States. The historic economic, social, and religious significance of the fish to the Nez Perce Tribe continues to this day, which makes the decline of fish populations in the Columbia River Basin a substantial detrimental impact to the Nez Perce way of life.

The Nez Perce Tribe has a legal, historic, economic, social, and cultural need to restore salmon runs.

Finding Solutions

In 1980, Congress passed the Northwest Power Act, which created the Northwest Power Planning Council and directed the Council to develop the Columbia River Basin Fish and Wildlife

Program. The program is designed primarily to address the impacts of the federal hydroelectric system on the fish and wildlife resources of the Columbia River Basin.

BPA has become the primary funding and implementing agency of the program. Under the Act, BPA has the responsibility to protect, mitigate impacts to, and enhance anadromous fish populations in the Columbia River Basin.

The Council recognized the opportunity to mitigate impacts to salmon runs in the Clearwater River Subbasin. In 1982, the Council authorized design and construction plans for fish production facilities on the Nez Perce Indian Reservation, and listed the facility in the Council's *1987 Fish and Wildlife Program* (Action Item 703(g)(2)).

The Nez Perce Tribe developed the *Nez Perce Tribal Hatchery Master Plan* (Larson and Mobrand, 1992) supporting documents, and the *1995 Supplement to the Master Plan* with a strategy to use a central hatchery to artificially propagate fish, and smaller satellite facilities to rear the fish. The Nez Perce Tribal Hatchery (NPTH) proposed supplementation to maintain or increase natural production to meet the need.

Purpose

Decision makers will use these purposes to evaluate the alternatives proposed to meet the need:

- Protect, mitigate, and enhance Columbia River Basin anadromous fish resources.
- Develop, increase, and reintroduce natural spawning populations of salmon within the Clearwater River Subbasin.
- Provide long-term harvest opportunities for Tribal and non-Tribal anglers within Nez Perce Treaty lands within four salmon generations (20 years) following project completion.
- Sustain long-term fitness and genetic integrity of targeted fish populations.
- Keep ecological and genetic impacts to non-targeted fish populations within acceptable limits.
- Promote Nez Perce Tribal management of Nez Perce Tribal Hatchery facilities and production areas within Nez Perce Treaty lands.

Scoping and Major Issues

Public scoping meetings were held on May 24, 1994, in Boise, Idaho, and on May 25, 1994, in Spalding, Idaho to determine the nature and scope of the issues of concern from the public and interested agencies. About 15 people attended each of the public meetings. BPA and BIA received 28 sets of written comments during scoping. Commentors raised these issues:

- Mainstream Columbia River passage problems.
- Genetic risks and the potential impact of the program on the genetic diversity of wild fish stocks.
- Impacts to wild anadromous and resident fish stocks through competition for space and food and diseases.
- The effectiveness of supplementation technology.
- Water quality impacts.
- The effect of excessive ocean and in-river harvest practices.
- Cost effectiveness.

Issues identified during the scoping process were discussed in the Draft EIS. The Draft EIS was distributed to agencies, groups, individuals and libraries in June 1996. A 45-day public review period ended on August 16, 1996. Two public meetings with an open house format were held in Boise and Lapwai, Idaho to review and receive comments on the Draft EIS. An additional comment period was opened on December 13, 1996 and ended January 27, 1997. Chapter 10 of this Final EIS records and provides responses to the comments on the Draft EIS. This Final EIS also provides updated information developed as a result of the comments received on the Draft EIS.

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Chinook *salmon are the largest salmon. The chinook has a greenish back, silver sides and belly. Chinook are long distance swimmers and travel to the farthest reaches of the Columbia Basin to spawn. The fish return from the ocean to the Columbia River in the spring, summer, and fall and are differentiated by the time of year they return. The term summer chinook is used in this document to refer to an early fall spawning, ocean-type chinook, similar to those currently found in the mid-Columbia River.*

Alternatives

Three alternatives, the Proposed Action, the Use of Existing Facilities Alternative, and the No Action Alternative, are being considered.

Proposed Action

The Proposed Action is a supplementation program that would rear and release spring and fall chinook (***Oncorhynchus tshawytscha***), biologically similar to wild fish, to reproduce in the Clearwater River Subbasin. Program managers propose techniques that are compatible with existing aquatic and riparian ecosystems and would integrate hatchery-produced salmon into the stream and river environments needed to complete their life cycle. Wild characteristics would be maintained, diseases would be controlled, fish would be adapted to the streams they are released into, and would be released using methods that maximize their survival in the wild.

The supplementation program would have three phases. The first (1-5 years) and second phases (6-10 years) of the program are the primary focus of this EIS. Phase I would begin outplanting efforts to reestablish naturally-reproducing salmon in selected tributaries of the Clearwater River Subbasin. Phase II would continue the effort using those returning adults to increase and stabilize production in project streams. Phase III (11-20 years) would create an opportunity for harvest, and would use ***adaptive management*** for specific actions based on the success of the first and second phases. Subsequent environmental documents would be prepared for Phase III as necessary.

The proposed program has many steps. First, eggs and sperm would be taken from broodstock. During Phase I, broodstock would be obtained from selected hatchery stocks identified in the program's genetic risk assessments. During Phase II, adults returning as a result of the supplementation actions would provide broodstock used for egg take. The fertilized eggs would then be incubated in two central hatcheries. Fish would be reared for a short time at the central hatcheries and then moved to acclimation facilities located on various rivers and streams to condition them to the natural environment. The specific stream and river reaches were chosen because they have suitable chinook habitat and are consistent with aboriginal fishing areas. Release locations, time of release, and age at release were selected to maximize survival and natural production. Table 2-1 summarizes the dimensions and requirements of NPTH facilities and Figure 2-1 provides a summary of operations.

Fingerling

Presmolt

Subyearling smolt

Spring chinook would be reared at the Cherrylane Central Incubation and Rearing Facility until they are fingerling size. A portion of these fish would be outplanted as fingerlings in early summer into three different streams. The remaining spring chinook would be moved to acclimation ponds on three other streams to be reared until autumn when they would be released as presmolts. The spring chinook from both release strategies would then smolt and migrate downstream during spring of the following year.

Fall chinook would be reared at the Cherrylane hatchery and at Sweetwater Springs Central Incubation and Rearing Facility until they reach fingerling size. They would then be moved to acclimation rearing ponds within these facilities where a portion would be released as ***subyearling smolts*** directly into the

Clearwater River during late spring or early summer. Remaining fish would be moved to other acclimation sites. They would be reared and imprinted on that source of water prior to being released as subyearling smolts in late spring or early summer. Fall chinook are expected to begin their seaward migration shortly after release.

The number of hatchery chinook released would be limited so that, when added to the number of wild chinook, the total would not exceed the amount of habitat available for that species. Each year, numbers for release would be recalculated, based on the results of the monitoring and evaluation program, to avoid exceeding the stream's ***carrying capacity***. All fish released would be marked with fin clips, coded wire tags, ***PIT tags***, visual implant tags or other forms of benign biological marks so that the hatchery fish can be distinguished from wild fish and the success of the program evaluated. Marking would also help track any fish that stray to other watersheds.

Several techniques would be used to count and capture adult chinook salmon returning from the sea such as temporary ***weirs***, fish ladders at acclimation sites and trapping facilities at Lower Granite Dam. Some adults would be used for broodstock; the remainder would be returned to the stream to be harvested or to reproduce naturally.

The actions proposed differ from many existing hatchery practices in the following ways:

- Supplementation spring chinook would be the offspring of cross-bred hatchery and wild adults in each generation.
- Spring chinook eggs would be incubated at ambient water temperatures to encourage natural rates of development.
- Fish would be reared in semi-natural ponds to increase survival in the environment. They would be conditioned by high velocity flows, exposure to natural feeds, minimal human contact and other elements of the natural environment.
- Fish would be released at different life stages to increase survival and minimize impacts to other fish.
- Fish would be released in several mainstem and tributary areas to establish spawning returns throughout the natural environment and optimize natural production.

Cherrylane

Mile
Kilometer

The Cherrylane hatchery site is on a flat bench on the south bank of the Clearwater River about 32 km (20 miles) east of Lewiston and adjacent to Highway 12 (see Map 3 and Photo 1).

The site is about 6 hectares (***ha***) (14 acres) and is used for agricultural production. The land, which is within the boundary of the Nez Perce Indian Reservation, is privately owned.

A hatchery building, water treatment facilities, rearing containers, effluent ponds, an operations and shop building, and two staff residences would be built on the site. The hatchery building would accommodate the spawning shelter, incubation room and early rearing area. The spawning shelter would be roofed with open sides and have receiving, fertilization and disinfection equipment.

Rearing containers, raceways, and ponds (circular or conventional) would be used to rear spring and fall chinook. Chinook would be early reared in approximately 32 circular ponds/raceway containers before being transferred to satellite facilities or directly released. Final rearing and release of 1,500,000 fall chinook would take place in on-site acclimation ponds.

Precautions would be taken to prevent bird predation, provide shading and cover, provide acclimation flows to condition fish before release, and prevent and control diseases when they occur. A fishway or fish ladder would also allow fall chinook adults imprinted to hatchery discharge water to return to the hatchery.

The operations and shop building would have an office, day room, washrooms, feed storage, chemical storage, laboratory, vehicle and tool storage, and shop work areas. Staff residences would be single-family, frame construction patterned after similar hatchery residences used in the Northwest. The site would be fenced and resident personnel would provide around-the-clock security to the hatchery grounds.

About 768,000 spring and 2,000,000 fall chinook would be incubated and reared at Cherrylane. Beginning in August, spring chinook eggs would be received for incubation. Then in November and December, fall chinook would be spawned, and their eggs incubated. Chinook eggs started at Cherrylane would be disinfected, fertilized and ***water hardened***. Fish would be incubated in the hatchery building in Heath trays. Each incubator tray would contain only the eggs of one female as a precaution against disease. Following incubation, fingerlings would be reared in containers until they reach their target weight for final rearing at satellite facilities or direct release to streams.

Fingerling

In February, about 500,000 fall chinook would be moved as fingerlings from the Cherrylane hatchery to the North Lapwai Valley satellite facility and reared and acclimated until release in May or June. The remaining 1,500,000 fall chinook would be moved to the acclimation ponds within Cherrylane itself. In May-June, about 265,000 of the spring chinook would be moved from the rearing containers at Cherrylane to satellite facilities located on Yoosa/Camp, Mill and Newsome creeks. In June, the remaining 503,000 spring chinook at Cherrylane would be released directly into three streams (Boulder, Warm Springs, and Meadow creeks) to complete final rearing in a natural environment.

Subyearling smolt

Also in June, the 1,500,000 fall chinook held on-site would be released from Cherrylane directly into the lower Clearwater River as subyearling smolts. The fall chinook would be released through a pipe from a collection area in the outdoor rearing ponds to a site in the river downstream of the water intake structure. Fish would be released in a controlled manner over an extended period of time to avoid short-term crowding, allow for some natural dispersal and to keep predators from concentrating in the release area.

Adult fall chinook returning to the Clearwater River would be held at Cherrylane from September through December and spawned on-site. Approximately 1,020 adults would be needed for maximum egg take.

Sweetwater Springs

Sweetwater Springs is located approximately 20 km (12 miles) southeast of Lewiston, Idaho. The proposed hatchery site is on land owned by IDFG and would occupy about 1.6 ha (4 acres) of the total 6 ha (15 acres) of property. The site contains an existing hatchery building with a spring-fed source. It is a small, relatively flat shelf of land at the headwaters of the westernmost fork of Sweetwater Creek. See Photo 2. The spring is the principal water source for this fork of Sweetwater Creek, and the stream eventually enters a canal which supplies water to the Lewiston Orchards Irrigation District Reservoir, Mann's Lake.

While it has been possible to use the existing facilities temporarily, improvements would be needed to meet production goals. Facility improvements include upgrading the water supply and distribution system, installing an incubation water chilling system, new isolation incubation units, rearing containers, staff housing, and storage, lab, and equipment space.

The principal production planned at Sweetwater Springs is to incubate and rear about 800,000 fall chinook. During Phase I, eyed-eggs would be imported to Sweetwater Springs in October to begin incubation. After hatching, fry would be early-reared at the site. In February, 400,000 fish reared to fingerlings at 440 fish/kg (200 fish/lb) would be transferred to the Luke's Gulch satellite facility. In April, the remaining 400,000 fall chinook would be moved to the Cedar Flats satellite facility when they are about 154 fish/kg (70 fish/lb).

Satellite Facilities

Six satellite facilities would be developed to acclimate and release young fish, and to capture and hold returning adult broodstock. (See Map 2.) The extended rearing period and acclimation at the satellite facilities is designed to ensure juvenile imprinting and adult return to river reaches associated with the satellites. Adults returning to satellites would be trapped by weirs or small fish ladders at their outfall.

The basic facility includes the following components: water intake(s), water transfer pipeline, juvenile rearing ponds, adult holding ponds, water outfall line, personnel living quarters (trailer), and fish food storage. Facilities would be developed as close to streams as possible, usually within 50 m (165 ft), of the streambank. Site reclamation and landscape planning would be part of each site plan. The existing character of each area would be maintained as much as possible.

Hatchery Operations

Disease Management

Nez Perce hatchery managers would guard against the transmission of disease from hatchery to wild fish and from hatchery fish to hatchery fish using many measures. These include screening broodstock for disease, disinfecting water at the central incubation and rearing facilities during the early life stages, controlling water temperature to reduce infections, controlling incubation densities, controlling the incidence of disease in the hatchery, and by ensuring that fish slated for release into the natural environment have met strict fish health quality standards. Fish would be inspected before transfer to satellite facilities and again before they are released into streams. Common diseases such as bacterial kidney disease would be monitored routinely in hatchery and wild populations. Less common diseases would be monitored as necessary.

Disease control and monitoring practice would conform with standards developed by the Nez Perce Tribe Fish Health Policy (1994) and the Integrated Hatchery Operations Team (***IHOT***) (IHOT, 1994). The Nez Perce Tribe Fish Health Policy defines policies, goals, and performance standards for fish health management, including measures to minimize the impacts to wild fish.

Egg Take and Incubation

Chinook production would follow specific management protocols to ensure that healthy fish are produced for reintroduction in the Clearwater River Subbasin. Fish would be supplied either as gametes shipped to the site and held in quarantine until disease testing and screening are completed, or as eyed-eggs imported from a certified quarantine incubation facility outside of the Clearwater River Subbasin.

After adults start returning, egg take would occur at the various satellite facilities and Cherrylane. Broodstock would be screened for specific pathogens. When ready to spawn, gametes from males and females would be taken and kept separate. Care would be taken to have as antiseptic conditions as possible.

Rearing Techniques

The NPTH would use innovative rearing techniques that have not been used as standard methods by other hatchery programs in the Columbia River Basin. Incubation and rearing water temperatures, rearing containers, rearing densities, release strategies, and broodstock management are different from those conventionally used in most facilities. The overall goal is to produce and release a fish that will survive to adulthood, spawn in the Clearwater River Subbasin and produce viable offspring.

Water temperatures in incubation and rearing containers would be controlled to best suit supplementation goals. Fall chinook would require an accelerated incubation and growth schedule to produce mature subyearling smolts in May and June. Naturally-produced subyearling smolts in the Clearwater River grow slowly in the cold river water and typically do not emigrate until July or August when lower Snake River flows and dam passage conditions are not as beneficial to their downstream migration. NPTH fall chinook subyearling smolts would be programmed to grow to a mature size sooner using the warmer groundwater. They would then be of a suitable size to migrate in June when flow through the Snake and Columbia River hydrosystem is currently managed to benefit chinook survival.

Subyearling smolt

Spring chinook will be incubated and reared in water that approximates the temperature regime of the streams where fish would eventually be released. This stock of chinook spends more time rearing in the Clearwater River Subbasin than do the subyearling migrants, and their natural emigration dates correspond to periods when hydrosystem operation facilitates passage. Consequently, temperatures in their rearing environment will be controlled to maintain growth rates consistent with those in their receiving streams.

After incubation and emergence, spring chinook fry would be kept in the early rearing containers until they are able to swim and take feed (about 3 weeks). In March to April, they would be

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NATURES is a natural rearing system that employs overhead cover, instream structure and substrate and unintrusive feed delivery systems.

moved to the outdoor early rearing areas containing circular or raceway type rearing vessels which would incorporate the use of NATURES type rearing designs:

- substrate
- subsurface feeding
- shading
- exposure to natural food
- velocity alteration to enhance swimming ability
- instream cover
- exposure to predators.

They would be reared in these containers until transferred to satellite facilities in May and June or released directly into the streams as fingerlings in June and July.

Fall chinook would spend two to four weeks in the early rearing area after incubation and emergence in mid January. In February they would be moved to the acclimation ponds at Cherrylane or to the North Lapwai Valley satellite.

During final rearing, the fish will be kept in ponds designed and operated to further incorporate NATURES rearing strategies and to simulate natural conditions. Ponds would be designed without hard, straight lines. Artificial features such as undercut banks, logs and other structures would be placed in the ponds and fish would have a place to hide and learn to avoid other fish. Predator response would be induced by exposing the fish to birds and fish released into ponds (e.g., seagulls, mergansers, bull trout or squawfish). Human activity around the ponds would be discouraged, and shading and overspray will be used to obscure overhead vision. Shading would also moderate warm summer water temperatures. Underwater feeding options would be pursued to avoid conditioning young fish to be fed by humans. Water flows in ponds would be increased to exercise and build physical stamina of fish to adapt to stream or river conditions following release. Fish would be reared at relatively low densities.

Release Techniques

Hatchery fish would be released at several different life stages to optimize survival, to evaluate different strategies, and/or be consistent with natural migratory behavior.

Fall chinook would be released as subyearling smolts. This migratory behavior is typical of lower elevation, larger river spawners. The fish would be released into the rivers during spring runoff in May and June when they weigh about 110 fish/kg (50 fish/lb). They would either join other outmigrants in the high flows or would reside in the river for awhile, and move downstream as water temperatures warm.

Most spring chinook would be released directly into stream habitats as fingerlings. Meadow, Warm Springs and Boulder creeks were selected for outplanting sites. These streams provide quality habitat. Fish would be released into these streams in June and July when they would be about 220 fish/kg (100 fish/lb). They would be transported to the streams by truck, and distributed by helicopters throughout the reaches of accessible spring chinook habitat. The Tribe would work with the USFS to minimize any impacts from the helicopters to the wilderness resource. The proposed size and timing of release were selected to correspond to favorable stream conditions for growth and survival. Fish released directly into the streams are expected to sustain higher mortality during the summer than ponded fish, but survivors are expected to gain a long-term fitness advantage through their experience of living under natural conditions.

The remaining spring chinook production would be moved in May at 440 fish/kg (200 fish/lb) to acclimation ponds at Yoosa Creek, Mill Creek and Newsome Creek. Fish would be confined in the acclimation ponds until September, and from that point on would be allowed to exit the ponds on their own free will. At this time, the fish would average about 44 fish/kg (20 fish/lb). The ponds would be drained in mid-October, and the remaining fish would be forced to enter the receiving streams. The September-October timeframe corresponds to the fall migratory pulse that occurs naturally in Idaho's spring chinook populations. This migratory pulse is stimulated by decreasing day lengths and cooler water temperatures and appears to be related to chinook seeking more favorable overwinter conditions in the mainstem rivers. The migratory pulse has been found through monitoring and evaluation trapping in Lolo and Meadow creeks in 1993-95 and is known in the Imnaha, South Fork Clearwater River and South Fork Salmon River from other smolt monitoring projects (NPT, 1996). The proposed release strategy would increase survival during the growing season, reduce competition among hatchery and wild fish for limited food resources, and better prepare pond-reared fish for living under natural conditions following their release.

NPTH hatchery fish would be released over a large geographic area to maximize the use of available rearing habitat in the Clearwater River Subbasin and to avoid overwhelming local anadromous and resident fish populations.

Adult Returns

Adult return numbers were generated by a spreadsheet model. The model follows hatchery and naturally-produced spawners through their life cycle, calculating juveniles produced in natal streams and subtracting out mortalities accrued as the fish grow, leave the streams, travel out into the ocean and back again to the natal streams or hatchery satellite. It also incorporates the hatchery:wild spawning protocols recommended for NPTH.

The adult return model uses a series of assumed survival rates by life stage within its iterations:

Spring Chinook Parr-To-Smolt Survival — The assumed survival rate to smolt for spring chinook released from satellite ponds is 19.5 percent. The assumed survival rate for spring chinook to smolt from direct stream releases is approximately 10 percent.

Spring Chinook Smolt-to-Adult Survival — The assumed survival rate for smolt-to-adult for spring chinook from satellite facilities is 0.4 percent (essentially double the current smolt-to-adult survival for Rapid River Hatchery fish at 0.2 percent). The assumed survival rate for smolt-to-adult for spring chinook from direct stream releases is 0.6 percent (triple the current smolt-to-adult survival rate for Rapid River fish).

Fall Chinook Subsmolt-to-Smolt Survival — The assumed subsmolt-to-smolt survival rate for fall chinook is 50 percent, which is essentially the post-release survival, and is based on a natural-type early rearing strategy.

Fall Chinook Smolt-to-Adult Survival — The assumed survival rate for smolt-to-adult for fall chinook is 0.8 percent (double the current 0.4 percent smolt-to-adult survival from Lyons Ferry 1984-1986 brood coded wire tag returns).

Adult Collection

Collecting adults would provide information about the success of the program in addition to providing broodstock. The number of returning adults would be used to calculate smolt-to-adult and adult-to-smolt (or parr) survival rates. Adult salmon produced by the NPTH program are expected to be abundant enough in 5-10 years to begin collecting them for use as hatchery broodstock (Phase II). Adults would be captured near satellite facilities using various methods.

Temporary weirs and adult traps would be placed in 11 streams that would either receive outplants of hatchery fish or would serve as experimental controls. The purpose of the structures is to count and sample returning adults so that supplementation success can be evaluated and to secure enough hatchery and wild fish for broodstock purposes. Depending on the species, weirs would be operated from late May through mid-September.

Fall chinook broodstock would be obtained from adults ascending the fish ladders at Cherrylane, Cedar Flats and Luke's Gulch and from adults captured at the weir on Lapwai Creek. Permanent adult collection systems - fishways or fish ladders - are proposed for the Cherrylane, Cedar Flats and Luke's Gulch facilities. These would allow those adults imprinted to the water source or chemical attractants to return to the facilities directly for broodstock. The adults ascending Lapwai Creek would encounter a weir near the satellite site, be captured and transported to Cherrylane.

A portion of the fall chinook broodstock might also be captured at Lower Granite Dam. Collection of fish at Lower Granite would concentrate on unmarked, wild returning spawners. These fish would be cross-bred with fish returning to the central incubation and rearing facilities or satellite facilities. The exact portion of the run that can be used for NPTH would require coordination with other agencies.

Broodstock Source and Management

Since not enough wild chinook salmon return to the Clearwater River Subbasin today to serve as a source of broodstock, the supplementation program would use broodstock from other locations. The following sources – all hatcheries – are being considered for broodstock during Phase I:

- spring chinook – Rapid River stock, which includes Rapid River, Dworshak, Clearwater and Lookingglass hatcheries and the Kooskia Hatchery; and,
- fall chinook – Lyon's Ferry Hatchery stock.

Final selection of the donor stock to use in NPTH would depend on coordination with NMFS, IDFG, and the U.S. v. Oregon Production Advisory Committee of the Columbia River Fish Management Plan. Acquisition of broodstock would also be determined through negotiation by the NPT within these forums. During Phase I of the implementation, it is assumed that broodstock acquisition would be coordinated annually. Eggs would then be distributed to the central hatcheries.

When the first generation fish return as adults, they would be collected using weirs to trap them. The adults would then be trucked or moved to the nearest adult holding pond for that species.

The NPTH is designed to ensure a balance of hatchery and wild spawners in both hatchery and streams. Some returning hatchery fish would be permitted to spawn with wild fish in the river or streams. Likewise, some returning wild fish would be spawned in the hatchery.

Spring Chinook — The Nez Perce Tribe would use a sliding scale based on the abundance of adult chinooks returning to the Clearwater River Subbasin to determine the ratio of hatchery-to-wild fish used for broodstock and mating protocols. The ratios favor wild fish for natural spawning as the wild population increases.

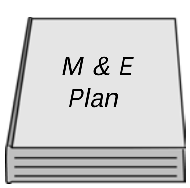
Fall Chinook — For the near future, the breeding of hatchery-reared and wild spawners applies only to spring chinook. Capture methods for obtaining fall chinook in the natural environment would require further exploration before it becomes feasible to cross-breed a significant portion of the wild run with hatchery fish. Consequently, breeding of wild and hatchery fall chinook spawners would be limited until such time that the unmarked run increases to a much higher level.

Harvest Management

An important goal of the supplementation program is to produce surplus adult fish for harvest. Harvest rates would be controlled to sustain wild and hatchery production. Population growth may be slow, requiring several years before harvest can occur. The Nez Perce Tribe would coordinate harvest management with other fisheries agencies in the basin. Tribal ceremonial harvest may occur at a controlled level to provide for the cultural and religious needs of the Nez Perce people. Tribal subsistence and non-tribal recreational fishing would be permitted only after predicted run sizes indicate that natural spawning and broodstock collection goals would be met.

Monitoring and Evaluation Plan

The Proposed Action would use adaptive management to guide hatchery operations. Monitoring and evaluation is a key part of adaptive management.



Five pairs of treatment and control streams have been identified for monitoring and evaluating the success of spring chinook supplementation. The treatment streams would be planted annually with juvenile spring chinook. Control streams would not be planted until some determination can be made of program success. Information gained during Phases I and II would be used to make the decision. Overall success of the program would be evaluated by adult returns.

Meadow Creek is an experimental unit separate from the treatment and control streams. Its purpose is to study short-term experiments that evaluate different release techniques in hopes that adaptive management can be more effective in implementing recovery of fish populations.

Costs

Capital construction would cost about $16 million (1997 dollars). Annual operations and maintenance costs after all facilities are fully developed would cost about $1,000,000 (1997 dollars) and monitoring and evaluation would cost about $500,000 (1997 dollars) annually. Harvest management is not included in the cost estimate.

Use of Existing Facilities Alternative

Commentors to the Draft EIS asked that existing facilities be reexamined as an alternative to construction of the Cherrylane central incubation and rearing facility. Additional information was gathered to respond to these comments.

This alternative would use space at existing hatchery facilities to incubate and rear chinook salmon for restoration in the Clearwater River Subbasin. Facilities at Dworshak National Fish Hatchery, Kooskia National Fish Hatchery, Hagerman National Fish Hatchery, and Clearwater Hatchery were considered. The use of Clearwater Hatchery was dropped from consideration because the Nez Perce Tribe prefers to use surplus space at the hatchery to produce coho salmon. The Sweetwater Springs central incubation and rearing facility, and satellite facilities described for the Proposed Action would also be built and used.

Dworshak National Fish Hatchery

Dworshak National Fish Hatchery is located at the confluence of the North Fork Clearwater River and the mainstem Clearwater River near the unincorporated town of Ahsahka, in north-central Idaho. (See Map 1.) The facility consists of 84 Burrows ponds, 42 raceways, 3 adult holding ponds, 128 deep troughs, and 45 stacks of vertical incubators. Water use ranges from 102-315 m^3/min (27,000 to 83,000 gpm) from the North Fork Clearwater River below Dworshak Dam via a direct line from the dam and water pumped from the river directly adjacent to the hatchery.

Hagerman National Fish Hatchery

Hagerman National Fish Hatchery is next to the Snake River in southern Idaho, about 8 km (5 miles) southeast of the town of Hagerman (see Map 1). The facility consists of 102 raceways, 66 starter tanks and a display pond. It currently rears summer steelhead for off-station release into the Salmon and Snake rivers as part of the LSRCP and rainbow trout for Dworshak reservoir mitigation. Water temperature is a constant 15 degrees C (59 degrees F). Raceways are organized into two systems, each system with three tiers for serial re-use of water. The amount claimed is 2.6 m^3/sec (92.5 ft^3/sec) from six major collecting structures.

Kooskia National Fish Hatchery

Kooskia National Fish Hatchery is located in north-central Idaho, about 120 km (75 miles) southeast of Lewiston in northwest Idaho County. The hatchery is in a narrow valley of Clear Creek, just upstream of the confluence with the Middle Fork Clearwater River. The facility consists of 12 raceways, 6 Burrows ponds, 42 circular starter tanks, 32 rectangular starter tanks, and 1 adult holding pond. Water rights total 51 m^3/min (13,456 gpm) from six wells and Clear Creek. Just over half the water is from Clear Creek. Water available for hatchery use ranges from 17-32 m^3/min (4,389 gpm to 8,527 gpm), with the majority supplied from Clear Creek. The hatchery is operated with a water re-use system that incorporates bio-filters between uses.

Kooskia National Fish Hatchery is not a stand alone facility. It is operated as a satellite facility of Dworshak NFH. Adults are trapped at Kooskia NFH, however, because of warm Clear Creek temperatures, fish must be transferred to Dworshak NFH for maturation and spawning. Eyed eggs are returned to Kooskia NFH in October.

Proposed Facility Production

Fall Chinook

The water at Dworshak National Fish Hatchery and Kooskia National Fish Hatchery is too cold for the accelerated growth needed for a June 1 release date with fish at 110 fish/kg (50 fish/lb). Instead, 500,000 fall chinook would be reared at Hagerman NFH to 110-130 fish/kg (50-60 fish/lb) by May 15. The fish would then be trucked up to the Clearwater and acclimated until released in June at the North Lapwai Valley satellite facility. Another facility would have to rear rainbow trout intended for Dworshak Reservoir mitigation that are currently reared at Hagerman NFH.

Spring Chinook

Kooskia National Fish Hatchery and Dworshak National Fish Hatchery would be used to rear about 800,000 spring chinook to fingerling/parr size 220-440 fish/kg (100-200 fish/lb). Fish would then be released into the direct release streams (Meadow Creek, Boulder Creek and Warm Springs Creek). The remainder would be moved to the spring chinook satellite sites for final rearing (see Figure 2-11.)

Facility Improvements

A 15-unit Heath incubator stack would be installed at Kooskia NFH and at least one unit of Dworshak NFH holding pond raceways would be converted to an adult holding pond. At Dworshak NFH, about 20 tanks would be installed and the chillers would be upgraded. Fry could also be put in ponds and raceways earlier at 550-880 kg/fish (250-400 fish/lb), which would require small mesh screens in the holding pond raceways.

At Hagerman NFH, to chill the eyed eggs, the existing chiller would be upgraded. A backup generator would be installed for the chiller.

Hatchery Operations

Disease Management

Currently used disease management measures would be used at the hatcheries. The USFWS has Fish Health Policy and Implementation Guidelines and disease prevention programs at all of its facilities (IHOT, 1996). These guidelines include disease control and disease prevention measures.

Egg Take and Incubation

During Phase I, fall chinook eggs would be imported as described in the Proposed Action. Spring chinook eggs would come from either returns to Dworshak/Kooskia or imported from Rapid River.

At the hatchery, different stocks from the different streams and mating strategies would not be isolated from each other. Incubation density would not necessarily be limited to one female per tray.

If the adult returns are sufficient for meeting broodstock needs in Phase II, egg take would occur at the various satellite facilities. Broodstock egg take, handling, and spawning protocols would be the same as those described for the Proposed Action.

Rearing Techniques

This alternative would employ rearing techniques commonly used for existing production at these facilities. The ability to accelerate fall chinook incubation and growth would be accomplished by incubating and rearing fish at Hagerman NFH. Upgrading the chillers at Dworshak and Kooskia would allow for incubating and early rearing spring chinook at water temperatures similar to those of the Proposed Action.

After incubation and emergence, spring chinook fry will be kept in conventional raceways which would ***not*** be able to incorporate the use of:

- substrate
- subsurface feeding
- exposure to natural food
- velocity alteration to enhance swimming ability
- instream cover
- exposure to predators.

The only NATURES type rearing technique that could be employed at the existing facilities is shading (Miller, January 28, 1997). Spring chinook would be reared in the raceways until transferred to satellite facilities in May and June or released directly into the streams as fingerlings in June and July.

Fall chinook would likewise be reared in conventional raceways at Hagerman and then moved to the North Lapwai Valley satellite for final rearing before release.

During final rearing, at the satellites, the fish would be reared in the same conditions, using the same techniques as described in the Proposed Action.

Fish would not be reared at low densities until they are transferred to the satellite facilities. Typical rearing densities employed at the existing facilities would be used for fish during the early rearing portions of their life cycle.

Release Techniques

Release techniques for this alternative would be the same as those described for the Proposed Action.

Adult Returns

The Use of Existing Facilities Alternative does not produce enough returns to meet the broodstock needs for the program. The differences are caused by the lesser number of fall chinook in this alternative (500,000 at Hagerman versus 1,500,000 at Cherrylane) and the different survival rates applied to juvenile life stages for the fish produced at the existing facilities. Fall chinook returning from production at Sweetwater Springs, Cedar Flats and Luke’s Gulch are the same as in the Proposed Action.

The differences and rationale for changes in juvenile survival rates are as follows:

Spring Chinook Parr-To-Smolt Survival — The assumed survival rate to smolt for spring chinook released from satellite ponds is 19.5 percent, which is the same as for the Proposed Action.

The assumed survival rate for spring chinook to smolt from direct stream releases is approximately 7 percent. This is less than that used for the Proposed Action because it is based on a 40 percent post-release survival (fingerling to parr and overwinter survival are the same as the Proposed Action).

Spring Chinook Smolt-to-Adult Survival — The assumed survival rate for smolt-to-adult for spring chinook from satellite facilities is 0.18 percent (essentially double the current smolt-to-adult survival for Dworshak fish at 0.09 percent). Smolt-to-adult survival rates were doubled just as they were for the Proposed Action because it is assumed that measures taken for salmon recovery will be successful and that migratory passage conditions will be improved such that at least a 1:1 replacement rate occurs. The Dworshak NFH smolt-to-adult return rates were applied rather than those for Rapid River NFH because Dworshak NFH has its own record of returns.

The assumed survival rate for smolt-to-adult for spring chinook from direct stream releases is 0.27 percent (triple the current smolt-to-adult survival rate for Dworshak Hatchery fish). As in the Proposed Action, smolt-to-adult survival rates were tripled for spring chinook with direct releases because it is assumed that these fish would have an acquired fitness advantage by their extended rearing in the natural environment in addition to the benefits accrued by salmon recovery efforts.

Fall Chinook Subsmolt-to-Smolt Survival — The assumed subsmolt-to-smolt survival rate for fall chinook is the same as for the Proposed Action (50 percent) because the fish would be reared at North Lapwai Valley for a time under NATURES type circumstances.

Fall Chinook Smolt-to-Adult Survival — The survival rate for smolt-to-adult for fall chinook is 0.18 percent (double the current 0.09 percent smolt-to-adult survival for Dworshak NFH spring chinook). Survival rates were doubled assuming salmon recovery efforts are successful.

Adult Collection

The adult collection program would be the same as for the Proposed Action, except broodstock needs would not be met. It is assumed that donor stock from some hatchery source would be provided to make up for the lack of eggs.

Broodstock Source and Management, Harvest Management, and Monitoring and Evaluation

The broodstock source and management, harvest management, and monitoring and evaluation would be the same as described for the Proposed Action.

Costs

Costs for this alternative would be about $8 million (1997 dollars).

No Action Alternative

The No Action Alternative is traditionally defined as the no build alternative. This No Action Alternative assumes that new facilities would not be built and that the supplementation program would not be carried out. The Nez Perce Tribe, BPA, BIA, the Council and others would rely on fish mitigation actions taken by other parties to achieve reestablishment of chinook fish runs in the Clearwater River Subbasin. This part of the Council's Fish and Wildlife Program would not be implemented.

Alternatives Eliminated From Consideration

BPA, BIA, the Nez Perce Tribe and others studied a variety of alternatives to meet the need including using acclimation facilities in the Salmon River Subbasin, and natural habitat enhancement and restoration. After study, these alternatives were eliminated from further consideration because they would not meet the need.

Comparison of Alternatives and Summary of Impacts

The Proposed Action would have the greatest amount of tribal harvest, employment, and management autonomy for the Nez Perce Tribe. The Existing Facilities Alternative would have lesser amounts and the No Action Alternative would result in no change in tribal harvest and management, and would create a loss in employment.

Potential for disturbance of cultural resources is greatest in the Proposed Action, less in the Existing Facilities Alternative and the least in the No Action Alternative. In any action alternative, the impact would be low because of monitoring and the ability to apply mitigative plans.

Impacts on geology and soils are expected to be low and short-lived for the Proposed Action and the Existing Facilities Alternative. Because of the additional construction at Cherrylane under the Proposed Action, impacts are expected to be greater in magnitude than for the Existing Facilities Alternative, but would still be low. No impacts are expected from the No Action Alternative.

Impacts to groundwater and surface water quantity and quality would be low for the Proposed Action and the Existing Facilities Alternative, although more groundwater would be used in the Proposed Action. No impacts to groundwater or surface water would result from implementation of the No Action Alternative.

Cherrylane is located outside the floodplain. Impacts from both action alternatives would be the same and are expected to have no effect on the floodplain. Although water collection systems and some satellite sites are within the 100-year floodplain, no rise in flood elevation, displacement of flood waters, storage volume or local increase in flood stage would be caused by either alternative. No impacts to the floodplain are expected from the No Action Alternative.

Eighteen categories of impacts were evaluated for the fisheries resource and they ranged in magnitude from none to moderate. The greatest impacts would occur from implementation of the Proposed Action. This alternative has the greatest potential for restoring naturally-spawning and rearing populations of salmon in the Clearwater Subbasin than the other alternatives. As a result, the aquatic ecosystem could return more toward a dependence on salmon as a principal component of the ecosystem.

The action alternatives would result in the same short-term level of displacement and disturbance on individual wildlife species during construction. The Proposed Action has the greatest potential for beneficial impacts to those species dependent on fish for forage. The No Action Alternative will do nothing to improve the availability of forage, thus posing some detrimental impacts in comparison, although this alternative would not cause habitat disturbance by construction activities.

Moderate impacts are expected to vegetation as a result of either action alternatives and would stem from the removal of riparian vegetation for satellite and central incubation and rearing facilities construction. Impacts to the wetland at Yoosa/Camp Creek site would be moderate, depending on the number of trees removed and the amount of fill entering the wetland. The amount of area impacted and mitigation strategies would be determined after final designs are completed. At that time locations for mitigation would be coordinated with the appropriate agencies and land managers. At Luke's Gulch impacts to a seasonal wetland would be low. The No Action Alternative would have no impacts on vegetation.

Land use would change at all sites affected by implementation of the action alternatives. Moderate levels of impacts are assessed for those sites at which land use changes from agriculture to fish production (Cherrylane, North Lapwai Valley, Luke's Gulch). Land use changes at other satellite sites would be low. Impacts would be smaller in magnitude in the Existing Facilities Alternative than the Proposed Action because of the elimination of the Cherrylane site. No impacts are expected with the No Action Alternative.

Recreational use changes would result from an increase in fishing associated with larger fish runs in the action alternatives. Again, greater change in fishing might be expected with the Proposed Action. No changes would result from the No Action Alternative.

Socioeconomic impacts resulting from short-term construction, long-term employment, changes in property and sales taxes and the revenue brought in by greater fishing opportunities would be beneficial and greater with implementation of the Proposed Action than the Existing Facilities Alternative. No economic impacts would be accrued with the No Action Alternative.

Moderate impacts to visual resources would occur at Cherrylane, Luke's Gulch, and North Lapwai Valley. Low impacts are expected at the other satellite sites and at Sweetwater Springs. Because of the inclusion of Cherrylane, greater impacts are expected from the Proposed Action than the Existing Facilities Alternative. No impacts are expected from the No Action Alternative.

Low impacts to air quality are expected from implementation of the action alternatives and would be caused by vehicle emissions, construction activities and pumps. No impacts are expected from the No Action Alternative.

An increase risk of fire caused by new facilities and workers in otherwise rural and forested areas could result from the implementation of the action alternatives. Because of the inclusion of Cherrylane, greater impacts would occur from the Proposed Action than the Existing Facilities Alternative. No impacts are expected from the No Action Alternative.

Chapter 1 Purpose and Need

In this Chapter:

- The Need for Action
- Finding Solutions
- Purposes
- Decisions to be made
- Other Issues

➲ For Your Information

Words and acronyms in bold and italics are defined in Chapter 9, **Glossary and Acronyms. Some are also defined in sidebars.*

***Naturally-reproducing** salmon are adult fish that spawn in a stream or river.*
***Wild** salmon are defined in this document as fish that have not spent any part of their life history in an artificial environment, and are the progeny of naturally-reproducing salmon regardless of parentage. For example, the progeny of hatchery fish that have been raised in the wild are considered wild. This distinction is made so that spring chinook in the Clearwater can be defined as wild.*

***Steelhead** are the sea going rainbow trout, reclassified as Pacific Salmon in 1989.*
***Anadromous fish** migrate from fresh to saltwater when young, spend the majority of their adult life in the ocean, and then return to their ancestral drainage to spawn.*

*The **Columbia River Basin** is the drainage of the Columbia River which includes parts of Canada, the Pacific Northwest, and parts of Montana, Wyoming, and Nevada.*

Chapter 1 explains a need to ***mitigate*** for ***naturally-reproducing**** salmon in the Clearwater River ***Subbasin*** in north central Idaho. (See Map 1.) This chapter describes the conditions and actions that created the need for action. This chapter also describes how the Nez Perce Tribe (***NPT***), the Bonneville Power Administration (***BPA***), the Bureau of Indian Affairs (***BIA***), the Northwest Power Planning Council (***Council***) and other interested parties developed the Nez Perce Tribal Hatchery program to meet the need.

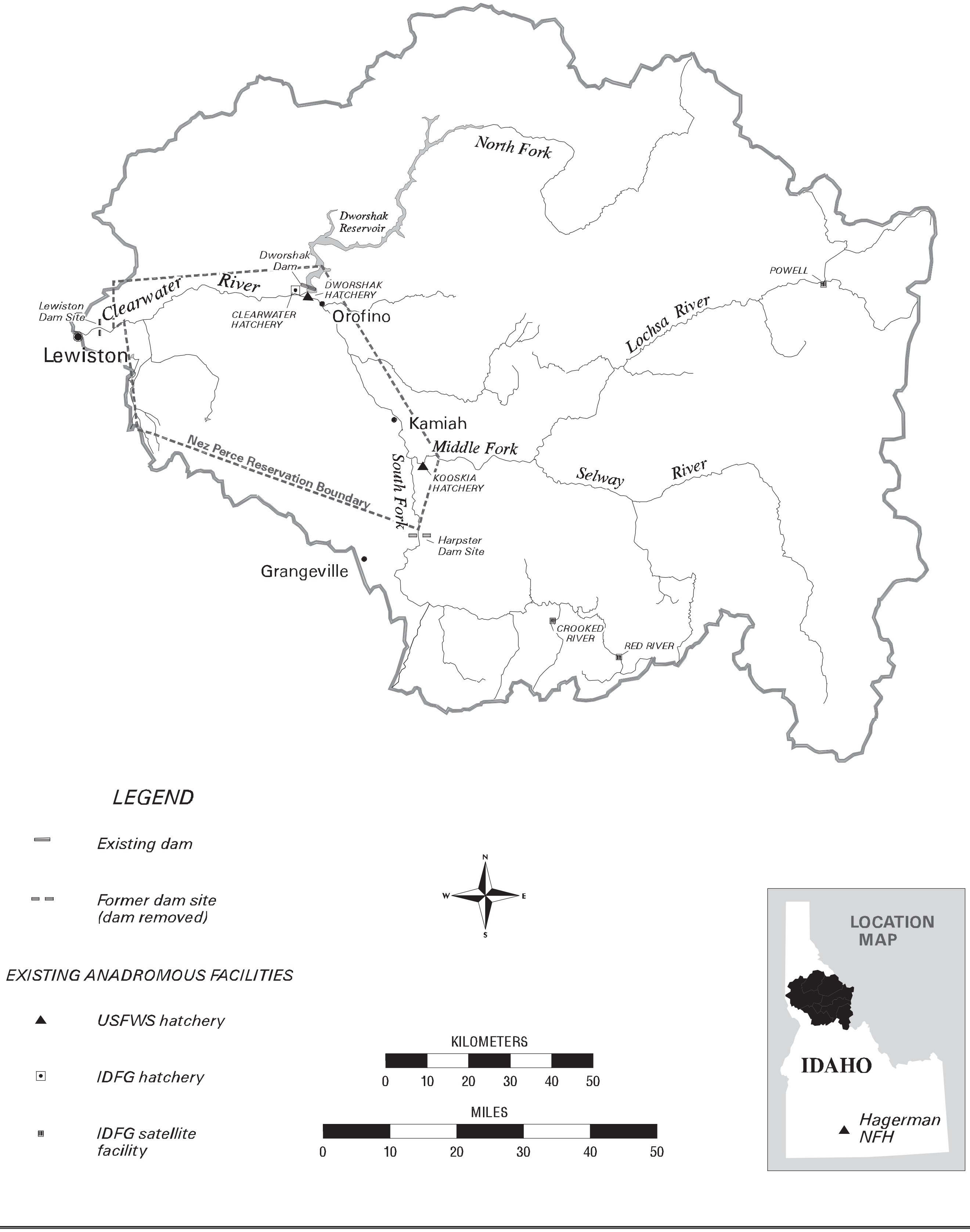
1.1 Need For Action

The Nez Perce Tribal Hatchery program responds directly to a need to mitigate for naturally-reproducing salmon in the Clearwater River Subbasin.

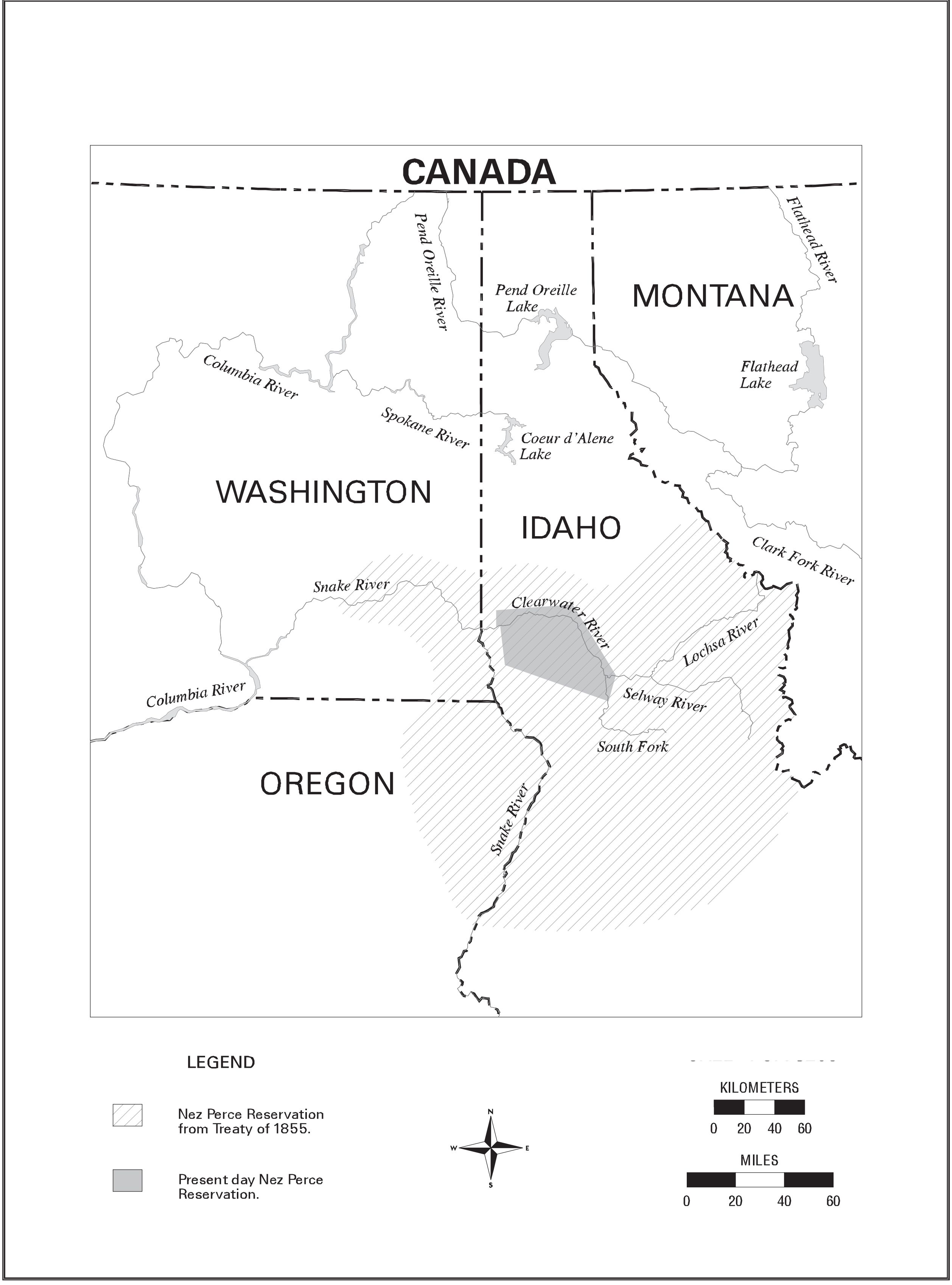
Salmon and ***steelhead*** are ***anadromous*** fish that migrate from freshwater to saltwater as juveniles, and back to freshwater again to spawn as adults. A century ago, as many as 16 million salmon and steelhead returned from the sea to spawn in the ***Columbia River Basin*** each year. Now, fewer than 2.5 million salmon and steelhead return annually: most return to hatcheries in the lower Columbia River; few return to spawn in the Clearwater River Subbasin.

Fewer salmon and steelhead return to the Columbia River Basin for many reasons. Natural events such as fire and floods altered the landscape, and streams and rivers used by fish. But human activities such as road building, mining, logging, land development, farming and ranching have caused the principal change in natural habitat used by fish and other species. Dams on the Columbia and Snake rivers and their tributaries created migration barriers for fish and permanently altered the free-flowing nature and environment of the largest Northwest rivers. Also

Nez Perce Tribal Hatchery Project Study Area



Map 1
Clearwater River Subbasin



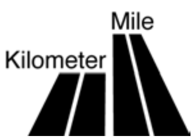
Map 2
Nez Perce Reservation

➲ For Your Information

Chinook *salmon are the largest salmon. The chinook has a greenish back, silver sides and belly. Chinook are long distance swimmers and travel to the farthest reaches of the Columbia Basin to spawn. The fish return from the ocean to the Columbia River in the spring, summer, and fall and are differentiated by the time of year they return.*

Coho *salmon are also called silver salmon.*

BPA uses metric measurements to comply with Public Law 100-418. See metric conversion chart on the inside of the back cover.



Riparian *habitat occurs along the banks of natural watercourses. The quality of riparian habitat is important to fish production.*

Substrate *is the material on the bed of a stream.*

since the 1800s, commercial fishermen have overharvested ***chinook***, ***coho***, and to a lesser extent steelhead in the ocean and in the Columbia River. Many salmon runs were depleted by overfishing by the first half of the twentieth century. <u>Harvest since the 1970s has been severely curtailed in the Columbia River.</u>

1.1.1 The Clearwater River Subbasin

The Clearwater River empties into the Snake River, which flows into the Columbia River (see Map 2). Of course, all harvest impacts and changes in the migratory conditions of the river system downstream affected the runs in the Clearwater River Subbasin, but environmental conditions within the subbasin itself have acted to destroy the native anadromous fish runs.

Hydroelectric and flood control dams eliminated most of the Clearwater River salmon. In 1910, the Harpster Dam was built on the South Fork of the Clearwater River at Harpster (about 32 kilometers [20 miles] up the South Fork). Harpster Dam eliminated salmon runs from the high quality spawning areas in this major tributary. In 1927, Lewiston Dam was built at the mouth of the ***mainstem*** of the Clearwater River. Lewiston Dam prevented passage of spring, summer and fall chinook from at least 1927 to 1940, although steelhead were evidently able to pass. Passage facilities were upgraded in the 1950s, but counts of chinook salmon between 1950 and 1957 ranged from only 7 to 63 fish, indicating that the indigenous run was probably eliminated by then. Harpster Dam was removed in 1963, which reopened the South Fork Clearwater. But Dworshak Dam was built at the mouth of the North Fork Clearwater River in 1974 and it blocked fish passage from that large river. Lewiston Dam was eventually removed in the winter of 1972-73, making most of the Clearwater once again a free-flowing system.

Other human-caused and natural events have shaped the character of the Clearwater River Subbasin. Much of the upper, forested headwaters were burned by catastrophic fires from 1910 to 1930, which contributed to increased erosion and sediment in streams from the surrounding burned-over hillsides. Also, early in the century large scale mining operations scoured many of the best spawning areas of the South Fork and North Fork Clearwater. Agricultural activities are concentrated in the lower subbasin and have resulted in high runoffs, altered streamflows, increased sediments and nutrients, and reduced the amount of ***riparian*** habitat in the lower mainstem and its tributaries. Timber harvest, and the road construction associated with it, have concentrated on the unburned portions of the forested watersheds, and have caused detrimental impacts to riparian habitat, runoff and stream ***substrate*** quality.

1.1.1.1 The Clearwater River Fish Community

There exists a biological need to restore salmon, a vital component of the Pacific Northwest ecosystem, back into the Clearwater Subbasin's rivers and streams.

➲ For Your Information

salmonids *belong to the family salmonidae, i.e., salmon, trout, steelhead, whitefish.*

Historically, ***salmonids***, sculpins, dace, and suckers dominated the Clearwater River fish community. Because of their physical size and prolific nature, salmon and steelhead were the most abundant and visible aquatic residents. They, along with older bull and cutthroat trout, dominated the fish community from the mouth of the mainstem Clearwater River up into its upper tributaries. Salmon and steelhead would go as far into the tributaries as possible while resident fish, like smaller cutthroat and bull trout, would live above the log jams and waterfalls, deep within the myriad of smaller streams. Suckers, dace and sculpins were most abundant in the lower mainstem reaches and their tributaries.

The Clearwater River today has lost the diversity that was part of the historic fish community. Most notably, indigenous chinook salmon populations are gone from the Clearwater River. Cutthroat and bull trout populations are in decline. Formerly abundant, Pacific lamprey now return in very low numbers. Steelhead, which managed to hang on during the dam building era, are no longer abundant nor distributed as widely. In addition, non-native brook trout, non-native rainbow and cutthroat trout have been introduced in headwater streams to establish sport fisheries and have altered the fish community through competition, predation, and reproduction. In the lower mainstem, non-native predators such as bass are present.

The loss of salmon has diminished the supply of nutrients in the Clearwater River.

Salmon once had a major role in the ecosystem of the Clearwater River Subbasin. The loss of salmon from its role has had and will continue to have dramatic effects. The biological niche of young chinook as prey and competitor, and of adult chinook as a nutrient source remains vacant. The loss of biomass provided by large salmon carcasses has made the overall aquatic ecosystem less productive. For thousands of years, while salmon runs were plentiful, the Clearwater River was supplied with nutrients brought in by returning adults from July through December, year after year. Within the last 100 years, that organic source has been shut off and most nutrients are now derived solely from streamside sources. Aquatic and terrestrial organisms that had evolved to depend on that nutrient source have been affected.

1.1.1.2 Hatchery Fish Production in the Clearwater Subbasin

Many attempts have been made to increase the populations of salmon and steelhead in the Clearwater River Subbasin.

➲ For Your Information

All hatcheries in the Clearwater River Subbasin are shown on Map 1.

Outplanting *is the process by which artificially propagated fish are released into a natural system.*

Eyed-eggs *are the life stage of a fertilized egg between the time the eyes become visible and hatching occurs.*

Fry *emerge from the yolk sack after the yolk is gone and are about 40 mm (1.6 inch) long.*

Fingerlings *are juvenile fish varying in length from 38 mm to 114 mm (1.5 to 4.5 inches).*

Fingerling

Smolts *are young salmon that are physiologically ready for the transition to saltwater.*

See Section 1.6.4 for more discussion of the Lower Snake River Compensation Plan.

Presmolts
Juvenile spring chinook salmon that are 100-150 mm (4-6 inches) long in the fall. They smolt and migrate to the ocean the following spring.

Presmolt

Beginning in the 1950s, spring, summer, fall chinook and coho salmon were ***outplanted*** in the subbasin in an attempt to reintroduce these runs. Primarily ***eyed-eggs*** were planted, but ***fry***, ***fingerlings*** and ***smolts*** were also planted. Although reintroduction attempts met with some success, runs declined after stocking ceased.

Kooskia National Fish Hatchery — Major hatchery construction began in the Clearwater River Subbasin in the 1960s. In 1966, Kooskia National Fish Hatchery was built near the mouth of Clear Creek on the Middle Fork Clearwater River. Kooskia National Fish Hatchery is within the Nez Perce Reservation boundary. (See Map 1.) The hatchery is a congressional appropriations facility and its purpose is to facilitate restoration of nationally significant fishery resources. Kooskia Hatchery is operated by the U.S. Fish and Wildlife Service (***USFWS***) and was originally designed to produce 2 million spring chinook smolts and 1 million steelhead smolts. Water quality and quantity problems, however, limit production to 800,000 chinook smolts (Nez Perce Tribe and Idaho Department of Fish and Game, 1990). Since 1978, Kooskia Hatchery has been operated as a complex with Dworshak National Fish Hatchery, sharing space to rear and hold chinook salmon and steelhead. In general, chinook are reared in the hatchery until smolt stage (1-1/2 years) and released directly into Clear Creek. Six hundred adults are needed to fully seed the hatchery. From 1984 to 1994, returns have ranged from 232 to 1,180, with an average of about 600, indicating that the hatchery is just meeting its broodstock production goals.

Dworshak National Fish Hatchery — Dworshak National Fish Hatchery is also operated by the USFWS and was built in 1969. Its purpose is to mitigate for the fish that spawned and spent the freshwater part of their life cycle in habitat of the North Fork Clearwater River no longer available because of the construction of Dworshak Dam. The hatchery is on the north bank of the Clearwater River just upstream of the mouth of the North Fork. Dworshak National Fish Hatchery is within the Nez Perce Reservation boundary. Originally built to produce only steelhead, it was expanded in 1981 under the Lower Snake River Compensation Plan (***LSRCP***) to rear chinook smolts as well. LSRCP production is intended to mitigate for anadromous fish losses caused by four Snake River dams. Slated production is for 2.3 million steelhead smolts and 1.3 million chinook smolts. In most years, chinook smolts are released at Dworshak in order to return enough adults to fill hatchery production. When surplus fry, ***presmolts*** or smolts are available, releases have been made in Lolo Creek and tributaries of the South Fork Clearwater River. Steelhead releases have also been predominantly at the hatchery with surplus production distributed primarily in the South Fork Clearwater River.

➲ For Your Information

Egg take *is the number of eggs needed to produce the next generation of adults.*

Over the years, Dworshak steelhead returns have been good, averaging about 6,000 fish. Under ideal situations, Dworshak's steelhead ***egg-take*** needs are 3,000-4,000 adults when spawning ratios of 1:1 are used. However, the hatchery has managed with as few as 1,800 adults by using males 2-3 times. This number fills not only Dworshak, but also provides 1.6 million eggs to Magic Valley State Hatchery and 1.1 million eggs to the LSRCP Clearwater Hatchery (U.S. Department of the Interior, Fish and Wildlife Service, February 1996).

Chinook returns to Dworshak have been slightly less than the numbers needed for eggs. From 1984 to 1994, numbers of adult chinook returning to Dworshak ranged from 74 to 2,042, with an average of 900 fish. About 1,200 adults are needed to meet the egg take. Dworshak's mitigation goal under the LSRCP is to return 9,135 spring chinook back to the Snake River and upstream.

Clearwater Fish Hatchery — Clearwater Fish Hatchery was constructed as a mitigation hatchery under the LSRCP and is operated by the Idaho Department of Fish and Game (***IDFG***). It is a relatively new hatchery completed in 1992. Its major facility is a central incubation and rearing hatchery located across the North Fork Clearwater from Dworshak Hatchery. Clearwater Fish Hatchery is within the Nez Perce Reservation boundary. It also has three satellite rearing ponds at Powell, located in the headwaters of the Lochsa River, and at Crooked River and Red River, which are in the headwaters of the South Fork Clearwater River. A specific production plan for the hatchery has not been developed, but the design criteria for the LSRCP gives an indication of general production goals.

Acclimate *is to subject fish to environmental conditions for a period of time so the fish can adapt, and obtain and develop the capability to return as adults to their natal stream. Environmental conditions include temperature, chemical smells, and visual, celestial, and geomagnetic cues.*

Clearwater Hatchery is slated to produce about 1.3 million spring chinook smolts and 1.7 million steelhead smolts. Its mitigation goals under the LSRCP are to return 11,910 spring chinook and 14,000 steelhead to the Snake River and upstream. The satellite ponds were built to receive and ***acclimate*** all of the spring chinook and a portion of the steelhead from the central incubation and rearing facility. Some chinook are transported to the acclimation facilities to be reared and released as presmolts and others are to remain at the facility and be transferred to the satellites for release as smolts. Salmon transported prior to smolting are more likely to return to the release site than to the site of their initial rearing. Broodstock for the hatchery will come from adults returning to the satellites. Steelhead will be outplanted in the Clearwater River. Adult steelhead broodstock will be captured from the satellite sites and surplus adult returns to Dworshak Hatchery.

Harvest augmentation *is producing fish principally for harvest.*

Hatchery Practices — Conventional hatcheries, such as Dworshak and Kooskia, focus on ***harvest augmentation***. Adults are available to be harvested in the mainstem river corridors and ocean when forecasted adult returns exceed hatchery broodstock needs. Such hatchery operations do not emphasize rearing or spawning in the natural environment. Typically, most steelhead

➲ For Your Information

***Homing** is navigational behavior that guides species during migrations.*

***Imprinting** is the physiological and behavioral process by which migrating fish assimilate environmental cues to aid their return to their stream of origin as adults.*

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

Map 2 shows the Nez Perce territory and present day reservation.

*Section 3.1, **Nez Perce Tribe** has a description of the importance of salmon to the Nez Perce Tribe.*

adults do not return to the hatchery because they are harvested by sportsmen and tribal fishers. To date, the vast majority of spring chinook return to hatcheries because there is no significant directed harvest (U.S. Department of Interior, Fish and Wildlife Service, February 1996). ***Homing*** in anadromous fish is acute, and adults that return to the hatchery are spawned and continue the cycle.

Over the years, conventional hatchery practices have been found to have drawbacks. Hatchery practices have altered genetic and morphological characteristics by selecting against natural traits. For example, hatchery practices have affected spawn timing, size and age at return, and ability to migrate long distances. Raceway rearing domesticates fish, reducing their ability to forage or seek protection in the natural environment. In the past, when fish have been released off-site, they have been released at inappropriate times, in unsuitable habitat, and with little or no acclimation. As a consequence, early mortality has been substantial and homing ***imprinting*** has been incomplete. The proportion of hatchery adults that stray into different watersheds increases as a result. Conventional hatchery practices have not been an effective means of restoring runs into the natural environment.

There exists a need for new technology to increase runs of naturally-reproducing salmon with the aid of hatcheries.

The need for novel rearing and breeding techniques is stated clearly in the *Draft Recovery Plan for Snake River Salmon* (U.S. Department of Commerce, National Marine Fisheries Service (***NMFS***), 1995) and the Tribal Restoration Plan (Nez Perce Tribe, et al., 1995). These plans suggest that conventional hatchery practices may not be the most effective means to restore natural populations. Rather, these plans and others have supported restoring natural populations using hatcheries in conjunction with well-defined ***supplementation*** programs. NMFS suggested revising rearing and breeding techniques to improve the quality of smolts. Such strategies include manipulating water temperatures, and diets to emulate natural growth patterns during rearing. NMFS also suggests decreasing rearing densities, using acclimation ponds and voluntary release strategies, and incorporating shade, substrate, cover, and structure in rearing containers. Training fish to forage, evade predators, and use other post-release survival skills is also suggested.

1.1.2 The Nez Perce Tribe

The Nez Perce once were one of the largest Plateau tribes in the Northwest (Walker, D., 1978). They occupied a territory of over 5 million hectares (13 million acres) that included what is today north central Idaho, southeastern Washington and northeastern Oregon. The Nez Perce Tribe is a federally-recognized tribe with sovereign status over its lands, people and resources. The Tribe's governmental rights and authorities extend to any natural resources which are reserved or protected in treaties, executive orders and federal statutes. The United States has a trust obligation toward the Nez Perce Tribe to protect these rights and authorities.

Salmon and other migratory fish species are an invaluable food resource and an integral part of the Nez Perce Tribe's culture. Anadromous fish have always made up the bulk of the Nez Perce tribal diet and this dependence on salmon was recognized in the treaties made with the Tribe by the United States. In 1855, representatives of the United States government negotiated a treaty with the Nez Perce in which the Tribe reserved:

> the exclusive right of taking fish in all the streams where running through or bordering said reservation is further secured to said Indians; as also the right of taking of fish at all usual and accustomed places in common with citizens of the Territory; (Treaty with the Nez Perce, 12 Stat. 957).

No subsequent treaty or agreement between the Nez Perce Tribe and the United States altered or affected this treaty-reserved right. These treaty-reserved fishing rights are the legal basis for the Tribe's involvement, as co-managers, in salmon restoration efforts. Thus, the legal, historic, economic, social, cultural, and religious significance of the fish to the Nez Perce Tribe continues to this day, which makes the decline of fish populations in the Columbia River Basin a substantial detrimental impact to the Nez Perce way of life.

Therefore, the Nez Perce Tribe has a legal, historic, economic, social, and cultural need to restore salmon runs.

1.2 Finding Solutions

In 1980, Congress passed the Northwest Power Act. The Northwest Power Act created the Northwest Power Planning Council and directed the Council to develop the Columbia River Basin Fish and Wildlife Program. The program is designed primarily to address the impacts of the federal hydroelectric system on the fish and wildlife resources of the Columbia River Basin.

BPA has become the primary funding and implementing agency of the program. Under the Act, BPA has the responsibility to protect, mitigate impacts to, and enhance anadromous fish populations in the Columbia River Basin.

The Council recognized the opportunity to mitigate impacts to salmon runs in the Clearwater River Subbasin. In 1982, the Council authorized design and construction plans for fish production facilities on the Nez Perce Indian Reservation, and listed the facility in the Council's *1987 Fish and Wildlife Program* (Action Item 703(g)(2)).

The Council then established an interim goal of doubling current salmon and steelhead runs to 5 million adult fish in the Columbia River Basin without losing biological diversity. The Council asked fishery agencies and Indian Tribes to develop plans and management strategies to achieve the Council's interim goal. The Nez Perce Tribe played a key role in this process. The fishery agencies and Tribes produced an Integrated System Plan in June 1991.

➲ For Your Information

Icons represent the many reports developed for this program and are added beside information from a specific report.

The Integrated System Plan, though not formally adopted, included a strategy for the Salmon and Clearwater rivers. A part of the strategy was to try using a central hatchery to artificially propagate fish, and smaller satellite facilities to rear the fish. The Nez Perce Tribe then developed the *Nez Perce Tribal Hatchery Master Plan* (Larson and Mobrand, 1992). The Master Plan describes the Nez Perce Tribal Hatchery (***NPTH***), which uses supplementation in its program.

Supplementation is a mechanism of intervening in a natural population with the purpose of halting decline or increasing natural production (U.S. Department of Commerce, NMFS, 1995). The basis for supplementation is that hatcheries can provide a higher survival in the egg-to-fry and egg-to-smolt life stages than occurs naturally (U.S. Department of Commerce, NMFS, 1995; Nez Perce Tribe, et al., 1995).

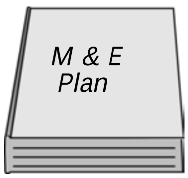
NEPA *requires that proposed major federal actions which may have significant impacts on the environment be examined in an environmental impact statement. NEPA helps public officials make decisions that consider environmental consequences.*

In May 1992, the Council approved the *Nez Perce Tribal Hatchery Master Plan*. The Council called on BPA and the Tribe to resolve some technical uncertainties before carrying out the Master Plan. The Council also asked the Tribe and agencies to begin the environmental analysis process to evaluate environmental impacts as required by the National Environmental Policy Act of 1969 (***NEPA***).

BPA and the Tribe met the Council's requirements. In 1992, the Tribe completed the *Genetic Risk Assessment of the Nez Perce Tribal Hatchery Master Plan*, (***NPTH GRA***) (Cramer and Neeley, 1992). The NPTH GRA assessed the genetic origins and uniqueness of the chinook population in each of the major Clearwater tributaries. It also identified genetic risks of the proposed supplementation program and offered recommendations for reducing those risks.

In 1994, the *Nez Perce Tribal Hatchery Predesign Study* (Montgomery Watson, 1994) was completed. The study evaluated proposed sites for the capability of the sites to grow fish. The study also defined preliminary development costs for carrying out the program.

In 1995, the Tribe completed the *Selway River Genetic Resource Assessment* (***Selway GRA***) (Cramer, 1995a). The Selway GRA assesses the genetic origins and uniqueness of the chinook populations in the Selway River Subbasin, and identifies the possible genetic risks from operation of hatchery satellite facilities in that subbasin. It serves as a supplement to the NPTH GRA.



The Tribe also developed the *Nez Perce Tribal Hatchery Monitoring and Evaluation Plan* (***M & E Plan***) (Steward, 1996). The M & E Plan describes short- and long-term monitoring and evaluation activities to help managers decide how effective supplementation is in restoring chinook salmon production in the Clearwater River Subbasin. Monitoring needs, procedures, and products are discussed as they relate to supplementation theory, program goals and objectives, and to program-specific performance criteria.

In 1995, the Tribe evaluated new information from the NPTH GRA, the Selway GRA, the Predesign Study, the M & E Plan, and an Endangered Species Act (***ESA***) listing (see Section 1.6.1, **Endangered Species Act**) and made changes to the Master Plan. These changes are described in the *1995 Supplement to the Master Plan* (***1995 Supplement***).

Finally, analysts used the information from these studies to refine the supplementation program and to complete the environmental analysis.

1.2.1 Nez Perce Tribal Hatchery Program

➲ For Your Information

*Chapter 2, **Proposed Action and Alternatives**, has a complete description of the supplementation program.*

The Nez Perce Tribal Hatchery Program was developed using the results of the Tribe's studies. NPTH would use supplementation to rebuild natural runs of chinook salmon. NPTH would use innovative incubation and rearing techniques to provide as much survival benefit as possible when fish are released into the wild (See Sections 2.1.3.3, **Rearing Techniques** and 2.1.3.4, **Release Techniques**). Water temperatures, rearing environment, and size of life stage of fish when released would be controlled to best fit with existing natural conditions. Fish would be released in under-used stream or river habitat and would return to spawn in that habitat rather than return solely to spawn in a hatchery.

long-term genetic fitness *is a measure of the ability of a population to survive natural selection over a number of generations.*

The mating protocols for spring chinook would mix returns from hatchery releases and naturally-spawning fish to maintain the ***long-term genetic fitness*** of the spring chinook population. At the same time, release numbers from NPTH would be controlled to keep ecological and genetic impacts to other fish populations within acceptable limits.

NPTH would be a long-term supplementation program. It is designed to aid natural production until such time that runs can perpetuate themselves and provide a harvest.

NPTH managers would try to produce enough salmon returning to spawn within 20 years after the start of the program so that some salmon could be harvested. Twenty years was selected as the goal because it is four chinook generations and it is a reasonable milestone for financing and expected harvest. To meet this goal, enough spring/summer and fall chinook would need to disperse into suitable habitats, survive to spawn in the wild, and produce enough viable offspring to allow some harvest.

1.3 Purpose

Decision makers will use these purposes to evaluate the alternatives proposed to meet the need:

- Protect, mitigate, and enhance Columbia River Basin anadromous fish resources.
- Develop, increase, and reintroduce natural spawning populations of salmon within the Clearwater River Subbasin.
- Provide long-term harvest opportunities for Tribal and non-Tribal anglers within Nez Perce Treaty lands within four salmon generations (20 years) following project completion.
- Sustain long-term fitness and genetic integrity of targeted fish populations.
- Keep ecological and genetic impacts to non-targeted fish populations within acceptable limits.
- Promote Nez Perce Tribal management of Nez Perce Tribal Hatchery facilities and production areas within Nez Perce Treaty lands.

1.4 Scoping and Major Issues

Scoping refers to a time when the public has a chance to express which issues they think should be considered in an environmental impact statement (***EIS***). BPA and BIA jointly published a Notice of Intent on April 29, 1994 to prepare an EIS, to provide notification for Floodplain and Wetlands Involvement, and to conduct public scoping meetings for the program (59 FR 22155). Public scoping meetings were held on May 24, 1994, in Boise, Idaho, and on May 25, 1994, in Spalding, Idaho. About 15 people attended each of the public meetings. BPA and BIA received 28 sets of written comments during scoping. Commentors raised these issues:

- The possibility that the program would fail if mainstream Columbia River juvenile and adult passage problems are not solved.
- Genetic risks and the potential impact of the program on the genetic diversity of wild fish stocks, particularly ESA-listed Snake River salmon species.
- Hatchery fish may adversely impact wild anadromous and resident fish stocks through competition for space and food and transfer of diseases in the natural environment.
- The effectiveness of supplementation technology.
- Water quality impacts from hatchery effluent and construction.
- The effect of excessive ocean and in-river harvest practices on the survival of weak stocks.
- The cost effectiveness of undertaking such a mitigation program given that anadromous fish runs continue to decline in the region.

Mainstem passage is being addressed in many other forums (see Section 1.7, **Issues Beyond the Scope of this EIS**). Consequently, an analysis and discussion of mainstem passage issues are not included for detailed evaluation within the scope of this EIS. Also, acclimation facilities in the Salmon River Subbasin have been eliminated from consideration in this EIS because of complications with salmon stocks listed as threatened under the Endangered Species Act. (See Sections 1.6.1, **Endangered Species Act**, and 2.3, **Alternatives Eliminated From Consideration**.)

Other issues raised during scoping and many added concerns are addressed in Chapter 4, **Environmental Consequences**.

Issues identified during the scoping process were discussed in the Draft EIS. The Draft EIS was distributed to agencies, groups, individuals and libraries in June 1996. A 45-day public review period ended on August 16, 1996. Two public meetings with an open house format were held in Boise and Lapwai, Idaho to review and receive comments on the Draft EIS. An additional comment period was opened on December 13, 1996 and ended January 27, 1997. Chapter 10 of this Final EIS records and provides responses to the comments on the Draft EIS. This Final EIS also provides updated information developed as a result of the comments received on the Draft EIS.

1.5 Decisions to be Made

When a project or program could involve more than one federal agency, those agencies work together during the planning and decision-making process. BPA and BIA are co-lead federal agencies on this program. The Nez Perce Tribe, though not a federal agency, acts as the primary cooperating agency. The U.S. Forest Service (***USFS***) and the USFWS are cooperating federal agencies.

A program of this size contains different alternatives and options for decision makers to consider. For this program, the following decisions must be made.

- BPA must decide whether to fund construction, operation, and maintenance of program facilities.
- BIA, as trustee for tribal trust resources, must decide whether to fund cyclical maintenance and rehabilitation of hatchery facilities. The decision whether to fund will be based on annual budget constraints and availability of funds.
- The Nez Perce Tribe must decide whether to accept the outcome in the Record of Decision developed after the environmental impact statement is completed.
- The USFS (Clearwater and Nez Perce National Forests) must decide if the program complies with currently approved forest plans and if special use permits for construction, operation, and maintenance of program facilities should be approved. If the program does not comply, forest plan(s) may need to be amended. The effects to other national forest uses, such as recreation, timber, mining, and grazing are discussed under land use in Chapter 4, **Environmental Consequences**, of this EIS.
- The USFWS will assess the impacts of the program on listed wildlife and plant species as written in a ***Biological Assessment*** and will determine if they concur with the assessment of the level of impacts on listed species.
- Though the NMFS is not a cooperating agency, it will review the determination of effect on listed populations of Snake River chinook salmon addressed in a Biological Assessment.

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*Two **Biological Assessments** are part of the final EIS. See Appendices A and B.*

See Chapter 5 for consultation and permits requirements specific to NPTH.

More information about federal, state, and local consultations and permits for this program is in Chapter 5, **Environmental Consultation Review and Permit Requirements**.

1.6 Relationship to Other Fish Plans, Programs and Projects Affecting the Clearwater River Subbasin

Many plans, programs and projects are related to this program. These are described in this section.

1.6.1 Endangered Species Act

In June 1990, NMFS was petitioned to list Snake River populations of spring, summer, and fall chinook as threatened and endangered under the Endangered Species Act. In their status review, NMFS determined that the abundance of Snake River spring/summer chinook (the two races were determined by NMFS to be a single species under the ESA) and fall chinook had declined to levels warranting protection under the Act. After initially being listed as threatened, Snake River spring/summer and fall chinook were reclassified as endangered species on August 18, 1994 (*Federal Register*, August 1994). When this emergency rule expired, their listed status reverted to threatened.

➲ For Your Information

Evolutionarily significant unit *is a population or group of populations that is considered distinct for purposes of conservation under the ESA.*

Critical habitat *is the minimum amount of habitat necessary for survival and enough area for the species to expand and recover to healthy population levels.*

NMFS finds that the Snake River fall chinook ***Evolutionarily Significant Unit*** (***ESU***) is made up of a single population which spawns in the mainstem Snake River and in the lower reaches of major tributaries downstream from Hells Canyon Dam, including the Clearwater River. The Lyon's Ferry Hatchery fall chinook population, which was derived from natural stock, is also considered part of the ESU. NMFS designated the section of the Clearwater River extending from its mouth upstream to Lolo Creek (about 85 km [53 miles]) as ***Critical Habitat*** for fall chinook.

NMFS also determined that the Snake River spring/summer chinook is an ESU. The run is made up of more than 30 subpopulations located in 12 major subbasins and Salmon River tributaries. NMFS concluded that populations of spring chinook that exist in the Clearwater River are not part of the Snake River ESU and therefore are not subject to the provisions of the Act (Matthews and Waples, 1991). Clearwater River spring chinook were excluded because the indigenous populations had been eliminated by Lewiston Dam. The spring chinook found in the drainage today can be traced to ancestors from outside the Clearwater River Subbasin (see Section 3.6, **Fish**). NMFS also elected not to designate portions of the Clearwater River Subbasin as Critical Habitat for spring chinook because "... the spring and summer chinook salmon inhabiting the Clearwater River Basin are not considered part of the evolutionary significant unit comprising Snake River spring/summer chinook listed under the ESA." (*Federal Register*, December 28, 1993.)

Other than Snake River fall chinook (found in the lower Clearwater River), no other species of fish residing in the

Clearwater River Subbasin has been listed as threatened or endangered. Summer steelhead populations within the Snake River drainage, including the Clearwater River Subbasin, are proposed for listing as a threatened or endangered species. Steelhead have been classified as ***Sensitive*** by the USFS and as a ***Species of Concern*** by IDFG. Cutthroat trout and bull trout are considered Species of Special Concern by IDFG and a Sensitive Species by the USFS.

Bull trout have been proposed for listing as a threatened species. No formal federal restoration effort has yet been developed (See Section 3.6.2.4, **Bull Trout**).

1.6.2 The Proposed Recovery Plan for Snake River Salmon

The ESA requires that recovery plans be developed and implemented for threatened and endangered species. NMFS is the agency responsible for developing a recovery plan for Snake River salmon and issued its Proposed Recovery Plan in March 1995. A final Recovery Plan is expected to be issued in 1997, and it will contain provisions to prevent further declines in the near term and affect the recovery of the species in the long term.

In order for the Recovery Plan to yield at least a stable, non-declining run, there must be an improvement made in the relationship between the number of smolts that leave the system to the number of adults that return. This smolt-to-adult survival rate for salmon must be increased by at least two fold. Improvements in smolt-to-adult survival will naturally focus on those aspects of the environment that humans control, such as harvest rates and downstream and upstream passage over dams. The efforts made to improve survival for listed endangered stocks will benefit hatchery and non-listed stocks in the same manner.

The success of the NPTH, other upriver hatchery or natural runs of salmon, whether the salmon are listed or not, ultimately depends on salmon recovery efforts (including the Snake River Recovery Plan, the Tribal Restoration Plan, and the Fish and Wildlife Program of the Northwest Power Planning Council).

The NPTH was designed assuming smolt-to-adult survival rates would be better than existing rates. Now that regional salmon recovery efforts have come to the forefront, and deliberate attention will be focused on improving survival, the prospects for rebuilding a naturally-reproducing spawning population by ***jump starting*** populations in underseeded habitat in the Clearwater River Subbasin have an improved potential for success.

➲ For Your Information

Jump start *Starting or setting in motion a stalled system or process.*

The NPTH program is consistent with many of the principles of the proposed Recovery Plan, supporting several of its objectives, but it is also at odds with a few specific measures. Because the measures included in the final Recovery Plan are unknown, further discussion on consistency is premature. However, some underlying principles of the Recovery strategy addressed by NPTH are:

- The Recovery Plan calls for limitation of releases of anadromous salmonids from Snake River hatcheries to 20.2 million smolts but that "... Production to support recovery (currently 1.24 million fish) is exempt from this limit." Production of fall chinook from Lyon's Ferry Hatchery is designed to support natural production of endangered Snake River salmon and is exempt from the limit (NMFS, September 5, 1996). Spring chinook production is included within the hatchery cap.

- The Recovery Plan calls for fisheries agencies and Tribes to design and carry out production-scale experiments at appropriate Columbia River Basin hatcheries to test individual release strategies and evaluate smolt quality indices believed to improve smolt quality. Such alternative release strategies and evaluations are an integral part of the NPTH Master Plan and M & E Plan.

- The Recovery Plan calls for reintroduction of spring/summer chinook salmon in the Lochsa and Selway rivers once an appropriate stock is identified. As a part of the NPTH planning process, two GRAs have been completed that present detailed evaluations of the stock histories and genetic risks associated with alternative brood sources for spring/summer chinook in the Clearwater River Subbasin. The 1995 Supplement stipulates that brood sources and brood-taking guidelines recommended in these genetic risk assessments would be adopted.

The Nez Perce Tribe, BPA, BIA, and others will continue to consult with NMFS as this EIS progresses, and as the Proposed Recovery Plan is reviewed and revised. (See Section 5.2, **Endangered and Threatened Species**, for more information about consultations.) Broodstock sources, construction and operation of facilities and other program-related activities would be evaluated in formal consultation with NMFS to determine whether they constitute a threat to the continued existence or habitat of listed species, or in some way interfere with their recovery. Impacts expected to any listed species are identified in Chapter 4, **Environmental Consequences**, and the Biological Assessments (see Appendices A and B).

1.6.3 Interactions of Hatchery and Naturally Spawning Salmon and Steelhead in the Columbia River Basin Programmatic EIS

A draft CEA EIS was prepared by NMFS, USFWS, and BPA in coordination with the Columbia Basin Fish and Wildlife Authority (***CBFWA***). CBFWA is a coordinating body for fish and wildlife agencies and the Native American Tribes who have fisheries management authority in the basin.

The draft EIS has been published for public comment. The draft EIS proposed to assess the cumulative impacts of all anadromous fish culture programs in the Columbia River Basin on natural production of salmon and steelhead. It focused on mainstem Columbia and Snake rivers. Its purpose is to examine strategies for outplanting of artificially produced salmon and steelhead in the Columbia Basin that better allocate the Basin's fish production capabilities while eliminating or minimizing risks to stock biodiversity. Its preferred alternative would result in substantially increasing the production of fish for supplementation in all portions of the Columbia River Basin and reducing the amount of fish released for conventional mitigation purposes.

Tribal organizations, environmental groups, and the Council's Independent Scientific Advisory Panel submitted highly critical comments on the draft CEA EIS. The comments criticized, among other things, the range of alternatives, the extent of the impact analyses, the limited geographic scope, and the analysis of connected actions. Many comments suggested the draft CEA EIS be completely redone. The federal sponsors of the draft CEA EIS have not decided whether to proceed with a final CEA EIS, and if so, how they would address the comments received.

If the federal agencies proceed with the CEA process, it would not be done for over a year. It would address the impacts of the Basin's anadromous fish production programs, and examine whether the federal fisheries managers should shift hatchery emphasis from providing harvest to rebuilding stocks through supplementation. If the CEA EIS is finalized, this NPTH EIS would not prejudice the outcome for a number of reasons. Those reasons include the fact that the CEA's primary goal would be to examine the cumulative impacts of hatcheries and harvest, and that the relatively small number of smolts released, and adults harvested from NPTH facilities are unlikely to have a statistically significant effect on the CEA cumulative impact analysis. In addition, if BPA issues a Record of Decision adopting an alternative under the CEA that requires changes in this program, this program would be changed to comply with the CEA decisions.

This NPTH EIS can proceed in the absence of a Record of Decision in the CEA process because the NPTH program is covered by a separate EIS. Moreover, the NPTH has purposes independent from those of the CEA. The NPTH's independent purposes include, but are not limited to 1) developing, increasing, and reintroducing natural-spawning populations of salmon within the Clearwater River Subbasin, and 2) sustaining long-term fitness and genetic integrity of targeted fish populations. The CEA EIS does not propose actions for meeting either of these purposes. Therefore, BPA concluded the NPTH EIS can proceed concurrently with the CEA process.

1.6.4 Lower Snake River Fish and Wildlife Compensation Plan (Additional Mitigation of Upstream Spawning)

A portion of the fall chinook production occurring at Lyon's Ferry Fish Hatchery has been slated to go upstream in an effort to improve the run of naturally-reproducing fish above Lower Granite Dam. A cooperative proposal was developed by NPT, USFWS and the Washington Department of Fish and Wildlife to acclimate fish to the river reaches using temporary acclimation facilities. Yearling smolts, which are larger than the fall chinook proposed in NPTH, would be released. They exhibit much higher adult return rates than do subyearling smolts, and would rebuild the runs more quickly. Acclimation facilities are being considered in the Snake and Clearwater rivers. In 1996, the Corps of Engineers distributed an environmental assessment describing the impacts of developing two fall chinook acclimation facilities: one on the Clearwater River at the confluence with Big Canyon Creek, and one on the Snake River at one of two sites about 32 km (20 miles) south of Clarkston, Washington.

During the spring of 1996, the Tribe and Corps of Engineers set up a satellite rearing facility at Pittsburg Landing on the Snake River. Approximately 113,000 yearling chinook from Lyon's Ferry Hatchery were acclimated and released at the site.

During the spring of 1997, the Tribe and Corps set up an additional satellite rearing facility at Big Canyon Creek on the Clearwater River. Planned fall chinook releases in 1997 are for 150,000 yearlings each at Pittsburg Landing and Big Canyon Creek, 270,000 subyearlings at Big Canyon Creek, and 50,000 subyearlings at Pittsburg Landing. Should this program to release fall chinook upstream of Lyon's Ferry continue into the future, the proposed central incubation and rearing facility at Cherrylane could be a candidate for a release site. If Cherrylane is a candidate, its environmental effects would be evaluated in a separate NEPA document by the funding agency.

1.6.5 Idaho Department of Fish and Game Anadromous Fish Management Plan

Supplementation of chinook populations in the Clearwater River Subbasin is part of the IDFG's *Anadromous Fish Management Plan for 1992-96*. There are differences and areas of consistency between the plan and NPTH. The management plan was developed with the proposed NPTH in mind, and consequently, IDFG specifically mentioned supporting tribal hatchery operations in the watersheds originally slated for production, that is, Lolo Creek and Newsome Creek. The Management Plan does not mention fall chinook production in the Selway or South Fork Clearwater or mainstem Clearwater.

Where hatchery production is discussed, an emphasis of the plan is to "... Work with the Nez Perce Tribe to develop hatchery fish release programs that preserve and protect genetic resources of naturally spawning chinook and steelhead populations." The Tribe has investigated the most appropriate stocks to use for the NPTH (Cramer, 1992 and 1995a) in the Clearwater River Subbasin and believes this goal is met. NPTH fall chinook broodstock would be taken from the existing Snake River Basin population. After initial stocking, spring chinook broodstock would come from locally adapted stocks.

A difference in management strategies regarding hatchery production in Fish Creek may occur in the future. The Management Plan specifically calls for not supplementing Fish Creek with either chinook or steelhead. Fish Creek has been designated as a control stream for NPTH, and as such, would not be outplanted during the near term. However, if supplementation proves effective, the Tribe may choose to use Fish Creek in the future. The Tribe would coordinate with IDFG on hatchery production.

1.6.6 Idaho Salmon Supplementation Studies

The Idaho Salmon Supplementation Study (***ISS***) is closely aligned with and partially dependent on the proposed NPTH program, but evaluation and production strategies differ between the two programs. The ISS is a cooperative effort among state, federal, and tribal agencies to assess what broodstock and release strategies are best for supplementing natural or depleted spring and summer chinook salmon populations, and what effect supplementation has on these populations. Evaluation of treatment and control streams focuses on ***parr*** densities, juvenile yield, and ***redd*** counts. NPTH would facilitate the studies by providing supplementation fish to Newsome Creek and Lolo Creek.

The NPTH M & E Plan would use some of the control streams used by the ISS, but methods of evaluation differ. Additionally,

➲ For Your Information

Parr *Juvenile salmonids develop bar-shaped marks on their sides called parr marks, between becoming fry and smolting.*

Redd *The reproductive nest dug in gravels by the female fish.*

outplanting strategies, species reared, and rearing techniques proposed for NPTH are different from those used by the ISS. Control streams would not be planted until some determination of program success is made. See Section 2.1.5, **Monitoring and Evaluation Plan**.

1.6.7 Columbia River Fish Management Plan (*CRFMP*)

The Columbia River Fish Management Plan is a court-approved settlement between the parties in U.S. v. Oregon, a case addressing treaty fishing rights in the Columbia River Basin. The signatories to the settlement are the United States of America acting through the Department of the Interior and the Department of Commerce; the Nez Perce Tribe; the Confederated Tribes of the Umatilla Indian Reservation; the Confederated Tribes of the Warm Springs Reservation of Oregon; the Confederated Tribes and Bands of the Yakama Indian Nation; and the states of Oregon and Washington. The plan is a framework for these parties to protect, rebuild, and enhance Columbia River fish runs while providing fish for both treaty Indian and non-Indian fisheries. The agreement establishes procedures to facilitate communication and resolve disputes through a Policy Committee composed of the parties. Two technical committees have been set up to guide management decisions of the Policy Committee. The Production Advisory Committee (PAC) responds to hatchery production issues; the Technical Advisory Committee (TAC) responds to harvest issues. The NPTH program would be undertaken as a measure under the Northwest Power Act and is separate from the United States' CRFMP duties, although operation and management of the hatchery must be consistent with the Plan.

The NPT, as proposed NPTH managers and CRFMP signatories, would be responsible for consultation with the other parties to CRFMP to ensure that hatchery management and operations are in compliance with the CRFMP with regard to production issues, harvest in the ocean and mainstem Columbia River and harvest in the Clearwater River in Idaho.

BPA is not a party in U.S. v. Oregon or CRFMP. Consequently, BPA would not undertake the NPTH as part of the U.S. v. Oregon settlement. Instead, BPA would proceed with this measure under its Northwest Power Act authority to protect, mitigate, and enhance anadromous fish in the Columbia River Basin affected by the Federal Columbia River Power System.

1.6.8 Biological Opinion on 1995-1998 Hatchery Operations in the Columbia River Basin

➲ For Your Information

Biological Opinion *Document stating the opinion of the USFWS or NMFS on whether a federal action is likely to jeopardize a listed species, or destroy critical habitat.*

Jeopardy *To jeopardize the continued existence of or to reduce the likelihood of the survival and recovery of a listed species.*

NMFS' approach for determining whether a proposed action jeopardizes the continued existence of listed Snake River salmon is described in this Biological Opinion. NMFS determined that proposed hatchery operations described by USFWS, NMFS, BPA, the Corps, and BIA at federal hatcheries are likely to jeopardize the continued existence of listed Snake River sockeye salmon, Snake River spring/summer chinook salmon, and Snake River fall chinook salmon. NMFS described a reasonable and prudent alternative to hatchery operations that will reduce impacts on endangered chinook and sockeye salmon. The alternative included those measures addressed in the Proposed Recovery Plan for Snake River Salmon.

NPTH was not included in the Biological Opinion, and therefore another Biological Opinion must be filed by NMFS.

1.6.9 PACFISH

PACFISH is a management strategy developed by the USFS and the U.S. Bureau of Land Management for anadromous fish-producing watersheds on federal lands (U.S. Department of Agriculture, U.S. Forest Service, 1995). PACFISH established goals to maintain or restore water quality, riparian areas, and associated fish habitats in order to provide healthy, functioning watersheds. Interim Riparian Management Objectives (***RMO***s) for stream channel conditions were defined to provide the criteria which "attainment, or progress toward attainment, of the riparian goals is measured." Interim Riparian Habitat Conservation Areas (***RHCA***) were established for all perennial and intermittent streams to achieve riparian management goals and objectives. PACFISH limits most riparian alterations (i.e., vegetative removal and soil disturbing activities) within 300 feet of perennial fish bearing streams and 150 feet of smaller non-fish bearing perennial streams. PACFISH states that modifications to the RHCA's usually requires completion of a Watershed Analysis to provide the ecological basis for the change.

The PACFISH Amendment, now part of the Nez Perce and Clearwater Forest Plans, applies to all proposed projects and ongoing projects and activities that pose an unacceptable risk to anadromous fish. This directive supersedes the existing forest plan where the amendment provides more protection for anadromous fish habitat.

The Lochsa, Selway and South Fork Clearwater rivers and Lolo Creek are considered anadromous watersheds under PACFISH. Construction of some proposed facilities could require removing vegetation and disturbing soil in riparian conservation areas on federal land, an activity regulated by PACFISH guidelines.

Construction activities proposed on national forest land would be evaluated at each site to determine if the specific activities meet PACFISH objectives. However, because both PACFISH and NPTH have the mutual goal of increasing natural production, it is unlikely that they would conflict. The Tribe would work with the USFS while designing and locating the proposed facilities. Special use permits would be obtained and PACFISH management objectives would be met (See Section 5.5, **State, Areawide and Local Plan and Program Consistency**).

1.6.10 Summary of Upstream Salmon Report

On November 8, 1995 the National Research Council, part of the National Academy of Sciences, released a scientific study on Pacific salmon with recommendations for establishing a sustainable future for salmon in the Pacific Northwest. The study emphasizes the importance of genetic diversity. With respect to hatcheries and supplementation, the report calls for changing roles of hatcheries from mitigation for dam mortality and production for fisheries to assisting recovery and providing an opportunity for genetic expression of wild populations.

NPTH is consistent with this recommendation as its emphasis is to supplement naturally-reproducing populations.

1.6.11 Wy-Kan-Ush-Mi-Wa-Kish-Wit: The Columbia River Anadromous Fish Restoration Plan of the Nez Perce Tribe, Umatilla, Warm Springs, and Yakama Tribes

This Tribal Restoration Plan (Nez Perce Tribe, et al., 1995) focuses on restoring salmon runs to the rivers and streams of the Columbia River system and embodies the tribal management philosophy of gravel-to-gravel management. This approach differs from many of the existing state and federal plans which are focused more on providing fish for sport and commercial harvest and returning fish to concrete hatcheries. The plan recognized the need to ensure that all of the salmon life cycle from the freshwater to the ocean are protected, managed or restored.

A key element in the restoration is to use hatchery technology to supplement the natural runs rather than supplant the natural runs as currently occurs with state and federal hatchery programs. Supplementation as defined in the Tribal Restoration Plan is the act of releasing young, artificially propagated fish into natural spawning and rearing habitat. As adults, these fish will return to spawn naturally in the stream where they were released rather than returning to the propagation facility. The NPTH is one of the supplementation hatcheries proposed in the plan.

1.6.12 Integrated Hatchery Operations Team

The Integrated Hatchery Operations Team (IHOT) was formed as a result of the Northwest Power Planning Council's amendments of the Fish and Wildlife Program. Section 6.2B in the Strategy for Salmon Volume II (1992) created the IHOT which is comprised of fisheries co-managers and cooperating entities.

IHOT's purpose is to improve salmonid propagation at existing and future facilities in the Columbia River Basin. To accomplish this, IHOT developed *Policies and Procedures for Columbia Basin Anadromous Salmonid Hatcheries* (1994). The purpose of this document is to provide regional guidelines for operation of all anadromous fish hatcheries. The Nez Perce Tribe is signatory to this document along with other Columbia River Basin state, tribal and federal fishery co-managers. Major issues include: regional hatchery coordination, hatchery performance standards, fish health, ecological interactions, and genetics. Hatchery operations covered are broodstock collection, spawning, incubation of eggs, fish rearing and feeding, fish release, equipment maintenance and operation, and personnel training.

1.6.13 Return to the River: Restoration of Salmonid Fishes in the Columbia River Ecosystem

In 1994, the Northwest Power Planning Council called on BPA to fund the Independent Scientific Group (***ISG***) to develop a conceptual foundation for the fish and wildlife program, to provide an overall set of scientific principles and assumptions on which the program and fish and wildlife management activities basinwide could be based, and against which they could be evaluated (ISG, 1996). *Return to the River* was the resulting document of the ISG efforts. The conceptual framework that was established is analogous to the picture which comes with a jigsaw puzzle. It can be used to guide fisheries managers in assembling the restoration of salmon in the Columbia River.

Return to the River attempts to identify ecological processes that require restoration, as opposed to identification of technological fixes. The ISG stresses the restoration of a normative ecosystem, one that provides the essential ecological conditions and processes necessary to maintain diverse and productive salmonid populations. It recognizes that the normative ecosystem falls along a continuum of conditions from slightly better than the current state of the river at one end to nearly pristine at the other end. It also recognizes that the region, through its policy representatives, will have to decide based on its economic, cultural, and ecological values, how far it will move the river along the normative continuum. *Return to the River* is not an implementation plan for salmon per se, but does establish the basic principles upon which restoration actions should be evaluated in their attainment of the overall conceptual framework.

In relation to supplementation programs, *Return to the River* finds that this new aspect of hatchery production is largely untested and that supplementation should be accompanied with a well designed and adequately funded monitoring and evaluation program. It finds that supplementation should be considered an experimental treatment in an integrated regional rebuilding program and may be useful for rebuilding depressed stocks in some localities. NPTH typifies such a supplementation program.

1.7 Issues Beyond the Scope of this EIS

During scoping, several concerns were raised about fish passage in the mainstem of the Columbia River. Specific comments were received about the need to improve passage, survival, and transportation technology (barging) for juvenile and adult salmonids on the Columbia River to successfully enhance fish runs in the Columbia Basin. Though mainstem passage is fundamental to the long-term success of the NPTH program, it is a difficult issue to analyze in the context of this EIS and it is outside the scope of this EIS. Many fisheries and other management agencies are directing studies about this issue and substantive improvements in mainstem passage conditions are expected:

- The System Operation Review, developed by BPA, the Corps and the Bureau of Reclamation;
- The System Configuration Study, developed by the Corps;
- The Lower Granite Dam Experimental Drawdown EIS, developed by the Corps and NMFS;
- The Supplemental EIS on Interim Columbia and Snake River Flow Improvement Measures for Salmon, developed by BPA, the Corps of Engineers and the Bureau of Reclamation; and
- The NMFS Biological Opinion on Federal Columbia River Power System Operations.

Concerns were also expressed during scoping about hydropower production at dams on the Columbia River and about fish habitat. Decisions about hydropower production are made in other forums; land management agencies and private landowners make decisions about habitat management. These issues are outside the scope of this EIS.

Also outside the purview of this EIS is a concern about how harvest limits of chinook salmon in the ocean and the Columbia

Basin are determined. Harvest limits in the ocean and Columbia River are outside the direct control of the BPA and BIA.

1.8 Organization of the Draft EIS

This environmental impact statement includes information necessary for public officials to make decisions based on the environmental consequences of federal actions.

Federal regulations specify the kinds of information decision-makers should have to make good decisions. This document follows those recommendations.

- Chapter 1 states the purpose and need for the program. Alternatives are evaluated based on the purpose and need.
- Chapter 2 describes the alternatives, including taking no action and summarizes the differences among alternatives, especially in potential environmental impacts.
- Chapter 3 describes the state of the existing environment that could be affected by the program. The existing environment includes human, natural and other resources.
- Chapter 4 describes the possible environmental consequences of the alternatives. Impacts can range from no or low impact to high impact.
- Chapter 5 reveals the licenses, permits and other approvals or conditions the alternatives must obtain or meet.
- Other chapters list individuals who helped prepare the EIS, references used, individuals, agencies, and groups the EIS will be sent to, a glossary, and an index. Supporting technical information is in appendices.

Chapter 2 Proposed Action and Alternatives

In this Chapter:

- Proposed Action
- The Use of Existing Facilities Alternative
- The No Action Alternative
- Alternatives Eliminated from Consideration

For Your Information

The Final EIS includes a new alternative.

BPA, BIA and the Nez Perce Tribe are proposing a supplementation program in the Clearwater River Subbasin to rebuild Clearwater chinook populations to sustainable levels. The Proposed Action proposes building chinook salmon incubation and rearing facilities and satellite facilities, and includes juvenile release and adult collection sites, a monitoring and evaluation plan, harvest plan, and other management activities.

The Use of Existing Facilities Alternative proposes using existing production hatcheries and the proposed satellite facilities in the Proposed Action to meet the need. Facilities at Dworshak National Fish Hatchery, Kooskia National Fish Hatchery, Hagerman National Fish Hatchery, and Sweetwater Springs would be used as central incubation and rearing facilities.

A No Action Alternative is also being considered. The National Environmental Policy Act requires federal agencies to analyze the consequences of taking no action, in this case, not meeting the needs that the supplementation program would fulfill.

This chapter also describes other alternatives that have been considered but eliminated from further consideration because they do not meet the purpose and need for the program.

2.1 Proposed Action

The Proposed Action is a supplementation program that would rear and release spring and fall chinook (***Oncorhynchus tshawytscha***), biologically similar to wild fish, to reproduce in the Clearwater River Subbasin. Program managers propose techniques that are compatible with existing aquatic and riparian ecosystems and would integrate hatchery-produced salmon into the stream and river environments needed to complete their life cycle. Wild characteristics would be maintained, diseases would be controlled, fish would be adapted to the streams they are released into, and would be released using methods that maximize their survival in the wild.

The supplementation program would have three phases. The first (1-5 years) and second phases (6-10 years) of the program are the primary focus of this EIS. Phase I would begin outplanting efforts to reestablish naturally-reproducing salmon in selected tributaries of the Clearwater River Subbasin. Phase II would continue the effort using those returning adults to increase and stabilize production in project streams. Phase III (11-20 years) would create an opportunity for harvest, and would use ***adaptive management*** for specific actions based on the success of the first and second phases. Subsequent environmental documents would be prepared for Phase III as necessary.

The proposed program has many steps. First, eggs and sperm would be taken from broodstock. During Phase I, broodstock would be obtained from selected hatchery stocks identified in the program's genetic risk assessments (see Section 2.1.3.7, **Broodstock Management**). During Phase II, adults returning as a result of the supplementation actions would provide broodstock used for egg take. The fertilized eggs would then be incubated in two central hatcheries. Fish would be reared for a short time at the central hatcheries and then moved to acclimation facilities located on various rivers and streams to condition them to the natural environment. The specific stream and river reaches were chosen because they have suitable chinook habitat and are consistent with aboriginal fishing areas. Release locations, time of release, and age at release were selected to maximize survival and natural production. Table 2-1 summarizes the dimensions and requirements of NPTH facilities and Figure 2-1 provides a summary of operations.

Spring chinook would be reared at the Cherrylane Central Incubation and Rearing Facility until they are fingerling size. A portion of these fish would be outplanted as fingerlings in early summer into three different streams. The remaining spring chinook would be moved to acclimation ponds on three other streams to be reared until autumn when they would be released as presmolts. The spring chinook from both release strategies would then smolt and migrate downstream during spring of the following year.

Fall chinook would be reared at the Cherrylane hatchery and at Sweetwater Springs Central Incubation and Rearing Facility until they reach fingerling size. They would then be moved to acclimation rearing ponds within these facilities where a portion would be released as ***subyearling smolts*** directly into the Clearwater River during late spring or early summer. Remaining fish would be moved to other acclimation sites. They would be reared and imprinted on that source of water prior to being

For Your Information

Adaptive management *uses management actions as part of an experimental design to refine understanding concerning scientific questions. As a result of these experiments, management should adapt, resulting in improved response to environmental problems. (Return to the River, ISG, 1996).*

Central Incubation and Rearing Facility *A fish hatchery in a central location distinguished by incubation and early rearing facilities that serves multiple fish stocks and satellite-stream locations. Usually located on the basis of water resources, climate, geography, central location, economy, and management needs.*

Fingerling

Subyearling smolt

Subyearling smolts *are juvenile salmonids that physiologically mature and migrate to the ocean when less than one year old; e.g., certain stocks of fall and summer chinook salmon.*

Table 2-1
Summary of
NPTH Facilities

Site	Program (Note 1)	Release Goals			Fish Culture Components (Note 2)							Site Area	Physical Components						Water Needs	Available GW (Note 4)	Available SW (Note 4)	SW Source
		Number	#/kg (#/lb)	metric tons (tons)	C-p	B-s	I-c	R-r-F	R-r-S	A-c	R-i	hectares (acres)	Adult Weir	Wells	Gravity Intake	Pump Station	Incubati-on (16 stacks) (Note 3)	cubic meters (cubic feet)/ rearing species	cubic meters/min (gpm)	cubic meters/min (gpm)	cubic meters/min (gpm)	
Sweetwater Springs T33N, S4, R4W	FCH SCH					*	*	*	*			1.6 (4)			yes		16	45 (1600) /Bs 181 (6400) /RrF	3.4 (900) @ April	3.4 (900)	NA	Spring source
Luke's Gulch (South Fork Clearwater) T31N, S28, R4E	FCH SCH	400,000	110 (50)	3.63 (4)	*	*		*	*	*	*	1.2 (3)		yes		yes		85 (3000) /Bs 651 (23000) /Ac	7.9 (2100) @ June (reuse of water from Bs)	1.7 (450)	U	Clearwater River
Cedar Flats (Selway) T32N, S25, R7E	FCH SCH	400,000	110 (50)	3.63 (4)	*	*			*	*	*	1.2 (3)				yes		142 (5000) /Bs 595 (21000) /Ac	10.2 (2700) @ June	NA	U	Selway River
Cherrylane T37N, S35, R3W	FCH	1,500,000	110 (50)	13.61 (15)	*	*	*	*	*	*	*	6 (14)		yes		yes	48 FCH 18 SCH 66 total	198 (7000) /Ac 283 (10000) /RrF	25 (6600) FCH 5.3 (1400) SCH	18.9 (5000)	U	Clearwater River
North Lapwai Valley T36N, S20, R4W	FCH	500,000	110 (50)	4.54 (5)	*	*			*	*	*	1.2 (3)	yes	yes		yes		736 (26000) /Ac	8.3 (2200) @ June	2.5 (670)	91.7 (249000)	Lapwai Creek
		2,000,000		25.4(28)																		
Cherrylane T37N, S35, R3W	SCH	2,800,000				*	*	*	*			6 (14)		yes		yes	48 FCH 18 SCH 66 total	2180 (77000) /Ac 283 (10000) /RrF	25 (6600) FCH 5.3 (1400) SCH	18.9 (5000)	U	Clearwater River
Yoosa\Camp Creek (Lolo Creek) T35N, S12, R6E	SCH	150,000	44 (20)	3.4 (3.8)	*	*		*		*	*	0.8 (2)	yes		yes			57 (2000) /Bs 368 (13000) /Ac	3.8 (1000) (reuse of water from Bs)	NA	11.5 (3050)	Lowest flow 1990-1995
Mill Creek (Mill Creek) T29N, S34, R4E	SCH	40,000	44 (20)	0.91 (1)	*	*		*		*	*	0.8 (2)	yes		yes			1 (400) /Bs 113 (4000) /Ac	1.1 (300) (reuse of water from Bs)	NA	10.7 (2830)	Lowest flow 1990-1995
Newsome Creek T30N, S31, R7E	SCH	75,000	44 (20)	1.7 (1.88)	*	*		*		*	*	0.8 (2)	yes		yes			20 (700) /Bs 198 (7000) /Ac	2.3 (600) (reuse of water from Bs)	NA	9.5 (2500)	Lowest flow 1990-1995
Boulder Creek (Lochsa)	SCH	83,000	220 (100)	0.377 (0.415)	*						*		yes									
Warm Springs Creek (Lochsa)	SCH	20,000	220 (100)	0.09 (0.10)	*						*		yes									
Meadow Creek (Selway)	SCH	400,000	220 (100)	1.81 (2)	*						*		yes									
Cedar Flats (holding for adults captured at Meadow Creek)	SCH					*							yes									
Eldorado Creek (Yoosa/Camp control)	SCH				*								yes									
John's Creek (Mill Creek control)	SCH				*								yes									
Tenmile Creek (Newsome Creek control)	SCH				*								yes									
Fish Creek (Boulder Creek control)	SCH				*								yes									
Brushy Fork (Warm Springs Creek control)	SCH				*								yes									
		768,000		8.29 (9.14)																		

1. FCH = Fall Chinook, SCH = Spring Chinook
2. Cp = Capture Adults, Bs = Hold Broodstock, Ic = Incubation, RrF = Rear Fry/Fingerlings, RrS = Rear Smolts, Ac = Acclimate Smolts, Ri = Release Site.
3. Combined Program for FCH and SCH: Overlap between incubation for FCH and SCH and overlap between rearing of SCH and acclimation of FCH.
4. GW = Groundwater, SW = Surface Water, U = Unlimited Supply, NA = Not Applicable.
5. Water information from NPT data, lowest flow measured over five years, 1990-95. North Lapwai Valley from USGS 1974-94.

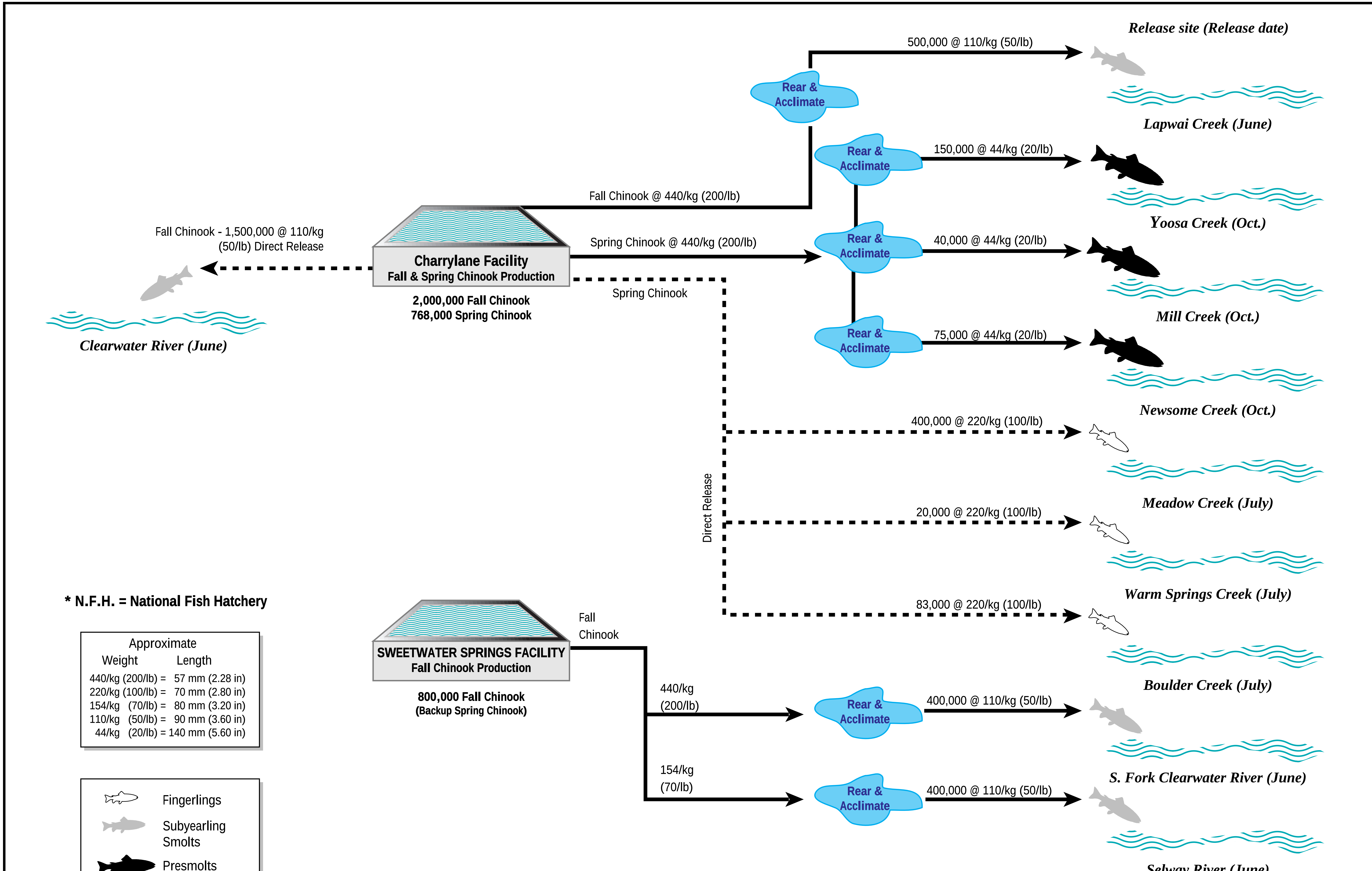


Figure 2-1
Proposed Action - Incubation, Rearing, Acclimation, and Release Sites

released as subyearling smolts in late spring or early summer. Fall chinook are expected to begin their seaward migration shortly after release.

The number of hatchery chinook released would be limited so that, when added to the number of wild chinook, the total would not exceed the amount of habitat available for that species. Each year, numbers for release would be recalculated, based on the results of the monitoring and evaluation program, to avoid exceeding the stream's ***carrying capacity***. All fish released would be marked with fin clips, coded wire tags, ***PIT tags***, visual implant tags or other forms of benign biological marks so that the hatchery fish can be distinguished from wild fish and the success of the program evaluated. Marking would also help track any fish that stray to other watersheds.

For Your Information

Carrying Capacity *refers to the maximum number or biomass of fish that could potentially be supported by a given habitat, as determined by prevailing physical, chemical, and biological conditions.*

A weir *is a fence placed in a stream to capture or count fish. See Photo 9.*

Several techniques would be used to count and capture adult chinook salmon returning from the sea such as temporary ***weirs***, fish ladders at acclimation sites, and trapping facilities at Lower Granite Dam. Some adults would be used for broodstock; the remainder would be returned to the stream to be harvested or to reproduce naturally.

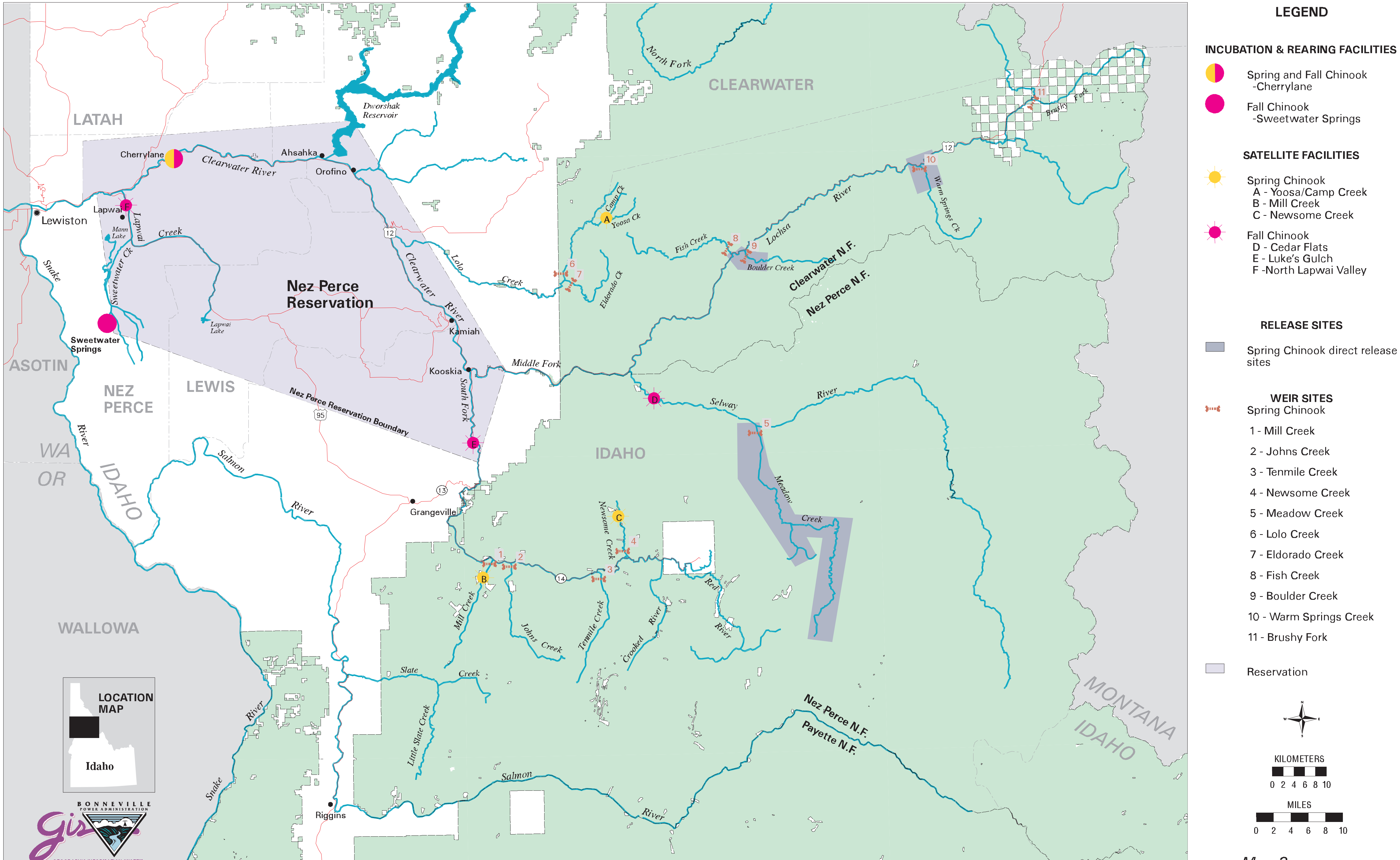
The actions proposed differ from many existing hatchery practices in the following ways:

- Supplementation spring chinook would be the offspring of cross-bred hatchery and wild adults in each generation.
- Spring chinook eggs would be incubated at ambient water temperatures to encourage natural rates of development.
- Fish would be reared in semi-natural ponds to increase survival in the environment. They would be conditioned by high velocity flows, exposure to natural feeds, minimal human contact and other elements of the natural environment.
- Fish would be released at different life stages to increase survival and minimize impacts to other fish.
- Fish would be released in several mainstem and tributary areas to establish spawning returns throughout the natural environment and optimize natural production.

2.1.1 Facility Description and Operations Summary

The Proposed Action has the components described in the following sections. Specifics about each of the sites, such as exact location of water source and discharge lines, orientation and location of ponds and housing facilities, location of temporary weirs and access road locations have not been developed. They will be determined when the final engineering

NEZ PERCE TRIBAL HATCHERY



Map 3

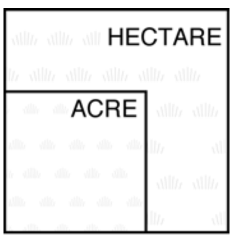
Facilities and Release Sites

designs are completed. At that time, more in-depth consultation will be required, specifically with the U.S. Forest Service, on development activities within National Forests.

Some proposed facilities may be changed or dropped if new information suggests modifications are required. The program is designed to be flexible and to allow changes over its life through adaptive management.

2.1.1.1 Cherrylane

For Your Information



Hectare: about two and one-half acres

The Cherrylane hatchery site is on a flat bench on the south bank of the Clearwater River about 32 km (20 miles) east of Lewiston and adjacent to Highway 12 (see Map 3 and Photo 1). The site is about 6 hectares (***ha***) (14 acres) and is used for agricultural production. The land, which is within the boundary of the Nez Perce Indian Reservation, is privately owned and the owners have signed contracts with BPA that secure a 3-year option for a 25-year renewable lease to develop a hatchery. This lease period is considered long enough to reestablish natural production to meet program goals and objectives and is renewable for additional periods.

Facilities Planned — Figure 2-2 shows a preliminary design for the Cherrylane hatchery. A hatchery building, water treatment facilities, rearing containers, effluent ponds, an operations and shop building, and two staff residences would be built on the site. The hatchery building would accommodate the spawning shelter, incubation room and early rearing area. The spawning shelter would be roofed with open sides and have receiving, fertilization and disinfection equipment. The incubation room would hold 66 double height ***Heath tray*** stacks and the early rearing area would contain rearing containers. Final design will provide stock isolation and quarantine sections in incubation and rearing.

Heath Tray Stacks
A commercial incubation unit consisting of eight or sixteen trays stacked above each other. One to two female's eggs can be incubated in each tray. Stock segregation and isolation can be done in units of eight or sixteen trays.

Rearing containers, raceways, and ponds (circular or conventional) would be used to rear spring and fall chinook. Volume of space required for spring and fall chinook are 283 m^3 and 2181 m^3 (10,000 ft^3 and 77,000 ft^3), respectively. Chinook would be early reared in approximately 32 circular ponds/raceway containers before being transferred to satellite facilities or directly released. Final rearing and release of 1,500,000 fall chinook would take place in on-site acclimation ponds.

Precautions would be taken to prevent bird predation, provide shading and cover, provide acclimation flows to condition fish before release, and prevent and control diseases when they occur. A fishway or fish ladder would also allow fall chinook adults imprinted to hatchery discharge water to return to the hatchery.

Photo 1

Cherrylane Site

The operations and shop building would have an office, day room, washrooms, feed storage, chemical storage, laboratory, vehicle and tool storage, and shop work areas. Staff residences would be single-family, frame construction patterned after similar hatchery residences used in the Northwest. The site would be fenced and resident personnel would provide around-the-clock security to the hatchery grounds.

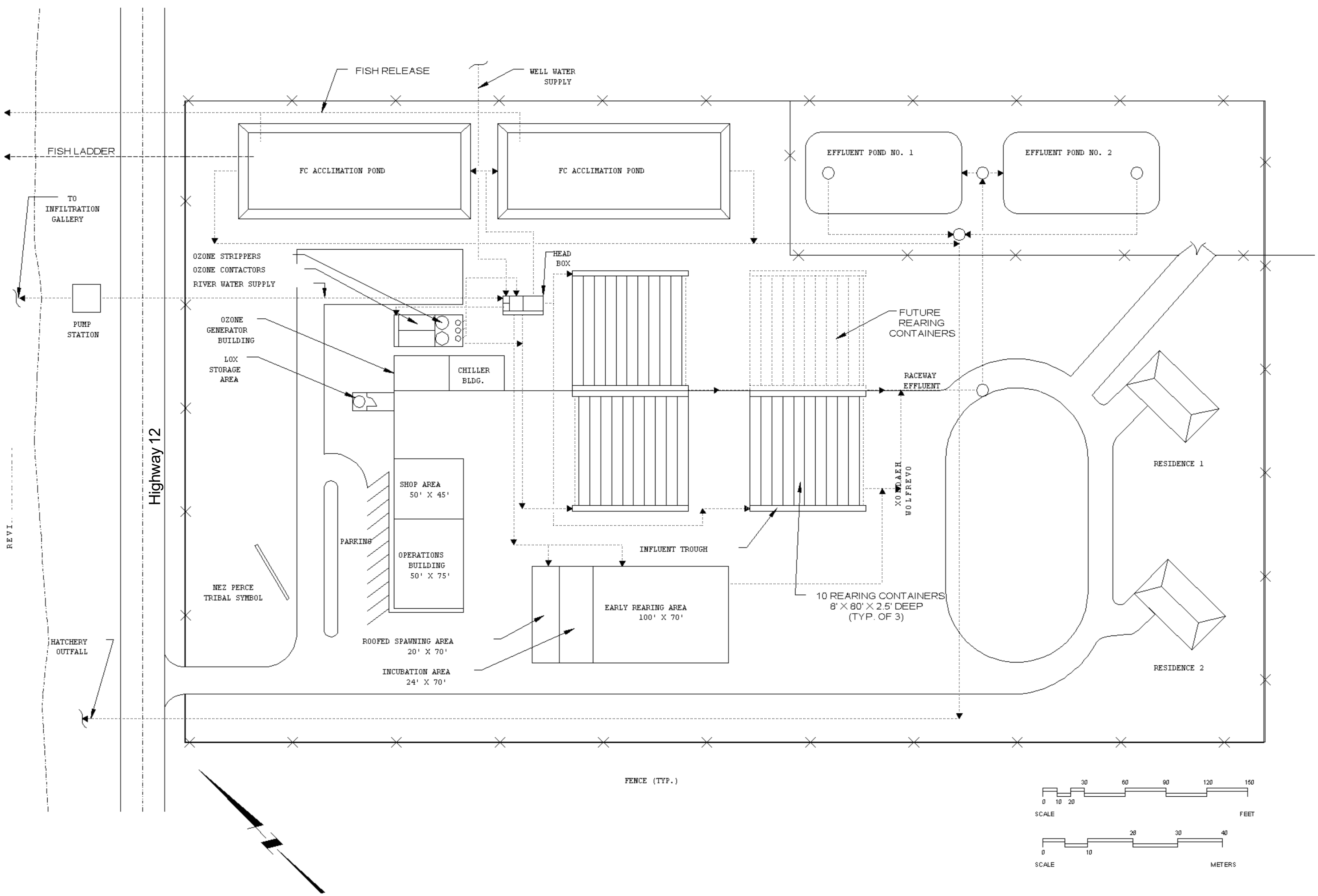
Fish — About 768,000 spring and 2,000,000 fall chinook would be incubated and reared at Cherrylane. Beginning in August, spring chinook eggs would be received for incubation. Then in November and December, fall chinook would be spawned, and their eggs incubated. Chinook eggs started at Cherrylane would be disinfected, fertilized and ***water hardened***. Fish would be incubated in the hatchery building in Heath trays. Each incubator tray would contain only the eggs of one female as a precaution against disease. Following incubation, fingerlings would be reared in containers until they reach their target weight for final rearing at satellite facilities or direct release to streams.

For Your Information

Water hardening *is the process of placing fertilized eggs in water so that the egg absorbs the water that accumulates in the space between the egg yolk and outer membrane.*

In February, about 500,000 fall chinook would be moved as fingerlings from the Cherrylane hatchery to the North Lapwai Valley satellite facility and reared and acclimated until release in May or June. The remaining 1,500,000 fall chinook would be moved to the acclimation ponds within Cherrylane itself. In May-June, about 265,000 of the spring chinook would be moved from the rearing containers <u>at Cherrylane</u> to satellite facilities located on Yoosa/Camp, Mill and Newsome creeks. In June, the remaining 503,000 spring chinook <u>at Cherrylane</u> would be released directly into three streams (Boulder, Warm Springs, and Meadow creeks) to complete final rearing in a natural environment.

Fingerling



NEZ PERCE TRIBAL HATCHERY
CHERRYLANE CENTRAL INCUBATION AND REARING FACILITY
FACILITY LAYOUT
FIGURE 2-2

Subyearling smolt

Also in June, the 1,500,000 fall chinook held on-site would be released from Cherrylane directly into the lower Clearwater River as subyearling smolts. The fall chinook would be released through a pipe from a collection area in the outdoor rearing ponds to a site in the river downstream of the water intake structure. Fish would be released in a controlled manner over an extended period of time to avoid short-term crowding, allow for some natural dispersal and to keep predators from concentrating in the release area.

Adult fall chinook returning to the Clearwater River would be held at Cherrylane from September through December and spawned on-site. Approximately 1,020 adults would be needed for maximum egg take.

Water — The facility would require a maximum of 30.3 m^3/min (8,000 gpm) of water. Water would be supplied from two sources: wells and the Clearwater River. Incubation, early rearing and potable water would be obtained from two on-site wells. One well can produce 7.5 m^3/min (2,000 gpm); the other can produce 11.4 m^3/min (3,000 gpm) (Sprenke and Ralston, 1992). A river water supply of about 11.4 m^3/min (3,000 gpm) would also be developed. A river intake using a deep, screened pipe or ***infiltration gallery*** is recommended for cold weather. No dam or diversion structure would be used. Groundwater could be pumped to the river intake to keep ice from clogging the line.

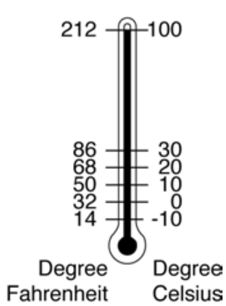
For Your Information

Infiltration Gallery *A water collection structure located in the gravels beneath the riverbed which allows collection of silt-free water.*

Ozonation *is used to prevent diseases in juvenile fish prior to development of their immune systems which occurs after they become fingerling size. Hyperactivated oxygen, ozone (O_3), oxidizes any organic material including pathogens found in the water.*

Water sterilization using ***ozonation*** is planned to ensure water from the river is free from waterborne pathogens. The proposed ozone system would inject ozone gas in an oxygen feed source into the water supply from the river. Residual ozone control and dissolved gas control would be managed by a forced air degassing/air stripping column. Control would be maintained through dissolved ozone monitoring and automatic control over the output of the ozonator. All disinfection equipment would have redundant units with automatic switches to ensure that all surface water is disinfected and degassed prior to use.

Water temperatures would be carefully controlled to reduce infections that could occur prior to the development of fish immune systems and to control growth and development. Groundwater at Cherrylane facility is 17 degrees C (60-62 degrees F). While this water is warm, it provides a pathogen free water source for incubation and early rearing. Chillers would be used to control the water temperatures to about 3 degrees C (38 degrees F) when needed. Clean groundwater chilled and used in small amounts in recirculated incubation systems will provide environmental conditions that mimic those in each of the receiving satellite facilities or direct release areas.



In the event that additional growth is needed to adjust size at time of release or to treat certain diseases, the Cherrylane groundwater offers thermal advantages. Fall chinook would require an accelerated incubation and growth schedule to produce mature subyearling smolts in May and June. The warmer groundwater would be tempered by chillers or mixed with ozone sterilized river water to provide rapid growth.

Access and Utilities — The site is next to U.S. Highway 12. Power from Washington Water Power is available.

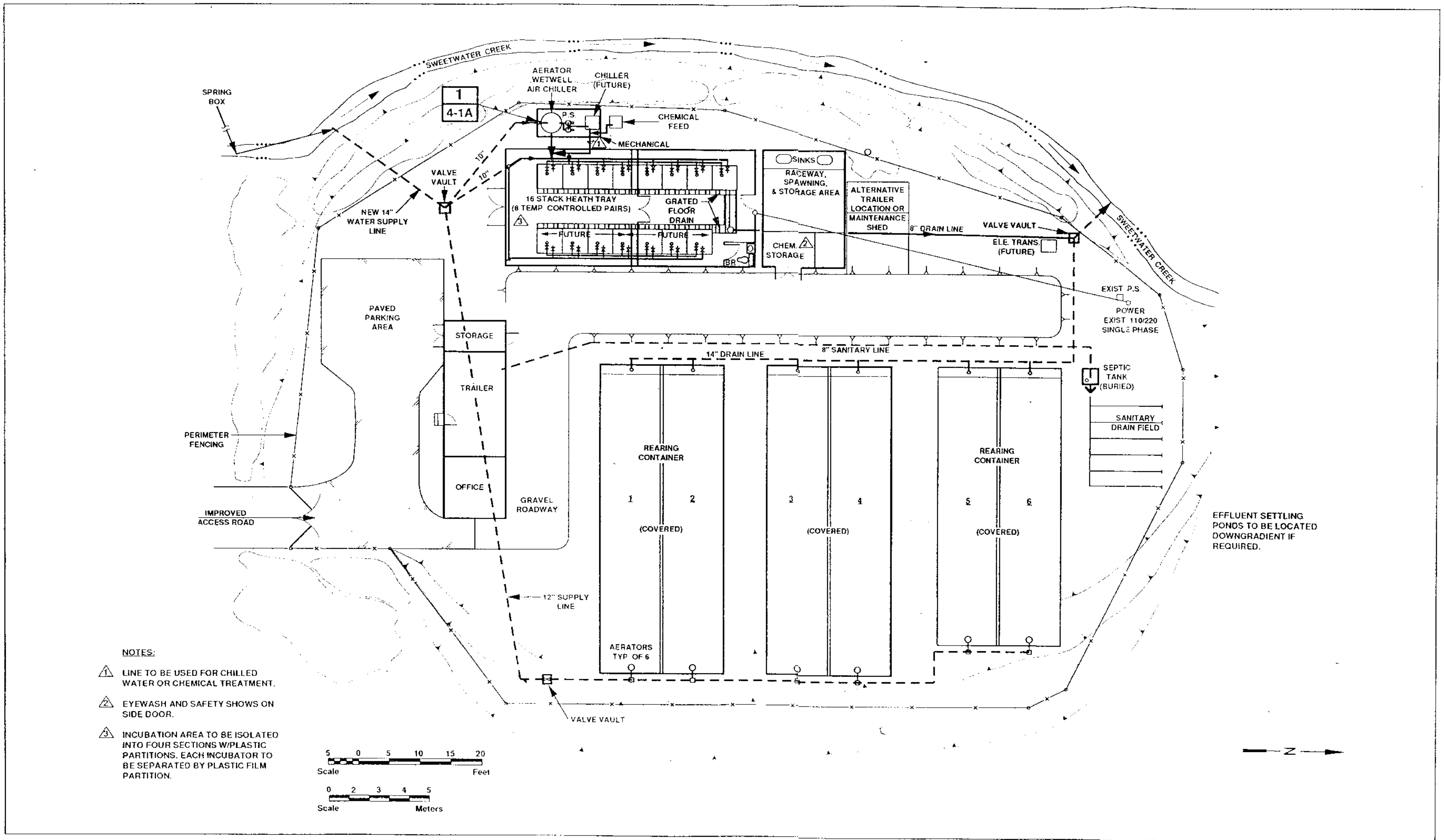
Waste — Two effluent settling ponds would be used to collect water when raceways are cleaned. Solids would be separated by two-hour gravity settling. Solids collected would be dried and applied to land or disposed of at an approved sanitary landfill. About 9 metric tons (10 tons) of fish waste would be produced based on 9 kg (20 lb) of waste/fish. Liquid effluent would be discharged to the Clearwater River downstream of the hatchery's water intake. Fish carcasses would be disposed of at a landfill or could be used as fertilizer. A septic system would be provided for human wastes. Any chemicals used would be handled, applied and disposed of in accordance with state and federal regulations.

2.1.1.2 Sweetwater Springs

Sweetwater Springs is located approximately 20 km (12 miles) southeast of Lewiston, Idaho. The proposed hatchery site is on land owned by IDFG and would occupy about 1.6 ha (4 acres) of the total 6 ha (15 acres) of property. The site contains an existing hatchery building with a spring-fed source. It is a small, relatively flat shelf of land at the headwaters of the westernmost fork of Sweetwater Creek. See Photo 2. The spring is the principal water

Photo 2

Sweetwater Springs Site



NOTES:

1. LINE TO BE USED FOR CHILLED WATER OR CHEMICAL TREATMENT.
2. EYEWASH AND SAFETY SHOWS ON SIDE DOOR.
3. INCUBATION AREA TO BE ISOLATED INTO FOUR SECTIONS W/PLASTIC PARTITIONS. EACH INCUBATOR TO BE SEPARATED BY PLASTIC FILM PARTITION.

NEZ PERCE TRIBAL HATCHERY
SWEETWATER SPRINGS HATCHERY SITE PLAN
CONCEPTUAL FACILITY LAYOUT
FIGURE 2-3

source for this fork of Sweetwater Creek, and the stream eventually enters a canal which supplies water to the Lewiston Orchards Irrigation District Reservoir, Mann's Lake.

The IDFG used Sweetwater Springs as an incubation station for spring chinook during the 1970s. When the IDFG ceased operations at Sweetwater Springs, the original 12 m x 24 m (18' x 40') metal building and a variety of equipment were left in place. In 1994, the IDFG gave the Nez Perce Tribe permission to improve the site and use it to rear spring chinook. In 1994 and 1995, the Tribe made a number of improvements to the original facilities including adding a new 305 mm (12-inch) water supply pipeline and flow control valve assembly to supplement the old 150 mm (6-inch) pipeline, and installing borrowed temporary rearing tanks. With these improvements the Tribe incubated, reared and outplanted approximately 435,000 Rapid River spring chinook in 1994 and 600,000 Cascade Hatchery stock coho salmon in 1995.

BPA is negotiating with IDFG to purchase the site.

Facilities Planned — While it has been possible to use the existing facilities temporarily, improvements would be needed to meet production goals. Facility improvements include upgrading the water supply and distribution system, installing an incubation water chilling system, new isolation incubation units, rearing containers, staff housing, and storage, lab, and equipment space. (See Figure 2-3.)

Because of its cool, spring water source, Sweetwater Springs has the potential to serve as a backup facility for the Cherrylane hatchery or as an advanced rearing or adult holding facility. It would be designed with flexibility to function in different roles. It would have rearing containers to raise young fish and hold a limited number of adult broodstock for extended periods. Multiple containers would be used to isolate different fish stocks. Forty-five cubic meters (1,600 ft^3) of space would be allocated to hold broodstock and 181 m^3 (6,400 ft^3) of space would be used for rearing fry. Containers would be permanently covered and screened to prevent birds from eating the fish.

No permanent residences would be built for the hatchery. Two or more small house trailers would be placed on concrete pads near the existing building. Electrical services would be provided. Bottled water would be used for domestic purposes. A new on-site septic tank and drainfield would be provided for wastewater service.

Fish — The principal production planned at Sweetwater Springs is to incubate and rear about 800,000 fall chinook. During Phase I, eyed-eggs would be imported to Sweetwater Springs in October to begin incubation. After hatching, fry would be early-reared at the site. In February, 400,000 fish reared to fingerlings at 440 fish/kg (200 fish/lb) would be transferred to the Luke's Gulch satellite

Fingerling

facility. In April, the remaining 400,000 fall chinook would be moved to the Cedar Flats satellite facility when they are about 154 fish/kg (70 fish/lb).

Water — The water supply originates from within a large concrete spring box that collects water from a hillside spring. The spring box prevents contaminants from entering a pipeline that flows directly to the hatchery. An estimated 3.4 m^3/min (900 gpm) water supply can be developed with improvements. Water temperature varies between 9-10 degrees C (48-50 degrees F) year-round. Water quality is suitable for rearing fish without treatment. Future improvements include enhancing access and security of the spring cistern, stabilizing the new pipeline, replacing the old pipeline, installing a new hatchery supply headbox (minor storage prior to distribution), adding aeration/chilling equipment, and installing a distribution system leading to and from incubation and rearing containers. Diverted water would be returned to the creek.

Access and Utilities — The Waha Highway leads south from Lewiston, Idaho to within 3 km (2 miles) of Sweetwater Springs. Final access is by a Nez Perce County-maintained gravel road and a private gravel road 0.8 km (0.5 mile) long. While access has been maintained during the 1994 and 1995 winters, the access road would need to be partially relocated and resurfaced with gravel to provide more secure seasonal access. Existing electrical utilities at the site would need to be upgraded from 220 volt single phase power to three phase 440-460 volt power. Phone service is already provided at the site.

Waste — Effluent settling ponds are unnecessary because a limited mass of fish would be reared at the site. Except for limited starter food programs, little fish waste would be discharged. Rearing containers would be cleaned at the end of each rearing cycle. Solids collected would be dried and applied to land or disposed of at an approved sanitary landfill. Liquid effluent from the incubation and rearing units would be directed back to Sweetwater Creek. A sanitary sewer is already provided at the site. Any chemicals used would be handled, applied and disposed of in accordance with state and federal regulations.

2.1.2 Satellite Facilities

Six satellite facilities would be developed to acclimate and release young fish, and to capture and hold returning adult broodstock. (See Map 3.) The extended rearing period and acclimation at the satellite facilities is designed to ensure juvenile imprinting and adult return to river reaches associated with the satellites. Adults returning to satellites would be trapped by weirs or small fish ladders at their outfall.

The basic facility includes the following components: water intake(s), water transfer pipeline, juvenile rearing ponds, adult holding ponds, water outfall line, personnel living quarters (trailer), and fish food storage. Facilities would be developed as close to streams as possible, usually within 50 m (165 ft), of the streambank. Site reclamation and landscape planning would be part of each site plan. The existing character of each area would be maintained as much as possible.

Specific components for each site are described in this section.

2.1.2.1 Luke's Gulch

For Your Information

Tribal land *is collectively owned by the Nez Perce Tribal Government.*

Luke's Gulch is on a flat bench above the South Fork Clearwater River upstream from Kooskia at River KM 13 (Mile 8). The site is forested and is ***tribal land***. See Photo 3.

Facilities Planned — Site development will encompass approximately 1.2 ha (3 acres). The pond at Luke's Gulch would rear, acclimate, and release juveniles and hold and spawn adults that return to the satellite. The design for the pond has not been chosen, but it could be reinforced concrete with vertical or sloped sides, asphalt with sloped sides, earthen lined, or a membrane with sloped sides. Reinforced concrete ponds are expensive, smooth membrane-lined ponds can be a safety hazard, and unlined earthen ponds are difficult to clean. A textured membrane with side slopes of 4:1 would be easy to maintain and would allow safe access to the pond for workers. See Figure 2-4.

Whatever the final design, the pond would provide about 650 m^3 (23,000 ft^3) of space. A center channel would have removable fiberglass pickets so that adults could be held and

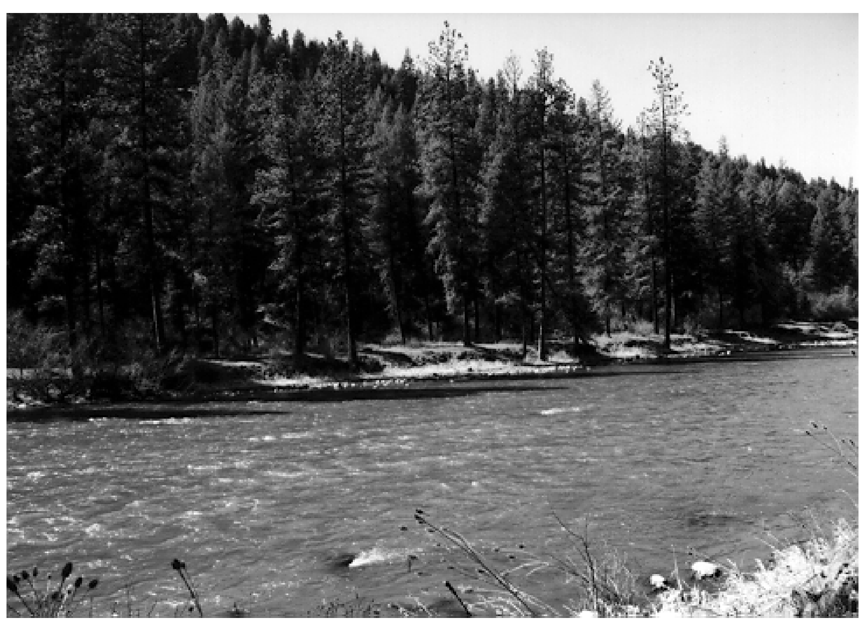
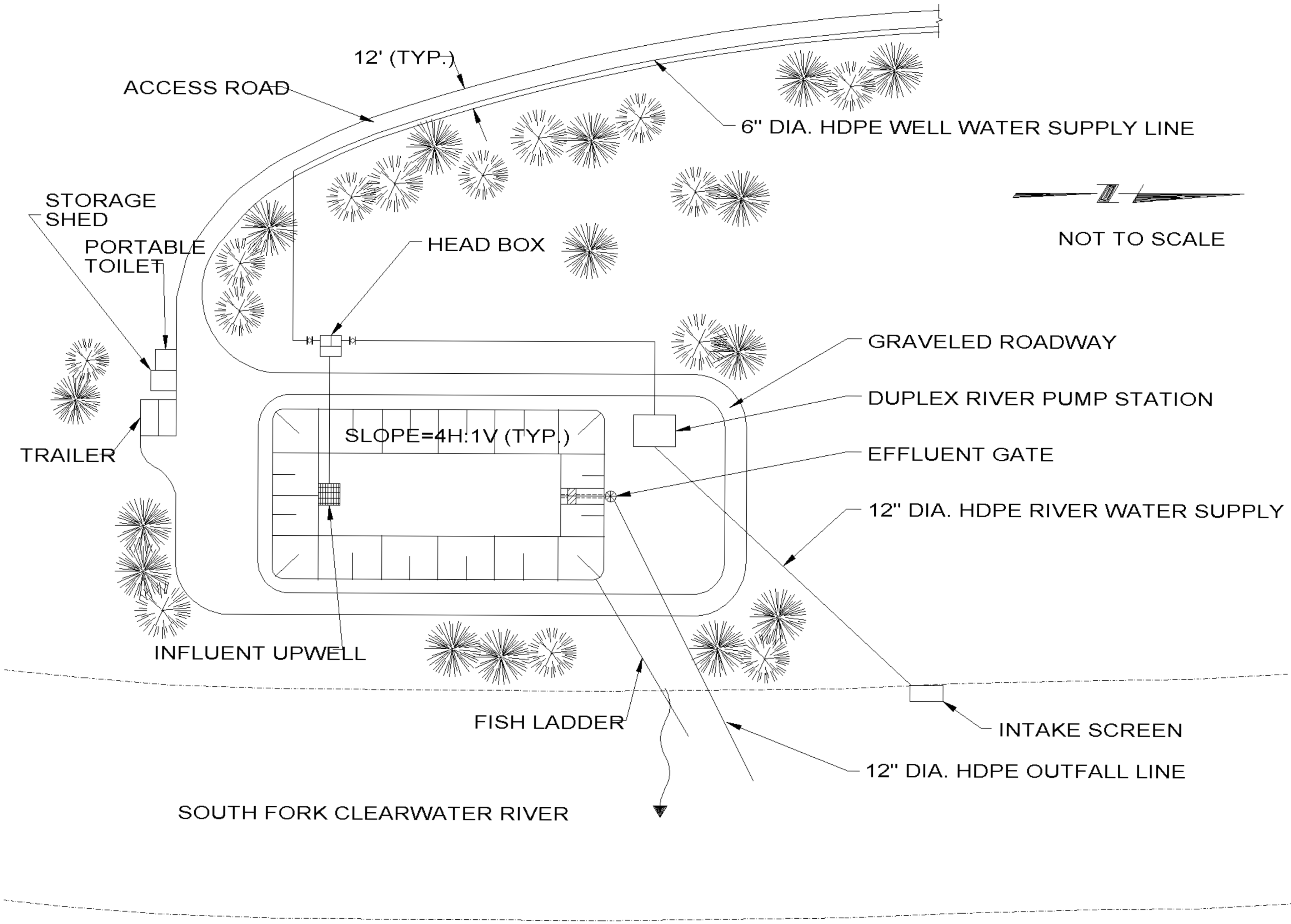


Photo 3

Luke's Gulch Site



NEZ PERCE TRIBAL HATCHERY
LUKE'S GULCH SATELLITE FACILITY CONCEPTUAL LAYOUT
FIGURE 2-4

sorted separately. The discharge structure for the ponds would be on the opposite end from the water supply and would have screens and stop logs to allow fish to leave the pond on their own. A bottom discharge would be provided to flush fish. A small fishway or ladder would be built from the pond outlet to the river to capture adult fish when they return to spawn and as a release channel for juveniles.

One trailer would be provided for staff. The trailer would be placed on a concrete pad, about 6 m x 6 m (20' x 20'). The trailer would have water, on-site wastewater containment, telephone and electricity. Potable water and portable waste water facilities would be provided.

Fingerling

Subyearling smolt

Fish — In February, the Luke's Gulch satellite facility would receive about 400,000 fall chinook fingerlings at 440 fish/kg (200 fish/lb) from the Sweetwater Springs hatchery. The fingerlings would be reared through June and released into the South Fork Clearwater River when they are at 110 fish/kg (50 fish/lb). Returning adults would be captured or induced to return by the fishway into the pond. They would be held from September through November and spawned on-site. Two hundred-seventy-two adults would be needed for maximum egg take from this site.

Water — To rear the fish proposed for this satellite would require 7.9 m^3/min (2,100 gpm) of water. A combination of well and river water would be used to rear fish. Two wells have been developed at the site that supply a total of 1.7 m^3/min (450 gpm) at 17 degrees C (62 degrees F) (Ralston and Sprenke, 1992). Well water would be the initial water source. Later, river water would be gradually mixed and exchanged for groundwater to imprint and acclimate the fish to this river area. A 6.2 m^3/min (1,650 gpm) river water intake would be developed. Water would be pumped from a screened intake to the holding pond inlet structure. The inlet structure would provide a gravity supply to the rearing/adult holding ponds. A combination of groundwater and river water would be used as an attractant for adults and to moderate holding pond temperatures. Water quality and supply are adequate for the program.

Access and Utilities — A paved highway at Stites, Idaho, ends about 8 km (5 miles) from the site. From the paved road a gravel county road leads to within 0.8 km (0.5 mile) of the site. About 0.8 km of old and new gravelled road would be developed to provide year-round access to the site. Electrical power and telephone service are available near the site.

Waste — Effluent settling ponds are unnecessary because a limited mass of fish would be reared at the site. About 2.4 metric tons (2.7 tons) of fish waste would be produced based on 9 kg (20 lb) of waste/fish. Except for limited starter food programs, little fish waste would be discharged. Liquid effluent from the rearing units would be discharged back to the river. Rearing containers

Photo 4

Cedar Flats Site

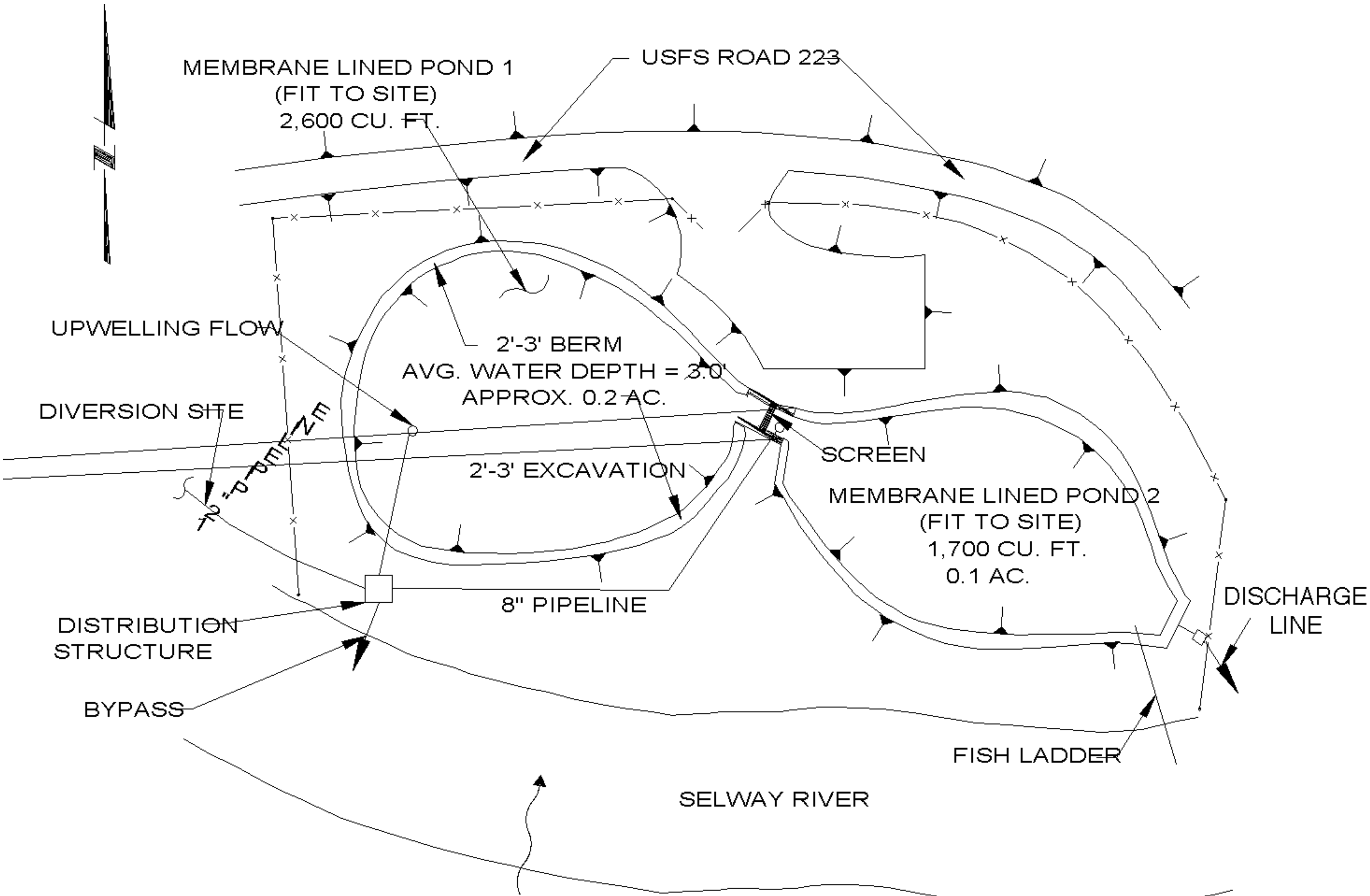
would be cleaned at the end of each rearing cycle. Solids collected would be dried and applied to land or disposed of at an approved sanitary landfill. Any chemicals used would be handled, applied and disposed of in accordance with state and federal regulations. Fish carcasses would be disposed of at a landfill or could be used as fertilizer. The staff trailer would have on-site waste containment facilities that would be periodically pumped out by a licensed contractor and disposed of at a local sewage treatment plant.

2.1.2.2 Cedar Flats

Cedar Flats is a developed site about 1.6 km (1 mile) immediately east of the USFS Selway District Ranger Station. The site is on a flat bench next to the Selway River at River KM 8 (Mile 5) in part of an old Job Corps facility being used by the USFS. The site has an existing water supply intake, wastewater treatment facility, power and other necessary utilities. See Photo 4.

Facilities Planned — Site development will encompass approximately 1.2 ha (3 acres) of land. A new river water intake, acclimation holding ponds and working facilities would be needed. See Figure 2-5. The facility would use the old pump house at the site but its infiltration line would need to be enlarged.

The portion of the Selway River that flows past the site is designated a *Recreational River* in the Wild and Scenic Rivers System. The facilities planned would be designed with the USFS to blend with other existing uses and not conflict with seasonal float boaters.



NOT TO SCALE

NEZ PERCE TRIBAL HATCHERY
CEDAR FLATS SATELLITE FACILITY CONCEPTUAL LAYOUT
FIGURE 2-5

Acclimation pond(s) would provide 736 m^3 (26,000 ft^3) of space. The pond would be designed to be visually compatible with the existing environment. The head box and discharge structure would be cast-in-place concrete. The pond would have an outlet pipeline, channel or other means to release fish and a small fishway to allow adults to return to the site.

A trailer for staff and temporary storage units would be located at the trailer court nearby.

Fingerling

Subyearling smolt

Fish — In April, the Cedar Flats satellite facility would receive about 400,000 fall chinook fingerlings (154 fish/kg [70 fish/lb]) from Sweetwater Springs. They would be received at a later date and larger size than those going to Luke's Gulch because only cold river water (7 degrees C [45 degrees F]) is available at the site. The fingerlings would be reared through early June and released at 110 fish/kg (50 fish/lb) into the Selway River. Fish would be released through an outlet pipe or other structure and would be paced to avoid a buildup of fish in the area and to enhance dispersal. The pond would have a small fishway to capture adult fish that are induced to return to spawn. Hatchery managers would use a unique chemical odor or other means to imprint juvenile fish so they will return to the facility as adults.

Beginning in May, adult spring chinook captured at the Meadow Creek weir would be transported down to the ponds at Cedar Flats. Approximately 405 spring chinook would be held there through spawning in September. The broodstock would provide the eggs needed for production at Meadow Creek, Warms Springs Creek and Boulder Creek and the fish would be spawned on-site.

In September, fall chinook adults would be returning to the Selway River. Adults captured from the river and those returning directly to the facility by the fishway would be held in the ponds from September through November and spawned on site. Two hundred seventy-two adults would be needed for maximum egg take.

Water — The existing water supply for USFS facilities cannot provide enough water (10.2 m^3/min [2,700 gpm]) to rear the fingerlings and hold the adults. The method to obtain sufficient water for the satellite has not been chosen. Options for obtaining the required flow rate include the following:

- Extend or replace the existing infiltration gallery farther out under the river bed. A minimum of 46 m (150 ft) of added perforated pipe would be necessary beneath the river. Extensions would be multiple laterals perpendicular to the river, or one extension parallel to the river tied into the existing system.
- Extend the infiltration gallery farther out into the river and install an intake structure in the river.

- Replace the existing infiltration gallery with a new infiltration gallery parallel to the river. The new system would need to be as close to the river as possible and at least 61 m (200 ft) long.
- Install multiple production wells next to the river.

Access and Utilities — The proposed site is between the Selway Ranger District office wastewater treatment facilities and the water supply intake pump station. The site was last improved as part of the Jobs Corps facility. Access to the site is by developed dirt road off Forest Service Road 223. The access road needs to be graded and gravelled.

Electrical power for the maintenance site, lighting, and pumping is available from both single and three-phase sources servicing the river intake pump station and wastewater treatment plant. Standby emergency power would be provided during the operating period for the intake station to supply water to the ponds.

Telephone lines are available nearby.

Waste — Effluent settling ponds are unnecessary because a limited mass of fish would be reared at the site. About 2.4 metric tons (2.7 tons) of fish waste would be produced based on 9 kg (20 lb) of waste/fish. Except for limited starter food programs, little fish waste would be discharged. Liquid effluent from the rearing units would be discharged back to the river. Rearing containers would be cleaned at the end of each rearing cycle. Solids collected would be dried and applied to land or disposed of at an approved sanitary landfill. Any chemicals used would be handled, applied and disposed of in accordance with state and federal regulations. Fish carcasses would be disposed of at a landfill or could be used as fertilizer. The existing wastewater treatment facility operated by the USFS would be used for domestic wastewater.

2.1.2.3 North Lapwai Valley

The North Lapwai Valley site is an alfalfa field on the west bank of Lapwai Creek about 1.3 km (0.8 mile) upstream from its mouth at the Clearwater River (River Mile 12). The flat, 10-ha (25-acre) site is owned by the Nez Perce Tribe. Less than 1.2 ha (3 acres) would be required for the satellite facility. See Photo 5.

Facilities Planned — The rearing pond(s) would be similar to the design used at Luke's Gulch and would provide 780 m^3 (26,000 ft^3) of space. The site is close to the town of Lapwai, so no permanent on-site housing is planned. Workers would use a small trailer while fish are being reared. The site would be fenced to provide security. See Figure 2-6.

Photo 5

North Lapwai Valley Site

Fingerling

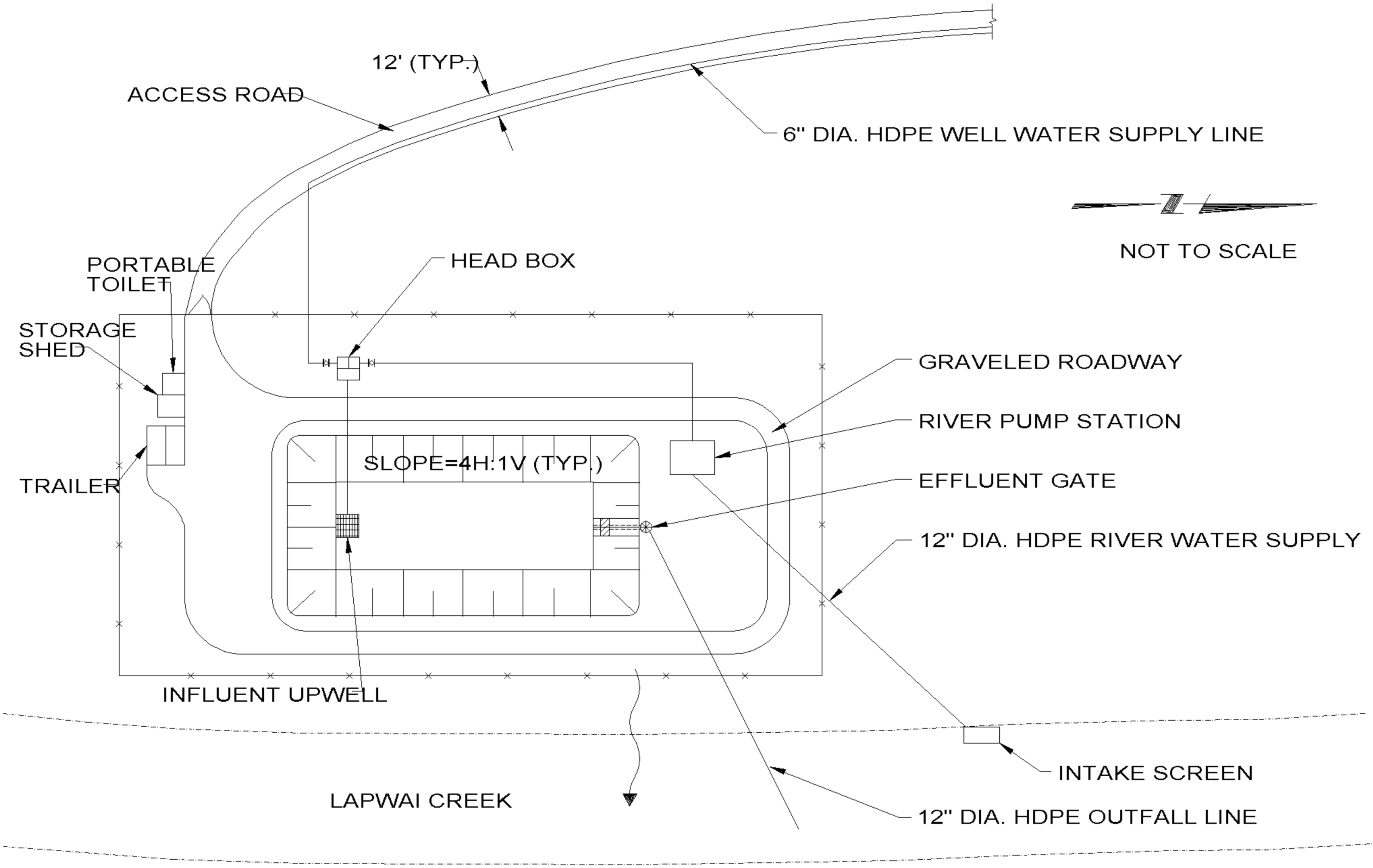
Subyearling smolt

Fish — In February, this satellite facility would receive about 500,000 fall chinook fingerlings at 440 fish/kg (200 fish/lb) from Cherrylane. Fish would be reared through June and released at 110 fish/kg (50 fish/lb) through a pipeline, channel or other structure into Lapwai Creek. Beginning in late September, returning adult fall chinook would be captured by a temporary weir at the facility site. After capture, adults would be placed in containers, transported to Cherrylane where they would be held in ponds until mature, and then spawned. Three hundred-forty adults are needed for maximum egg take at this site.

Water — The maximum quantity required at this site is 8.3 m^3/min (2,200 gpm). Ground and surface water would be used. Initially, well water would be used for rearing. Later, water from Lapwai Creek would be mixed with groundwater to imprint and acclimate fish to this area and to moderate the water temperature. Approximately 5.8 m^3/min (1,530 gpm) of surface water will be needed for maximum production during late May and June.

Access and Utilities — The site is next to U.S. Highway 95. A gravel county road leads into the site; about 152 m (500 ft) of gravel road would need to be developed. Electrical and telephone utilities are available.

Waste — No sanitary sewer system would be developed at the site. Portable construction-type domestic wastewater facilities would be maintained by a commercial vendor during periods of construction and seasonal operations. Effluent settling ponds are unnecessary because a limited mass of fish would be reared at the site. About 3 metric tons (3.4 tons) of fish waste would be produced based on 9 kg (20 lb) of waste/fish. Except for limited



NEZ PERCE TRIBAL HATCHERY
NORTH LAPWAI VALLEY SATELLITE FACILITY CONCEPTUAL LAYOUT
FIGURE 2-6

starter food programs, little fish waste would be discharged. Liquid effluent from the rearing units would be discharged back to the creek. Rearing containers would be cleaned at the end of each rearing cycle. Solids collected would be dried and applied to land or disposed of at an approved sanitary landfill. Any chemicals used would be handled, applied and disposed of in accordance with state and federal regulations.

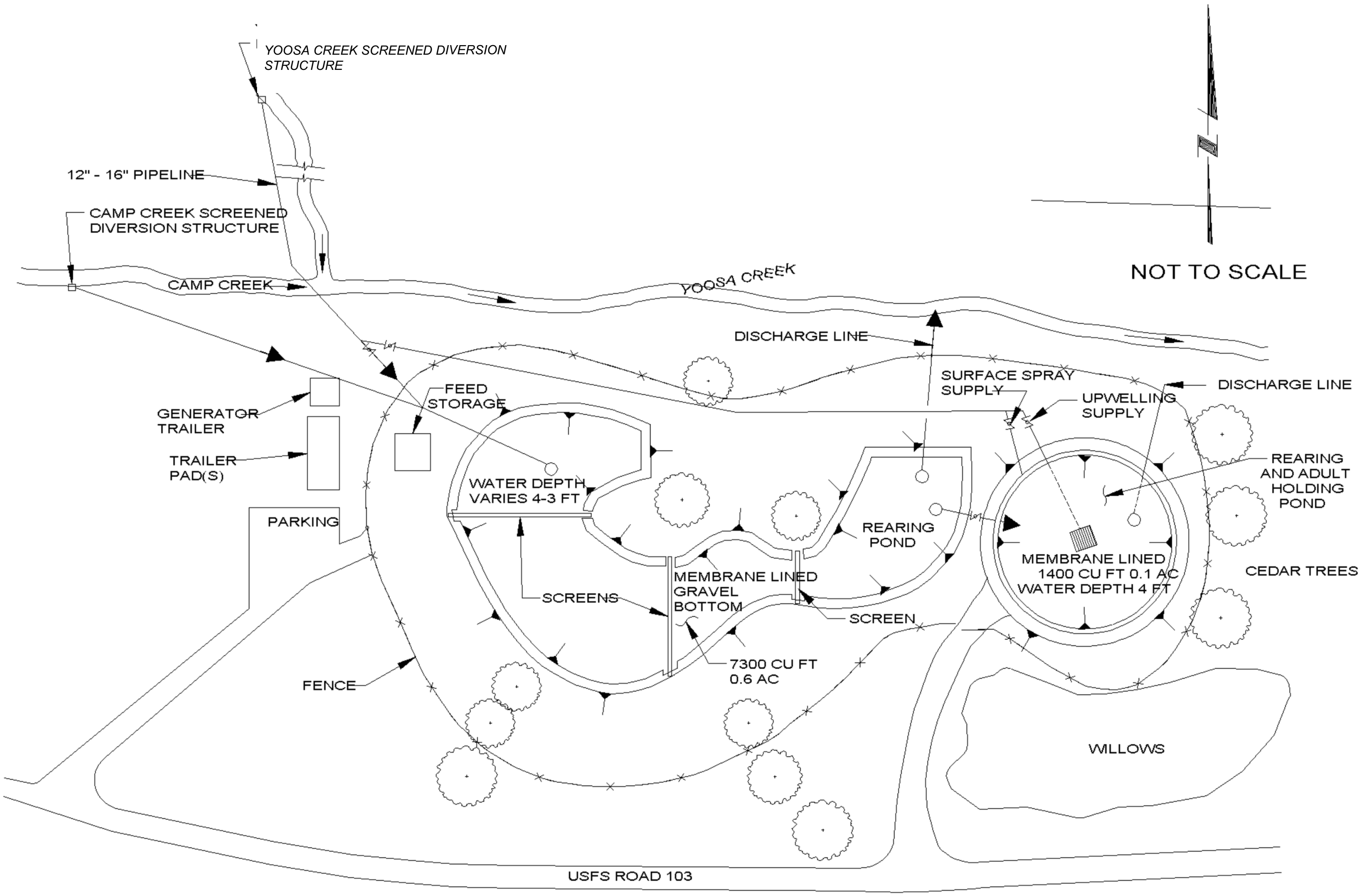
2.1.2.4 Yoosa/Camp Creek

The Yoosa/Camp Creek site is next to U.S. Forest Service Road No. 103, southwest of the Musselshell Camp in the Clearwater National Forest. The site is located in a stand of cedar and pine on the western bank of Yoosa Creek about 10 m (33 ft) downstream of the confluence of Yoosa and Camp creeks. Yoosa Creek flows into Lolo Creek at stream km 72 (Mile 45). See Photo No. 6.

Facilities Planned — The satellite facility would require 0.8 ha (2 acres) of development. Total pond volume needed is 425 m^3 (15,000 ft^3); (368 m^3 [13,000 ft^3] for acclimation and 57 m^3 [2,000 ft^3] for holding broodstock). Ponds with irregular shapes are planned to conform with the site and to avoid removing large trees. Some excavation would be done, but most of the ponds would be made using fill material. The fill material would be stabilized with vegetation or other materials after construction. A house trailer would be provided for seasonal workers. See Figure 2-7.

Photo 6

Yoosa/Camp Creek Site



NEZ PERCE TRIBAL HATCHERY
YOOSA/CAMP CREEK SATELLITE FACILITY CONCEPTUAL LAYOUT
FIGURE 2-7

Fingerling

Presmolt

Fish — In May, about 150,000 spring chinook fingerlings from Cherrylane at 440 fish/kg (200 fish/lb) would be brought to this site. The fish would be acclimated for an early October release before the onset of winter. When the fish are at 44 fish/kg (20 fish/lb), they would be allowed to exit on their own into Yoosa Creek through a pipeline, channel or other structure. The site would also be used to hold returning adults captured at the Lolo Creek weir site. Adults would be held from May through September and spawned on-site. One hundred thirty-six spring chinook are needed for maximum egg take.

Water — All water for this site would be diverted from surface flows from both creeks through a low pressure line to a headbox. The maximum flow required at this site is estimated at 3.8 m^3/min (1,000 gpm). Minimum instream flows measured at the site are 11.5 m^3/min (3,050 gpm). Sufficient flow exists to meet the needs for the site. No more than one half of either creek would be diverted for rearing purposes so as not to adversely impact the instream habitat.

Access and Utilities — A portable generator would provide power. Communications would be by radio if a suitable relay station is found. Potable water would be brought to the site to support seasonal (May through October) staff living in small house trailers. On-site graveled road access would be developed off USFS Road No. 103. Due to weight limitations on paved forest roads in the months of May and June (to avoid road damage), alternate routes may be proposed to transfer the fingerlings to the satellite facility. The Tribe would obtain a special use permit from the USFS for the trailer and would agree to comply with the requirements on that permit, including removing the trailer following the completion of the program.

Waste — No sanitary sewer system would be developed at the site. Portable construction-type domestic wastewater facilities would be maintained by a commercial vendor during periods of construction and seasonal operations. Effluent settling ponds are unnecessary because a limited mass of fish would be reared at the site. Except for limited starter food programs, little fish waste would be discharged. Liquid effluent would be discharged to the creek. Rearing containers would be cleaned at the end of each rearing cycle. Solids collected would be dried and applied to land or disposed of at an approved sanitary landfill. Any chemicals used would be handled, applied and disposed of in accordance with state and federal regulations. Fish carcasses would be disposed of at a landfill or could be used as fertilizer.

Photo 7

Mill Creek Site

2.1.2.5 Mill Creek

The Mill Creek site is next to U.S. Forest Service Road No. 309, Hungry Ridge Road, between the west bank of Mill Creek and the road. The site is a forested inclined bench less than 100 m (330 ft) wide, next to Mill Creek, about 3.2 km (2 miles) upstream of its confluence with the South Fork Clearwater River. See Photo No. 7.

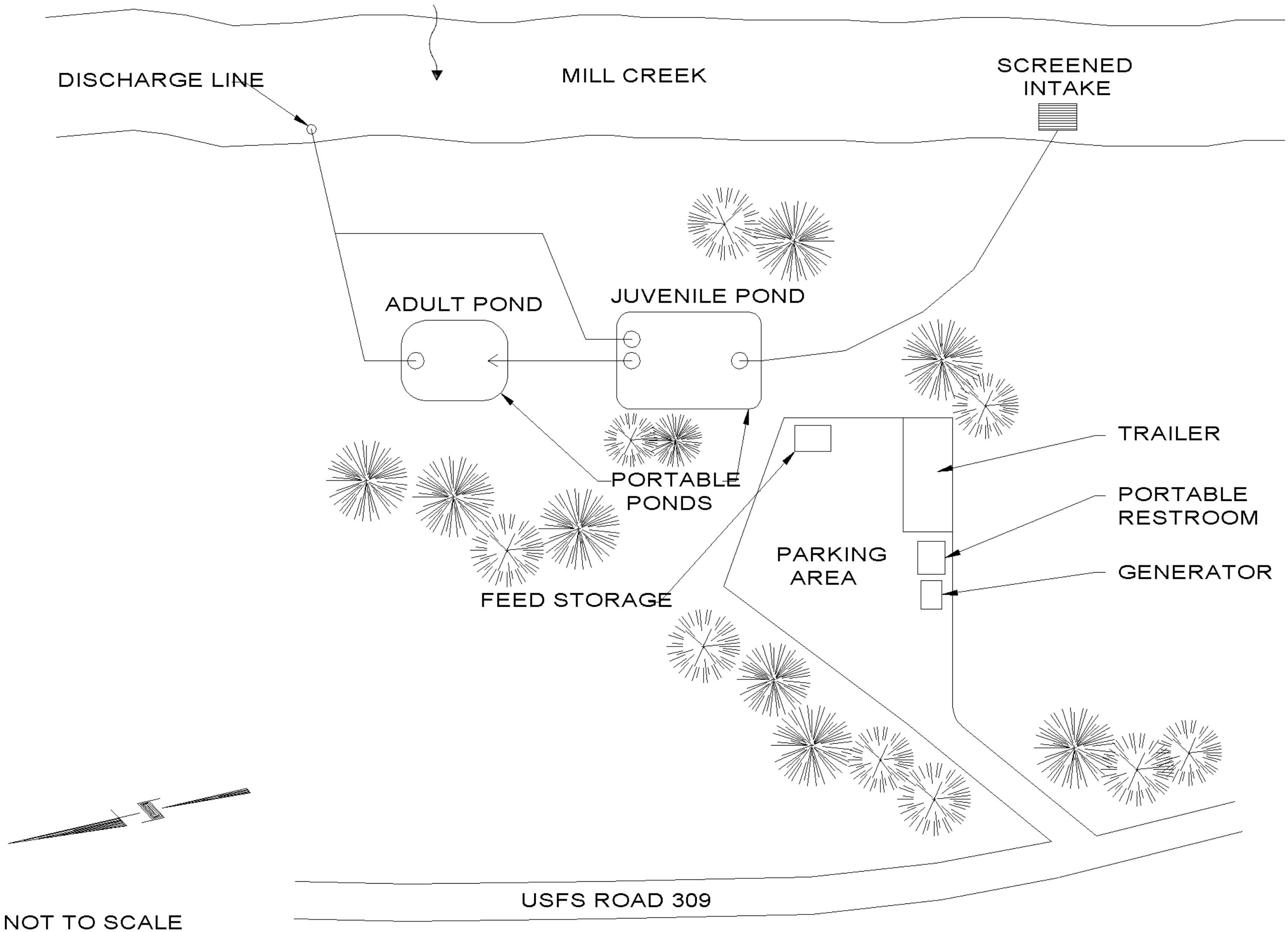
Facilities Planned — Facilities development would affect approximately 0.8 ha (2 acres) of land. Due to the small size and limited production (40,000 presmolts) at this site, portable type containers may be used. Two ponds, a juvenile pond and an adult pond would hold the fish. Juvenile pond size would be about 112 m^3 (4,000 ft^3). The adult pond size would be about 11 m^3 (400 ft^3). Personnel would be housed seasonally in a small trailer from May through October. This would provide security at the site. See Figure 2-8.

Fingerling

Presmolt

Fish — In May, about 40,000 spring chinook fingerlings at 440 fish/kg (200 fish/lb) would be brought from Cherrylane for rearing through October. In October, presmolts at 44 fish/kg (20 fish/lb) would exit on their own into Mill Creek through a pipeline. Beginning in May, adult spring chinook returning to Mill Creek would be trapped in a temporary weir and held in ponds until spawned. Thirty-six spring chinook are needed for maximum egg take.

Water — Water taken from Mill Creek would flow by gravity and supply up to 1.1 m^3/min (300 gpm) to ponds. Minimum instream flows measured at the site are 10.7 m^3/min (2,828 gpm). Sufficient flow exists to meet the needs for the site. A screened intake and surface mounted pipeline and distribution box would provide water for juvenile rearing and adult holding.



NEZ PERCE TRIBAL HATCHERY
MILL CREEK SATELLITE FACILITY CONCEPTUAL LAYOUT
FIGURE 2-8

Access and Utilities — No utilities are available at the site. All utility services would be portable and supplied from May through October. A 100 m (330 ft) access road would be needed.

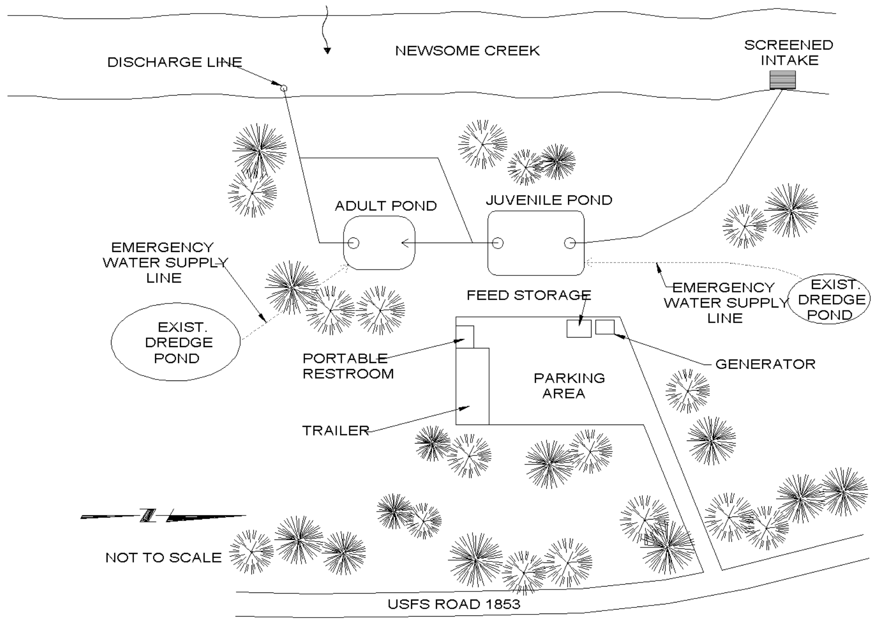
Waste — No sanitary sewer system would be developed at the site. Portable construction-type domestic wastewater facilities would be maintained by a commercial vendor during periods of construction and seasonal operations. Effluent settling ponds are unnecessary because a limited mass of fish would be reared at the site. About 324 kg (720 lb) of fish waste would be produced based on 9 kg (20 lb) of waste/fish. Except for limited starter food programs, little fish waste would be discharged. Liquid effluent would be discharged to the creek. Rearing containers would be cleaned at the end of each rearing cycle. Solids collected would be dried and applied to land or disposed of at an approved sanitary landfill. Any chemicals used would be handled, applied and disposed of in accordance with state and federal regulations. Fish carcasses would be disposed of at a landfill or could be used as fertilizer.

2.1.2.6 Newsome Creek

This site is along the east bank of Newsome Creek about 70 m (230 ft) upstream of the confluence of Beaver Creek. The site is next to U.S. Forest Service Road No. 1853 and is about 5 km (3 miles) upstream from the confluence of the South Fork Clearwater. The site was dredge mined in the early 1900s and has been graded into a level plateau. See Photo 8.

Photo 8

Newsome Creek Site

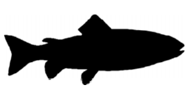


NEZ PERCE TRIBAL HATCHERY
NEWSOME CREEK SATELLITE FACILITY CONCEPTUAL LAYOUT
FIGURE 2-9

Facilities Planned — Facilities development would require about 0.8 ha (2 acres) of land. Ponds for adults and juveniles would be constructed in the bench next to Newsome Creek.

One juvenile and one adult pond would be built at the site in the dredge tailing plain less than 50 meters (160 ft) from the stream. The juvenile pond must have a usable volume of not less than 210 m^3 (7,000 ft^3). The adult pond would contain a volume of 21 m^3 (700 ft^3). Adults would be trapped in a seasonal weir near the stream mouth and trucked to the site. A temporary trailer with a small generator would be provided at the site. See Figure 2-9.

Fingerling



Presmolt

Fish — In May, about 75,000 spring chinook fingerlings at 440 fish/kg (200 fish/lb) would be brought from Cherrylane for rearing through October. In October, presmolts at 44 fish/kg (20 fish/lb) would exit the pond on their own into Newsome Creek. Presmolts would exit through the effluent pipeline. Returning adults would be held at the site also. They would be captured from May through September and spawned on-site. Sixty-eight adult spring chinook are needed for maximum egg take.

Water — Water for the site would be taken from Newsome Creek through a screened intake and surface mounted pipeline and distribution box. The water would flow by gravity to rearing containers. A supply up to 2.3 m^3/min (600 gpm) is needed. Minimum instream flows measured at the site is 9.5 m^3/min (2,513 gpm). Sufficient flow exists to meet the needs for the site.

Because the area upstream of the site has been mined, the site is at risk if sediment is released from an abandoned placer mine. In an emergency, the Newsome Creek satellite facility can be protected from sediment releases from the mine by using water from existing ponds in Newsome Creek's floodplain. These ponds are separated from Newsome Creek and would prevent silt from the placer mine from entering the satellite facility.

Access and Utilities — No utilities are available at the site. All utility services would be portable and would be on site from May through October. The site is next to Forest Service Road No. 1853. A gravel spur road about 200 m (660 ft) long will be used for access to the site. No additional fill material would be needed.

Waste — No sanitary sewer system would be developed at the site. Portable construction-type domestic wastewater facilities would be maintained by a commercial vendor during periods of construction and seasonal operations. Effluent settling ponds are unnecessary because a limited mass of fish would be reared at the site. About 620 kg (1,380 lb) of fish waste would be produced based on 9 kg (20 lb) of waste/fish. Except for limited starter food programs, little fish waste would be discharged. Liquid effluent would be discharged to the creek. Rearing containers would be cleaned at the end of each rearing cycle. Solids collected would be dried and applied to land or disposed of at an approved sanitary landfill. Any chemicals used would be handled, applied and disposed of in accordance with state and federal regulations. Fish carcasses would be disposed of at a landfill or could be used as fertilizer.

2.1.3 Hatchery Operations

2.1.3.1 Disease Management

Both wild and hatchery fish can have or carry a variety of diseases. Some diseases spread easily in a conventional hatchery environment. Although there is limited research on disease transmission among fish, there is a concern that some hatchery fish have spread diseases to wild fish populations (Steward and Bjornn, 1990).

Nez Perce hatchery managers would guard against the transmission of disease from hatchery to wild fish and from hatchery fish to hatchery fish using many measures. These include screening broodstock for disease, disinfecting water at the central incubation and rearing facilities during the early life stages, controlling water temperature to reduce infections, controlling incubation densities, controlling the incidence of disease in the hatchery, and by ensuring that fish slated for release into the natural environment have met strict fish health quality standards. Fish would be inspected before transfer to satellite facilities and again before they are released into streams. Common diseases such as bacterial kidney disease would be monitored routinely in hatchery and wild populations. Less common diseases would be monitored as necessary.

Disease control and monitoring practice would conform with standards developed by the Nez Perce Tribe Fish Health Policy (1994) and the Integrated Hatchery Operations Team (***IHOT***) (IHOT, 1994) (see Section 1.6.12). The Nez Perce Tribe Fish Health Policy defines policies, goals, and performance standards for fish health management, including measures to minimize the impacts to wild fish.

2.1.3.2 Egg Take and Incubation

During Phase I of the program, eggs would be imported from other hatcheries. Chinook production would follow specific management protocols to ensure that healthy fish are produced for reintroduction in the Clearwater River Subbasin. Fish would be supplied either as gametes shipped to the site and held in quarantine until disease testing and screening are completed, or as eyed-eggs imported from a certified quarantine incubation facility outside of the Clearwater River Subbasin.

At the hatchery, all eggs would be disinfected. Stocks would be isolated from each other to limit the potential for transferring disease. Incubation density would be limited to one female per tray, and disease sanitation procedures would be routinely followed. Fish health inspections would be conducted at least twice, one prior to transfer to satellite facilities and again prior to release from the satellite facilities into the river.

After adults start returning (Phase II), egg take would occur at the various satellite facilities and Cherrylane. Broodstock would be screened for specific pathogens. When ready to spawn, gametes from males and females would be taken and kept separate. Care would be taken to have as antiseptic conditions as possible. Sperm and eggs would be kept on ice and transported within eight hours to the central hatcheries for fertilization. Mixing of gametes would follow the mating protocols described in Section 2.1.3.7, **Broodstock Source and Management**. Once at the hatchery, procedures would follow those described above.

2.1.3.3 Rearing Techniques

The NPTH would use innovative rearing techniques that have not been used as standard methods by other hatchery programs in the Columbia River Basin. Incubation and rearing water temperatures, rearing containers, rearing densities, release strategies, and broodstock management are different from those conventionally used in most facilities. The overall goal is to produce and release a fish that will survive to adulthood, spawn in the Clearwater River Subbasin and produce viable offspring.

Water temperatures in incubation and rearing containers would be controlled to best suit supplementation goals. Fall chinook would require an accelerated incubation and growth schedule to produce mature subyearling smolts in May and June. Naturally-produced subyearling smolts in the Clearwater River grow slowly in the cold river water and typically do not emigrate until July or August when lower Snake River flows and dam passage conditions are not as beneficial to their downstream migration. NPTH fall chinook subyearling smolts would be programmed to grow to a mature size sooner using the warmer groundwater. They would then be of a suitable size to migrate in June when flow through the Snake and Columbia River hydrosystem is currently managed to benefit chinook survival.

Spring chinook will be incubated and reared in water that approximates the temperature regime of the streams where fish would eventually be released. This stock of chinook spends more time rearing in the Clearwater River Subbasin than do the subyearling migrants, and their natural emigration dates correspond to periods when hydrosystem operation facilitates passage. Consequently, temperatures in their rearing environment will be controlled to maintain growth rates consistent with those in their receiving streams.

For Your Information

NATURES is a natural rearing system that employs overhead cover, instream structure and substrate and unintrusive feed delivery systems.

After incubation and emergence, spring chinook fry would be kept in the early rearing containers until they are able to swim and take feed (about 3 weeks). In March to April, they would be moved to the outdoor early rearing areas containing circular or raceway type rearing vessels which would incorporate the use of NATURES type rearing designs:

- substrate
- subsurface feeding
- shading
- exposure to natural food
- velocity alteration to enhance swimming ability
- instream cover
- exposure to predators.

They would be reared in these containers until transferred to satellite facilities in May and June or released directly into the streams as fingerlings in June and July.

Fall chinook would spend two to four weeks in the early rearing area after incubation and emergence in mid-January. In February they would be moved to the acclimation ponds at Cherrylane or to the North Lapwai Valley satellite.

During final rearing, the fish will be kept in ponds designed and operated to further incorporate NATURES rearing strategies and to simulate natural conditions. Ponds would be designed without hard, straight lines. Artificial features such as undercut banks, logs and other structures would be placed in the ponds and fish would have a place to hide and learn to avoid other fish. Predator response would be induced by exposing the fish to birds and fish released into ponds (e.g., seagulls, mergansers, bull trout or squawfish). Human activity around the ponds would be discouraged, and shading and overspray will be used to obscure overhead vision. Shading would also moderate warm summer water temperatures. Underwater feeding options would be pursued to avoid conditioning young fish to be fed by humans. Water flows in ponds would be increased to exercise and build physical stamina of fish to adapt to stream or river conditions following release.

For Your Information

The Piper Index is a formula cited in Piper, et al., (1982) that describes, for fish hatcheries, the relationship between the size of fish and density (pounds of fish per cubic foot of rearing space).

Fish would be reared at relatively low densities. The NMFS (1995) describe problems in rearing fish at high densities such as increased fingerling mortality from disease and increased smolt mortality after release. They recommend future rearing of spring chinook in the Columbia River Basin hatcheries at a density which does not exceed 9.6 kg/m^3 (Piper Index of 0.13). The Master Plan calls for final rearing fish at a Piper Index of 0.10 density which is less than that needed to meet NMFS recommendations and should impart economic efficiency to the hatchery by enhancing overall survival of NPTH fish. Lower rearing densities will also provide a means for reducing temperature induced stress during the warmer summer periods, particularly for those fish kept through the summer at Yoosa/ Camp, Mill and Newsome creeks.

Recent literature reviews and experiments conducted by NMFS evaluate improvements in post-release survival by fish reared using these novel techniques. Maynard, et al. (1995) conducted a review of semi-natural culture strategies for enhancing the post release survival of anadromous salmonids. They discuss the difference in post release survival of fish reared in semi-natural and conventional hatchery settings. They found that fish reared in earthen ponds and in tanks with substrate, cover, and instream structure had better cryptic coloration for the stream environment into which they were released than did fish reared in barren grey tanks, similar to the surroundings in conventional raceways. Maynard, et al., (1995) reported that these semi-naturally reared fish had almost 50 percent higher post release survival than did their conventional reared counterparts. They reported that predator avoidance strategies resulted in increased survival by hatchery fish as did some sort of exercise regime. Maynard, et al. (1996c) conducted a study which suggested that a typical hatchery diet of fish pellets supplemented with live-food could enhance the post-release forage ability and survival of cultured fish used for supplementation and stock enhancement. NMFS researchers (Maynard, et al. 1996b) also conducted experiments using NATURES. They found that post release survival was markedly improved for fall chinook (51 percent higher) and spring chinook (24 percent higher) than for fish reared in conventional rearing settings.

2.1.3.4 Release Techniques

Hatchery fish would be released at several different life stages to optimize survival, to evaluate different strategies, and/or be consistent with natural migratory behavior.

Fall chinook would be released as subyearling smolts. This migratory behavior is typical of lower elevation, larger river spawners. The fish would be released into the rivers during spring runoff in May and June when they weigh about 110 fish/kg (50 fish/lb). They would either join other outmigrants in the high flows or would reside in the river for awhile, and move downstream as water temperatures warm.

Most spring chinook would be released directly into stream habitats as fingerlings. Meadow, Warm Springs and Boulder creeks were selected for outplanting sites. These streams provide quality habitat. Fish would be released into these streams in June and July when they would be about 220 fish/kg (100 fish/lb). They would be transported to the streams by truck, and distributed by helicopters throughout the reaches of accessible spring chinook habitat. The Tribe would work with the USFS to minimize any impacts from the helicopters to the wilderness resource. The proposed size and timing of release were selected to correspond to favorable stream conditions for growth and survival. Fish released directly into the streams are expected to sustain higher mortality during the summer than ponded fish, but survivors are expected to gain a long-term fitness advantage through their experience of living under natural conditions.

The remaining spring chinook production would be moved in May at 440 fish/kg (200 fish/lb) to acclimation ponds at Yoosa Creek, Mill Creek and Newsome Creek. Fish would be confined in the acclimation ponds until September, and from that point on would be allowed to exit the ponds on their own free will. At this time, the fish would average about 44 fish/kg (20 fish/lb). The ponds would be drained in mid-October, and the remaining fish would be forced to enter the receiving streams. The September-October timeframe corresponds to the fall migratory pulse that occurs naturally in Idaho's spring chinook populations. This migratory pulse is stimulated by decreasing day lengths and cooler water temperatures and appears to be related to chinook seeking more favorable overwinter conditions in the mainstem rivers. The migratory pulse has been found through monitoring and evaluation trapping in Lolo and Meadow creeks in 1993-95 and is known in the Imnaha, South Fork Clearwater River and South Fork Salmon River from other smolt monitoring projects (NPT, 1996). The proposed release strategy would increase survival during the growing season, reduce competition among hatchery and wild fish for limited food resources, and better prepare pond-reared fish for living under natural conditions following their release.

Fish released directly into stream and pre-smolt releases would sustain higher mortality than fish reared in a conventional hatchery for the same period of time. Hatcheries offer control over environmental conditions to a great extent, allowing survival to be high. However, hatchery fish sustain considerable mortality following release into the river. This is understandable since they have had no chance to develop the “natural” behaviors that allow them to survive. The NPTH release strategy is designed to focus on producing more fit fish by subjecting them to environmental conditions for more of their lives. In the end, the strategy may even be more cost-effective than conventional hatcheries because the cost of raising fish for 6 months to 1 year longer in the hatchery may not be justified by increased returns.

NPTH hatchery fish would be released over a large geographic area to maximize the use of available rearing habitat in the Clearwater River Subbasin and to avoid overwhelming local anadromous and resident fish populations. Releases of fall chinook would occur in the mainstem lower Clearwater River and 48-96 km (30-60 miles) upstream in the larger tributaries, the Selway and South Fork Clearwater rivers. Spring chinook would be released in the smaller tributaries of the mainstem Clearwater, Lochsa, Selway and South Fork Clearwater rivers.

2.1.3.5 Adult Returns

Table 2-2 displays the expected returns for NPTH at 20 years into the future. The numbers were generated by a spreadsheet model. The model follows hatchery and naturally-produced spawners through their life cycle, calculating juveniles produced in natal streams and subtracting out mortalities accrued as the fish grow, leave the streams, travel out into the ocean and back again to the natal streams or hatchery satellite. It also incorporates the hatchery:wild spawning protocols recommended for NPTH.

The adult return model uses a series of assumed survival rates by life stage within its iterations:

Spring Chinook Parr-To-Smolt Survival — The assumed survival rate to smolt for spring chinook released from satellite ponds is 19.5 percent. This is based on a 65 percent post-release survival and a 30 percent overwinter survival. The post-release survival was based on information presented in Maynard, et. al (1995) for facilities using natural-type rearing strategies. The overwinter survival rate is based on information presented in the Idaho Salmon Supplementation Studies (Bowles and Leitzinger, 1991).

The assumed survival rate for spring chinook to smolt from direct stream releases is approximately 10 percent. This is based on a 65 percent post-release survival, a 72 percent fingerling to parr survival, and a 30 percent overwinter survival in addition to considering the carrying capacity of the receiving stream and the number of natural parr present (Maynard, et. al, 1995; Leitzinger and Bowles, 1991).

Spring Chinook Smolt-to-Adult Survival — The assumed survival rate for smolt-to-adult for spring chinook from satellite facilities is 0.4 percent (essentially double the current smolt-to-adult survival for Rapid River Hatchery fish at 0.2 percent). Smolt-to-adult survival rates were doubled because it is assumed that recovery efforts will be successful and that migratory passage conditions will be improved such that at least a 1:1 replacement rate occurs. Rapid River return rate was used because it is assumed that the Cherrylane facility would be more similar to Rapid River than to a conventional, concrete style hatchery. The Rapid River Hatchery uses earthen ponds which could reflect the benefits accrued from early rearing in more natural type setting.

The assumed survival rate for smolt-to-adult for spring chinook from direct stream releases is 0.6 percent (triple the current smolt-to-adult survival rate for Rapid River fish). Smolt-to-adult survival rates were tripled for spring chinook with direct releases because along with benefits accrued by recovery efforts, it is assumed that these fish would have an acquired fitness advantage by their extended rearing in the natural environment.

Fall Chinook Subsmolt-to-Smolt Survival — The assumed subsmolt-to-smolt survival rate for fall chinook is 50 percent, which is essentially the post-release survival, and is based on a natural-type early rearing strategy.

Fall Chinook Smolt-to-Adult Survival — The assumed survival rate for smolt-to-adult for fall chinook is 0.8 percent (double the current 0.4 percent smolt-to-adult survival from Lyons Ferry 1984-1986 brood coded wire tag returns). Survival rates were doubled because it is assumed that recovery efforts will be successful and that migratory passage conditions will be improved such that at least a 1:1 replacement rate occurs. Lyons Ferry Hatchery return

Table 2-2 Expected Adult Salmon Returns from Hatchery and Wild Fish

Stream	Total Adult Returns	Adults Available for Broodstock	Adults Available for Natural Reproduction	Adults Available for Harvest
Spring Chinook				
Lolo Creek (1)	329	136	63	130
Mill Creek (1)	95	36	46	13
Newsome Creek (1)	171	69	42	60
Boulder Creek (2)	146	67	58	21
Warm Springs (2)	35	16	14	5
Meadow (Selway) (2)	676	322	248	106
Number at 20 years	**1,452**	**646**	**471**	**335**
Early Run Fall Chinook				
Luke's Gulch (3)	574	272	154	148
Cedar Flats (3)	574	272	154	148
Fall Chinook				
Cherrylane	2,213	1,020	620	573
North Lapwai Valley (3)	739	340	208	191
Number of fall chinook at 20 years	**4,100**	**1,904**	**1,136**	**1,060**

(1) Assumes postrelease survival is 65% and smolt-to-adult survival is double the current rate.
(2) Assumes postrelease survival is 65% and smolt-to-adult survival is triple the current rate (because fish have acquired a fitness advantage due to extended rearing in the wild).
(3) Assumes postrelease survival is 50% and smolt-to-adult survival is double the current rate.

rates were used because this facility also uses earthen rearing ponds, which are assumed to be closer to a natural setting than typical concrete facilities.

2.1.3.6 Adult Collection

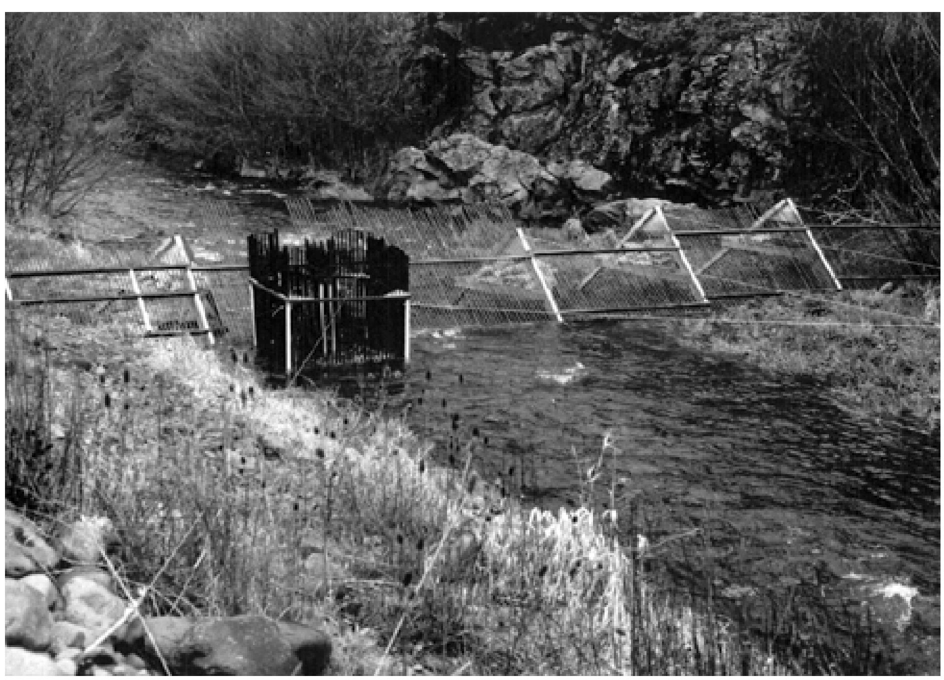
Collecting adults would provide information about the success of the program in addition to providing broodstock. The number of returning adults would be used to calculate smolt-to-adult and adult-to-smolt (or parr) survival rates. Adult salmon produced by the NPTH program are expected to be abundant enough in 5-10 years to begin collecting them for use as hatchery broodstock (Phase II). Adults would be captured near satellite facilities using various methods.

Temporary weirs and adult traps would be placed in 11 streams that would either receive outplants of hatchery fish or would serve as experimental controls. The purpose of the structures is to count and sample returning adults so that supplementation success can be evaluated and to secure enough hatchery and wild fish for broodstock purposes. Depending on the species, weirs would be operated from late May through mid-September.

Portable weirs (see Photo 9) are made of wood and/or metal and have angled guide fences supported by frames. Fence panels are closely spaced pickets that run vertically through the frame and contact either a permanent concrete sill or the undisturbed streambed. Permanent anchoring points on either stream bank would be required at each weir site. These could range from existing boulders to concrete anchors placed flush with the bank

Photo 9

Temporary Weir



surface or steel members driven into the bank. In all cases, the anchoring points would have adequate protection (through riprap or burial) to prevent bank erosion or structural damage during high river flows.

Preliminary weir site selection was based on similar drainage characteristics, streams with existing operating weirs, and accessibility. The Tribe would consult with the USFS on final locations for weir sites to avoid conflicts with any resources. The Tribe would abide with the terms and conditions of any special use permits including removing weirs after the program is completed unless otherwise directed by the USFS.

The weirs divert upstream migrating adults into traps (live-boxes) where they are held until released or transported to the adult holding ponds. Fish not needed for broodstock would be released upstream of the weirs within 12 hours. During the trapping period, the weirs would require continual monitoring. Fisheries technicians would be stationed at the sites to operate the weirs around-the-clock, seven days a week.

Fall chinook broodstock would be obtained from adults ascending the fish ladders at Cherrylane, Cedar Flats and Luke's Gulch and from adults captured at the weir on Lapwai Creek. Permanent adult collection systems - fishways or fish ladders - are proposed for the Cherrylane, Cedar Flats and Luke's Gulch facilities. These would allow those adults imprinted to the water source or chemical attractants to return to the facilities directly for broodstock. The adults ascending Lapwai Creek would encounter a weir near the satellite site, be captured and transported to Cherrylane.

A portion of the fall chinook broodstock might also be captured at Lower Granite Dam. Collection of fish at Lower Granite would concentrate on unmarked, wild returning spawners. These fish would be cross-bred with fish returning to the central incubation and rearing facilities or satellite facilities. The exact portion of the run that can be used for NPTH would require coordination with other agencies. Recently, fisheries managers in the U.S. v. Oregon Production Advisory Committee have proposed that a small percentage (5 percent) of the unmarked fall chinook run crossing the dam be used to cross-breed with adults returning to Lyons Ferry Hatchery (Larson, 1997). Should production activities currently underway for fall chinook, including NPTH, and other recovery efforts result in a dramatic increase in unmarked returns over the dam, then it is likely that a portion would be taken into NPTH for spawning in a similar manner as are the fish for Lyons Ferry. Impacts to the naturally-spawning population would be determined in the multi-agency quorums responsible for recovering the run.

Figure 2-10 shows adult collection methods and numbers for the Proposed Action. Table 2-2 shows predicted annual adult salmon returns, adults available for broodstock, natural production and harvest in 20 years. Weir sites are shown on Map 3.

2.1.3.7 Broodstock Source and Management

Since not enough wild chinook salmon return to the Clearwater River Subbasin today to serve as a source of broodstock, the supplementation program would use broodstock from other locations. The following sources – all hatcheries – are being considered for broodstock during Phase I:

- spring chinook – Rapid River stock, which includes Rapid River, Dworshak, Clearwater and Lookingglass hatcheries and the Kooskia Hatchery; and,
- fall chinook – Lyon's Ferry Hatchery stock.

Final selection of the donor stock to use in NPTH would depend on coordination with NMFS, IDFG, and the U.S. v. Oregon Production Advisory Committee of the Columbia River Fish Management Plan. Acquisition of broodstock would also be determined through negotiation by the NPT within these forums. During Phase I of the implementation, it is assumed that broodstock acquisition would be coordinated annually. Eggs would then be distributed to the central hatcheries.

When the first generation fish return as adults, they would be collected using weirs to trap them (see Section 2.1.3.6, **Adult Collection**). The adults would then be trucked or moved to the nearest adult holding pond for that species. Adults would be held in adequate space and water flow to alleviate stress that could occur from overcrowding and temperature. The standard rule of thumb for holding adults at hatcheries is to have a flow rate of not less than 0.004 m^3/min (1 gpm) per adult and to provide space of not less than 0.283 m^3 (10 ft^3) per adult (Senn, et al., 1984). NPTH can hold fish in flows of 0.012-0.016 m^3/min (3-4 gpm) per adult and in space of at least 0.283 m^3 (10 ft^3) per adult. These holding criteria should provide a safety measure to alleviate outbreak of stress related effects.

The NPTH is designed to ensure a balance of hatchery and wild spawners in both hatchery and streams. Some returning hatchery fish would be permitted to spawn with wild fish in the river or streams. Likewise, some returning wild fish would be spawned in the hatchery.

Spring Chinook — The Nez Perce Tribe would use a sliding scale based on the abundance of adult chinooks returning to the Clearwater River Subbasin to determine the ratio of hatchery-to-wild fish used for broodstock and mating protocols (Cramer, 1992

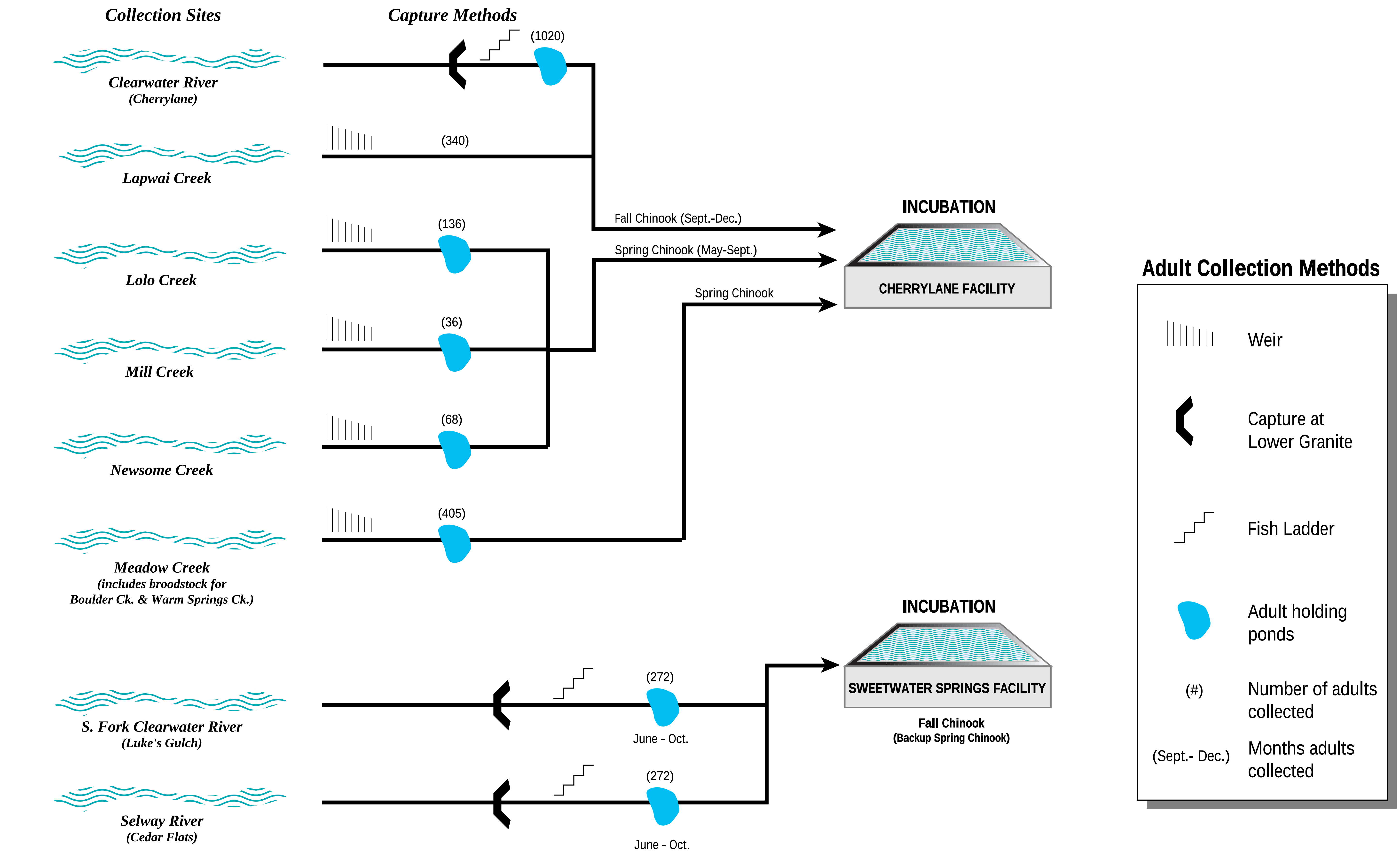


Figure 2-10
Proposed Action - Adult Collection

and 1995a) (see Table 2-3). The ratios favor wild fish for natural spawning as the wild population increases. However, the proportion of hatchery fish that spawn naturally would be allowed to increase if the wild chinook population falls below 12 pair per stream. In this case, wild fish would be brought into the hatchery to spawn so that the remaining gene pool would have the advantages offered by increased survival during early rearing. Run forecasting in conjunction with baseline data on return rates to each stream would be used to predict if the runs are likely to drop below 12 pairs. Hatchery fish would be marked (See Section 2.1, **Proposed Action**).

The sliding scale was developed to protect the genetic resources in the small populations of chinook salmon in the Clearwater River Subbasin yet allow for population growth. The sliding scale is discussed in more detail in Appendix C.

Fall Chinook — For the near future, the breeding of hatchery-reared and wild spawners applies only to spring chinook. Capture methods for obtaining fall chinook in the natural environment would require further exploration before it becomes feasible to cross-breed a significant portion of the wild run with hatchery fish. The obvious method for capturing wild fall chinook would be to take fish as they cross Lower Granite Dam. However, it is unlikely that fisheries managers in the basin would permit a significant portion of the wild run to be taken into a hatchery. Consequently, breeding of wild and hatchery fall chinook spawners would be limited until such time that the unmarked run increases to a much higher level.

Table 2-3 Hatchery (H) To Wild (W) Spawner Ratios

Natural Returns	Brood for Hatchery	Fertilization Procedure	Spawners for Wild
Greater than Broodstock Goal for Hatchery	At least 50% W	Random, H x W	At least 33% W.
Fewer than Broodstock Goal for Hatchery	At least 33% W	Random, H x W to extent possible	At least 25% W. 12 pair minimum
Between 12 to 24 Pairs	Keep all W males: Male ratio = 3H:1W H females equivalent to H + W males	Split-cross W males; each to two H females.	Release all W females. Female ratio = 3H:1W H males equivalent to H+W females.
Fewer than 12 Pairs	Keep all W fish + capacity H fish. Spawn and rear H + W separately. Smolt release for W + captive brood.	Matrix for W. Random for H.	100% H up to spawning habitat capacity

In Phase II, it is expected that most of NPTH fall chinook broodstock would come from hatchery adults returns to Cherrylane or the satellites. A gradual blending of wild fish into NPTH broodstock would occur in time. It is anticipated that a program similar to that proposed for Lyons Ferry would be adopted by NPTH. This program proposes capture and cross-breeding of a limited number of wild fall chinook at Lower Granite with Lyons Ferry hatchery fish. Exact numbers of fish and the impacts to the wild run would be considered by the fisheries managers in the Columbia Basin before such a program can occur. Appropriate environmental documents would be prepared as required by funding agencies.

Fish released from the Cedar Flats and Luke's Gulch satellite facilities would have to return as an early fall spawner (early September to end of October) to successfully incubate and rear in the South Fork Clearwater and the Selway River. Presently, most fall chinook spawning in the Clearwater occurs from October through November. Therefore, the early spawning portion of the fall chinook run would be most likely to reestablish a naturally spawning and rearing group of fish in these upper reaches.

2.1.4 Harvest Management

An important goal of the supplementation program is to produce surplus adult fish for harvest. Harvest rates would be controlled to sustain wild and hatchery production. Population growth may be slow, requiring several years before harvest can occur.

The Nez Perce Tribe would coordinate harvest management with other fisheries agencies in the basin. The U.S. v. Oregon Technical Advisory Committee determines harvest allocation on the Columbia River and ocean fisheries. (See Section 1.6.7, **Columbia River Fish Management Plan**.) Washington Department of Fisheries, Oregon Department of Fish and Wildlife, IDFG and the Nez Perce Tribe coordinate to determine harvest in the Snake River. Harvest in the Clearwater River would be a coordinated action between IDFG and the Nez Perce Tribe. Harvest levels would be based on adult returns, subject to spawning escapement and broodstock requirements.

Tribal ceremonial harvest may occur at a controlled level to provide for the cultural and religious needs of the Nez Perce people. Tribal subsistence and non-tribal recreational fishing would be permitted only after predicted run sizes indicate that natural spawning and broodstock collection goals would be met. Surplus hatchery fish would be targeted, allowing weaker wild stocks to rebuild to self-sustaining levels. The returns were predicted by a model discussed in Section 2.1.3.5, **Adult Returns**.

Fishing would be limited to designated areas and times, using techniques that avoid or minimize impacts on non-target stocks. Such techniques include run size forecasting, setting harvest rates that vary with in-season natural spawning estimates, fishing in tributaries or other areas where only one stock is available or above a weir where monitoring and broodstock collection occur, selectively harvesting externally marked hatchery fish, and imposing gear and catch and release restrictions.

2.1.5 Monitoring and Evaluation Plan

The Proposed Action would use adaptive management to guide hatchery operations. Monitoring and evaluation is a key part of adaptive management.

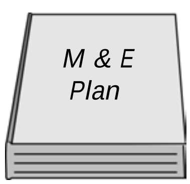
The concept of adaptive management has been recently discussed in the Return to the River (ISG, 1996). Their definition states "Adaptive management uses management actions as part of an experimental design to refine understanding concerning scientific questions. As a result of these experiments, management should adapt, resulting in improved response to environmental problems." The Fish and Wildlife Program document for the Council, the Yakima Fisheries Project Final Environmental Impact Statement (BPA, 1996) and the Tribal Restoration (Nez Perce Tribe, et al., 1995) use the concept to promote action in the face of significant scientific uncertainties (ISG, 1996). There are any number of scientific uncertainties in relation to hatchery supplementation that need to be assessed during operational efforts to restore natural runs of fish. For example, the best mechanism to incubate and rear fish to mimic natural production needs to be determined, as well as optimum fish size for release and release timing. Beneficial and adverse effects of supplementation to existing populations need to be monitored and the results incorporated into production strategies. Monitoring of returns, spawning success and harvest are also aspects of hatchery management that would feed back into and revise the supplementation program. These production and harvest strategies require scientific testing of hypotheses to determine which management action is most suitable for meeting program goals. Management actions can then be revised in accordance with the results. The Monitoring and Evaluation Plan provides the backbone of experimental hypotheses.

After reviewing the Nez Perce Tribal Hatchery Master Plan, the Council directed the Tribe to develop a Monitoring and Evaluation Plan that met the following criteria:

1. Employed an ecosystem approach
2. Assessed ecological risks

- Identified critical uncertainties
- Focused on genetic resources, survival, reproductive success, and ecological interactions
- Evaluated cumulative impacts.

3. Included baseline biological and habitat surveys.
4. Identified facilities needed to conduct M & E.
5. Integrated with other research programs; in particular, the Idaho Supplementation Studies (Idaho Department of Fish and Game) and the Snake River Genetics Monitoring Program (National Marine Fisheries Service).
6. Considered the recommendations and methods developed under the Regional Assessment of Supplementation project.
7. Consulted with the NMFS and other agencies regarding:
   - Endangered species management
   - Hatchery policy
   - Hydrosystem operation and water quality
   - Other potential management actions



Each of these concerns was addressed in the development of the M & E Plan. A copy of the Executive Summary for the M & E Plan is presented as Appendix D. In general, the plan uses risk assessment and prioritization techniques to define the magnitude and significance of risks associated with the program, then proposes strategies for avoiding undesirable impacts and collecting the information necessary to evaluate program success. A *Before-After, Treatment-Control* stream experimental design is proposed as the most effective approach to determining whether supplementation causes increased numbers of returning spring chinook in treated (supplemented) streams. *Before-After* refers to observations made pre- and post-supplementation. *Treatment and Control* refers to supplemented and non-supplemented streams respectively.

Five pairs of treatment and control streams have been identified for monitoring and evaluating the success of spring chinook supplementation. (See Table 2-4 and Map 3.) Temporary weirs and adult traps would be used to count and compare adult returns. In treatment streams, the number of returning adults would then be used to calculate smolt-to-adult and adult-to-smolt (or parr) survival rates. An estimate of natural production resulting from adult spawning in the streams would be used to adjust the number of fish outplanted from the hatcheries. The treatment streams would be planted annually with juvenile spring chinook.

Table 2-4
Treatment/Control
Stream Pairs

Treatment Stream	Control Stream
Lolo Creek	Eldorado Creek
Mill Creek	Johns Creek
Newsome Creek	Tenmile Creek
Boulder Creek	Fish Creek
Warm Springs Creek	Brushy Fork Creek

Control streams would not be planted until some determination can be made of program success. Information gained during Phases I and II would be used to make the decision. Overall success of the program would be evaluated by adult returns. Specifically, staff would count marked adult chinook salmon returning over Lower Granite Dam and to weirs downstream of spawning areas. Fish biologists would use the counts as a measure of population status and trends. Additionally, late summer parr densities and redd counts would be used to evaluate program success. Several genetic, demographic, and life history parameters would be monitored to check if hatchery-reared chinook perform as expected and that interactions with resident fish are not detrimental. Additional environmental documents and coordination with state and other agencies would be completed before outplanting control streams.

Meadow Creek is an experimental unit separate from the treatment and control streams. Its purpose is to study short-term experiments that evaluate different release techniques in hopes that adaptive management can be more effective in implementing recovery of fish populations.

The M & E Plan offers techniques that would not only evaluate the performance of hatchery fish, but would determine their impacts on wild fish and other aquatic biota. These data and other information would be used by program managers to continuously upgrade NPTH goals, objectives, and operations.

2.1.6 Costs

Capital construction would cost about $16 million (1997 dollars). Annual operations and maintenance costs after all facilities are fully developed would cost about $1,000,000 (1997 dollars) and monitoring and evaluation would cost about $500,000 (1997 dollars) annually. Harvest management is not included in the cost estimate.

2.2 Use of Existing Facilities Alternative

The use of existing facilities was considered but then eliminated from the Draft EIS because an agreement was reached in 1990 not to use the facilities in place of the NPTH (Wagner, 1990) and none of the managers of the hatcheries indicated in NEPA team meetings or during the scoping process that there was room available to rear additional fish. However, commentors to the Draft EIS asked that existing facilities be reexamined as an alternative to construction of the Cherrylane central incubation and rearing facility. Additional information was gathered to respond to these comments. BPA and NPT asked those responsible for the existing facilities described below for information that could be used to describe this alternative and evaluate it.

This alternative would use space at existing hatchery facilities to incubate and rear chinook salmon for restoration in the Clearwater River Subbasin. Facilities at Dworshak National Fish Hatchery, Kooskia National Fish Hatchery, Hagerman National Fish Hatchery, and Clearwater Hatchery were considered. The Sweetwater Springs central incubation and rearing facility, and satellite facilities described for the Proposed Action would also be built and used. Discussion presented in Section 2.1.1, **Facility Description and Operations Summary** would be the same for these facilities.

The facilities would be required to amend their existing authorization for chinook production to incorporate additional production for NPTH. Dworshak and Clearwater are authorized to produce chinook salmon to mitigate for losses of *adult fish* caused by the construction of the four dams on the Lower Snake River. Both these facilities are far from meeting their mitigation requirements, and will not meet them without an eight-fold increase in either smolt-to-adult survival or juvenile production (Murphy and Johnson, 1990). For example, Dworshak National Fish Hatchery is designed to return 9,135 spring chinook salmon by the production of 1.4 million juveniles. As described in Section 1.1.1.2, **Hatchery Production in the Clearwater Subbasin**, this facility has an average return of only 900 adults, which does not meet its egg take and is far from its mitigation requirement. Therefore, this alternative would add fish production to a facility that is unable to meet its existing mitigation purposes because of limited juvenile production.

Existing facilities are described briefly in Section 1.1.1.2, **Hatchery Production in the Clearwater Subbasin**. More specific information on the facilities is given below.

2.2.1 Facilities Description and Operations Summary

2.2.1.1 Dworshak National Fish Hatchery

Dworshak National Fish Hatchery is located at the confluence of the North Fork Clearwater River and the mainstem Clearwater River near the unincorporated town of Ahsahka, in north-central Idaho. (See Map 1.) The facility consists of 84 Burrows ponds, 42 raceways, 3 adult holding ponds, 128 deep troughs, and 45 stacks of vertical incubators. Water use ranges from 102-315 m^3/min (27,000 to 83,000 gpm) from the North Fork Clearwater River below Dworshak Dam via a direct line from the dam and water pumped from the river directly adjacent to the hatchery.

2.2.1.2 Hagerman National Fish Hatchery

Hagerman National Fish Hatchery is next to the Snake River in southern Idaho, about 8 km (5 miles) southeast of the town of Hagerman (see Map 1). The facility consists of 102 raceways, 66 starter tanks and a display pond. It currently rears summer steelhead for off-station release into the Salmon and Snake rivers as part of the LSRCP and rainbow trout for Dworshak reservoir mitigation. Water temperature is a constant 15 degrees C (59 degrees F). Raceways are organized into two systems, each system with three tiers for serial re-use of water. The amount claimed is 2.6 m^3/sec (92.5 ft^3/sec) from six major collecting structures.

2.2.1.3 Kooskia National Fish Hatchery

Kooskia National Fish Hatchery is located in north-central Idaho, about 120 km (75 miles) southeast of Lewiston in northwest Idaho County. The hatchery is in a narrow valley of Clear Creek, just upstream of the confluence with the Middle Fork Clearwater River. The facility consists of 12 raceways, 6 Burrows ponds, 42 circular starter tanks, 32 rectangular starter tanks, and 1 adult holding pond. Water rights total 51 m^3/min (13,456 gpm) from six wells and Clear Creek. Just over half the water is from Clear Creek. Water available for hatchery use ranges from 17-

32 m^3/min (4,389 gpm to 8,527 gpm), with the majority supplied from Clear Creek. The hatchery is operated with a water re-use system that incorporates bio-filters between uses.

Kooskia National Fish Hatchery is not a stand alone facility. It is operated as a satellite facility of Dworshak NFH. Adults are trapped at Kooskia NFH, however, because of warm Clear Creek temperatures, fish must be transferred to Dworshak NFH for maturation and spawning. Eyed eggs are returned to Kooskia NFH in October.

2.2.1.4 Clearwater Hatchery and Satellites

The use of Clearwater Hatchery was dropped from consideration because the Nez Perce Tribe prefers to use surplus space at the hatchery to produce coho salmon.

2.2.2 Proposed Facility Production

2.2.2.1 Fall Chinook

The water at Dworshak National Fish Hatchery and Kooskia National Fish Hatchery is too cold for the accelerated growth needed for a June 1 release date with fish at 110 fish/kg (50 fish/lb). Instead, 500,000 fall chinook would be reared at Hagerman NFH to 110-130 fish/kg (50-60 fish/lb) by May 15. The fish would then be trucked up to the Clearwater and acclimated until released in June at the North Lapwai Valley satellite facility. Another facility would have to rear rainbow trout intended for Dworshak Reservoir mitigation that are currently reared at Hagerman NFH.

2.2.2.2 Spring Chinook

Kooskia National Fish Hatchery and Dworshak National Fish Hatchery would be used to rear about 800,000 spring chinook to fingerling/parr size 220-440 fish/kg (100-200 fish/lb). Fish would then be released into the direct release streams (Meadow Creek, Boulder Creek and Warm Springs Creek). The remainder would be moved to the spring chinook satellite sites for final rearing (see Figure 2-11.)

2.2.3 Facility Improvements

A 15-unit Heath incubator stack would be installed at Kooskia NFH and at least one unit of Dworshak NFH holding pond raceways would be converted to an adult holding pond. At

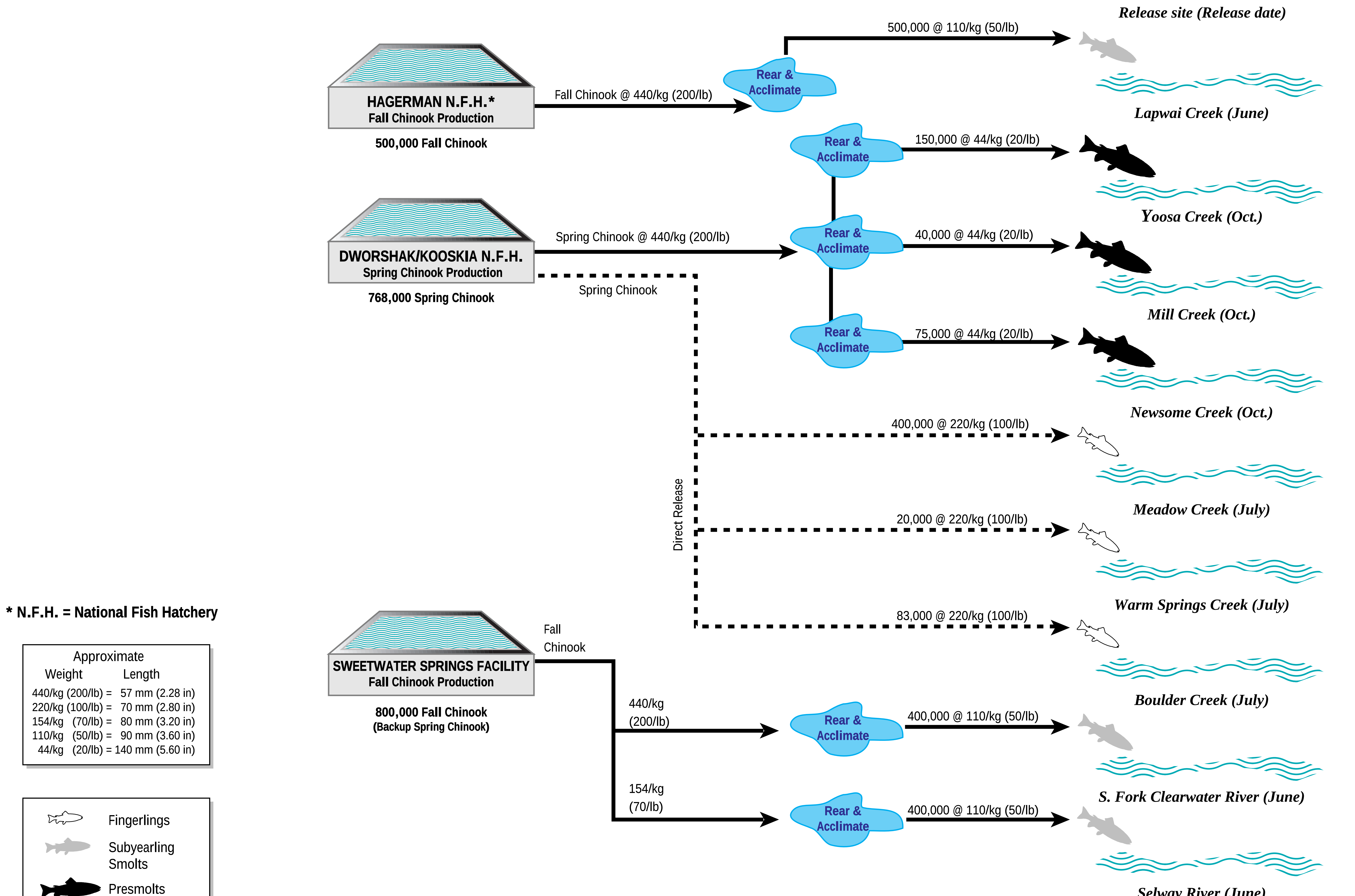


Figure 2-11
Existing Facilities Alternative - Incubation, Rearing, Acclimation, and Release Sites

Dworshak NFH, about 20 tanks would be installed and the chillers would be upgraded. Fry could also be put in ponds and raceways earlier at 550-880 kg/fish (250-400 fish/lb), which would require small mesh screens in the holding pond raceways.

At Hagerman NFH, to chill the eyed eggs, the existing chiller would be upgraded. A backup generator would be installed for the chiller.

2.2.4 Hatchery Operations

2.2.4.1 Disease Management

Currently used disease management measures would be used at the hatcheries. The USFWS has Fish Health Policy and Implementation Guidelines and disease prevention programs at all of its facilities (IHOT, 1996). These guidelines include disease control and disease prevention measures.

2.2.4.2 Egg Take and Incubation

During Phase I, fall chinook eggs would be imported as described in the Proposed Action. Spring chinook eggs would come from either returns to Dworshak/Kooskia or imported from Rapid River.

At the hatchery, different stocks from the different streams and mating strategies would not be isolated from each other. Incubation density would not necessarily be limited to one female per tray.

If the adult returns are sufficient for meeting broodstock needs in Phase II, egg take would occur at the various satellite facilities. Broodstock egg take, handling, and spawning protocols would be the same as those described for the Proposed Action.

2.2.4.3 Rearing Techniques

This alternative would employ rearing techniques commonly used for existing production at these facilities. The ability to accelerate fall chinook incubation and growth would be accomplished by incubating and rearing fish at Hagerman NFH. Upgrading the chillers at Dworshak and Kooskia would allow for incubating and early rearing spring chinook at water temperatures similar to those of the Proposed Action.

After incubation and emergence, spring chinook fry will be kept in conventional raceways which would ***not*** be able to incorporate the use of:

- substrate
- subsurface feeding
- exposure to natural food
- velocity alteration to enhance swimming ability
- instream cover
- exposure to predators.

The only NATURES type rearing technique that could be employed at the existing facilities is shading (Miller, January 28, 1997). Spring chinook would be reared in the raceways until transferred to satellite facilities in May and June or released directly into the streams as fingerlings in June and July.

Fall chinook would likewise be reared in conventional raceways at Hagerman and then moved to the North Lapwai Valley satellite for final rearing before release.

During final rearing, at the satellites, the fish would be reared in the same conditions, using the same techniques as described in the Proposed Action.

Fish would not be reared at low densities until they are transferred to the satellite facilities. Typical rearing densities employed at the existing facilities would be used for fish during the early rearing portions of their life cycle. Thus, while the Proposed Action would rear 76-mm (3-inch) fish at a Piper Index of 0.10, the existing facilities would rear the same size fish at a density index of 0.35.

2.2.4.4 Release Techniques

Release techniques for this alternative would be the same as those described for the Proposed Action (see Section 2.1.3.4).

2.2.4.5 Adult Returns

The adult return model was applied to the production using existing facilities and the expected returns at 20 years into the future are shown in Table 2-5. There is considerable difference in returns using the two different alternatives. The Use of Existing Facilities Alternative does not produce enough returns to meet the broodstock needs for the program. The differences are caused by the lesser number of fall chinook in this alternative (500,000 at Hagerman versus 1,500,000 at Cherrylane) and the different survival rates applied to juvenile life stages for the fish produced at the existing facilities. Fall chinook returning from production at Sweetwater Springs, Cedar Flats and Luke's Gulch are the same as in the Proposed Action.

The differences and rationale for changes in juvenile survival rates are as follows:

Spring Chinook Parr-To-Smolt Survival — The assumed survival rate to smolt for spring chinook released from satellite ponds is 19.5 percent, which is the same as for the Proposed Action.

The assumed survival rate for spring chinook to smolt from direct stream releases is approximately 7 percent. This is less than that used for the Proposed Action because it is based on a 40 percent post-release survival (fingerling to parr and overwinter survival are the same as the Proposed Action). Maynard, et. al (1995) present information on the difference in survival rates between fish reared under NATURES and conventional hatchery raceways. Chinook released directly into the streams would have no NATURES conditions applied prior to release.

Spring Chinook Smolt-to-Adult Survival — The assumed survival rate for smolt-to-adult for spring chinook from satellite facilities is 0.18 percent (essentially double the current smolt-to-adult survival for Dworshak fish at 0.09 percent). Smolt-to-adult survival rates were doubled just as they were for the Proposed Action because it is assumed that measures taken for salmon recovery will be successful and that migratory passage conditions will be improved such that at least a 1:1 replacement rate occurs. The Dworshak NFH smolt-to-adult return rates were applied rather than those for Rapid River NFH because Dworshak NFH has its own record of returns.

The assumed survival rate for smolt-to-adult for spring chinook from direct stream releases is 0.27 percent (triple the current smolt-to-adult survival rate for Dworshak Hatchery fish). As in the Proposed Action, smolt-to-adult survival rates were tripled for spring chinook with direct releases because it is assumed that these fish would have an acquired fitness advantage by their extended rearing in the natural environment in addition to the benefits accrued by salmon recovery efforts.

Fall Chinook Subsmolt-to-Smolt Survival — The assumed subsmolt-to-smolt survival rate for fall chinook is the same as for the Proposed Action (50 percent) because the fish would be reared at North Lapwai Valley for a time under NATURES type circumstances.

Table 2-5 Expected Adult Salmon Returns from Hatchery and Wild Fish

Stream	Total Adult Returns	Adults Available for Broodstock	Adults Available for Natural Reproduction	Adults Available for Harvest
Spring Chinook				
Lolo Creek (1)	115	100	0	15
Mill Creek (1)	30	26	0	4
Newsome Creek (1)	58	50	0	8
Boulder Creek (2)	34	30	0	4
Warm Springs (2)	9	8	0	1
Meadow (Selway) (2)	164	142	0	22
Number at 20 years	**410**	**356**	**0**	**54**
Early Run Fall Chinook				
Luke's Gulch (3)	574	272	154	148
Cedar Flats (3)	574	272	154	148
Fall Chinook				
North Lapwai Valley (3)	739	340	208	191
Number of fall chinook at 20 years	**1,887**	**884**	**516**	**487**

(1) Assumes postrelease survival is 40% and smolt-to-adult survival is double the current rate.
(2) Assumes postrelease survival is 65% and smolt-to-adult survival is triple the current rate (because fish have acquired a fitness advantage due to extended rearing in the wild).
(3) Assumes postrelease survival is 50% and smolt-to-adult survival is double the current rate.

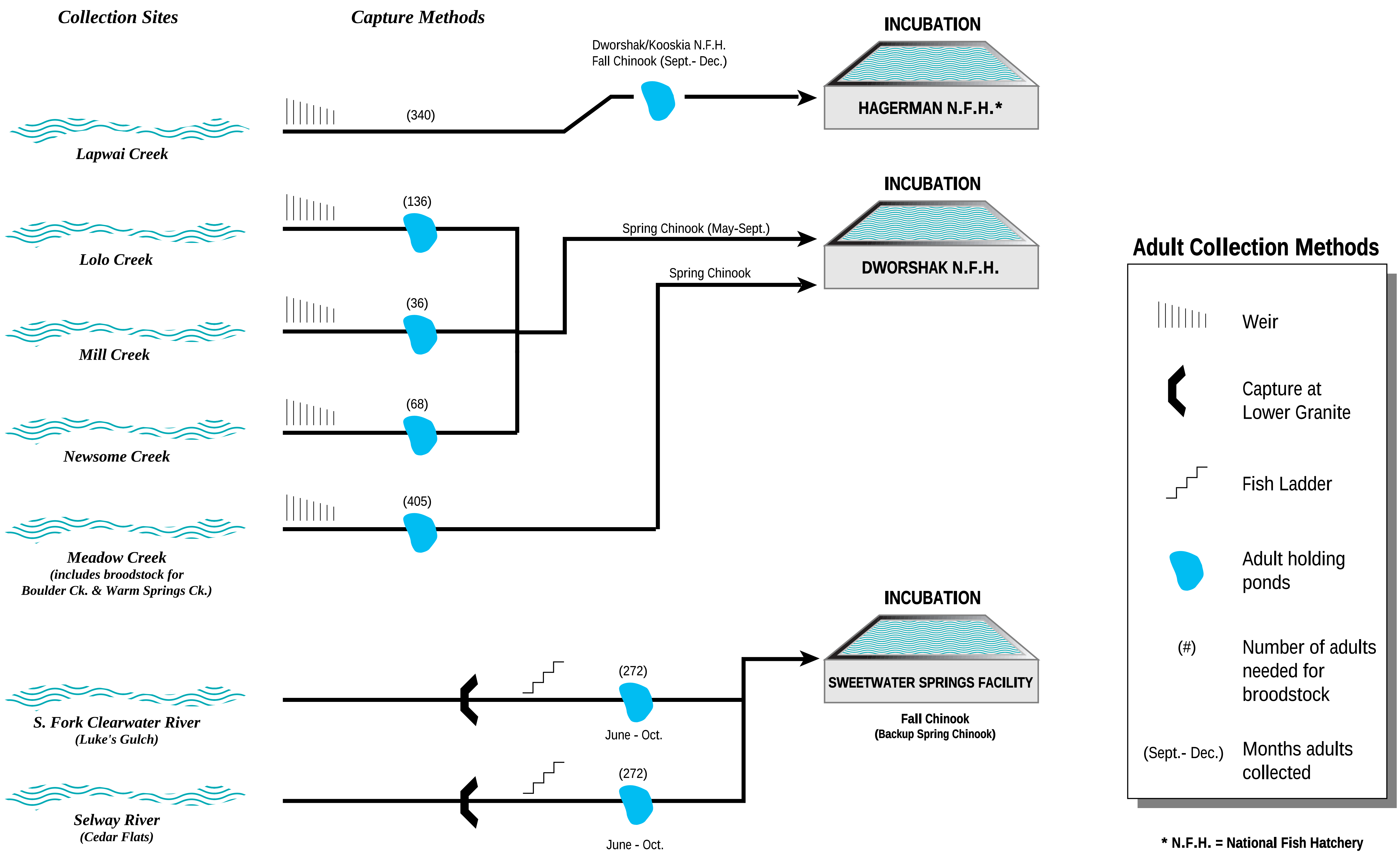


Figure 2-12
Existing Facilities Alternative - Adult Collection

Fall Chinook Smolt-to-Adult Survival — The survival rate for smolt-to-adult for fall chinook is 0.18 percent (double the current 0.09 percent smolt-to-adult survival for Dworshak NFH spring chinook). Survival rates were doubled assuming salmon recovery efforts are successful.

2.2.4.6 Adult Collection

The adult collection program would be the same as for the Proposed Action, except as mentioned in Section 2.2.4.5, **Adult Returns**, broodstock needs would not be met. It is assumed that donor stock from some hatchery source would be provided to make up for the lack of eggs. (See Figure 2-12).

2.2.4.7 Broodstock Source and Management

The broodstock source and management would be the same as described for the Proposed Action.

2.2.4.8 Harvest Management

Harvest management would be as described under the Proposed Action.

2.2.4.9 Monitoring and Evaluation

Monitoring and Evaluation would be as described under the Proposed Action.

2.2.4.10 Costs

Costs for this alternative would be about $8 million (1997 dollars).

2.3 No Action Alternative

The No Action Alternative is traditionally defined as the no build alternative. This No Action Alternative assumes that new facilities would not be built and that the supplementation program would not be carried out. The Nez Perce Tribe, BPA, BIA, the Council and others would rely on fish mitigation actions taken by other parties to achieve reestablishment of chinook fish runs in the Clearwater River Subbasin. This part of the Council's Fish and Wildlife Program would not be implemented. Table 2-6 shows the expected adult salmon returns under this alternative.

Table 2-6 Expected Adult Returns from the No Action Alternative

Stream	Total Adult Returns (1, 2)	Adults Available for Broodstock	Adults Available for Natural Reproduction	Adults Available for Harvest
Spring Chinook				
Lolo Creek	56	0	48	7
Mill Creek	0	0	0	0
Newsome Creek	51	0	44	7
Boulder Creek	0	0	0	0
Warm Springs	0	0	0	0
Meadow (Selway)	65	0	56	8
Number at 20 years	**172**	**0**	**148**	**22**
Early Run Fall Chinook				
Luke's Gulch	0	0	0	0
Cedar Flats	0	0	0	0
Fall Chinook				
North Lapwai Valley	0	0	0	0
Number of fall chinook at 20 years	**0**	**0**	**0**	**0**

(1) Assumes spring chinook natural smolt-to-adult survival is triple current rate from Rapid River Hatchery.
(2) Assumes fall chinook natural smolt-to-adult survival rate is triple current rate from Lyons Ferry.

2.4 Alternatives Eliminated From Consideration

BPA, BIA, the Nez Perce Tribe and others studied a variety of alternatives to meet the need. After study, the following alternatives were eliminated from further consideration.

2.4.1 Salmon River Acclimation Facilities

The NPTH Master Plan included the Salmon River as a potential subbasin for acclimation facilities. Slate Creek, a tributary to the lower Salmon River, was targeted to receive spring chinook produced at Cherrylane. Slate Creek was eliminated from consideration after Snake River spring and summer chinook were reclassified as threatened under the Endangered Species Act and concerns were raised about the origin of stock in the Salmon River Subbasin. The Nez Perce Tribe may consider using Slate Creek again in the future if conditions change or if new information or new technology becomes available.

2.4.2 Natural Habitat Enhancement and Restoration

Like most drainages in the interior Pacific Northwest, the Clearwater River Subbasin has been subjected to human disturbances that have diminished salmon production. In particular, the amount of inorganic sediments and chemical pollutants have increased as a consequence of logging, mining, agriculture, urban development, road building, recreation and other human activities. Many of these activities and their associated impacts would be mitigated or avoided through implementation of natural resource management plans that are sensitive to the needs of anadromous fish.

Under this alternative, natural processes and ongoing rehabilitation efforts would be allowed to proceed with the goal of restoring chinook populations to the Clearwater River Subbasin. Improvements in habitat quality and availability would presumably lead to increases in salmon production. Potential habitat enhancement measures include selective releases of water from Dworshak Dam, removal or alteration of natural or human-caused barriers to fish migration, pollution abatement, improvement in road construction and logging methods, revegetation of riparian areas and instream enhancement. With regard to the latter, a large number of instream habitat improvement projects have been completed within the Clearwater River Subbasin over the last two decades (Baer, 1990; Espinosa and Lee, 1991; Siddal, 1992). These projects have been undertaken in all of the streams (Lolo Creek, Mill Creek, and Newsome Creek) proposed for spring chinook satellite facilities for NPTH. Other spring chinook streams are partially or entirely within wilderness or roadless areas and habitat management impacts in their watersheds are few (Meadow Creek, Tenmile Creek, Johns Creek, Boulder Creek and Warm Springs Creek). Although these streams have been subject to fire, woody debris recruitment to the streams and the improved habitat complexity associated with wood, will occur through the reestablishment of a mature riparian canopy. Because of their roadless or wilderness nature, there are few opportunities or needs to actively improve habitat quality for fish.

There have been many different measures taken to improve fisheries habitat in those streams where habitat enhancement actions have occurred. They have focused on eliminating barriers to passage, abatement of road derived sediment, placement of instream structures and bank stabilization. Many of these habitat enhancement projects were implemented during the last 15 years as a result of the Northwest Power Act and the Columbia River Basin Fish and Wildlife Program.

Habitat improvement efforts continue. The Forest Service has an active fish habitat and watershed improvement program. They implement projects on an annual basis, concentrating on those roaded areas most affected by resource management activities. In addition, the Nez Perce Tribe has been funded to implement habitat improvement actions through BPA's Early Action Watershed program. These projects focus on road obliteration, fencing, passage improvement and sediment abatement in Lolo Creek, Eldorado Creek and Newsome Creek and other drainages in the Clearwater and Salmon River Basins. Future projects are also likely to be completed in Mill Creek and other non-NPTH streams. In summary, efforts to improve habitat in many streams in the Clearwater Subbasin are ongoing, but these efforts do not take direct action to restore natural seeding of salmon habitat.

Natural seeding in streams is extremely low because adult escapement is poor. Sufficient high quality habitat is currently available in the Nez Perce Tribal ceded territory to meet the purpose and need if the salmon returns were sufficient to seed the streams. Habitat improvement by itself cannot recover severely depressed stocks to levels of abundant surpluses. Without supplementation, seeding levels may never reach a point at which natural populations could be self sustaining. Therefore, this alternative was eliminated from further consideration because it would not meet the purpose and need.

2.5 Comparison of Alternatives and Summary of Impacts

Table 2-7 provides a summary and comparison of the environmental consequences of each alternative based on the assumptions used in this EIS. Table 2-8 provides a comparison of the alternatives against the purposes defined for the program.

The Proposed Action would have the greatest amount of tribal harvest, employment, and management autonomy for the Nez Perce Tribe. The Existing Facilities Alternative would have lesser amounts and the No Action Alternative would result in no change in tribal harvest and management, and would create a loss in employment.

Potential for disturbance of cultural resources is greatest in the Proposed Action, less in the Existing Facilities Alternative and the least in the No Action Alternative. In any action alternative, the impact would be low because of monitoring and the ability to apply mitigative plans.

Impacts on geology and soils are expected to be low and short-lived for the Proposed Action and the Existing Facilities Alternative. Because of the additional construction at Cherrylane under the Proposed Action, impacts are expected to be greater in magnitude than for the Existing Facilities Alternative, but would still be low. No impacts are expected from the No Action Alternative.

Impacts to groundwater and surface water quantity and quality would be low for the Proposed Action and the Existing Facilities Alternative, although more groundwater would be used in the Proposed Action. No impacts to groundwater or surface water would result from implementation of the No Action Alternative.

Cherrylane is located outside the floodplain. Impacts from both action alternatives would be the same and are expected to have no effect on the floodplain. Although water collection systems and some satellite sites are within the 100-year floodplain, no rise in flood elevation, displacement of flood waters, storage volume or local increase in flood stage would be caused by either alternative. No impacts to the floodplain are expected from the No Action Alternative.

Eighteen categories of impacts were evaluated for the fisheries resource and they ranged in magnitude from none to moderate. The greatest impacts would occur from implementation of the Proposed Action. This alternative has the greatest potential for restoring naturally-spawning and rearing populations of salmon in the Clearwater Subbasin than the other alternatives. As a result, the aquatic ecosystem could return more toward a dependence on salmon as a principal component of the ecosystem.

Table 2-7 Summary of Impacts from Alternatives

Resources	Proposed Action	Existing Facilities Alternative	No Action Alternative
Nez Perce Tribe	High	Moderate	None -
Cultural Resources	Low +	Low	None
Geology and Soils	Low +	Low	None
Water Resources	Low +	Low	None
Floodplains	None	None	None
Fish	Moderate	Low	None -
Wildlife	Low +	Low	None
Vegetation	Moderate +	Moderate	None
Land Use	Moderate +, Low	Moderate, Low	None
Socioeconomics	Moderate +	Moderate	None -
Visual Resources	Moderate +, Low	Moderate, Low	None
Air Quality	Low +	Low	None
Public Health and Safety	Low +	Low	None
Costs	$17 million	$8 million	
+/- is weighting within that level of impact			

Table 2-8 Comparison of Alternatives to the Purposes

Purpose	Proposed Action	Existing Facilities Alternative	No Action Alternative
Protect, mitigate, and enhance Columbia River Basin anadromous fish resources.	Would meet to the greatest extent. Its genetic management plan coupled with the M&E Plan would serve to protect anadromous fish resources. In addition, this alternative results in the largest predicted adult returns and increase in natural spawning populations which would serve to meet the mitigation and enhancement goals.	Would meet to a lesser extent than the Proposed Action. Would apply the same protection elements, yet predicted adult returns would not be as great.	Would take no action to protect, mitigate and enhance fish resources.
Develop, increase, and reintroduce natural-spawning populations of salmon within the Clearwater River Subbasin.	Would meet this purpose to the greatest extent. As described above, this alternative would result in the largest predicted increase in naturally-spawning populations. Many of the returns would occur in streams or river reaches where historic populations have been eliminated or exist at remnant levels.	Would meet this purpose to a lesser extent because of the lower predicted returns. All activities are also within the Clearwater River Subbasin.	Would not meet the purpose. Any increase or reintroduction of spawning populations of salmon would occur only through natural rates of straying and colonization.
Provide long-term harvest opportunities for Tribal and non-Tribal anglers within Nez Perce Treaty lands within four salmon generations (20 years) following project completion.	Meets this purpose to the greatest extent because of the larger predicted returns.	Would meet this purpose to a lesser extent than the Proposed Action.	Would not meet this purpose.
Sustain long-term fitness and genetic integrity of targeted fish populations.	The broodstock management plan and M&E Plan would sustain the long-term genetic fitness and integrity of fish returns. Naturally-spawning chinook populations would be more abundant in this alternative and would be incorporated into the broodstock to a larger extent.	The broodstock management plan and M&E Plan would sustain the long-term genetic fitness and integrity of fish returns.	Would not meet this purpose.
Keep ecological and genetic impacts to non-targeted fish populations within acceptable limits.	The carrying capacity criteria, natural type rearing strategies, and acclimation to the return sites would serve to limit ecological impacts to non-targeted fish species. Larger returns of anadromous fish, and greater juvenile production would result in restoring the ecological balance of the salmon rivers and streams to a greater extent.	The carrying capacity criteria, natural type rearing strategies, and acclimation to the return sites would serve to limit ecological impacts to non-targeted fish species.	Would not meet this purpose.
Promote Nez Perce Tribal management of Nez Perce Tribal Hatchery facilities and production areas within Nez Perce Treaty lands.	Meets this purpose to the greatest extent.	Will not meet this purpose because it would continue non-Nez Perce management within the Nez Perce reservation boundaries by keeping the primary juvenile production at USFWS facilities.	Would not meet this purpose.

The action alternatives would result in the same short-term level of displacement and disturbance on individual wildlife species during construction. The Proposed Action has the greatest potential for beneficial impacts to those species dependent on fish for forage. The No Action Alternative will do nothing to improve the availability of forage, thus posing some detrimental impacts in comparison, although this alternative would not cause habitat disturbance by construction activities.

Moderate impacts are expected to vegetation as a result of either action alternatives and would stem from the removal of riparian vegetation for satellite and central incubation and rearing facilities construction. Impacts to the wetland at Yoosa/Camp Creek site would be moderate, depending on the number of trees removed and the amount of fill entering the wetland. The amount of area impacted and mitigation strategies would be determined after final designs are completed. At that time locations for mitigation would be coordinated with the appropriate agencies and land managers. At Luke's Gulch impacts to a seasonal wetland would be low. The No Action Alternative would have no impacts on vegetation.

Land use would change at all sites affected by implementation of the action alternatives. Moderate levels of impacts are assessed for those sites at which land use changes from agriculture to fish production (Cherrylane, North Lapwai Valley, Luke's Gulch). Land use changes at other satellite sites would be low. Impacts would be smaller in magnitude in the Existing Facilities Alternative than the Proposed Action because of the elimination of the Cherrylane site. No impacts are expected with the No Action Alternative.

Recreational use changes would result from an increase in fishing associated with larger fish runs in the action alternatives. Again, greater change in fishing might be expected with the Proposed Action. No changes would result from the No Action Alternative.

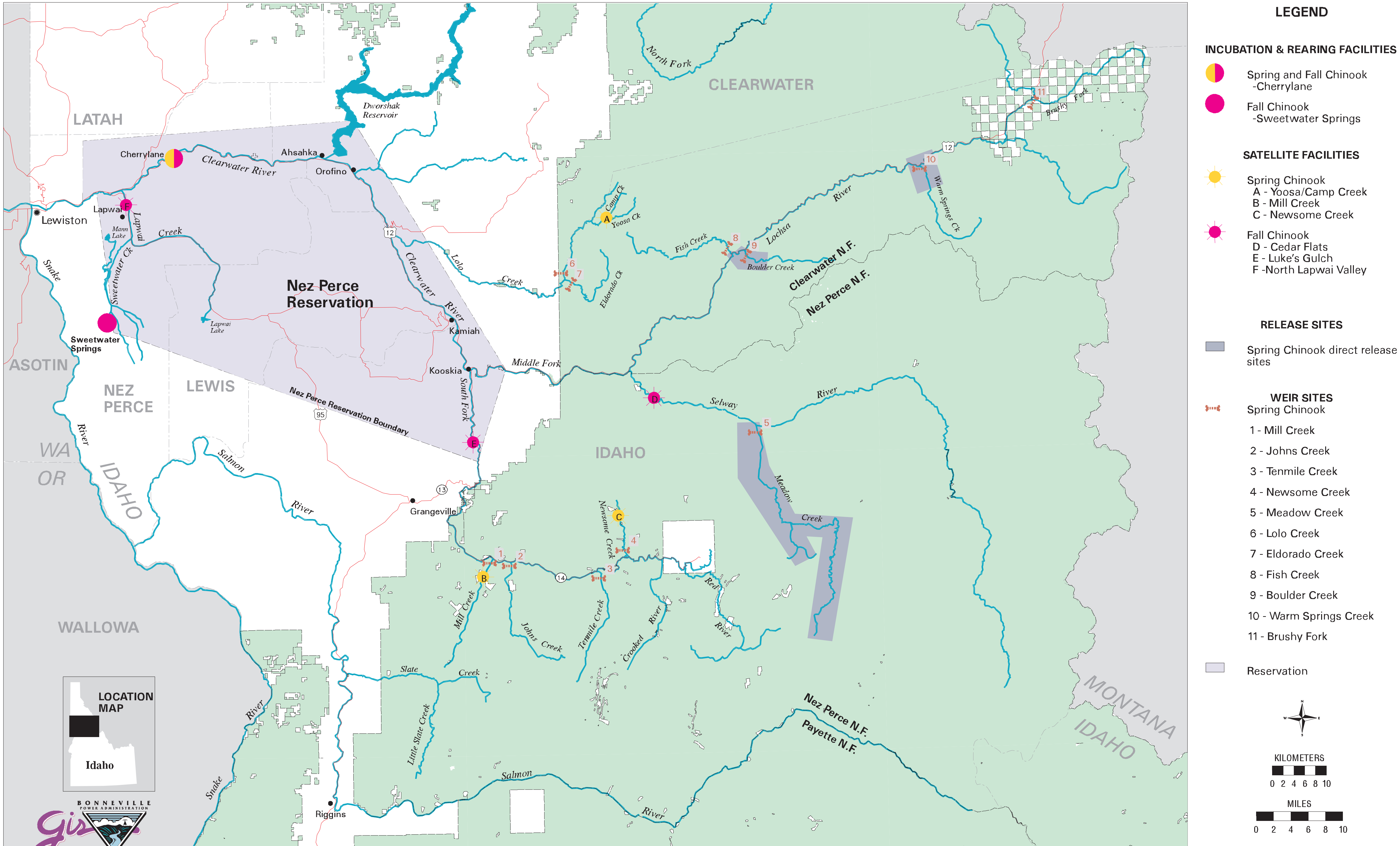
Socioeconomic impacts resulting from short-term construction, long-term employment, changes in property and sales taxes and the revenue brought in by greater fishing opportunities would be beneficial and greater with implementation of the Proposed Action than the Existing Facilities Alternative. No economic impacts would be accrued with the No Action Alternative.

Moderate impacts to visual resources would occur at Cherrylane, Luke's Gulch, and North Lapwai Valley. Low impacts are expected at the other satellite sites and at Sweetwater Springs. Because of the inclusion of Cherrylane, greater impacts are expected from the Proposed Action than the Existing Facilities Alternative. No impacts are expected from the No Action Alternative.

Low impacts to air quality are expected from implementation of the action alternatives and would be caused by vehicle emissions, construction activities and pumps. No impacts are expected from the No Action Alternative.

An increase risk of fire caused by new facilities and workers in otherwise rural and forested areas could result from the implementation of the action alternatives. Because of the inclusion of Cherrylane, greater impacts would occur from the Proposed Action than the Existing Facilities Alternative. No impacts are expected from the No Action Alternative.

NEZ PERCE TRIBAL HATCHERY



Map 3

Facilities and Release Sites

Chapter 3 Affected Environment

In this Chapter:

- Existing human and natural resources
- Protected Resources

This chapter describes the existing environment that would be affected by the alternatives. For most resources, the facilities proposed in the Use of Existing Facilities Alternative are not included in the Affected Environment because these facilities have been developed previously and resources such as land use, soils, etc. have been disturbed or otherwise affected.

For Your Information

The Nez Perce fished for salmon along the Columbia River and in the Clearwater River Subbasin.

Map 2 shows the Nez Perce territory.

3.1 Nez Perce Tribe

3.1.1 Importance of Salmon to the Nez Perce Tribe

The Nez Perce have always been fishers. Abundant salmon runs in the Northwest have served as the mainstay for sustenance and cultural activities. Salmon are a staple and are essential to tribal ceremonies and feasts, in addition to funerals and weddings. The presence of salmon in salmon streams is also important to tribal appreciation for the circle of life, the interconnection of all beings created in the country Nez Perce call home.

The Council estimates that during the 1850s a population of 4,000 Nez Perce consumed about 1220 metric tons (1290 tons) of salmon annually (Northwest Power Planning Council, 1985). The Council's estimates were based on historic references of population size, caloric intake, and daily tribal harvests. At an average fish weight of 9 kilograms (20 pounds), this estimate equals about 129,200 fish. This value appears to be low however, because the Council finds that the estimate does not consider salmon used for dog food, fuel, and trade, so the estimated catch is a minimum.

Industrialization brought on the decline of salmon runs through intensive salmon canning operations, dams, irrigation, mining, and timber harvest. Salmon runs have been drastically reduced and harvest occurs in only a few specific areas. Nevertheless, salmon remain important to Nez Perce culture and subsistence. The Nez Perce Tribe regulates tribal member harvest within the reservation, ceded lands, and usual and accustomed

Table 3-1
Recent Salmon Harvest by Nez Perce Tribal Members

Year	Zone 6 Commercial* (1)	Zone 6 Ceremonial and Subsistence (2)	Rapid River - Circle C Hatchery (3)	North Fork Clearwater River - Dworshak National Fish Hatchery and Clear Creek - Kooksia National Fish Hatchery (4)
1980	1087	NA	NA	NA
1981	1630	NA	NA	NA
1982	1525	NA	NA	NA
1983	1448	NA	NA	NA
1984	2372	NA	NA	NA
1985	3082	NA	2023	NA
1986	4717	NA	1855	NA
1987	7343	1219	2430	210
1988	NA	NA	3520	312
1989	NA	1244	544	404
1990	NA	1581	980	644
1991	NA	NA	0	0
1992	NA	NA	643	160

* Zone 6 commercial fishery targets upper Columbia River fall chinook, all other fisheries reported for spring/summer chinook.
NA means data were unavailable.
(1) From: Mauney (1987)
(2) From: Villalobos and Mauney (1988), Mauney (1989), and Mauney (1991)
(3) From: Mauney (1992a)
(4) From: Mauney (1992b)

fishing areas by opening and closing seasons and setting harvest limits and gear restrictions. Table 3-1 shows recent salmon harvests by the NPT in the Columbia River and at upriver hatcheries.

The average annual harvest can be used to estimate total present day harvest by Nez Perce tribal members. Annual commercial harvest for salmon in the ***Zone 6*** fishery on the Columbia River averages about 2,900 fish. The ceremonial and subsistence fishery averages 1,350 fish. Rapid River salmon catch averages 1,500 fish and the Clearwater fishery averages about 290 fish. Therefore, the total estimated catch is about 6,000 salmon annually. Compared to the historic harvest of salmon (129,200 fish annually), recent harvests have been only about 5 percent of traditional harvest.

For Your Information

Zone 6 *is the Treaty Indian Set-Net fishery from Bonneville Dam to McNary Dam, 140 miles of river open to commercial fishing.*

3.1.1.1 Treaty Fishing Rights

The importance of fishing to the Nez Perce Tribe is not only substantiated by anthropological evidence, but rights reserved in treaties specifically address and guarantee the ability of the Tribe to harvest fish.

Hunting and fishing rights are guaranteed in treaties drawn up through negotiation between tribes and the United States, similar to those between the United States and any foreign government (Cohen, 1982). Treaties were signed to guarantee the Tribe would reserve special rights, including rights to hunt and fish, and receive compensation, in exchange for cession of Indian land (Cohen, 1982).

Among the rights reserved by tribes in exchange for land are the right to hunt and fish in a manner that allows the tribes to maintain their way of life. For example, the 1855 treaty with the Nez Perce in Article 3 states:

> The exclusive right of taking fish in all the streams where running through or bordering said reservation is further secured to said Indians; as also the right of taking fish at all usual and accustomed places in common with citizens of the Territory; and of erecting temporary buildings for curing, together with the privilege of hunting, gathering roots and berries, and pasturing their horses and cattle upon open and unclaimed land.

Many Northwest tribes that historically relied on fishing have language in their treaties that also secures "...the right of taking fish at all usual and accustomed grounds and stations... in common with citizens of the territory." This is an important concept in regards to the Indian fishery off-reservation and in the Columbia River.

In 1905, the United States vs. Winans case established what a "right" implied. The case involved a non-tribal member who attempted to prevent tribal members from fishing at a traditional site by buying and then claiming absolute title to the land (American Indian Resource Institute, 1988). The Supreme Court ruled against this claim and established two important precedents. First, hunting and fishing rights are not rights granted by the government to tribal signatories, but rather they are rights reserved by the tribes in exchange for lands (American Indian Resource Institute, 1988). Second, tribal members cannot be barred from accessing their usual and accustomed fishing sites since their reserved right is essentially an easement over private as well as public lands (Cohen, 1982).

In 1974, a case tried in Washington Federal District Court established what was meant by the right of tribes to harvest fish "in common" with the citizens of the territory. Judge Boldt's decision relied heavily on understanding the situation under which the treaties were written. The court determined two distinct entities were involved during treaty making, Indian tribes and the United States. The separation of two political entities effectively denied the state's assertion that all citizens have the same rights with respect to harvesting fish. In their treaties ceding land to the United States, these specific tribes had reserved the right to harvest fish in a manner that allows them to maintain their way of life.

The understanding that there are only two entities involved, was then applied to actual allocation of harvestable fish. The court's interpretation was that harvest "in common" meant equal distribution between the two entities, or that each is allowed a 50/50 share (American Indian Resource Institute, 1988). Judge Belloni applied the 50/50 principle to Columbia River fisheries in U.S. v. Oregon in 1975 (Nez Perce Tribe, et al., 1995).

In summary, the Nez Perce Tribe is a recognized sovereign government with historic and legal connections to the condition of salmon runs in the Columbia Basin. The Tribe has pursued avenues to increase salmon runs throughout the years to maintain their cultural heritage, including planning and researching the Proposed Action over the last 12 years.

3.1.2 Demographics and Employment

For Your Information

*Additional information can be found in Section 3.10, **Socioeconomics**.*

The Nez Perce Reservation covers about 303 500 ha (750,000 acres) and crosses five counties of north central Idaho: Nez Perce, Lewis, Idaho, Latah, and Clearwater. Two major highways cross the reservation. U.S. Highway 12 travels east to west along the Clearwater River, connecting Montana and Washington; and U.S. Highway 95 travels north and south, connecting Boise, Lewiston, and Coeur d'Alene.

Reservation population is 17,867 (Wilson, 1995). The number of enrolled Nez Perce tribal members is 2,871, of which 1,595 live on the reservation (Wilson, 1995). An additional 300 members of other tribes also live on the reservation (Wilson, 1995). Total Indian population (Nez Perce tribal members and members of other tribes) living within this area is about 11 percent of the reservation population.

The reservation has several small towns, each with some tribal members. The three most important in terms of tribal membership and employment are Lapwai, Kamiah and Orofino (Nez Perce Tribe, 1992).

Lapwai is on the western side of the reservation nearest to Lewiston (see Map 3). About 80 percent of Nez Perce tribal members live in Lapwai since it is the employment hub including central Nez Perce tribal offices, the BIA and Indian Health Service (***IHS***) Unit for Northern Idaho, and the Nez Perce National Historical Park (Nez Perce Tribe, 1992). About 330 people are employed by various federal and tribal government operations in and around Lapwai.

Kamiah, Idaho, is 97 km (60 miles) up the Clearwater River from Lapwai and is where various field offices administered by the Tribe, IHS, and BIA are located (see Map 3). About 15 percent of enrolled tribal members live in and around Kamiah and there are about 62 employees for governmental field offices in the Kamiah area (Nez Perce Tribe, 1992).

About 5 percent of enrolled tribal members live in and around Orofino, Idaho (Nez Perce Tribe, 1992) (see Map 3). Orofino is about 48 km (30 miles) upstream of Lapwai and it is, or has been, the location of field offices for Tribal Head Start, Community Health Representatives, and Tribal Fisheries. Some 20-25 employees of tribal fisheries work in Orofino. The Head Start and Community Health offices have not been open recently. Other Nez Perce tribal members live off the reservation in surrounding communities such as Lewiston, Clarkston and Grangeville.

The Nez Perce Tribal Employment and Training Department has 1,227 tribal members on its work force list (Nez Perce Tribe, 1992). About 65 percent are unskilled and need training or education (Nez Perce Tribe, 1992). Training assistance waiting lists have an average of 135 individuals (Nez Perce Tribe, 1992). Though the seasonally adjusted unemployment rate within the reservation boundaries is 10 percent, Nez Perce tribal members have a seasonally adjusted unemployment rate of about 40 percent, with a high of about 60 percent during winter when seasonal work is unavailable (Nez Perce Tribe, 1992). Similarly, the poverty rate affecting members of the Nez Perce Tribe is about 46 percent, according to figures provided by BIA (Nez Perce Tribe, 1992).

3.2 Cultural Resources

Cultural resources are ***nonrenewable*** evidence of human occupation or activity in any district, site, building, structure, artifact, ruin, object, work of art, architecture, or natural feature important in human history at the national, state, or local level. Cultural resources are important for their potential to provide an understanding of long-term human adaptation as well as information regarding patterns of history and culture. Cultural resources are recorded as historic properties, which include any prehistoric or historic resource included, or eligible for inclusion in, the National Register of Historic Places (***NRHP***). Eligible properties include both properties formally determined as such by the Secretary of the Interior and other properties that meet NRHP listing criteria (36 CFR 60.4).

3.2.1 Prehistory

For Your Information

*See Section 3.1, **Nez Perce Tribe** for more information about the Nez Perce tribal culture.*

The prehistoric record of the Clearwater River Subbasin is divided into four periods defined by development from a foraging culture to evidence of semi-subterranean houses about 6,000 years ago. Beginning about 3,000 years ago, many traditional Nez Perce patterns appear in the archaeological record and are continually represented since that time (Sappington, 1994). Coeur d'Alene groups also may have reached into the upper North Fork and Little North Fork of the Clearwater River (Chalfant, 1974). The Flathead groups are documented as visiting the eastern headwaters of the drainage (Teit, 1930). Unlike these tribes, the Nez Perce have no migration stories, and other tribes have not claimed to have permanently lived in the Clearwater drainage (Sappington, 1994). This overlapping use of peripheral areas is consistent with land use patterns noted in literature of the broader region.

3.2.2 History

The first historic accounts of this area come from the Lewis and Clark Expedition, which passed through the area in 1805 and 1806. The Nez Perce helped the members of the expedition recuperate before the expedition continued. In 1812-13, a fur trading post was operated by the Pacific Fur company near the confluence of the Clearwater and Snake rivers (Josephy, 1983). The next contact was in 1835 when Samuel Parker entered the area.

In 1836, Henry Spalding established a mission near Lapwai at the request of the Nez Perce (Ruby and Brown, 1986). The missionaries taught reading and writing and introduced farming to the area (Haines, 1955). In 1838, the Smiths opened a short-lived mission around Kamiah. In 1855, the Nez Perce signed a treaty with the United States. Gold was discovered in the North Fork of the Clearwater in 1861 and this ushered in the mining period and the resulting influx of Euro-Americans. Lewiston and other mining camps developed during this time, though the mining activity and townsites were in trespass on the Nez Perce Reservation (Mattson, et al., 1983). The result of this intrusion was that the Nez Perce were forced to sign another treaty in 1863 that created the reservation boundaries existing today.

In 1900, the railroad reached into the Clearwater drainage as far as Stuart (Kooskia) and a number of stations were located in the drainage. Logging, agriculture, and other forms of industry developed around this time and have persisted.

3.2.3 Study Area

Reminder

The existing hatcheries proposed in the Use of Existing Facilities Alternative were not included in the study area because the land has been disturbed.

The study area surveyed for cultural resources included the Cherrylane and Sweetwater Springs proposed central hatchery sites, the satellite facilities sites and the general area of the spring chinook direct release sites. Background research, review of previous surveys, an archaeological survey, and test excavations at select areas were done under a contract to the Nez Perce Cultural Resource Program. This work surveyed all of the lands in question and identified cultural resources within the area. Consultation with the Idaho State Historic Preservation Officer (***SHPO***) is ongoing.

Research identified five sites within the study area. All sites are prehistoric and possess characteristics that appear to make them eligible for inclusion in the National Register of Historic Places under Criterion d, scientific information. Cherrylane, Sweetwater Springs, North Lapwai Valley, Cedar Flats, and Luke's Gulch sites had artifacts.

The Sweetwater Springs site may have artifacts that are 9,000 years old, with three possible prehistoric occupations of the site.

Surveying would continue until design is complete and final locations of facilities and road improvements are known.

3.3 Geology and Soils

This section describes existing geologic formations, soil types, geologic hazards including ***seismicity***, ***fault zones***, slope stability, and site-specific erosion characteristics of the soils at proposed new facility sites in the Clearwater River Subbasin.

3.3.1 Geology

Geologic forces gradually uplifted the Clearwater River Subbasin between 1 and 13 million years ago and formed the Bitterroot Mountains. Continuous erosion of the uplifted basalt and underlying granite created the web of rivers, streams, and canyons that drain the basin. Erosion has created steep and unstable slopes. Gravity and water have transported slope debris to valley bottoms and floodplains. Other landforms created within the Clearwater River Subbasin include ***breaklands***, upland basins, rolling hills, deep canyons, mountain peaks, and alpine ridges.

For Your Information

Breaklands *are relatively steeply sloping, typically have basalt outcrops, and represent a transitional zone between valley bottoms and upland basins.*

Breaklands are transitional slopes underlain with basalt between valley bottoms and upland basins. Slopes and soils vary, with some basalt outcropping at the surface and the erosion potential of soils varying.

Deep canyons formed where rocks and soils eroded down to underlying granite. Wind erosion formed upland basins and rolling hills by transporting and depositing eroded materials. The upland basins and rolling hills make up the Palouse steppe and include most of the upland drainage on top of the basalt breaklands. Farther upstream and upslope are mountain peaks and alpine ridges formed as wind, water and temperature weathered rocks made of granite, ***gneiss*** and ***schist***.

Gneiss *is a banded metamorphic rock with the same composition as granite.* ***Schist*** *is a metamorphic rock consisting of laminated, often flaky, parallel layers.*

3.3.1.1 Central Incubation and Rearing Facilities

The Cherrylane site is on depositional debris from nearby canyons and the Clearwater River in the valley bottom. Sweetwater Springs is in a canyon shielded by breaklands.

3.3.1.2 Satellite Facilities

The North Lapwai Valley site is on the valley bottom along Lapwai Creek near the mainstem of the Clearwater River. The remaining five satellite sites are in canyons formed by rivers and streams in upland basins. Nearby slopes at these sites are breaklands or upland basin landforms.

3.3.1.3 Spring Chinook Direct Release Sites and Weir Sites

The spring chinook direct release sites are in upland basins along extended reaches of tributaries to the Lochsa and Selway rivers. Similarly, all weir sites are on tributaries to the Clearwater, South Fork Clearwater, Selway, and Lochsa rivers in canyons of upland basins.

3.3.1.4 Seismic Hazard

All proposed facilities are within the Clearwater River Subbasin. Although no major geologic faults have been located within the subbasin, 11 seismic events have been recorded since 1800. The events were felt by many individuals, but structural damage was slight.

Cherrylane is the only proposed facility near a known seismic activity zone, the minor Cherrylane fault. This fault is a zone of high permeability due to rock fracturing or from ancient stream channels following the fault (Sprenke and Breckenridge, 1992). No specific engineering design requirements exist beyond adherence to the Uniform Building Code for seismic protection.

No other proposed facilities are within a known seismic activity zone.

3.3.2 Soils

Soils within the Clearwater River Subbasin vary in composition and characteristics, but generally range from very deep (greater than 1.5 m [60 inches]) and well drained ***silty-loams***, to sandy subsurface soils, and rock outcrops. Unique features of the breaklands and the granitic mountain geology discussed previously include a severe erosion potential. Weathering breaks down the basalt or granitic rocks easily into smaller particles.

Because of their moderate to steep (60 to 90 percent) slopes, the breaklands have a moderate rating for potential ***mass failure*** such as landslides. Building and road construction on these slopes require additional measures to control or minimize erosion or slide potential.

3.3.2.1 Central Incubation and Rearing Facilities

The Cherrylane site is on soils of the Uhlig Silt Loam soil complex that originate on alluvial terraces, and are very deep and well-drained. The soils have moderate permeability and high water capacity. The soils have a potential for erosion with rapid water runoff. The Cherrylane site is relatively flat, however, which reduces the erosion potential.

Reminder

The existing hatcheries proposed in the Use of Existing Facilities Alternative were not included in the study area because the land has been disturbed.

The Sweetwater Springs site is on soils in the Lapwai-Bridgewater soil complex that originate on stream terraces with very deep and well-drained silty-loams. These soils have moderate permeability and hold water for later use by vegetation. The site is on a flat terrace and erosion potential is low.

3.3.2.2 Satellite Facilities

The Luke's Gulch site is on soils of the Klickson-Suloaf soil complex that are in very steep, north facing canyons. Soil composition is 45 percent silt-loam and 25 percent cobbly-silt loam, with the remaining soil a combination of gravelly-loam, rock outcrop and other similar soils. The Klickson silt loam drains well and has moderate permeability, but in combination with slope and other soil properties, rapid runoff, slope instability (landslide) and severe surface erosion are possible. The Luke's Gulch site is on a flat terrace below a steep slope so the erosion potential is reduced.

The Cedar Flats site is on a variety of soil types that are generally fine textured with low to moderate erosion potential. Specific information describing the drainage characteristics, permeability and water capacity are not available, requiring on-site soil testing prior to construction. Nearby slopes (across the road) are moderate to steep, but the site itself is on a flat terrace.

The North Lapwai Valley site is on soils in the Lapwai-Bridgewater soil complex on a stream terrace with very deep and well-drained silty-loams. These soils have moderate permeability and flooding and erosion of surface soils would be rare.

The Yoosa/Camp Creek site soils are dark brown silty loams with decomposed organic material in the top 26 cm (10 inches). Soils display characteristics of seasonal saturation.

The Mill Creek site is on surface soils that formed in volcanic ash-influenced ***loess***, a type of wind deposit mixed with underlying highly-stratified sandy deposits. These soils are well or moderately well-drained. The site is in a shallow V-shaped draw bottom, and adjacent slopes are moderate to steep (60 to 90 percent). The soil type on the slopes has a high erosion potential, particularly for road building.

loess *Fined grained material, dominated by silt-sized particles and deposited by wind.*

Newsome Creek was extensively mined in the past and the site is mostly mined stream rubble and sediment. Soils near the site have characteristics similar to the Mill Creek site. Stratified, sandy subsoil deposits are common in this region, and adjacent slopes could be unstable and erode if disturbed.

3.3.2.3 *Spring Chinook Direct Release Sites and Weir Sites*

Spring chinook direct release sites and weir sites are all located in the upland region of the Clearwater River Subbasin or upper drainages and tributaries of the South Fork Clearwater River, Selway River, and the Lochsa River.

This region has similar soil and slope characteristics that include very steep breaklands with dense mineral soil derived from hard crystalline rocks (schist, gneiss and granite). Surface soils were formed by the volcanic-ash influenced loess and mixed with the underlying sandy material. The dominant slopes are moderate to steep and have a northerly aspect. As discussed previously, disturbed or exposed soils in this region with these soil characteristics tend to ***slump*** and erode. Road construction and other activities on steep slopes increase the potential for debris avalanches and ***mass wasting***. The Lochsa River drainage has greater susceptibility to these events because of soil properties and the degree of weathering within this region. Proposed facilities within this drainage area would be limited to temporary monitoring weirs or spring chinook direct release sites.

For Your Information

mass wasting *The slow downward slope of rock debris.*

3.4 Water Resources

This section includes a description of existing groundwater and surface water conditions in the Clearwater River Subbasin of Idaho. Major topics of the groundwater section include a discussion of temperature and quantity in the overall region and at specific new facility sites that require groundwater. The surface water section includes a discussion of river flows, temperature, and quality in the overall region and at specific proposed new sites.

3.4.1 Groundwater

Proposed new facility sites are next to streams and the flow of groundwater at these sites is generally hydraulically linked to surface water flow. The major advantage for groundwater use at the sites is its relatively constant temperature, about 16 degrees C (60 degrees F). This water can be used to temper the extreme cold surface water temperatures found in the region during November through March and warm summer flows. Groundwater is also considered to be free of pathogens that affect fish.

3.4.1.1 *Central Incubation and Rearing Facilities*

At Cherrylane, two wells can provide 18.9 m^3/min for the proposed facilities (see Table 2-1). Projected depth to water (drawdown) for wells at this pumping rate is less than 30 m

Reminder

*The existing hatcheries proposed in the Use of Existing Facilities Alternative were not included in this section because water is currently being used at the hatcheries (see Section 2.2.1, **Facilities Description and Operations Summary**).*

(100 ft) after 100 days of pumping. Water quality, quantity and temperature would remain relatively constant even if a well is operated year-round. Groundwater temperature at the site is relatively warm, 17 degrees C (62 degrees F), and would be mixed with surface water in the winter and summer to provide temperature control. The water supply at Cherrylane is of acceptable quality and quantity for fish culture purposes.

Groundwater (spring flow) is currently used at the Sweetwater Springs facility and is of acceptable quality and quantity for fish culture purposes. The spring provides approximately 3.4 m^3/min of 9-10 degree C (48-50 degree F) water year-round (Montgomery Watson, 1994). This spring serves existing hatchery facilities and has been shown to be adequate for incubation and salmon rearing. The existing spring would be the only source of water supply at this site. The proposed facility lies upstream of Sweetwater Diversion Dam, which diverts water into Reservoir A (Mann Lake). Both of these facilities are part of the Bureau of Reclamation's Lewiston Orchards Project, which provides irrigation, municipal, and industrial water to the Lewiston Orchards Irrigation District.

3.4.1.2 Satellite Facilities

The Luke's Gulch site would require groundwater for fish production. Groundwater information for this site was obtained from Ralston (1992). Results of groundwater testing indicate that a water supply 1.7 m^3/min (450 gpm) can be obtained from two production wells at the site.

Water quality of the groundwater obtained from two test wells appears to be acceptable for salmon culture. The temperatures remain relatively constant at 17 degrees C (62 degrees F). Mixing with surface water would be required in the spring and summer to achieve desired temperatures.

Groundwater would also be used at the proposed North Lapwai Valley site. Three deep wells have been developed and yield 2.5 m^3/min (670 gpm) of 16-17 degrees C (59-62 degrees F) water. The well water is free from diseases that affect fish.

Surface water would be used at all other satellite facilities.

3.4.1.3 Spring Chinook Direct Release Sites and Weir Sites

The spring chinook direct release sites and weir sites do not require groundwater.

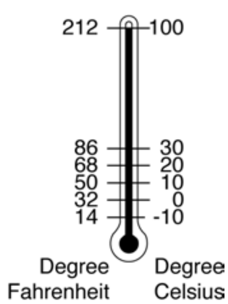
3.4.2 Surface Water

The Clearwater River Subbasin provides approximately one-third of Snake River flow and has a drainage area of approximately 24 980 km^2 (9,645 mi^2). The Clearwater River mainstem joins the Snake River 224 km (139 miles) upstream of the Columbia River. The major tributaries of the Clearwater are the North Fork Clearwater, South Fork Clearwater, Middle Fork Clearwater, Lochsa, and Selway rivers.

Based on available flow information, the average river flows at most of the new facility sites are more than adequate, however, large annual flow variations can occur due to varying degrees of snowpack (Nez Perce Tribe and Idaho Department of Fish and Game, 1990).

Overall water quality in the Subbasin is good, particularly in the Lochsa and Selway rivers' drainages. The water quality for streams draining the Clearwater and Nez Perce National Forests is considered to be very good to excellent.

Water quality in the mainstem Clearwater River and its tributaries has been affected in the past by agriculture, forestry, mining and residential development, with sediment the major pollutant. However, impacts tend to be site-specific and are normally caused by high runoff events (rain or rain-on-snow). Localized erosion and sedimentation are attributed to livestock grazing, road construction, farming, and natural slumps. Fish pathogens are always found in natural flowing waters. Sediments and fish pathogens can be drawn into hatchery facilities that use surface water.



Elevated stream temperatures, especially associated with low streamflow, can constrain fish production in the mainstem of the smaller drainages and the smaller tributaries of the mainstem, lower South Fork, and Middle Fork Clearwater River drainages. The recommended range of rearing temperatures for salmon is between 5-16 degrees C (40-60 degrees F). Stream temperatures exceeding 16 degrees C (60 degrees F) are typically encountered during July and August.

3.4.2.1 Central Incubation and Rearing Facilities

The Cherrylane site is on the mainstem of the Clearwater River. Monthly average minimum river flows at Spalding, which is 9.6 km (8 miles) downstream, typically range from a minimum of 18.9 m^3/min (5,000 cfs) in October to a maximum of 59 455 m^3/min (35,000 cfs) in June (Arnsberg, et al., 1992). About 11.4 m^3/min is needed to add to the available groundwater at the site. This site could potentially be exposed to contamination from spills on U.S. Highway 12.

Recommended production water temperatures are typically exceeded during July and August, and sometimes in June. Fish eggs in the facility during August would be in water cooled by chillers.

3.4.2.2 Satellite Facilities

The Luke's Gulch site is on the South Fork Clearwater River at River KM 14 (River Mile 9), approximately 6 km (4 miles) upstream from the town of Stites. Monthly average minimum river flow typically ranges from 187 m^3/min (110 cfs) in October to 1614 m^3/min (950 cfs) in May. A 6.2 m^3/min (1,650 gpm) river water intake would be developed. This site could potentially be exposed to contamination from spills on State Highway 13.

Recommended production water temperature is typically acceptable during the proposed rearing period (February through June). Surface water temperatures would be moderated by groundwater flow from September through November when adults would be held.

The Cedar Flats site is on the Selway River at River KM 8 (River Mile 5). Monthly average minimum river flow typically ranges from a minimum of 552 m^3/min (325 cfs) in October to a maximum of 13 507 m^3/min (7,950 cfs) in May. About 10.2 m^3/min (2,700 gpm) of surface water is needed at this facility.

Recommended production water temperature is typically exceeded during July and August, and sometimes in June and September when adults would be held. However, pond shading, adequate flow and low densities would moderate stress caused by increased temperatures.

The North Lapwai Valley site is on Lapwai Creek, 0.8 km (0.5 mile) upstream from the confluence with the Clearwater River. Stream flow would be used at this facility in conjunction with groundwater. The greatest need for facility flow is during June. Monthly average stream flow during June is 91.6 m^3/min (53.9 cfs). Approximately 5.8 m^3/min (1,530 gpm) of surface water would be needed for maximum production during late May and June.

Recommended water temperatures would not be exceeded during the February through May rearing period. Seasonal sedimentation and pathogens could occur at this site because it is surrounded by land used for agriculture. This site could potentially be exposed to contamination from spills on U.S. Highway 95.

The Yoosa/Camp Creek site is at the convergence of Yoosa and Camp creeks. The proposed facility would withdraw a portion of its water supply from each stream. As neither of these streams appears to have been gauged, monthly flow was estimated using data from lower in the Lolo Creek system at the Section 6 Bridge.

The Proposed Action states that no more than one half of either creek would be diverted for rearing purposes so as not to adversely impact instream habitat. The measured streamflows at this site indicate that it should be possible to provide the required facility flows, 3.8 m^3/min (1,000 gpm), without exceeding one half of available streamflow.

Water temperatures at Yoosa/Camp Creek are low due to the elevation and forest cover, and are expected to be ideal for rearing during the operational months of the facility (May through October).

The Mill Creek site is about 3.2 km (2 miles) from the mouth of the creek at the Clearwater River. Mill Creek has not been gauged in the past so it was necessary to estimate the monthly streamflow using an estimate based on Fish Creek. Fish Creek near Lowell, Idaho, has a similar drainage area, elevation, and forest cover as Mill Creek. The flow data are based on Fish Creek, adjusted by the ratio of drainage areas for the two basins. Due to site-specific differences in precipitation and runoff, true streamflow at this site could vary significantly from predicted values. Available streamflow at the Mill Creek site appears to be adequate for the required facility flows, 1.1 m^3/min (300 gpm), for any month during the year.

Water temperatures at the Mill Creek site are expected to be satisfactory during the anticipated operating period (May through October) because of cover and elevation, low densities and adequate water flows.

For Your Information

*See Section 3.9, **Land Use**, for more information.*

The Newsome Creek site is upstream from the confluence of Newsome and Beaver creeks. The site is on dredged tailing deposits from upstream mines. Although Newsome Creek was extensively dredge mined, the USFS has worked to mitigate the effects or potential effects from an abandoned placer mine upstream over the last 20 years. BPA and USFS also have been actively restoring and enhancing riparian habitat along Newsome Creek. The USFS has been attempting to trap sediment and keep it from entering Newsome Creek since 1985. The agency has recently implemented a rehabilitation plan to keep sediment out of the creek. The project involves maintaining and reinforcing existing sediment traps to prevent sediment from reaching the waterway. The rehabilitation of the ***gloryhole*** is necessary to reduce the potential for a major catastrophic event, according to the USFS. This proposed project is scheduled to be completed in 1997. The water quality in Newsome Creek is considered good.

gloryhole *A term used for an hydraulic placer mine.*

Streamflows were estimated for Newsome Creek using a hydrological estimate based on Fish Creek. Streamflow is adequate for the required flows, 2.3 m^3/min (600 gpm), for the alternatives.

Water temperatures at the Newsome Creek site are expected to be within the minimum recommended standard for rearing when the facility would be in operation because of the elevation.

3.4.2.3 Spring Chinook Direct Release Sites and Weir Sites

All spring chinook direct release sites and weir sites are in the upper reaches of the South Fork Clearwater, Selway, and Lochsa rivers and their tributaries. These sites were selected because they have acceptable water quality, instream habitat, and streamflows for natural production. In general, similar water quality is expected at the Yoosa/Camp Creek, Cedar Flats, Mill Creek, and Newsome Creek sites, which are also located in the upland region. At these satellite sites, water temperature was the primary water quality characteristic of concern. Water temperature is expected to be within recommended standards during the periods when the facilities are operating.

3.5 Floodplains

The Federal Emergency Management Agency (FEMA) identifies a ***100-year floodplain*** as an area that has a 1 percent chance of being flooded in 100 years. Restrictions are placed on certain developments within floodplains and mitigation measures are sometimes required. A development can be built in the floodplain if the proposal depends on the river (e.g., a hatchery) and measures are taken to assure that the flood level would not rise.

Floods in north central Idaho are created by high spring runoff from melting snowpacks, warm winter rain on snow or a combination of rain on melting snowpacks. Juvenile salmonids would be acclimated at satellite facilities during the spring runoff, from the end of May through the first part of June.

3.5.1 Floodplain Determination Methods

FEMA has not prepared floodplain maps for any of the proposed facility sites. To determine the 100-year floodplain at each site, the 100-year flood elevation was estimated and compared to the elevation at the site. Analysts used existing U.S. Geological Survey stream gauge records at stream locations as close to each site as possible to determine channel characteristics at each site: slope; channel roughness; bottom width, and top width. The data were then used to determine a channel's flood capacity.

3.5.2 Central Incubation and Rearing Facilities

Reminder

The existing hatcheries proposed in the Use of Existing Facilities Alternative were not included because the land has been disturbed.

The Cherrylane and Sweetwater Springs sites are estimated to be outside the 100-year flood elevation. Water inlets and outlet structures would be located within the stream channel.

3.5.3 Satellite Facilities

The Luke's Gulch, Yoosa/Camp Creek, and North Lapwai Valley sites are estimated to be outside the 100-year floodplain.

Based on the natural topography at the site and the deposits in the river upstream and downstream of the site, Cedar Flats would be within the 100-year floodplain and would be impacted by a flood of this magnitude.

At Mill Creek, some or all of the facility could potentially be within the 100-year floodplain, because available flat space is limited due to the topography.

At Newsome Creek, some or all of the facility could potentially be within the 100-year floodplain. However, it may be possible to locate the facility high enough or far enough from the creek to be outside the 100-year floodplain. Final facility design would evaluate the site topography to determine if this is possible.

3.5.4 Spring Chinook Direct Release Sites and Weir Sites

FEMA has not mapped the areas of the spring chinook direct release sites or weir sites. Direct release sites require no development, and potential for impact is minimal. All weirs would be located within the active stream channel. These structures are designed to minimize changes in stream hydraulics and result in no backwater upstream of the weir sites.

3.6 Fish

This resource section is divided into three general sections. The first section presents an overview of the historical and contemporary species composition of the Clearwater River Subbasin. The second section discusses fish biology and the third section describes the existing condition of habitat areas that may be directly and indirectly affected by the alternatives.

3.6.1 Overview of Historical and Contemporary Fish Communities

For Your Information

biomass *Total weight of organisms per unit volume.*

omnivorous *Eating both plant and animal substances.*

thermal regime *Temperature regime.*

The historical fish community in the Clearwater River Subbasin was structured from headwater to lower elevation reaches. Species diversity and ***biomass*** generally increases downstream in response to increased water temperatures, productivity, habitat size, and niche diversity (substrate, food types, etc.). Fish species in headwater reaches such as cutthroat and bull trout, generally require cooler water temperatures, feed primarily on aquatic and terrestrial insects, and are limited in numbers by physical factors such as the availability of pools and cover. Species found at lower elevations tend to be more temperature tolerant, are either ***omnivorous*** or large invertebrate-fish predators, and are regulated in number to a greater degree by biological rather than by physical factors (Li, et al., 1987).

Most tributaries to the South Fork Clearwater, North Fork Clearwater, Selway and Lochsa meander through high altitude meadows before cutting steeply down through wooded canyons bisecting the main river valley. If accessible, these upstream areas were likely used at one time by anadromous chinook and steelhead since they typically contain excellent spawning and rearing habitat. Farther upstream, westslope cutthroat trout and sculpins predominated. Bull trout and the infrequent dace and sucker were also in the upstream reaches of fish-bearing streams in the Clearwater River system.

Downstream of the headwater zone and extending all the way to the tributary mouth, the fish assemblage transitioned to one dominated by steelhead, chinook salmon, older cutthroat and bull trout, and mountain whitefish. The change appears to be a function of the local ***thermal regime***. Coho salmon may also have been present, however, the evidence for this is inconclusive. Accounts of coho returning to the Clearwater drainage by Nez Perce Indians and early non-Indian residents are reported by Lane, et al., (1981) and Schoning (1940). Sculpins and longnose dace were widely distributed, living close to the bottom and in backwater pools. Suckers scoured the stream bottom for food.

Low elevation mainstem and tributary reaches of the Clearwater River supported a mix of Pacific lamprey, suckers, redside shiners, sculpins, mountain whitefish, and, less commonly, adult salmonids. These fish may have been abundant as well in lower elevation tributaries where low streamflows cause high water temperatures.

The fish community found in the Clearwater today differs in several important respects from the historical assemblage. Some species have either dropped out entirely or exist as remnant populations (see Table 3-2). Most notably, indigenous populations of salmon have been eliminated from the Clearwater River. The spring and fall chinook that spawn naturally in the Subbasin today are hatchery fish, the descendants of hatchery fish, or the descendants of fish from other areas that strayed into the subbasin at some time in the past. Coho salmon are believed to be extinct (NPT and IDFG, 1990). Cutthroat and bull trout populations are also in decline. The formerly abundant Pacific lamprey presently returns to the Clearwater in very low numbers. Steelhead were once found in all streams that contained suitable spawning habitat; they, too, are no longer as abundant nor distributed as widely as they were under pristine conditions.

3.6.1.1 Causes of Change in the Fish Community

The Clearwater fish community has changed in composition over time due to natural and human disturbances.

Natural Disturbances — Natural events such as glaciation, changing climate regimes, volcanic eruptions, and on a shorter time scale, floods, fire, and landslides have altered the terrestrial landscape, and with it the aquatic ecosystem. For example, in the past 100 years, fire has denuded large tracts of land in the Clearwater River Subbasin at least three times. Vegetation loss due to fire has increased erosion, runoff rates, sedimentation, and water temperatures. These physical processes and variables affect species composition, aquatic productivity, and the quality and availability of fish habitat.

Natural disturbances can cause a temporary decline in salmon populations, but over the long run they usually act to maintain environmental heterogeneity and stimulate salmon production. Pacific salmon evolved in unstable freshwater environments. They can adjust to natural disturbances if they are not too severe and enough time exists for them to recover between successive events.

Human Disturbances — The activities of humans, including land development and use, resource extraction, recreation, dam construction, water withdrawals and diversions have altered the natural condition of the Clearwater River Subbasin. The result has been the loss, degradation, and simplification of aquatic habitat.

Table 3-2
Status of Native Fish of Free-Flowing Sections of the Clearwater River

__A-run steelhead__ return to the drainage in the fall and spawn in small, lower elevation streams in the late winter and early spring. The larger-bodied __B-run steelhead__ return in the fall or the spring and spawn in medium-size, higher elevation streams from March to June.

Species	Status	
	Historical	Current
Spring Chinook Salmon *Oncorhynchus tshawytscha*	Abundant	Rare
Summer Chinook Salmon *Oncorhynchus tshawytscha*	Unknown	Extinct Rare
Fall Chinook Salmon *Oncorhynchus tshawytscha*	Common	Rare Rare
A-run Steelhead *Oncorhynchus mykiss*	Abundant	Rare
B-run Steelhead *Oncorhynchus mykiss*	Abundant	Rare
Coho Salmon *Oncorhynchus kisutch*	Unknown	Extinct
Westslope cutthroat trout *Oncorhynchus clarki*	Abundant	Common
Bull Trout *Salvelinus confluentus*	Common	Rare
Mountain Whitefish *Prosopsium williamsoni*	Common	Common
Piute Sculpin *Cottus beldingi*	Abundant	Abundant
White Sturgeon *Acipenser transmontanus*	Rare	Rare
Shorthead Sculpin *Cottus confusus*	Common	Common
Torrent Sculpin *Cottus rhotheus*	Common	Common
Mottled sculpin *Cottus bairdi*	Common	Common
Pacific Lamprey *Lampetra tridentata*	Common	Rare
Northern Squawfish *Ptychocheilus oregonensis*	Common	Common
Longnose Dace *Rhinichthys cataractae*	Common	Common
Speckled Dace *Rhinichthys osculus*	Abundant	Abundant
Redside Shiner *Richardsonius balteatus*	Common	Common
Bridgelip Sucker *atostomus columbianus*	Common	Common
Largescale Sucker *Catostomus macrocheilus*	Rare	Rare
Chiselmouth *Acrocheilus alutaceus*	Rare	Rare
Sand Roller *Percopsis transmontana*	Unknown	Unknown

Source: Maughan, 1971; IDFG, 1991; Nez Perce Tribe unpublished data; USFWS, 199

Many of the physical changes have been so severe and have occurred so fast that the resident biota and natural recovery processes have been unable to adjust and compensate. For example, logging, road building, mining, and agricultural activities are known to cause many adverse effects including higher water temperatures, increased erosion and sediment input to streams, and decreased instream and streambank cover. These types of disturbances have a much greater impact on the aquatic environment because they occur over a larger area and at much more frequent intervals than does fire.

Other examples of human-related activities that have diminished aquatic habitat in the Clearwater River Subbasin include dredge and hydraulic mining in the upper South Fork Clearwater drainage, log driving in the mainstem Clearwater and the lower ends of its principle tributaries, and residential development along lower portions of the Clearwater River. These activities, acting concurrently with other natural and human disturbances, have influenced the composition of the Clearwater fish community and contributed to a decline in the productivity of many species.

Another source of recent declines of anadromous salmon and steelhead in the Clearwater River Subbasin was the construction and operation of large multipurpose dams along the migratory route of these species. The dams were constructed to generate power, control floods, facilitate navigation, and transport logs to mills. Over 20 non-federal dams were built in the Clearwater River Subbasin alone. Three have had a dramatic impact on fish resources: Lewiston Dam, built at the mouth of the Clearwater near Lewiston in 1927; Harpster Dam, built on the South Fork near the town of Stites in 1910; and Dworshak Dam, built at the mouth of the North Fork Clearwater River in 1974. These three dams eliminated chinook in hundreds of miles of formerly accessible habitat. Harpster Dam and Dworshak Dam completely blocked access to upstream areas on the South Fork and North Fork. Lewiston Dam and Harpster Dam, which eliminated wild chinook in the Clearwater Basin, have been removed, but Dworshak Dam remains. There are currently no plans to reconfigure Dworshak Dam to provide passage for anadromous fish.

Eight run-of-the-river hydroelectric dams have been built on the mainstem Snake and Columbia rivers downriver from Lewiston. The first was Bonneville Dam, the lowermost project, in 1937. Lower Granite Dam, the last and farthest upriver of the eight dams, was completed in 1975. These dams created a series of slackwater impoundments and barriers to migration that have contributed to the reduction of smolt-to-adult survival to the point that, on average, fewer than two fish return for every pair of fish that spawned in the previous generation. Dams, in combination with other human impacts, led to the extinction of Clearwater chinook and the listing of chinook populations from the Snake River Basin as threatened under the ESA.

Certain human activities have generated substantial fisheries benefits within the Clearwater River Subbasin. Artificial propagation, habitat enhancement, and other fisheries management actions have helped restore and protect chinook salmon populations in many areas of the watershed, and support a nationally-known steelhead sport fishery.

An average of 14,000 steelhead are caught each year in the Clearwater by tribal and non-tribal fishermen. Up to 50 percent of the steelhead produced by Dworshak Hatchery are outplanted in the South Fork Clearwater to support the sport fishery between Orofino and Kooskia, and to supplement natural production. Similar efforts have failed to increase chinook production to sustainable levels.

Fishing — Fishing was another major cause of change in the relative abundance of salmon and trout in the Clearwater River system. Chinook, coho, sockeye, and, to a lesser extent steelhead from the Columbia River were harvested in ocean and freshwater commercial fisheries that grew rapidly in the later parts of the 1800s. The annual catch of Columbia River salmon peaked in 1883 at 20 400 metric tons (21,400 tons), declined to around 11 900 metric tons (12,500 tons) by 1890, and fluctuated about this level for the next quarter century (Beiningen, 1976). At an average of 9 kg/fish (20 pounds/fish), this equals 1.5 to 2.5 million fish a year. The apparent stability of the fishery belied the over-exploitation and rapid decline in abundance of spring and summer chinook that occurred during this period. As stocks of spring and summer chinook were depleted, the fishery began to target fall chinook. Until Lewiston Dam was built, Clearwater chinook populations were probably affected to the same extent by these activities as other Snake River tributary populations (Craig and Hacker, 1940).

Commercial, sport, and Tribal fishers today catch fewer Snake River chinook and a much smaller percentage of the total upriver fish than they did previously.

Introductions and Invasions of Non-Native Species — The introduction and spread of non-native species in the watershed was also partly responsible for recent changes in the Clearwater River fish community. Some of these species are now so abundant that they will undoubtedly interact with juvenile chinook through competition, predation or other means. Brook trout, for example, were introduced as a sport fish in the early part of the century, and have subsequently spread throughout the Clearwater system. Brook trout compete directly with chinook, bull trout, and cutthroat trout for food and space in headwaters. They also reproduce with bull trout that live in similar habitats.

In the past, non-native resident rainbow trout and cutthroat trout were raised in hatcheries and released into Clearwater streams and lakes by the IDFG with the goal of augmenting the recreational fishery. There is no evidence that these fish have established viable populations, but they may have hybridized with locally adapted fish. They also attracted anglers who killed juvenile steelhead, chinook, and bull trout.

Non-native populations of smallmouth bass were recorded in Lewiston Dam counts in 1928, and so have long been a component of the fish community. The creation of reservoir habitat by mainstem dams and recent increases in water temperatures caused by logging, urban and agricultural development, and fires have helped smallmouth bass and other warmwater species spread into the Clearwater River system.

Other non-native populations include carp, rainbows, kokanee, largemouth bass, tench, yellow perch, pumpkinseed, black crappie, and brown bullhead.

3.6.2 Fish Biology

3.6.2.1 Chinook Salmon

Chinook salmon exhibit two basic life history strategies called stream-type and ocean-type (Gilbert, 1912), depending on the length of time the juveniles spend in freshwater before migrating to sea. Stream-type chinook populations are typically found in colder streams and rivers, either at higher elevations or in interior drainages of the Pacific Northwest and rear for one or more years in freshwater. Ocean-type chinook occur in warmer coastal streams and mainstem reaches of large rivers such as the Snake and Columbia and migrate before the end of the first year.

Chinook populations are further differentiated into spring, summer, fall, and winter-run races based on the time of year that adults return to freshwater to begin their upstream spawning run (Johnson, et al., 1991). All but winter chinook occur in the Columbia River Basin; the distribution of winter chinook is limited to a few California river systems. Migration timing is useful for management purposes, but is an unreliable indicator of taxonomic status or evolutionary relationship. Other factors such as genetic similarities, spawning location and time, length of freshwater residency, and timing of juvenile outmigration need to be considered in differentiating chinook salmon stocks.

The best available scientific information indicates that Snake River spring chinook and summer chinook make up a single species or ESU (Matthews and Waples, 1991) that is distinct from the Snake River fall chinook ESU (Waples, et al., 1991). Snake River spring/summer chinook (henceforth referred to as spring chinook) are stream-type chinook. Snake River fall chinook are ocean-type chinook. Spring chinook are readily differentiated from fall chinook salmon. Fall chinook salmon pass Bonneville

Dam in August through October, spawn later in the fall, spawn and rear in mainstem areas rather than in tributaries, outmigrate in their first year of life, and possess unique genetic characteristics.

Although summer chinook are aggregated with spring chinook in the Snake River, distinct populations of fall spawning, ocean-type summer chinook occur in several large tributaries to the mid-Columbia River. There is evidence that a similar race of chinook existed at one time in lower reaches of the Grande Ronde and possibly in other large tributaries to the Snake River (Cramer, 1995a).

Spring Chinook Salmon — Adult spring chinook, primarily 4-year olds but ranging in age from 3 to 5 years, return to the Clearwater River Subbasin from May through September. They typically hold in deep pools until spawning in late August or September. Early arriving spawners tend to spawn earlier and at higher elevations than late arriving spawners. Spring chinook spawn in cool, low to moderate gradient streams that provide good summer-long rearing conditions for juvenile fish. Spawning and rearing habitat includes most tributaries of the upper Clearwater River Subbasin (see Map 4). As is typical of salmonids, eggs are deposited in redds dug in suitable spawning gravel. There are no similar-sized fish spawning at the same time as the salmon, so hybridization is unlikely and competition for spawning and incubation habitat is between similar salmon.

Depending on water temperatures, spring chinook fry in the tributaries of the Clearwater River usually hatch in December and emerge from the gravel in late February and March, but they may emerge as late as June (U.S. Department of Commerce, NMFS, 1995). Emergent fry disperse downstream into pools and other low velocity areas. As they grow larger, juvenile chinook live closer to the head of the pools where there is better access to drifting food. Aquatic and terrestrial immature and adult insects are the primary food of juvenile chinook.

In Idaho, if a stream was at carrying capacity, densities of spring chinook fingerlings (parr) could be expected to range from 90 fish/100 m^2 in excellent habitat to 10 fish/100 m^2 in poor habitats (NPT and IDFG, 1990). These densities are very high and indicate that salmon were and could be the dominant fish species in mountain stream habitats of the Pacific Northwest. Because salmon and steelhead are usually the most common inhabitants of these habitats, they have adopted mechanisms to coexist. The chinook fry emerge earlier than steelhead fry, so they are generally not competitors when they are very small. As they grow larger, the chinook tend to congregate in the pools and reside throughout the water column, whereas similar-sized steelhead occupy more swift areas found in runs and riffle habitat. Larger steelhead coexist with smaller chinook in pools, but differences in body size and habitat tend to minimize competition.

Spring chinook typically rear for a year in freshwater before starting their seaward migration. However, many parr migrate from nursery to overwintering areas in lower tributary and mainstem reaches in the fall. The onset of morphological and physiological changes associated with smolting and seaward migration of yearling spring chinook usually occurs in early spring. Emigration peaks in April and May, typically just prior to the peak runoff period in the Snake River Basin. Migratory timing and behavior is controlled by genetic and environmental factors. Time of entry into saltwater depends on river flows and whether fish are collected and transported by barge to release points downstream of Bonneville Dam.

Spring chinook spend relatively little time in the Columbia River estuary before migrating offshore where they spend one to three years rearing before returning to freshwater to spawn (Howell, et al., 1985). Information on estuarine residence times and the marine distribution of spring chinook is limited. Snake River-bound adult spring chinook pass Bonneville Dam between late February and June, peaking in late April and early May. Fish destined for higher elevation streams tend to be the first to arrive on the spawning grounds (Matthews and Waples, 1991).

Summer Chinook Salmon — Adult Snake River chinook that migrate past Bonneville Dam in June through July and spawn in tributaries have traditionally been called summer chinook. However, as mentioned earlier, Snake River spring and summer chinook are now considered a single species by federal fisheries managers for purposes of administration of the ESA.

The type of summer chinook referred to as Snake River summer chinook in pre-ESA documents probably existed at one time in the Clearwater River Subbasin, but appears to be absent from the existing species complex. There is compelling evidence that another form of summer chinook, an ocean-type fish that spawned later in the autumn than spring chinook but earlier than fall chinook, may also have existed within the Subbasin in the recent past. This form of summer chinook still exists in several larger tributaries to the mid-Columbia River. It would have spawned at intermediate elevations and, unlike Snake River spring/summer chinook, would have migrated to the ocean as subyearling, ocean-type chinook. The densities of summer chinook smolts from the existing mid-Columbia populations are very high, like those of the fall chinook, because they begin outmigration soon after emerging from the gravel.

Although direct evidence is lacking, the historical existence of an ocean-type summer chinook in the Clearwater River is based on three observations:

- Hatchery records from the early 1900s indicate that a late spawning (early September to end of October), subyearling outmigrant form of wild summer chinook historically occurred in the Grande Ronde River, a nearby tributary to the Snake River that is similar in size to the Clearwater River;

- A similar race of ocean-type summer chinook salmon presently returns to tributaries of the mid-Columbia River and,
- Ocean-type summer chinook have the spawning times and juvenile life histories that are best matched to the temperature regimes found in the mainstem Clearwater River and lower portions of its major tributaries.

It is not clear what may have eliminated summer chinook from the Snake River Basin, but a plausible cause is that the populations were overfished to the point that they could not sustain themselves. Harvest rates on summer chinook averaged 89 percent during 1938-1944 and, although accurate estimates are not available, probably ranged much higher earlier in the century (WDF and ODFW, 1992). It is also possible that intense fishing pressure caused a genetic shift towards earlier and later migration and spawning times, that is, toward spring and fall chinook life history types, among the survivors. A similar response to over harvest was documented for coho salmon from the Clackamas River (Cramer, et al., 1991).

The type and quality of habitat present in the system suggests that summer chinook production is possible. Cramer (1995a) examined the temperature regimes of upper Clearwater and Selway rivers and found that mean monthly temperatures in those streams generally drop to 2 degrees C (36 degrees F) by mid-to-late November. Studies indicated that spawning cannot occur before water temperatures have dropped below 14 degrees C (52 degrees F), which is the tolerance limit of freshly spawned eggs. Spawning must also occur early enough for the eggs to develop to a stage at which they can tolerate near-freezing temperatures. Embryonic development must progress to the eyed stage before temperatures reach 2-5 degrees C (36-41 degrees F) if the eggs are to avoid excessive mortality (Beacham and Murray, 1987). Cramer (1995) compared the temperature data with the biological tolerances of chinook and the substrate conditions to determine that a summer chinook would be suitable to outplant in the lower Selway River (see Map 4). The progeny of summer chinook that spawn in these areas would migrate to sea in their first summer of life to avoid high water temperatures in the upper Clearwater during summer.

Fall Chinook Salmon — Snake River fall chinook (which includes those bound for the Clearwater) usually pass Bonneville Dam beginning in August and Lower Granite Dam by mid-August. They spawn predominantly in the Snake River, but also in lower reaches of its larger tributaries, the Clearwater, Grand

Ronde, Imnaha and Salmon rivers. Recent redd counts show that approximately one quarter of the fall chinook spawning in the Snake River Basin above Lower Granite Reservoir occurs in the Clearwater River (Table 3-3). Spawning occurs from October through November. Age at spawning varies from 2 to 5 years, and is usually 3-4 years. No other large fish spawn on the gravel bars of larger rivers in the fall, which indicates there is little competition and chance for hybridization.

In the Clearwater, fall chinook fry emerge in April through May which is approximately one month later than fry emerging in the Snake River (Connor, et al., 1993). Juvenile fall chinook disperse into low-velocity, near-shore areas where they rear for several weeks before smolting and actively migrating downriver. In the Snake River, if an area of the mainstem is at carrying capacity, densities of fall chinook smolts could be expected to range from 180 fish/100 m^2 in good habitat to 66 fish/100 m^2 in fair habitat (NPT and IDFG, 1990). In these areas, they compete for space with similar sized shiners, suckers, and dace. Zooplankton, and later, macro-invertebrates predominate in juvenile fall chinook diets.

In normal years, the peak dates of passage of juvenile wild fall chinook at Lower Granite Dam occur in late June and early July (Chapman, et al., 1991). Some fall chinook are collected at Snake and Columbia River collector dams and transported to release sites below Bonneville Dam. However, they are not collected as readily as spring and summer chinook. The Clearwater River fall chinook, because of their later emergence time, pass Lower Granite in late July and August. Reservoirs upstream of Snake River dams warm quickly during the summer which poses problems for July and August migrants. Because of warmer river conditions and later emergence time, Clearwater fall chinook may seek cool water refuge during the summer and migrate out in the following spring; thus adopting more of a "stream-type" life history characteristic typical of spring chinook (Arnsberg, 1996).

Snake River fall chinook spend 1 to 4 years (usually 3) in the ocean before returning to freshwater to spawn. No reliable information is available regarding the ocean distribution of Clearwater River fall chinook. However, if it is assumed that their distribution is reflected by the pattern of recoveries of tagged Lyon's Ferry Hatchery fall chinook in the ocean fishery, then over 95 percent of Clearwater fish rear off the coasts of Washington, Oregon, and California (Busack, 1991). They are subjected to intense fisheries in the ocean and in the lower Columbia River. Ocean and inriver harvest rates of wild Snake River fall chinook have decreased in recent years. For example, the 1988-1990 ocean harvest averaged 16.9 percent compared with 13.9 percent in 1991. Inriver harvest averaged 47 percent for 1988-1990, 27 percent in 1991, and 20 percent in 1992.

Table 3-3 Fall Chinook Redd Counts

Fall Chinook Redd Counts by Aerial Surveys, 1986-1995									
	Snake		Clearwater		Grande Ronde		Imnaha		
Year	Count	Percent of Total	Count	Percent of Total	Count	Percent of total	Count	Percent of Total	Total
1986					0				0
1987	59				7		1		67
1988	43	65%	21	32%	1	2%	1	2%	66
1989	47	81%	10	17%	0	0%	1	2%	58
1990	29	78%	4	11%	1	3%	3	8%	37
1991	41	84%	4	8%	0	0%	4	8%	49
1992	45	57%	26	33%	5	6%	3	4%	79
1993	59	40%	36	24%	49	33%	4	3%	148
1994	51	50%	37	36%	15	15%	0	0%	103
1995	41	49%	20	24%	18	22%	4	5%	83
Average (1988-1995)	44.5	63%	19.75	23%	11.1	10%	2.5	4%	77.9

Snake River counts 1987-1993: Rondorf, C.W. and K.F. Tiffan. 1994 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 Ene
Bonneville Power Administration, Division of Fish and Wildlife. Project Number 91-029, Contract Number DE-AI79-91BP21
Snake River Counts 1994-1995: Aaron Garcia, IFRO, Personal Communication. 1996.
Clearwater River Counts 1988-1995: Bill Arnsberg, NPT - Personal Communication. 1996.
Grande Ronde and Imnaha River Counts 1986-1995: Aaron Garcia, IFRO, Personal Communication. 1996.

There is no evidence that Snake River fall chinook are subdivided into multiple subpopulations as appears to be the case for spring chinook (Waples, et al., 1991). Even under pristine conditions, the Clearwater River fall chinook population was probably not subdivided since spawning and rearing habitat in the Subbasin is unfragmented. It is probable, however, that early spawning fall chinook spawned higher up in the drainage than late-arriving spawners.

3.6.2.2 Steelhead

Clearwater River steelhead are divided into two life history types that are differentiated by genetic, morphological, and run timing differences. A-run steelhead return to the drainage in the fall and spawn in small, lower elevation streams in the late winter and early spring. The larger-bodied B-run steelhead return in the fall or the spring and spawn in medium-size, higher elevation streams from March to June. Most of the B-run fish are destined for the Lochsa and Selway river drainages.

Juvenile steelhead rear in a variety of habitat types, moving into progressively faster and deeper water as they increase in size. Highest densities are found in moderate-to-steep gradient stream channels. In Idaho, if a stream is at carrying capacity, densities of steelhead smolts could be expected to range from 10 fish/100 m^2 in excellent habitat to 3 fish /100 m^2 in poor habitat (NPT and IDFG, 1990). Steelhead smolt after one to three (typically two) years of stream residency; the length of time depends on growing conditions. A small percentage of juvenile steelhead do not smolt and remain lifetime residents in freshwater. The smolt outmigration period extends from mid-March to June. Steelhead spend one to two years (A- and B-run fish), and sometimes three years (B-run fish) in the ocean before returning to freshwater. Repeat spawning, a relatively common occurrence among coastal populations of summer steelhead, is uncommon among Snake River steelhead.

Although the indigenous strain of steelhead remains intact and scattered throughout the Clearwater system, wild fish have declined in number and are less widely dispersed than in former times. Most of the steelhead that spawn naturally are wild fish; few if any hatchery fish contribute to natural production. Runs of naturally-spawning adult summer steelhead to the Subbasin have ranged from a low of near 1,000 in 1975-77 to a high of 8-9,000 in 1982-83 (NPT and IDFG, 1990). Approximately 2,700 and 1,000 B-run steelhead are estimated to have passed Lower Granite Dam in the 1994-95 and 1995-96 run years (IDFG data). The percentage going into and spawning in the Clearwater and Salmon river subbasins is unknown.

3.6.2.3 Cutthroat Trout

The westslope cutthroat trout is common throughout the Clearwater River Subbasin, particularly in smaller tributaries higher up in the system. Both non-migratory (resident) and migratory (***adfluvial***) forms of westslope cutthroat trout are present. The resident form is the more common of the two. They spawn, rear, and complete their life cycle within a limited geographic range, usually in headwater reaches upstream of barriers to anadromous fish. Densities of cutthroat from streams characterized as having strong populations, average 2-10 per 100 m^2 (Rieman and Apperson, 1989).

Adfluvial cutthroat spawn and rear for two or three years in natal streams, then migrate to main rivers (or lakes) where food is more plentiful to spend most of their adult lives. This life history type is most likely to overlap and compete with chinook and other anadromous fish for food and space.

Westslope cutthroat are considered to be a *Species of Special Concern* by IDFG and a *Sensitive Species* by the USFS. The species is sensitive to habitat modification, needing clean gravel and water to spawn and incubate. Westslope cutthroat are easy to catch, and so are prone to over-harvest. They also readily reproduce with similar-sized rainbow trout and other subspecies of cutthroat trout.

3.6.2.4 Bull Trout

This member of the genus *Salvelinus* is distinguished by being a large fish-eating predator with an adfluvial life history. They have comparatively narrow habitat preferences, and are long lived, highly mobile, and have been targeted in a fishing program because they eat other fish. Historically, bull trout ranged throughout the upper Clearwater drainage downstream of migration barriers. They prefer to spawn and rear in localized areas, in small, cold, high altitude streams. As juveniles, bull trout coexist with cutthroat and brook trout, but they are a relatively minor component of the assemblage. Densities from streams where the alternatives would occur are less than one fish/100 m^2. As they grow in size, they prefer larger stream or river habitats and feed on juvenile chinook and other small fishes. Young chinook, steelhead and cutthroat are common in their diets. After reaching sexual maturity (5-8 years), bull trout return to spawn in natal streams. Mature bull trout reside in mainstem reaches at least as far downstream as the Middle Fork Clearwater near Kooskia, Idaho. Some fish move into the lower ends of small tributaries in the summer to avoid higher mainstem temperatures.

Like cutthroat, bull trout are also listed as a *Species of Special Concern* and a *Sensitive Species*. They risk hybridization with brook trout because they can be close in size and spawn in the same habitats in the fall. The result is sterile offspring, and loss of genetic contribution from all adults. Bull trout require very cold, clean waters to spawn, and both of these characteristics can be altered by riparian timber harvest and road building.

In June 1997, the USFWS proposed the bull trout for listing as threatened in the Columbia River. The USFWS is now taking public comment on the proposed listing. No formal federal restoration effort has yet been developed. A description of the relationship of the state of Idaho's bull trout conservation plan with NPTH is presented below.

Idaho Governor Phil E. Batt proposed a State of Idaho Bull Trout Conservation Plan in 1996. The conservation plan focuses on bull trout recovery within select key watersheds. Most NPTH treatment and control streams (with the exception of Lolo and Eldorado Creek) are within sselect key watershed areas. Principal conservation activities have not yet been developed, but the plan indicates that they will focus on alleviating human-caused habitat related impacts such as sediment sources, loss of bank cover and stability, migration barriers and poaching. The plan states that the loss of anadromous fish runs has led to a lack of prey for bull trout. Consequently, supplementation of chinook could increase that prey base serving to enhance bull trout populations.

3.6.2.5 Brook Trout

Though well-established today in the upper reaches of many Clearwater tributaries, brook trout are not native to the drainage. They were deliberately introduced into the Clearwater River system over 50 years ago. The temperature preferences of brook trout relegate them to headwater reaches, essentially the same areas occupied by cutthroat and juvenile bull trout. They tend to be more abundant in moderate to low gradient channels, particularly in degraded watersheds. Huntington (1995) reported a mean density of about 3 brook trout/100 m^2 in channels in these watersheds.

3.6.2.6 Mountain Whitefish

The mountain whitefish is distantly related to salmon and trout, belonging to the subfamily *Coregoninae* of the family *Salmonidae*. In terms of biomass, this rapidly growing, mobile species dominates the fish assemblage in many mid-to-upper elevation rivers in the Clearwater River Subbasin. Large schools of adult whitefish, often numbering in the hundreds, migrate between overwintering habitat, summer feeding stations, and fall spawning areas on an annual basis (Pettit and Wallace, 1975). Whitefish spawn en masse, without digging redds, in low gradient riffles in October through December. Juveniles rear individually or in small groups in nursery streams. They feed primarily on bottom-dwelling organisms, which limits competition with chinook and steelhead. As they grow larger, they disperse downstream to occupy the pools and deeper water in lower tributary mainstem reaches. Whitefish provide a modest winter fishery.

3.6.2.7 Other Species of Fish

Sculpins of all sizes (maximum length approximately 150 mm [6 inches]) are found throughout the Clearwater River Subbasin. Their body shape and bottom orientation make them well suited to life in higher velocity runs and riffles of small to medium-size streams. Sculpins are omnivorous; larger individuals readily prey on post-emergent chinook and other small fish trapped in confined spaces.

Longnose dace are a common inhabitant of all but the smallest streams in the subbasin. Large numbers of young dace can be readily located in low velocity, depositional areas (e.g., backwater pools) near the stream's margin. Larger dace (up to 140 mm [5.6 inches] or so) are solitary nomads; they gradually take up residence in fast water, mid-channel habitats where they scour the stream bed in search of food.

Northern squawfish, largescale suckers, bridgelip suckers, smallmouth bass (non-native), and redside shiners are found in varying degrees of abundance in the lower river, but are less common in areas containing high densities of juvenile salmonids other than fall chinook salmon. The proximity of Lower Granite reservoir may contribute to higher densities of these species in the lower Clearwater River. Of these species, squawfish and smallmouth bass are significant predators, and redside shiners are significant competitors, of juvenile chinook salmon.

White sturgeon are relatively common in Lower Granite Reservoir and in free-flowing reaches of the Snake River so they probably occur in limited numbers in the lower Clearwater River. Although no data are available, it is likely that small numbers of subadult sturgeon move into the lower Clearwater in search of food. Sturgeon are primarily bottom feeders, but larger fish may prey upon smaller fishes, such as subyearling fall chinook salmon.

Pacific lamprey were at one time distributed widely in the Clearwater River and constituted a major source of food for the Nez Perce Indians. Large numbers of adult lamprey were observed in the Lewiston Dam fish ladder during early years of observation (Schoning, 1940). Although accurate estimates of population numbers are unavailable, the general consensus is that lamprey populations in the Columbia and Snake rivers have declined significantly. Mainstem dams and degradation of spawning and rearing habitat are thought to be major causes for the decline.

The sedentary lamprey larvae remain buried for five or more years in soft substrate, slackwater areas in the main channel and low elevation tributaries before metamorphosing and emigrating to the ocean in the spring. They spend 12 to 20 months in the ocean living as parasites on other fish before entering freshwater in April to August. Lampreys mature sexually over winter and spawn from April to July.

3.6.3 Existing Condition of Fisheries

The geographic location of the affected environment for this document is confined to the Clearwater River Subbasin, specifically, the mainstem rivers: Clearwater, Lochsa, Selway and South Fork Clearwater; and the tributary streams proposed for outplanting spring chinook. Because they are anadromous species, chinook salmon would interact with a host of species during their migratory journey. After leaving the Clearwater, the effects of the fish produced by implementing the action alternatives would be mingled with those of all other wild and hatchery produced salmon and steelhead.

3.6.3.1 Tributary Streams (Spring Chinook Habitat)

Most, if not all, of the spring chinook salmon indigenous to the Clearwater River are believed to have been eliminated by Lewiston Dam. Fulton (1970) stated the dam prevented passage during the 14 years 1927-1940, until a new fishway restored passage in 1940. Spring and summer chinook were counted in only 3 years prior to 1950 (Holmes, 1961). Those counts were 311 chinook in 1928, 102 chinook in 1929 and 7 chinook in 1930. Once counting at Lewiston Dam was resumed in 1950, counts of spring chinook for the next seven years ranged from only 7 to 63 fish. Considering the vast size of the Clearwater River Subbasin, this small number of fish must have been strays (Cramer and Neeley, 1992).

Efforts to reintroduce spring chinook into the Clearwater River began in 1947 with the outplanting of juvenile chinook reared from eggs obtained from wild Salmon River stock. Between 1961 and 1987, nearly 50 million spring chinook eggs were outplanted into Selway and South Fork incubation channels (Horner and Bjornn, 1981; Chapman, et al., 1991). An additional 7,300 hatchery spring chinook adults and over 20 million hatchery spring chinook fry, fingerlings, and smolts were outplanted into natural production areas during the same time period. The adults were surplus broodstock from Rapid River and Kooskia hatcheries released in the South Fork drainage. The eggs and juveniles were obtained from several within-basin and out-of-basin sources, including adults of mixed parentage that were trapped at Bonneville Dam, wild adults from various Salmon River populations, and hatchery adults returning to several Columbia Basin hatcheries, notably Rapid River, Dworshak, and Kooskia hatcheries. Hatchery production and supplementation since 1987 has emphasized the development of within-basin broodstock to encourage the establishment of locally adapted, self-perpetuating populations throughout the Subbasin.

Spring chinook returning to the Clearwater River Subbasin today originated from a hatchery, so the runs of naturally-reproducing adults are the result of those outplanting efforts. Annual returns of spring chinook to existing hatchery and satellite facilities in the Clearwater River Subbasin along with an estimated number of naturally-reproducing adults are summarized in Table 3-4. The wild return was derived from annual redd counts made in index areas of major watersheds. The adult spring chinook return at Dworshak and Kooskia was moderately strong in 1993 (2003 fish) but the 1994 and 1995 returns were the lowest on record. Although the 1995 basinwide redd count data has not yet been compiled, natural returns are as depressed as those to the hatcheries.

Wild populations, or at least sporadic aggregations of naturally-reproducing spring chinook salmon, presently occur in Lolo Creek, and in the Lochsa, Selway, and South Fork Clearwater river drainages (see Map 4). Table 3-5 presents the redd count data from the Lochsa, Selway and South Fork Clearwater since 1973.

NPTH Streams — There are 11 streams that would be specifically affected by the action alternatives. Ten of these are treatment and control streams; Meadow Creek would be used as a stream to evaluate release strategies (see Table 2-4).

Of the five NPTH streams slated for supplementation with spring chinook, only Lolo Creek and Newsome Creek have been surveyed for redds on a regular basis; Newsome Creek since 1974 and Lolo Creek since 1987 (see Table 3-6). Both streams have been supplemented heavily, so redd counts reflect both hatchery outplanting and natural production. Redd counts for Newsome Creek have ranged from a high of 55 in 1993 when adults from Rapid River Hatchery were outplanted in the stream, to several years of no returns. Redd counts for Lolo Creek have ranged from a low of 7 redds in 1994 to a high of 31 redds in both 1987 and 1988. Redd surveys were initiated on two of the NPTH treatment streams, Boulder Creek and Warm Springs Creek, in 1995 and no redds were found. Mill Creek was surveyed by NPT fish biologists in 1993, 1994 and 1995 and no redds were found.

Spring chinook redd surveys have also been conducted on a regular basis in two of the NPTH control streams, Eldorado Creek and Brushy Fork Creek. No spring chinook redds have been observed in Eldorado Creek since 1989, when spawner surveys were initiated. Redd counts for Brushy Fork Creek, which have been recorded since 1972, have ranged from 4 in 1994 to a high of 57 in 1993 (see Table 3-6).

Some measurements of juvenile salmonid densities have been made in all treatment and control streams (see Table 3-7). In most instances, steelhead are the predominant salmonid present with an average of about 5 fish/100 m^2. Of the streams to be outplanted with NPTH chinook, Boulder Creek, Fish Creek, Newsome Creek and Mill Creek contain comparatively high densities of juvenile steelhead. Densities of chinook are low in most areas (less than 1 fish/100 m^2) with the exception of Newsome Creek and Tenmile Creek, which were surveyed after they were outplanted with hatchery fish. Westslope cutthroat are the next most abundant fish species, averaging 1 fish/100 m^2. Bull trout and brook trout are more uncommon in mainstem habitats occupied by chinook. Data used for background purposes in compiling Table 3-7 were taken from stream surveys in larger habitat. Juvenile bull trout and especially cutthroat have a much greater relative abundance in the smaller tributary feeder streams.

Table 3-4
Estimated Spring Chinook Adult Returns
for the Clearwater River 1973-1994

Year	Dworshak	Kooskia	Red River	Crooked River	Powell	Total Hatchery	Redd #'s Index Areas*	Total Wild**	Total Clearwater
1973		50				50	354	5,206	5,256
1974		37				37	100	1,471	1,508
1975		221				221	33	485	706
1976		801				801	112	1,647	2,448
1977		3,023				3,023	167	2,456	5,479
1978		2,045				2,045	175	2,574	4,619
1976		382				382	32	471	853
1980		68				68	66	971	1,039
1981		268				268	86	1,265	1,533
1982		255				255	83	1,221	1,476
1983		365				365	45	662	1,027
1984	82	341	111			534	70	1,029	1,563
1985	334	529	126			989	83	1,221	2,210
1986	516	283	NA			799	77	1,132	1,931
1987	2,017	687	519			3,223	79	1,162	4,385
1988	1,972	595	394			2,961	95	1,397	4,358
1989	1,700	973	104		154	2,931	23	338	3,269
1990	2,042	1,141	53	29	179	3,444	37	544	3,988
1991	165	467	18	20	33	703	30	441	1,144
1992	370	312	39	228	270	1,219	49	721	1,940
1993	823	1,180	139	402	500	3,044	85	1,250	4,294
1994	74	232	31	26	86	449	22	324	773
Average	918	648	139	141	204	1,264	87	1,272	2,536

1973-1983 data from Lindland and Bowler, 1986.
Hatchery returns to Dworshak from Hatchery Evaluation Team. Dworshak-Kooskia NFHS. 1995.
Redd counts from 1982-1992 from Hassemer, 1993.
Redd counts for 1993-1994 from Elms-Cockrum, T., E. Leitzinger, and C. Petrosky. 1995.
*Redd Extrapolation data is from a regression estimate in Lindland and Bowler, 1986. (Redd #/0.068)
**Wild return is calculated by number of redds in index area divided by 0.068.

Table 3-5

Redd Counts in the Clearwater River Subbasin

Since 1973

Year	Selway River	Bear Creek	Running Creek	Whiteca-p Creek	Moose Creek	Selway Total	Crooked Fork	Brushy Fork	Lochsa Total	Newsome Creek	Crooked River	Red River	American River	South Fork Total	Clearwater Total
1973	261	26	NC	7	32	326	60	NC	60	NC	NC	NC	NC	0	396
1974	66	10	NC	2	15	93	22	6	28	3	5	12	NC	20	141
1975	21	5	NC	1	4	31	6	4	10	10	41	20	NC	71	112
1976	58	14	NC	4	15	91	36	13	49	5	13	15	NC	33	173
1977	97	18	NC	1	23	139	51	15	66	17	50	50	NC	117	322
1978	125	13	NC	NC	17	155	37	25	62	22	23	52	NC	97	314
1976	21	3	NC	2	4	30	6	12	18	9	4	20	NC	33	81
1980	40	7	NC	3	4	54	16	10	26	7	8	31	7	53	133
1981	47	8	NC	4	6	65	27	25	52	7	9	47	12	75	192
1982	38	8	NC	3	5	54	34	17	51	5	4	82	21	112	217
1983	26	8	NC	4	6	44	7	6	13	7	12	85	9	113	170
1984	30	6	NC	6	7	49	28	9	37	1	22	65	NC	88	174
1985	36	NC	NC	NC	NC	36	47	14	61	7	10	92	23	132	229
1986	30	10	NC	7	9	56	30	11	41	6	9	82	14	111	208
1987	36	9	4	6	8	63	28	10	38	15	17	81	31	144	245
1988	38	10	2	5	7	62	42	9	51	20	27	51	12	110	223
1989	5	7	0	3	3	18	8	9	17	4	3	45	1	53	88
1990	13	6	1	2	2	24	16	4	20	0	10	66	2	78	122
1991	12	8	0	1	2	23	9	1	10	0	NC	5	1	6	39
1992	18	9	0	0	2	29	22	1	23	0	NC	46	1	47	99
1993	33	13	0	5	10	61	34	29	63	64	27	43	75	209	333
1994	10	9	0	2	0	21	1	0	1	0	4	11	1	16	38
Average	48	9	1	3	9	69	26	11	36	10	16	48	15	78	184

NC means not counted.
1973-1984 from Lindland and Bowler (1986)
1985-1992 from Hassemer (1993)
1993-1994 from Elms-Cockrum, T., E. Leitzinger, and C. Petrosky. 1995.

Table 3-6
Chinook Salmon Redd Counts in
NPTH Treatment and Control Streams Since 1987

Stream	Year								
	1987	1988	1989	1990	1991	1992	1993	1994	Data Source
Boulder	NC	NC	NC	NC	NC	NC	NC	NC	
Brushy Fork A	10	9	9	4	1	1	29	0	1,6
Brushy Fork B	26	29	6	6	5	9	28	4	1,6
Eldorado	NC	NC	0	0	0	0	0	0	2,3
Fish	NC	NC	NC	NC	NC	NC	NC	NC	
Johns	NC	NC	NC	NC	NC	NC	NC	NC	
Lolo	31	31	24	25	14	19	24	7	2,3
Meadow	NC	NC	NC	NC	NC	NC	3	3	4
Mill	NC	NC	NC	NC	NC	NC	0	0	4
Newso-me	15	20	4	0	0	2	55	0	1,3,5
Tenmile	NC	NC	NC	NC	NC	NC	NC	NC	
Warm Springs	NC	NC	NC	NC	NC	NC	NC	NC	

NC = Not counted.
Brushy Fork A = Traditional trend analysis area.
Brushy Fork B = Counts conducted outside traditional trend analysis area.
Newsome Creek 55 redds in 1993 are from adult outplant.
Sources:
1. Hassemer, P.F. 1993. Salmon spawning ground surveys, 1989-1992. Project F-73 - R-15. Idaho Department of Fish and Game.
2. Murphy, Pat. U.S.F.S. Clearwater National Forest. 1995. Personal communication. Table 2. Six ye comparison of spring chinook redd counts in the Lolo Creek Drainage 1987-1992.
3. Hesse, J.A. and B.D. Arnsberg. 1994. Salmon supplementation studies in Idaho rivers. Annual Rep 1993.
4. Nez Perce Tribe. Unpublished data.
5. Arnsberg, B.D. 1993. Salmon supplementation studies in Idaho rivers. Annual work summary.
6. Elms-Cockrum, T., E. Leitzinger, and C. Petrosky. 1995. Salmon spawning ground surveys, 1994. Idaho Dept. of Fish and Game Report IDFG 95-38.

Potential Production — Potential production, that is, the capacity of a stream to produce fish under existing or future conditions, was estimated by applying the Smolt Density Model (***SDM***) developed by the Northwest Power Planning Council (Monitoring and Evaluation Group, 1989), to habitat data compiled for the Clearwater River system. For each stream segment, the SDM calculates the total surface area of habitat available for chinook (and steelhead) parr, and uses an adjustment factor that takes habitat quality and use into account to convert habitat surface area to number of parr. Estimates are summed across stream segments to estimate total stream production. Parr abundance is often converted to smolt yield by applying a suitable parr-to-smolt survival rate.

The SDM was applied to all NPTH spring chinook streams to estimate the number of spring chinook parr and smolts that might conceivably be produced under existing conditions if all available habitat were fully used. Results for NPTH streams are presented in Table 3-8. The number of chinook that might be produced by all treatment streams is similar to what might be produced by control streams; however individual streams vary widely in production potential due to their size and accessibility to anadromous fish. Stream carrying capacities range from 17,000 to 157,000 spring chinook smolts. The percentage of the calculated carrying capacity presently used by juvenile spring chinook, based on recent parr density data, ranges from 0-9 percent.

As is true of <u>most</u> salmon-bearing streams in Idaho, the amount of rearing habitat available to juvenile chinook in the Clearwater River Subbasin far exceeds current levels of use. For example, chinook parr densities in Lolo Creek for the 5-year period ending in 1989 averaged only 26 percent of carrying capacity, though the stream was heavily supplemented at the time. Spring chinook parr densities in the Lochsa and Selway subbasins over the same period were estimated to be 8 percent and 2 percent, respectively, of carrying capacity (Scully and Petrosky, 1991).

3.6.3.2 Mainstem Rivers (Fall Chinook Habitat)

Anecdotal evidence suggests that a late spawning race of chinook salmon, most likely fall chinook, were indigenous to the Clearwater River Subbasin. But because of the Lewiston Dam, lack of biological study, and effects of the turn of the century commercial fishery downriver, the characteristics of the run are unknown. The biologist R.W. Schoning reported that the Clearwater River historically supported runs of fall chinook (Schoning, 1940). He recounts conversations with Lewiston residents who observed chinook trying to ascend Lewiston Dam as late as mid-October or remember spearing fall chinook in the

Table 3-7

Juvenile Salmon Densities from NPTH Treatment and Control Streams

Fish Density (#/100 square meters)							
Stream	**Chinook**	**Trout Fry**	**Rainbow Steelhead**	**Cutthroat**	**Bull**	**Brook**	**Data Source**
Boulder		2.53	15.41			0.35	1,2
Brushy Fork	2.34	6.20	1.70	0.10	0.18		3
Eldorado	0.16	1.70	1.08	2.17			4
Fish	0.02	5.22	9.28	0.82			5
Johns	0.03	3.95	4.33	0.35			6
Lolo	0.96	3.06	1.69	0.91		0.02	7,8
Lolo (Yoosa)	0.16	1.41	1.87	2.63		0.03	9
Lolo (Camp)		1.80	2.50	1.54		3.40	9
Meadow	0.67	0.37	1.96	0.32			10
Mill	0.03	6.85	7.54	1.90			11
Newsome	16.10	2.91	9.77	0.31	0.07		12
Tenmile	3.94	1.78	4.80	0.04	0.02		13
Warm Springs	0.51	2.35	2.56	1.03	0.08		14

* In determining existing population estimates, the densities from recent stream surveys were used. Numbers from all habitat types (e.g. pool, riffle, and were combined for an average density. Because of inconsistencies in data reported, all rainbow steelhead, cutthroat, bull trout, and brook trout fry were combined in a single "fry" category. All fish aged 1,2,3, and older were combined into a single species category. Densities were taken from stream surv conducted in areas accessible to spring chinook.

Sources:

1. Clearwater BioStudies, Inc. 1993. Habitat conditions and salmonid abundance in Boulder and Huckleberry Creeks, Lochsa Ranger District, Summer
2. Clearwater BioStudies, Inc. 1994. Habitat conditions and salmonid abundance in the upper Boulder Creek Drainage, Lochsa Ranger District, Summer1994.
3. Clearwater BioStudies, Inc. 1993. Habitat conditions and salmonid abundance in Brushy Fork Creek, Powell Ranger District, Summer 1993.
4. Clearwater BioStudies, Inc. 1993. Habitat conditions and salmonid abundance in Eldorado Creek, Pierce Ranger District, Summer 1992.
5. Clearwater BioStudies, Inc. 1993. Habitat conditions and salmonid abundance in the Fish Creek Drainage, Lochsa Ranger District, Summer 1993.
6. U.S.F.S. Nez Perce National Forest. 1991. Draft 1991 Johns Creek Survey.
7. Inter-fluve, Inc. 1993. Lolo Creek, final habitat typing report. Prepared for Bureau of Land Management Cottonwood Resource Area.
8. Clearwater BioStudies, Inc. 1993. Habitat conditions and salmonid abundance in Lolo Creek, Pierce Ranger District, Summer 1993.
9. Clearwater BioStudies, Inc. 1993. Habitat conditions and salmonid abundance in Yoosa and Camp Creeks, Pierce Ranger District, Summer 1992.
10. IDFG database for 1988-1994 at two sites.
11. U.S.F.S. Nez Perce National Forest. 1990. Draft 1990 Mill Creek Survey.
12. IDFG database for 1987-1992 at four sites.
13. IDFG database for 1985-1994 at two sites.
14. IDFG database for 1989-1994 at the mouth of Warm Springs Creek.

Table 3-8

Potential Spring Chinook Adult, Parr and Smolt Production under Existing Conditions and Percent of Available Habitat Presently Used in NPTH Experimental Streams

Stream	Adult Spawners	Parr Capacity	Smolt Capacity	Percent Utilized
Treatment Streams				
Lolo Creek (1)	637	234,989	157,443	4
Mill Creek	193	N/A	N/A	N/A
Newsome Creek	108	71,367	47,816	0
Boulder Creek	268	98,889	66,256	0
Warm Springs	69	25,303	16,953	1
Total Production Potential	**1,275**	**430,548**	**288,468**	
Control Streams				
Eldorado Creek	263	97,194	65,120	0
John's Creek	136	50,235	33,657	0
Tenmile Creek	163	60,313	40,410	9
Fish Creek	460	169,718	113,711	0
Brushy Fork Creek (2)	316	116,590	78,115	7
Meadow Creek	1,347	497,182	333,112	1
Total Production Potential	**2,685**	**927,730**	**621,580**	

Predicted by the Smolt Density Model (MEG, 1989). Adult spawners back-calculated from Smolt Density Model. Percent utilized estimates were provided by the NP
(1) Does not include Eldorado Creek
(2) Includes Spruce Creek

Selway River just before freeze up in years prior to dam construction. Interviews with NPT members who observed fishing or fished for salmon themselves in the Clearwater River before Lewiston Dam was built also indicate that chinook salmon supported a viable aboriginal fisheries well into November (Lane, et al., 1981).

As with spring chinook, egg-incubation channels were used as the primary method for reintroducing fall chinook to the Clearwater River Subbasin. Between 1960-1967, over 6 million eyed-eggs were planted in hatching channels in the lower Selway River near Selway Ranger Station (Cramer, 1995a). An additional 550,000 fall chinook fry were outplanted into the Middle Fork Clearwater in 1967 and some 300,000 eggs were placed in Warm Springs Creek in the upper Lochsa River in 1960 and 1961 (NPT and IDFG, 1990). All but 700,000 of the eggs were from lower Columbia River origin (Spring Creek Hatchery). The reintroduction efforts were discontinued in 1968 due to insignificant returns (Hoss, 1970). The poor returns of fall chinook are not at all surprising, given that a lower Columbia stock was used for brood source and was probably poorly adapted for survival in the Clearwater basin (Cramer, 1995a). The one year that Snake River stock were used did produce some adult returns, 122 fish (Richards, 1967). Additionally, predation and silting at the hatching channels reduced success of emerging fry (Cramer, 1995a).

Fall chinook counts were discontinued after the removal of Lewiston Dam in 1973. No further estimates of fall chinook abundance were obtained until 1988 when Nez Perce and USFWS biologists began to conduct annual aerial spawning surveys. Since then, an average of 20 redds per year have been counted in the Clearwater River (See Table 3-9). The redds are distributed rather evenly from the confluence of the North Fork to the confluence with the Snake, with the greatest number found on the island just upstream of Cherrylane (Arnsberg, 1996).

NPTH Mainstem — The mainstem Clearwater River serves as a migratory corridor and holding area for adult anadromous salmonids. Adult steelhead occupy the mainstem river from October until May. Spring chinook travel through the river rather quickly, but will occupy deeper holes in their spawning streams from July through September. Fall chinook will linger in the lower mainstem in October, November and December.

The mainstem Clearwater River also provides overwinter and early rearing habitat for salmon and steelhead. From evidence found in outmigration studies, a significant portion of the juvenile steelhead and spring chinook occupy the mainstem river from November until smolting in the spring. Fall chinook incubate and spend 1-3 months in the mainstem river before beginning their downstream migrations. During the summer, most salmonids are absent from the mainstem. Water temperatures become too warm in lower reaches of the Clearwater River to permit high rates of growth

Table 3-9
Fall Chinook Redds Counted in the Clearwater River 1988-94

Year	Number
1988	21
1989	10
1990	10
1991	4
1992	26
1993	36
1994	37

* 1988 - 1993 from Biological Assessment - South Fork Clearwater River. USFS, Nez Perce National Forest.1995.
* 1994 from Bill Arnsberg, NPT. Personal communication.

and survival. In addition, juvenile salmonids do not fare well in association with warmwater fish species, many of which compete for the same resources or prey upon smaller salmonids.

The fish component of the mainstem Clearwater River has been evaluated in recent studies by the Nez Perce Tribe (Connor, 1989, and Arnsberg, et al., 1992). Connor (1989) reported that, in 1989, chinook parr were uncommon. Steelhead parr and residualized hatchery smolts were more abundant, but still in the low range (less than 1 fish/100 m^2). Redside shiners, largescale suckers and mountain whitefish were the most abundant species observed in their study.

Arnsberg, et al. (1992) found higher chinook and steelhead densities in 1990, but still less than 0.5 fish/100 m^2. Redside shiners were the most abundant species, with whitefish and suckers being the next most abundant. They reported that whitefish and suckers outnumbered all juvenile salmonids by 10 to 1 in 1898 and 1990.

Some habitat use data was compiled by Connor (1989). The residualized steelhead hatchery smolts were observed in high velocity areas, close to the bottom and shallower depths (around 1.2 m [4 ft]). The young shiners occupied low velocity areas adjacent to the slow water. Largescale suckers selected moderate velocity areas, deeper in the river and whitefish selected positions near the bottom in water less than 1 m (3.3 ft) deep.

Potential Production — The potential production of large river habitats is more difficult to assess than for smaller. There are no reliable ways of determining existing or potential densities in a river habitat, or measuring the amount of habitat available. Computer model simulations have been used to predict the amount of habitat area for spawning and rearing salmon in river habitats at different flows, and information on the Clearwater River comes from such studies. Arnsberg, et al. (1992) reported modelling that indicates the lower mainstem Clearwater River can provide habitat for as many as 90,000 chinook salmon redds, which they also believe is an overestimate. But if a more realistic accounting of spawning area could support even half that amount, the production potential in the Clearwater would be enormous. Assuming there are 45,000 redds, with 4,000 eggs per redd, and that a quarter of those survive to smolt, a rough estimate is that as many as 45 million chinook smolts could be produced in the lower river. Arnsberg, et al. (1992) reported that the habitat modelling shows the river does not have a large amount of fry habitat because of the high velocities. But fry from large river spawners, such as fall chinook, migrate during their first year anyway. Larger rivers are underseeded now and the potential for production for a subyearling migrant is vast.

3.7 Wildlife

Wildlife that use riparian habitats in the area can be divided into seven major groups: waterfowl, upland game birds, raptors, aquatic furbearers, big game, other wildlife groups, and threatened, endangered, and U.S. Forest Service designated sensitive species. Each group is discussed in this section.

3.7.1 Waterfowl

The proposed sites at Cherrylane on the lower Clearwater River, Cedar Flats on the Selway River and Luke's Gulch site on the South Fork Clearwater River are near riparian habitats used by waterfowl. Because of warmwater temperatures, waterfowl use the islands upstream (Fir Island) and downstream (Cottonwood, Turkey, and Hog Islands) of the Cherrylane site for nesting. Wintering waterfowl, mostly Mallard ducks and Canada geese, are the most abundant wildlife in these habitats (Asherin and Orme, 1978). Waterfowl also use the riparian habitats in upriver tributaries occasionally and during migrations.

3.7.2 Upland Game Birds

Upland game birds such as ring-necked pheasant, mourning doves, chukar partridges, and valley quail occasionally use the riparian habitats near the Cherrylane, North Lapwai Valley, and Sweetwater Springs sites (Asherin and Orme, 1978). Riparian vegetation in the lower Clearwater and Salmon rivers provide nesting cover and winter food sources for game birds. Blue and ruffed grouse make transitory use of upland riparian habitats associated with the spring chinook satellite facilities. The Cherrylane, North Lapwai Valley, and Sweetwater Springs sites have been previously disturbed and much of the bird habitat has been altered by agricultural activities and existing fish hatchery facilities.

3.7.3 Aquatic Fur Bearers

Aquatic fur bearers such as beaver, muskrat, fisher, mink, and river otter occur in the lower Clearwater River corridor and in upland watersheds. In general, these animals depend on riverine areas, bays, ponds, tributaries, and riparian forests for den sites and foraging areas. Water barriers around den sites provide essential protection from predators. Beaver and river otter are common in the Lolo-Eldorado watersheds. Beaver distribution is strongly related to the presence of riparian food sources such as cottonwood trees and willows plus protected areas such as sloughs, inlets, and ponds (Asherin and Orme, 1978). Mink and river otter use slackwater habitats for foraging and denning. Otters can be expected to occur near all sites associated with NPTH. Fishers generally use mid-to-late successional forests and riparian zones. These forest types have multilayered canopies which help regulate temperatures and provide suitable denning sites (cavities and downed logs).

Riparian zones serve as dispersal and travel corridors as well as an ample prey base (Jones, et al., 1994). Fishers might be expected in the streams used for treatment and control.

3.7.4 Big Game

Big game species such as white-tailed deer, mule deer, elk, black bear, cougar, and moose occur in the program area. These species sometimes use riparian corridors to move between summer and winter ranges and can use the sites for calving and fawning. Moose are often observed foraging in riparian areas and are expected at Cedar Flats, Meadow Creek, Newsome Creek, and Yoosa/Camp Creek sites. During severe winters, riparian habitats can provide cover necessary for survival. In the lower Clearwater River Valley and South Fork Clearwater, low densities of animals are expected because of development. However, during the winter, deer are common near Cherrylane, Sweetwater Springs, Cedar Flats and the South Fork Clearwater.

3.7.5 Raptors

According to Asherin and Claar (1976) and Asherin and Orme (1978), riparian forests and wetlands along the Columbia, Snake, and Clearwater rivers provide perching and nesting opportunities and concentrated prey for up to 24 raptor species. Of these, only the osprey, northern harrier, and bald eagle are directly associated with riparian and wetland habitats. The bald eagle is discussed in Section 3.7.7, **Threatened and Endangered Wildlife**.

Osprey nest along the corridors of the Clearwater, Lochsa, Selway and South Fork Clearwater rivers, and although there may be some transitory use of tributaries of the mainstem rivers, osprey are not known to nest there. They are associated more with large bodies of open water. Large ponderosa pine and cottonwood trees provide nesting and roost sites. Fish populations of the mainstem rivers provide a forage base for the osprey.

Harriers such as the marsh hawk use meadow areas near the satellite facilities located in Lolo, Eldorado, Yoosa, and Meadow creeks (South Fork Clearwater River). These birds feed mostly on rodents (Asherin and Orme, 1978).

3.7.6 Other Wildlife

Other riparian-dependent species use the habitats of the lower Clearwater River corridor and upland watersheds. Blue heron, kingfishers, dippers, and raccoons are the more predominant species. Blue heron forage and nest along mainstem rivers. Occasionally, they are observed in the larger tributaries of the upland drainages. Kingfishers, dippers, and raccoons use the riparian and stream habitats of tributaries. Kingfishers and dippers are common in all tributaries of the area. They forage on aquatic insects and fish and nest in streambanks or nearby slopes. Raccoons also frequent the stream and riparian habitats of the tributaries and forage on fish and mussels found in the tributary streams.

3.7.7 Threatened and Endangered Wildlife

The bald eagle, a species listed as threatened by the U.S. Fish and Wildlife Service, is known to inhabit the mainstem corridor of the Clearwater, lower Selway, and South Fork Clearwater rivers (Asherin and Orme, 1978) and are commonly observed on Fir Island just upstream from the Cherrylane site. Bald eagles use the mainstem corridor during the winter, which provides suitable winter habitat in the form of perch sites, roost sites, and access to prey. There are no known nesting or roosting trees at other sites (Asherin and Orme, 1978; Davis, 1994; Blair, March 1995), and eagles are not known to frequent the upland tributary networks to any significant degree. These watersheds are small and usually frozen-over during winter.

Other federally-listed wildlife species found or potentially occurring in upland tributary watersheds are the grizzly bear (threatened), peregrine falcon (endangered) and the gray wolf (endangered). These species historically used the lowland and upland habitats of the area. There have been no confirmed reports of grizzly bears on the Clearwater and Nez Perce National Forests since 1956 (Davis, 1994 and Blair, 1995). The Selway Bitterroot Wilderness, located in the Lochsa and Selway river watersheds, will be the likely proposed recovery area for the bear and the recovery area will be determined after release of the Final EIS for the grizzly bear recovery. The greatest potential impacts to the grizzly bear resulting from land/resource management activities would result from an increase in road density, substantial increase in human activity within a previously undisturbed habitat, reduction of forage, or directed hunting activities.

The peregrine falcon is found in the Snake and Salmon river drainages where it nests on cliff sites along the rivers or secondary drainages. Peregrines feed and winter in open country where prey concentrate, such as marshes and river bottomlands. Peregrines often depend on riparian habitats for food such as waterfowl, shorebirds and upland bird life (Bechard, Beig, and Howard, 1989). None of the proposed sites are considered probable nesting areas due to lack of suitable habitat.

The gray wolf has been listed as endangered on the Clearwater and Nez Perce National Forests. The U.S. Fish and Wildlife Service currently considers the gray wolf nonessential experimental status, according to Section 10(j) of the ESA of 1973, as amended. Nonessential experimental animals located outside national park lands and national wildlife refuges are treated for purposes of Section 7 of the Act as if they were only proposed for listing (*Federal Register*, November 22, 1994). (See Section 5.2, **Endangered and Threatened Species** for more information.)

The project area for the NPTH lies completely within the Central Idaho Experimental Management Area for the recovery of the gray wolf in Idaho. Gray wolves were captured in Canada in 1995 and 1996. Fifteen wolves were released in Idaho in 1995 and 20 wolves in 1996. As of March 12, 1997, 28 wolves released under experimental rules outlined in the Federal Register (Vol. 59, No. 224, Endangered and Threatened Wildlife and Plants; Establishment of a Nonessential Experimental Population of Gray Wolves in Central Idaho and Southwestern Montana, pp. 60266 - 60281), remain free roaming within the recovery area (Idaho Wolf Updates, 1997). Of the 28 collared wolves in the recovery area, eight were last known to be north of the Salmon River. One pair found in the upper North Fork drainage has a collared wolf that joined with a non-collared wolf. One animal is found in the Oriole Creek drainage on the Idaho-Montana border, and one is in the White Sands Creek area. One pair was in the upper Selway Creek area. Locations can vary from week to week.

All project sites located in the upper drainages of the Clearwater River could fall within the home range of these free roaming wolves, however, none of the listed project sites are known to have denning or rendezvous sites located near them.

3.7.7.1 Sensitive Species (U.S. Forest Service Designated)

Several sensitive species (including plants) are found in riparian habitats of the upland areas. Sensitive wildlife species that may frequent the riparian habitats of satellite sites are the Harlequin duck and the Coeur d' Alene salamander. Harlequin ducks have been observed in the Lochsa and Selway rivers and their larger tributaries. Harlequin ducks are diving ducks that winter along the Pacific coast and then migrate inland to nest along forested, mountain streams. Harlequin ducks prefer streams in canyons, or meandering and braided streams. They prefer dense riparian vegetation for cover (USDA, Swiftwater EIS, 1995) and undisturbed, pristine areas are considered prime habitat for Harlequin duck nesting and brood-rearing activities.

Harlequin duck observations on the Nez Perce National Forest are rare, and breeding has not been documented on the Forest (USDA, Swiftwater EIS, 1995). More frequent observations have been documented in the upper Lochsa River area. A breeding pair was observed about 1.6 km (1 mile) upstream from the mouth of Papoose Creek in 1992 (USDA, West Fork Papoose EIS, 1995). For the most part, harlequin ducks have been observed outside the areas where satellite facilities might be constructed.

Coeur d' Alene salamanders are known to occur on the Clearwater and Nez Perce National Forests (USDA, Orogrande EA, 1994 and Swiftwater Draft EIS, 1993). In fact, salamanders have been found along tributaries of the Selway River and the Meadow Creek (satellite site) drainage (USDA, Swiftwater Draft EIS, 1993). They have also been observed in the Lolo Creek watershed (Davis, 1994). These salamanders are typically associated with disjunct coastal biota of the Rocky Mountains primarily north of the Salmon River. The Coeur d' Alene salamander is most often observed in moist, forested areas at moderate elevations below 1500 m (4950 ft). Typical habitat features favored by the salamander are fractured bedrock or gravel, often under a dense tree canopy, near cascading water. Salamanders feed on aquatic and semiaquatic insects (USDA, Swiftwater Draft EIS, 1993). On the lower Selway River, the salamanders are found generally below 800 m (2640 ft) elevation in three major habitat types: spring seeps, waterfall spray zones, and riparian areas of small cascading creeks (USDA, Swiftwater Draft EIS, 1993).

3.8 Vegetation

For Your Information

*A **province** is an area of land less extensive than a region having a characteristic plant and animal population.*

The Clearwater River Subbasin is within two major subcontinental areas with broad similarities generally referred to as ***provinces***. Each province is made up of smaller areas that correspond to broad vegetation regions having fairly uniform climate. Upland vegetation in the Subbasin varies considerably between the two provinces. In the Semiarid Steppe Lowlands Province, which includes the stream breaklands and the Palouse and Camas prairies in the mainstem and South Fork Clearwater drainages, the climax vegetation ranges from grasslands with some ponderosa pine and Douglas fir to forests of grand fir, Douglas fir and ponderosa pine. Agriculture, forestry and residential development have drastically altered the upland vegetation in this province (NPT and IDFG, 1990).

The Columbia Forest Highland Province, which includes the Lochsa, Selway, upper South Fork and upper half of the Middle Fork Clearwater drainages, is divided into two sections. One section includes the breaklands along the drainage mainstem up to the mountains and includes climax vegetation of hemlock, cedar, grand fir, Douglas fir, spruce, subalpine fir and ponderosa pine. The other section consists of alpine ridges, peaks and glacier cirques and includes climax vegetation of subalpine fir, whitebark pine with inclusions of alpine meadows and alpine larch.

Past forest fires, especially from 1910 through 1934, have set back the vegetative succession in large areas of the Lochsa and Selway drainages. Today, brush fields are dominant on the south slopes in these burned areas. Timber harvest has also changed the upland vegetative conditions. Harvest has occurred and is planned in the lower Selway, South Fork, Middle Fork, and lower and upper Lochsa drainages (NPT and IDFG, 1990).

Riparian zones are found next to watercourses such as streams, rivers, springs, ponds, lakes, or tidewaters and represent the connection between terrestrial and aquatic environments. The riparian zone has vegetation that extends from the water's edge landward to the edge of the vegetative canopy (O'Connell, et al., 1993). The condition of the riparian vegetation in the Clearwater River Subbasin ranges from pristine in the Selway and Lochsa drainages to severely degraded and/or absent in parts of the mainstem and South Fork Clearwater drainages (Nez Perce Tribe and Idaho Fish and Game, 1990). Both natural phenomena such as forest fires and human activities such as road building and mining have degraded the riparian vegetation. The following sections describe general riparian vegetation conditions at the proposed facility sites.

3.8.1 Central Incubation and Rearing Facilities

3.8.1.1 Cherrylane

The Cherrylane facility site is a flat parcel on the south side of the Clearwater River. The site is developed agricultural land presently used for hay production. After the hay crops have been harvested, the site is used for fall pasture. Highway 12 runs along the length of the site and separates it from the Clearwater River. A narrow riparian zone exists along the banks of the Clearwater River across Highway 12 from the Cherrylane site. Riparian vegetation is dominated by black cottonwood with associated overstory species, including: box-elder, black locust, white alder, Coyote willow and Wood's rose. Weedy understory species include crab grass, reed canarygrass and horsetail.

3.8.1.2 Sweetwater Springs

The Sweetwater Springs site is vegetated with sparse black cottonwood, Ponderosa pine and Wood's rose. Bluebunch wheatgrass is the native understory grass though yellow star-thistle has invaded the area due to disturbance by livestock grazing. Cheat grass and bulbous bluegrass also are common.

3.8.2 Satellite Facilities

3.8.2.1 Luke's Gulch

The Luke's Gulch site is along the South Fork of the Clearwater River. Vegetation is dominated by black cottonwood, Ponderosa pine, Douglas fir, and hawthorn in the overstory growing up to the edge of the river. The understory is composed of grasses and forbs including reed canarygrass, horsetail, bluebunch wheatgrass, Kentucky bluegrass, cheat grass and common yarrow.

The hillside and flat bench at the base of the slope display seasonal wetland characteristics. Wood's rose and hawthorn dominate the slope overstory vegetation. The herbaceous layer on the hillside is dominated by moss and strawberry. The site was dry during the September site investigation, but approximately 0.2 to 0.4 ha (0.5 to l acre) of this area shows indications of a seasonal wetland resulting from apparent hillside springs or seeps.

3.8.2.2 Cedar Flats

The Cedar Flats site is along the Selway River. The site itself is disturbed and dominated by grass-like species. Riparian forest vegetation surrounds the site. The forest is dominated by western red cedar with minor amounts of grand fir, Douglas fir and Engelmann spruce in the overstory. Common shrubs are huckleberry, common snowberry and twinflower. Understory species include queencup beadlily, western goldthread, ladyfern, and arrowleaf groundsel. The site is in a USFS-designated Riparian Habitat Conservation Area.

3.8.2.3 North Lapwai Valley

Riparian vegetation is absent from the reach of Lapwai Creek bordering the North Lapwai Valley site. The creek has been channelized and the banks diked and lined with riprap. Cottonwood and willow are sparse along the creek. The fields next to the creek are in agricultural production.

3.8.2.4 Yoosa/Camp Creek

The Yoosa/Camp Creek site is an undisturbed, forested jurisdictional wetland covering an estimated 0.6 to 0.8 ha (1.5 to 2 acres). The dominant community type is western red cedar-ladyfern. These are wetland plants that satisfy the vegetation criteria for a ***jurisdictional wetland***. Associated species include grand fir, Engelmann spruce, mountain ash, willow, common snowberry, dogwood, Sitka alder, Devil's club, western thimbleberry, queencup beadlily, arrowleaf groundsel, star-flowered Solomon plume and pinegrass. The site is in a USFS-designated Riparian Habitat Conservation Area.

For Your Information

jurisdictional wetlands *are those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.*

3.8.2.5 Mill Creek and Newsome Creek

The Mill Creek and Newsome Creek satellite sites are along the South Fork Clearwater River drainage. Mining operations from the 1860s to the 1950s have damaged riparian zones at the Newsome Creek site so the vegetation is limited. Forest vegetation at these sites includes grand fir, Douglas fir, Engelmann spruce and western larch in the overstory; Pacific yew and fool's huckleberry, in the shrub layer; and queencup beadlily, wild ginger, beargrass, and star flowered Solomon plume in the herbaceous layer. The sites are in USFS-designated Riparian Habitat Conservation Areas.

3.8.3 Spring Chinook Direct Release Sites and Weir Sites

Spring chinook direct release and weir sites are located in the headwater drainages of Lolo Creek, and the Lochsa, Selway and South Fork Clearwater rivers. The condition of the riparian vegetation in these drainages ranges from natural in undeveloped watersheds to severely altered in drainages subjected to mining and timber harvest. Overall, riparian vegetation is in good condition at these sites.

3.8.3.1 Lolo Creek Sites

Two weir sites are located along Lolo Creek and Eldorado Creek, a tributary of Lolo Creek. Riparian vegetation along Lolo Creek is dominated by western red cedar. Associated tree species include Douglas fir, grand fir, and Engelmann spruce. Understory species include thimbleberry, dogwood, snowberry, ladyfern, arrowleaf groundsel and pinegrass.

3.8.3.2 Lochsa River Sites

Lochsa River sites include the Boulder Creek and Warm Springs Creek release and weir sites and three other weir sites in Fish Creek, Lake Creek, and Brushy Creek. Lochsa River riparian forest vegetation includes western red cedar, grand fir, Douglas fir and western larch in the overstory; and ninebark and other various shrubs in the understory. The herbaceous layer includes wild ginger, arrowleaf groundsel, queencup beadlily and pinegrass.

The Warm Springs Creek and Brushy Creek weir sites are upstream on the Lochsa River, northeast of the Fish Creek and Boulder Creek sites. Riparian forest vegetation at these sites includes grand fir, Douglas fir and Engelmann spruce in the overstory. Shrubs include common snowberry, prickly currant and Rocky Mountain maple. Understory species include queencup beadlily, ladyfern, arrowleaf groundsel and pinegrass.

3.8.3.3 Selway River Sites

The Meadow Creek release and weir site is in the southern Selway River drainage. Riparian forest vegetation at this site includes western red cedar, grand fir, western white pine and Engelmann spruce in the overstory. The most common shrub is fool's huckleberry. Understory species are queencup beadlily, western goldthread, ladyfern, and arrowleaf groundsel.

3.8.3.4 South Fork Clearwater River Sites

The Johns Creek and Tenmile Creek weir sites are along the South Fork Clearwater River drainage. Forest vegetation at these sites include grand fir, Douglas fir, Engelmann spruce and western larch in the overstory; Pacific yew, and fool's huckleberry in the shrub layer; and queencup beadlily, wild ginger, beargrass, and star flowered Solomon plume in the herbaceous layer.

3.8.4 Wetlands

Throughout the Clearwater River Subbasin, wetlands can be found in areas along streams and rivers. A high water table near streams and soils that are often saturated allow water-loving plants such as ladyfern, sedges, Devil's club, and willows to grow. Such habitats can extend through an entire drainage system from the smallest intermittent headwater streams to the large mainstem rivers.

Wetlands are found at two proposed sites. At the Yoosa/Camp Creek site, there is a forested wetland about 0.8 ha (2 acres). A perched water table causes the soils to be saturated for much of the growing season and vegetation is dominated by western red cedar and ladyfern.

At Luke's Gulch a perennial spring is upslope from the proposed site. Development of the site would require access road improvements across a seasonal wetland that receives surface water from the springs located on the hillside and a flat bench at the base of the slope. Vegetation is dominated by Wood's rose and hawthorn, and the herbaceous layer is dominated by moss and strawberry.

3.8.5 Threatened and Endangered Plant Species

Threatened and endangered plant species are native plants that have been given special status because of concern over their continued existence. Species in danger of extinction are classified as endangered. Species at risk of becoming endangered are listed as threatened. *Howellia aquatilis* (water howellia), listed threatened, is a federally-listed plant occurring in Idaho. <u>There is one documented location of a water howellia in Idaho, in Bonner County (Blair, 1997). In order to germinate, the plant requires seasonally ponded wetlands such as sloughs and oxbows which dry out in the fall (Kibbler, 1997). Potential impacts to this plant could result from direct removal during construction, application of herbicide or by changing the hydrology of the area.</u>

National Forest sensitive plant species could occur in the upland riparian areas of the Clearwater and Nez Perce Forests where satellite facilities would be constructed. Many of these species are found in and associated with riparian areas. However, USFS records indicate that no sensitive plants species are present on the proposed sites.

3.9 Land Use

The proposed Nez Perce Tribal hatchery facilities would be sited in a 8000 km^2 (3,200 mi^2) geographic area of north-central Idaho. This geographic area includes portions of Nez Perce, Lewis, Clearwater and Idaho counties. Program facilities would be developed on private lands, tribal lands, and public lands within the Clearwater and Nez Perce National Forests. Two spring chinook direct release sites are proposed within the Nez Perce National Forest and one in the Clearwater National Forest. Weir sites are proposed throughout both national forests. Most lands within these two national forests are under the control of the federal government, but private lands are also found within the forests' boundaries.

The Clearwater River Subbasin has evolved since the mid-1800s from exclusive Nez Perce Tribal occupancy to one of a number of political subdivisions that include incorporated and unincorporated communities, counties, national forests, the Nez Perce Reservation, and private property within what is now the state of Idaho. Major landholders in the Subbasin include the federal government with 60 percent of the land, private property owners with 32 percent, and the state of Idaho with 5 percent. Tribal and other lands comprise the remainder, approximately 3 percent. (See Table 3-10.)

Table 3-10

Land Ownership

Landowner	Percentage
Federal Government	60
Private	32
State of Idaho	5
Tribal Lands	1.5
Other	1.5
Total	100

Land use activities within the Subbasin include forestry, mining and grazing in the national forests and on private lands. Other land uses relate to farming and urban development. A well-developed transportation network serves the area.

Both the Clearwater and Nez Perce National Forests have adopted forest plans. These forest plans were developed in accordance with the National Forest Management Act (***NFMA***) of 1976. Forest plans are intended to guide all natural resource management activities within the forests and establish management standards as well as the suitability of lands for resource development. Forest plans are valid until revised, and typically commit forest managers to a course of action no longer than 15 years. The forest plans take state and local regulations into effect as well as federal law so as to avoid, or at least to minimize, potential conflicts with other agencies and plans. Both forest plans were adopted in 1987.

For Your Information

NFMA passed in 1976 as amendments to the Forest and Rangeland Renewable Resources Planning Act and requires the preparation of regional and forest plans and the preparation of regulations to guide that development.

Of the four counties in the program area, Clearwater County and Nez Perce County have comprehensive plans and zoning ordinances.

3.9.1 Central Incubation and Rearing Facilities

3.9.1.1 Cherrylane

The Cherrylane site is on private land. The site is in an unincorporated portion of Nez Perce County and is zoned in two zoning districts: Agriculture, 20-acre minimum (A) and Agriculture/Residential (A/R). Ninety-five percent of the property is located in Section 34, T37N, R3W, and is zoned A (20-acre minimum). The remainder of the property is in Section 35 and is zoned A/R, five-acre minimum (Ruse, December 1996). The 6 ha (14 acre) site is a portion of a larger tract of land in agricultural use. The property is currently being used to grow hay and is irrigated. Title to the property is held by Cherrylane Ranches, an Idaho Corporation. The proposed site is designated by the U.S. Natural Resources Conservation Service (***NRCS***) as prime farmland (see Section 5.6, **Farmland Protection Policy Act**).

Title to the parcel immediately west of the subject site is held by the Potlatch Cherrylane Seed Orchard Facility (Potlatch). Potlatch grows grafted conifer trees at this location to produce seeds for their reforestation program. To protect the cones containing the seeds from insect damage, Potlatch applies pesticides during the spring and summer months. These chemicals are currently applied from the air by helicopters. In addition, according to company representatives, other pesticides and herbicides are applied infrequently by ground spray as needed. Potlatch has requested assurance that the proposed hatchery facility would not prevent their use of pesticides and herbicides. In addition, the company has requested assurance that the Proposed Action would not affect the groundwater aquifer in a way that would jeopardize their water supply (Boling, June 1994).

3.9.1.2 Sweetwater Springs

The Sweetwater Springs site is on state-owned land in a portion of unincorporated Nez Perce County. The parcel is presently zoned AR (Agricultural-Residential, 5-acre minimum) by Nez Perce County. IDFG acquired the parcel in 1960. The site is currently being used by the Nez Perce Tribe to raise salmon.

3.9.2 Satellite Facilities

The proposed satellite facilities are spread throughout the Subbasin. These facilities, as they relate to land use, are discussed next.

3.9.2.1 Luke's Gulch

The Luke's Gulch site is on tribal land within unincorporated Idaho County. The proposed site is immediately adjacent to a parcel of private land, and is accessed by crossing this parcel over an existing easement. This adjacent property is unimproved but currently has a mobile home that is occupied infrequently.

3.9.2.2 Cedar Flats

The proposed Cedar Flats site is within the administrative area of the Selway Ranger Station within the Nez Perce National Forest. The proposed site lies on the north bank of the Selway River, which is designated as a *Recreational River* in the ***Wild and Scenic River System***. The site is about 11 km (7 miles) upstream from the Middlefork Clearwater River, and is accessed by Forest Service Road No. 223, a road that is open year-round. The site is in the Riparian Habitat Conservation Area of the Selway River, and is within Management Unit 8.2A. Management Unit 8.2A is managed for "...Outstandingly remarkable values and free-flowing river conditions as specified in the Wild and Scenic Rivers Act of 1968, as amended." The Nez Perce Forest has determined that some waterways within the forest are more important than others in maintaining the fishery/water quality objective, and protecting the fishery habitat of those waterways. With respect to the Selway River, at the proposed Cedar Flats site, the Forest Plan recommends maintaining the habitat potential at 100 percent, the most restrictive objective.

3.9.2.3 North Lapwai Valley

The North Lapwai Valley site is on tribal land in unincorporated Nez Perce County. The site is currently being used to grow grass hay.

3.9.2.4 Yoosa/Camp Creek

The Yoosa/Camp Creek site is in the Clearwater National Forest within Management Units E1 and M2. E1 is the largest management unit in the Forest, containing over a half million acres. The main emphasis of this management unit is to provide a sustained production of wood products and to maintain viable populations of big game and resident fish along with adequate protection of soil and water quality. Big game, primarily elk, are to be managed through limited road closures. Dispersed recreation and livestock grazing will be provided if found to be compatible with timber management goals. No timber sales are currently underway, but five timber sales are proposed during the next 5 years: Knoll Creek, Camp Creek, Relaskop Creek, Prism, and Snowy Summit. In addition, some not yet identified small salvage sales may be located upstream from the facility. The site is also in a Riparian Habitat Conservation Area.

The M2 Management Area is associated with riparian areas, wetlands, floodplains, etc. M2 consists of only those riparian areas in the Forest that are associated with specific management areas, including the E-1 Management area, that are suitable for timber management. The Forest Plan states that these narrow corridors (100-foot wide strips of land on either side of aquatic zones) should be considered an integral part of surrounding or adjacent lands. The Forest Plan states that riparian areas which exist in other management areas will be managed in accordance with the management direction for those management areas.

The Forest Plan contains a number of standards for facilities proposed within the M2 Management Area:

- requiring that drainage structures and erosion control measures be installed or constructed and reconstructed prior to the normal wet season;
- avoiding new construction near or adjacent to streams except specified crossings;
- designing mitigation measures that will effectively reduce sediment from road construction, use and maintenance; and,
- designing road fills, landings, tanker fills etc., that will maintain the functions of the riparian areas, including flood moderation, and prevent direct resource damage.

3.9.2.5 Mill Creek

The Mill Creek site is within the Clearwater District of the Nez Perce National Forest. The proposed site lies on the west bank of lower Mill Creek, and is designated as Management Unit 16C in the Nez Perce National Forest Plan. The purpose of Management Unit 16 is to increase usable forage for elk and deer on potential winter range. The fishery/water quality objective for this area (designated C) was to maintain a fishery habitat potential of 80 percent however, because chinook salmon are present, the Forest Plan fishery/water quality objective will be corrected from 80 percent to 90 percent (U.S. Department of Agriculture, Forest Service, Hungry Mill Timber Sales DEIS, 1993). No timber sales are currently underway in the management unit, but the Hungry Mill timber sale should occur within the next 10 years, and two grazing allotments are currently in effect, totaling 900 animals (cows and calves). The site is also in a Riparian Habitat Conservation Area.

For Your Information

*Visual Quality Objectives are explained in Section 3.11, **Visual Resources**.*

3.9.2.6 Newsome Creek

The Newsome Creek site is in the Nez Perce National Forest, within the riparian area of Management Unit 17B. Management Unit 17 is managed for timber production and other multiple uses on a sustained yield basis while meeting visual quality objectives of retention or partial retention. Two grazing allotments are currently in effect within the watershed, totalling 170 cow/calf pairs. No timber sales are being entertained at the present time until improvement of the stream conditions are evident. The *B* designation in the management unit means that the Forest intends to maintain a 90 percent fishery/water quality objective for fishery habitat in the management area. The site is also in a Riparian Habitat Conservation Area.

The Newsome Creek site is about 4 km (2.5 miles) from the Haysfork Gloryhole, an abandoned hydraulic placer mine that ceased operation in 1915. This gloryhole, also referred to as the Montana Placer, is the single largest sediment producer in the Newsome Creek watershed according to the USFS. It has been estimated that over 508 metric tons (500 tons) of sediment leave the gloryhole annually. The USFS has been attempting to trap the sediment and keep it from entering Newsome Creek since 1985. The agency has recently implemented a rehabilitation plan to keep sediment out of the creek. The project involves maintaining and reinforcing existing sediment traps to prevent sediment from reaching the waterway. The rehabilitation of the gloryhole is necessary to reduce the potential for a major catastrophic event, according to the USFS. This proposed project was scheduled to be completed in 1996, but because of weather-related delays, work will continue in summer 1997.

Although the Haysfork Gloryhole has been abandoned, mining continues on a smaller scale in the streams of the area.

3.9.3 Spring Chinook Direct Release Sites and Weir Sites

Three spring chinook direct release sites are proposed within the Clearwater and Nez Perce National Forests. These sites are within Boulder, Warm Springs and Meadow creeks.

Boulder Creek drains an area of 14 000 ha (57 mi^2), and approximately three quarters of the watershed lies within the Selway-Bitterroot Wilderness. The watershed is entirely publicly owned, and is administered by the USFS. Land use is primarily recreation. The Wilderness Gateway Campground lies at the mouth of Boulder Creek, at the confluence of Boulder Creek and the Lochsa River.

Warm Springs Creek drains an area of approximately 17 000 ha (64 mi^2), two thirds of which lies in the Selway-Bitterroot Wilderness. Land use is primarily recreation. Johnson Hot Springs is 0.4 km (1/4 mile) from its confluence with the Lochsa River.

Meadow Creek drains approximately 62 000 ha (240 mi^2). The drainage is entirely held in public ownership (USFS), and is primarily used for recreation. Meadow Creek lies within the largest designated roadless area on the Nez Perce National Forest. Meadow Creek has experienced little mining activity over the years. Mining was confined to two tributaries of Meadow Creek: Three Prong Creek, and Eastfork Meadow Creek.

Weir sites are proposed in both national forests.

3.9.4 Recreation Resources

The recreational opportunities within north-central Idaho are numerous, particularly within the area's two national forests, the Clearwater and the Nez Perce. These recreational opportunities include both developed and dispersed recreation. Developed recreation is recreation that occurs where improvements enhance recreational opportunities and accommodate intensive recreation activities within a defined area. An example of developed recreation is a developed campground. Dispersed recreation is outdoor recreation which occurs outside of developed sites in both the roaded and roadless forest environment as well as on private land. Hunting and cross-country skiing are examples of dispersed recreation.

The recreational opportunities (both developed and dispersed) in the area include a wide range of activities. An example of the recreational opportunities available include:

- hunting and fishing;
- camping and hiking;
- boating and rafting;
- mushrooming and berry-picking;
- cross-country skiing and snowmobiling;
- gold panning and rock collecting;
- bird watching;
- photography; and
- sightseeing, which enhances the quality of all recreational experiences.

Recreational activities depend on access and a well developed transportation network exists in the area. A study undertaken by the University of Idaho in 1987 found that north-central Idaho was the destination for over 10 percent of the leisure travelers in the state (University of Idaho, 1988). Tourism and recreational pursuits as an industry is growing in Idaho as it is nationwide. Tourism is currently the third largest industry in Idaho (Robb, 1995).

The following describes the recreational resources close to the proposed sites.

3.9.4.1 Cherrylane

An important steelhead fishery occurs from fall through spring in the mainstem of the Clearwater River near the Cherrylane site. Rafting and swimming are common activities during the summer. Also, the lower Clearwater River from Lewiston to Myrtle is known as one of the few areas in the world to find sillimanite, a gem-quality mineral (Nez Perce Comprehensive Plan, 1979). Other than fishing, swimming, rafting, and rock hounding on the Clearwater River, no other recreational opportunities exist in the immediate vicinity of the proposed site, except hunting, if permitted by the property owners in the area.

3.9.4.2 Sweetwater Springs

The only recreation opportunity in the immediate vicinity of the Sweetwater Springs site is hunting for upland game birds and deer, if allowed by the property owners in the area.

3.9.4.3 Luke's Gulch

Recreational opportunities in the vicinity of this site include steelhead fishing during the fall through the spring, and rafting and swimming in the summer. Anglers will usually fish from the bank on the opposite side of the river near highway pullouts.

3.9.4.4 Cedar Flats

The portion of the Selway River that flows past the Cedar Flats site is designated a Recreational River in the Wild and Scenic Rivers System. The river is used seasonally by anglers and float boaters for day use parking. This site is the first available parking below O'Hara Campground.

3.9.4.5 North Lapwai Valley

Recreational opportunities nearby include the Visitors Center of the Nez Perce National Historical Park at Spalding, about 1.6 km (1 mile) north on U.S. Highway 95. Picnickers also use the park located just below the Visitors Center.

3.9.4.6 Yoosa/Camp Creek

The primary recreational opportunity in the vicinity of Yoosa/ Camp Creek is elk hunting. Other recreational opportunities in the area include hiking, camping, fishing, gold panning, and berry-picking (U.S. Department of Agriculture, Forest Service, Mox Remains Timber Sale Environmental Assessment, 1993).

There are several undeveloped campsites located along system roads within the area and one established forest trail. Forest trail No. 48 (the Austin Ridge Trail), which traverses through the area, is open to all terrain vehicle (ATV) use. The trail passes within 1 km (0.5 mile) of the proposed satellite facility at its closest point. Trail No. 40 (the Nee-Me-Poo Trail), registered as a National Historic Trail, is not open to any motorized vehicle use. This trail traverses the ridge north of Yoosa Creek, and passes within 1.6 km (1 mile) of the site at its closest point. Both of these trails receive light use throughout the summer and early fall months. There are also a few trails that traverse the ridges along the eastern and southern boundaries. These trails receive light use during the fall for the purpose of big game hunting and are not maintained. There is one outfitter (Burlingame Outfitters, Kamiah, Idaho) permitted within this portion of Yoosa Creek drainage.

3.9.4.7 Mill Creek

The Mill Creek site would be reached off the Hungry Ridge Road, a road that is open most of the year. The closest recreational site is the South Fork Campground, about 2 km (1.2 miles) northeast of the proposed facility on the South Fork Clearwater River. Facilities at the campground include picnic facilities, trailer parking, potable water station, sanitation facilities including trailer sanitation facilities, and fishing access. Big game habitat also exists in the area surrounding the site, particularly elk habitat. Recreational opportunities in the area include hunting, fishing, camping, and picnicking.

3.9.4.8 Newsome Creek

The Newsome Creek site is near the Newsome Recreation Area. The Newsome Recreation Area is used as an area for dispersed camp sites. The area is improved with sanitation facilities. The road to the Newsome Creek site, Forest Service Road No. 1858, is open year-round. Recreational opportunities in the area in addition to camping include hunting, fishing, sightseeing, snowmobiling, bicycling, and gold panning. The area has been totally altered by hydraulic and placer mining; some sediments in the area are 6 m (20 ft) thick (U.S. Department of Agriculture, Forest Service, 1994).

3.9.4.9 Spring Chinook Direct Release Sites and Weir Sites

All the spring chinook direct release sites and weir sites are within wilderness or roadless areas. These areas are used by a variety of recreationists for activities such as hunting, fishing, backpacking, float boating, camping, and panning for gold and other minerals. Increased recreational use is anticipated in the future.

3.10 Socioeconomics

The action alternatives would take place in north-central Idaho, immediately below the state's panhandle. This area is called the Seaport Area because it is connected to the Pacific Ocean by the Columbia and Snake rivers. The program area is in Clearwater, Lewis, Nez Perce and Idaho counties.

North-central Idaho has a rich history that includes thousands of years of Native American habitation and subsequent settlement by others in the mid-1800s in search of gold. Today the area's principal export base depends on its most valuable natural resource, timber. The lumber and wood products industry, including paper and related products, provide the bulk of manufacturing employment in the area.

Because the Proposed Action would specifically impact the Nez Perce Tribe, existing population and other socioeconomic characteristics of the area are divided into general and Native American sections.

3.10.1 Population

The population of the four county area has changed little since the early 1980s, expanding by less than 5 percent to 65,000 persons while the state's population as a whole grew by 20 percent (see Table 3-11). The primary reason for this relatively low population expansion in the area is high outmigration during the 1980s as residents sought employment opportunities elsewhere. The four counties lost population during the 1980s. The increase in population during the past 15 years has largely occurred since 1990 (Idaho Department of Employment, February 1995, and U.S. Department of Commerce, Bureau of the Census, Population Estimate Branch, 1990).

The Native American population in the area is concentrated primarily in Nez Perce County (see Table 3-12). As of 1990, approximately 2,400 Native Americans lived in the four county area, with 1,865 living on the Nez Perce Reservation and tribal lands. Native Americans are the largest minority group in the area, making up about four percent of the general population. The median age of this population group was 25.3 years (1990), compared to 31.5 years for the state as a whole (Bureau of the Census, 1990).

3.10.2 Employment

The civilian labor force is the number of people in a population group who are over 16 years of age and who are either working or actively seeking work. Over two-thirds of the area's labor force resides in Nez Perce County (see Table 3-13). The labor force participation rate for Native Americans in the area during 1990, the most recent information available, was 59 percent. This compared to a labor force participation rate of 60 percent for the general population, and 65.5 percent for the state as a whole (U.S. Department of Commerce, 1990 Census of Population, Social and Economic Characteristics, State of Idaho, and U.S. Department of Commerce, 1990 Census of Population, Social and Economic Characteristics, American Indian and Alaska Native Areas).

Lumber and wood products employment contribute to the major share of employment in the manufacturing sector of the local area, although the employment base is also heavily dependent on the local government and trade sectors. Employment in the lumber and wood products industry typically yields a high value to the federal and local economy, since the products produced bring in resources from outside the local area, and the wages paid are relatively high. Traditionally the trade and government sectors are not at the high end of the wage scale. The employment sectors that offer the most covered employment in the four county area, that is, covered by the employment insurance program, are trade (24%), manufacturing (22%), government (21.5%), and services (19%). This employment pattern is markedly different from the employment pattern of the Native Americans living and working in the area. Of this population group, 45 percent were employed by the government sector, 23 percent were employed in the manufacturing sector, and 8.6 percent were employed in the agricultural, forestry and fisheries (U.S. Department of Commerce, 1990 Census of Population, Social and Economic Characteristics, State of Idaho,

Table 3-11
General Population of North Central Idaho 1980-1994

County	1980	1990	1994	Percent change 1980-1994
Nez Perce	33,220	33,750	37,430	13
Clearwater	10,390	8,500	9,060	13
Lewis	4,120	3,500	3,910	5
Idaho	14,770	13,780	14,980	1
County Totals	62,500	59,550	65,380	5
State Totals	944,130	1,006,750	1,133,030	20

Source: Idaho Department of Employment, 1995

Table 3-12
Native American Population of North Central Idaho 1990

County	All Persons	Native Americans	Percent Native Americans of Total Population
Nez Perce	33,750	1,680	5
Clearwater	8,500	180	2
Lewis	3,520	170	5
Idaho	13,780	350	3
County Totals	59,550	2,380	4

Source: Idaho Department of Employment, Regional Economic Profiles, 1994.

Table 3-13
Labor Force Data
for the Four-County Area
1990

	General Population	Native American Population
Civilian Labor Force	30,790	743
Employment	28,910	549
Unemployment	1,880	194
Unemployment Rate	6.10%	26.00%

Source: Idaho Department of Employment and 1990 Census of Population, Social and Economic Characteristics, American Indian and Alaskan Native Areas.

and U.S. Department of Commerce, 1990 Census of Population, Social and Economic Characteristics, American Indian and Alaska Native Areas). This employment pattern reveals unusually high employment in the government sector, an employment sector that pays relatively low wages.

3.10.3 Unemployment Rate

The unemployment rate for Native Americans in 1990 was extremely high at 26 percent. As an ethnic group, Native Americans registered the highest unemployment rate of all ethnic groups in the area. (See Table 3-13).

3.10.4 Income

Per capita income is the mean income computed for every man, woman and child in a particular population group. It is computed by dividing the total income by the total population. Table 3-14 reveals that both Nez Perce and Lewis counties have a higher per capita income than for the state as a whole. This is because of the value of the lumber and wood products industry on both local and state economies. Both Nez Perce and Lewis counties have relatively high employment in the lumber and wood products industries.

Table 3-15 shows the low per capita income the Native Americans had in north-central Idaho in 1990, the most recent information available. Per capita income among tribal members is less than 40 percent of that for non-tribal members in the local area, and also for the state as a whole.

Table 3-14
Per Capita Income North Central Idaho
1988-1992

County	1988 (1988 dollars)	1990 (1990 dollars)	1992 (1992 dollars)	Percent Change 1988-1992 (Nominal)
Nez Perce	$14,133	$16,372	$18,061	27.80%
Clearwater	$12,112	$14,065	$15,774	30.20%
Lewis	$13,225	$17,565	$17,122	29.50%
Idaho (County)	$11,245	$13,580	$14,625	30.10%
Four County Total	**$12,678**	**$15,395**	**$16,395**	**29.30%**
State Total	**$12,850**	**$15,304**	**$16,649**	**29.60%**

Source: Idaho Department of Employment, Regional Economic Profiles, 1994.

Table 3-15
Per Capita Income Native American Population 1990

County	1990
Nez Perce	$6,390
Clearwater	$4,250
Lewis	$7,640
Idaho (County)	$4,860
Reservation-Wide	$6,100

Source: U.S. Department of Commerce, Economics and Statistics Administration, Bureau of Census, Table 17 "Selected Social and Economic Characteristics for American Indian and Alaska Native Areas: 1990."

3.11 Visual Resources

This section includes the following: an overview of visual resources in the region; information from the USFS about resources on its respective forestland; and a description of the existing visual resources in the area that could potentially be affected by the program. Visual resources on tribal and private land were determined by field work.

3.11.1 General

The Clearwater River Subbasin is characterized by farm and rangeland in the lowlands and forest in the highlands. Much of the forestland is owned by the federal government. This land is managed by the USFS and is divided into management units in its Forest Plans. Some of the units have been managed for timber and other resources; others have been managed as wilderness and maintained in a natural state except for trails.

The land able to be farmed or used as range has been managed and altered. Roads follow along rivers and creeks. Farmsteads, small agricultural and/or timber towns, and small villages dot the landscape and are far from each other. Ridges and plateaus provide sweeping vistas of farmland and mountains. Rivers and creeks wind through deep canyons.

The Selway River at the Cedar Flats site is designated a Recreational River in the Wild and Scenic River System. Some roads, though their primary use is transportation, are also designated scenic highways and are used heavily for access to recreation opportunities and for scenic enjoyment. The visual quality of the area is valued by hikers, bikers, float boaters, motorists and residents.

Much of the Nez Perce and Clearwater National Forests are natural-appearing forestlands. In some areas outside of the wildernesses, management activities are apparent. Examples of management activities include timber harvest, roads, gravel pits, recreation facilities, utility corridors, and some mining operations. Harvested timber land is in different stages of regrowth.

Planned USFS actions will change the forest landscape as roads are constructed into undeveloped areas and as timber management activities change the age and distribution of timber stands.

3.11.2 Visual Quality Objectives

The USFS has developed visual quality objectives (***VQOs***) for all of its forest management units. Visual quality objectives are visual resource management goals. Each VQO describes a different degree of acceptable alteration of the landscape. The degree of alteration is measured in terms of visual contrast with the surrounding natural landscape.

Initial VQOs were based on degree of scenic quality, visible areas, and aesthetic concerns of users using the Visual Management System (U.S. Department of Agriculture, Forest Service, 1974). There are five levels:

- ***preservation*** applies to wilderness and other special areas where the natural landscape should be unaltered by forest management activities;
- ***retention*** applies to areas where activities should not be evident to the casual forest visitor;
- ***partial retention*** applies to areas where activities may be evident but must remain subordinate to the natural landscape. These visually sensitive areas are along major state and federal highways, wild and scenic river corridors, and other high public use areas;
- ***modification*** and ***maximum modification*** apply to less visually-sensitive areas where changes can dominate the natural landscape but should look natural from a long distance.

The Forest Service developed mitigation measures to reduce the severity of impact and constrain management activities. See Section 4.11, **Visual Resources,** for potential impacts and mitigation.

3.11.3 Central Incubation and Rearing Facilities

3.11.3.1 Cherrylane

The proposed site is on private land used for irrigated agriculture. It is in a wide valley along the Clearwater River. The site is screened from the river by riparian vegetation, specifically cottonwoods. One residence is above the site and about 0.8 km (0.5 mile) upriver. The Potlatch Tree Farm abuts the site. Highway 12 is between the site and the river. The highway is four lanes at this location, but is mostly two lanes elsewhere. Between September to the end of May people fish for steelhead along the river. The site is not screened from the highway. Agricultural outbuildings, grain silos, etc. are nearby. See Photo No. 1 in Chapter 2.

3.11.3.2 Sweetwater Springs

The proposed site is on state-owned rangeland next to the springs. The site is in a canyon near the highway to Waha and cannot be seen from U.S. Highway 95. The area is of rolling hills, with grass-forbs, cottonwoods, and other riparian vegetation along the creek. The existing facility is located along a dirt and gravel farm road used by workers and occasionally hunters. The area to be used has already been cleared and its surfaced gravelled. See Photo No. 2 in Chapter 2.

3.11.4 Satellite Facilities

3.11.4.1 Luke's Gulch

The site is on a flat bench above the South Fork Clearwater River. Pine and fir trees grow on the bench. See Photo No. 3 in Chapter 2. The bench is at the base of a steep hill with deciduous riparian vegetation. One residence used as a vacation home for 1-2 weeks per year is nearby. Another residence is downriver about 0.6 km (0.25 mile) from the site and is high up the steep canyon. The site is visible from State Highway 13, which is across the river from the site. Anglers occasionally fish from the riverbank near the site.

3.11.4.2 Cedar Flats

This site is on a flat river plain of USFS administrative land along the Selway River, which is a designated Recreational River in the Wild and Scenic River System. The site is near Johnson Bar Campground. See Photo No. 4 in Chapter 2. The area is between the Selway Ranger District office wastewater treatment facilities and the water supply intake pump station. The site was improved as part of a Jobs Corps facility. An existing dirt access road runs through the site. The site is screened from Forest Service Road 223 by large cedars. The river is used by float boaters, campers, and others for recreation. O'Hara Creek Campground is 3.2 km (2 miles) upstream from the site. Anglers and float boaters use the site for parking and day use. The VQOs for the site are retention and preservation.

3.11.4.3 North Lapwai Valley

This site is on tribal land near the town of Lapwai. The site is along Lapwai Creek and Highway 95 in an agricultural field. The site is surrounded by rolling hills in rangeland, and riparian vegetation including cottonwoods and alders along the creek. See Photo No. 5 in Chapter 2. Highway 95, a Scenic Byway, is about

60 m (200 ft) from the site. One residence is within 90 m (300 ft) of the site. The site is 0.8 km (0.5 mile) from the Nez Perce National Historical Park.

3.11.4.4 Yoosa/Camp Creek

The site is in the Clearwater National Forest, in Forest Service management unit E1. The only applicable VQO in the area is from the Nee-Me-Poo National Historical Trial. The VQO is modification for areas in the middleground as viewed from the trail. Modification means that man's activity may dominate the characteristic landscape, but should appear as a natural occurrence in the foreground and middle ground. The 0.4 ha (1 acre) site is dominated by large cedars and white pine. The site is along Forest Service Road 103 at mile marker 8. See Photo No. 6 in Chapter 2. The area is used occasionally by recreationists and there are dispersed camping areas near the site.

3.11.4.5 Mill Creek

This site has moss, Douglas Fir, swordfern and riparian vegetation. It is next to Mill Creek along Hungry Ridge Road on a bench beneath the road in a narrow canyon. See Photo No. 7 in Chapter 2. The road is used by loggers, hikers, ranchers, and others for commerce and recreation. Open grazing is allowed in the area. The site is in Nez Perce National Forest Management Area 16c. Although there is no visual quality objective within the Forest Plan for this management unit, the Forest Plan has a forest-wide objective that states: Dominant man-caused activities will be kept subordinate. They should be designed to appear natural to the casual observer. Visual resources should be retained for visual and recreational enjoyment.

3.11.4.6 Newsome Creek

The site is on Forest Service land along Forest Service Road 1858. The area is flat, near the confluence of Newsome and Beaver creeks. See Photo No. 8 in Chapter 2. The setting is a mountain stream with pine and alder along its banks and Douglas fir, grand fir, spruce and lodgepole pine on the surrounding hills. The area is made up of cobbles where mine tailings have been piled. There is no topsoil, except where the pine trees are growing.

The Elk City Trail (wagon road) is nearby. Camp sites are about 2.4 km (1.5 miles) down the road.

Although there are no designated visually-sensitive resources in this area, residents of Newsome and recreationists use Forest Service Road 1858 frequently.

3.11.5 Spring Chinook Direct Release Sites and Weir Sites

The spring chinook direct release sites and weir sites proposed are on remote national forestland. The Tribe will consult with the USFS on final location of the sites to avoid conflicts with recreation and other resources.

3.12 Air Quality

National Ambient Air Quality Standards (***NAAQS***) are established by the U.S. Environmental Protection Agency (***EPA***). The Federal Clear Air Act required EPA to:

- identify pollutants that may endanger public health;
- issue air quality criteria documents to reflect the latest scientific information about the effects of these pollutants have on human health or welfare; and
- set primary and secondary standards for these pollutants.

In Idaho, the state of Idaho, Department of Health and Welfare, Division of Environmental Quality is responsible for air quality management in parts of the counties containing proposed facilities. Air quality management at facilities located within national forest land is the responsibility of the EPA.

In general, existing air quality throughout the Clearwater River Subbasin is excellent. All potential site areas have air quality that falls within National Ambient Air Quality Standards.

3.13 Public Health and Safety

The proposed Cherrylane and Sweetwater Springs facilities and the satellite and release sites are in areas without fire protection services. If a fire occurred, no services would be provided (Tomberg, 1995). On-site water supply could be used for fire protection. In remote forested areas, state and federal agencies could be contacted for fire fighting if forests were threatened.

Medical and hazardous material response is available from the city of Lewiston for the Cherrylane site (Lynard, 1995). Emergency medical response is available from the nearby town of Waha for the Sweetwater Springs site. Lewiston and Orofino have hospitals. Most towns throughout the area have quick response emergency care available. Helicopter transport out of Spokane, Washington is available to serve St. Joseph's Regional Medical Center in Lewiston and the Clearwater Valley Hospital in Orofino.

The State Police, County Sheriffs, and tribal and federal agents police their respective jurisdictions.

Chapter 4 Environmental Consequences

In this Chapter:

- Specific impacts from alternatives
- Proposed mitigation
- Cumulative impacts
- Comparison of alternatives

This chapter discusses the potential impacts of the alternatives on the environment.

To analyze potential impacts from construction, operation and maintenance activities, resource specialists analyzed actions using a scale with four impact levels: high, moderate, low and no impacts. Definitions of the impact levels vary with each resource. Impact definitions are given in the first part of each resource discussion.

Specialists considered direct, and indirect impacts in the short and long term. Direct impacts are caused by the action and occur at the same time and place. Indirect impacts are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Impacts can be beneficial or adverse. The impact discussion lists ***mitigation*** that could reduce impacts and ***cumulative impacts*** of the alternatives. Cumulative impacts are created by the incremental effect of an action when added to other past, present, and reasonably foreseeable future actions.

The level of detail for each affected resource depends on the character of that resource, the significance of the issue, and the scale of analysis most relevant for the affected resource. Additional detail can be found in appendices and program files.

Impacts were also assessed based on the premise that changes made to the salmon's environment as a result of overall recovery effort will occur. These recovery efforts will result in wild spawning Snake River chinook salmon being able to return at a rate that, at the least, replaces themselves.

4.1 Nez Perce Tribe

The Proposed Action has the ability to affect several important aspects of tribal life. Primary are salmon harvest, and its associated cultural and subsistence implications, employment, and fisheries management.

4.1.1 Proposed Action

4.1.1.1 Tribal Harvest

The Proposed Action could increase salmon runs so tribal harvest can be sustained into the future. The Master Plan describes a gradual increase in harvest corresponding to an increase in runs after broodstock needs and natural spawning goals are met. Table 2-2 shows the predicted levels of harvest after the program has been operating for 15-20 years. More than 300 spring chinook and 1,000 fall chinook would be available for tribal and non-tribal member harvest.

If monitoring and evaluation show the program is successful, supplementation would proceed in other drainages of the Clearwater River. Other salmon spawning habitats in the basin would be seeded. Salmon would begin to regain its historical place as an important subsistence food for the Nez Perce.

4.1.1.2 Tribal Employment

The Proposed Action would increase employment. Tribal members could be employed in facility construction, operation and management. Thirteen full time and 15 part-time employees would be needed to operate and maintain the facilities and to conduct monitoring and evaluation studies (Walker, G., 1995) (see Table 4-1).

4.1.1.3 Fisheries Management

As manager of hatchery facilities, the Nez Perce Tribe would have a direct influence on fish runs returning to their homelands. Tribal hatchery managers, with input from fisheries co-managers in the region, would determine how, when and where to rear, release and harvest fish produced from the hatchery. The managers would select stocks best suited to program goals.

A primary goal of the Proposed Action is to provide for harvest of surplus adults by getting production into underseeded habitat and coupling that with production from fish reared in a more typical hatchery setting to help overcome poor adult return rates. Success in achieving this goal would require adaptive management (see Section 2.1.5, **Monitoring and Evaluation Plan**). The best mechanism to incubate and rear fish to mimic natural production needs to be determined. Optimum release timing and fish size need to be determined. Beneficial and adverse effects of supplementation on existing populations need to be monitored and the results fed back to hatchery production specialists. Evaluation of returns and establishment of harvest strategies are

Table 4-1
Estimated Number of Positions and Employees Needed

Facility	DHO	HM	AHM	SOF	HT	ST (Part time)	ST (Full time)	M&E
Cherrylane	0.5	1	1		1	1		6
Sweetwater Springs		1				2	1	
Yoosa/Camp				0.5		2	1	
Mill Cr.				0.5		2		
Newsome Cr.				0.5		2		
Cedar Flats				0.5		2		
Luke's Gulch				0.5		2		
North Lapwai Valley				0.5		2		
Total	0.5	2	1	3	1	15	2	6

DHO - Director of Hatchery Operations
HM - Hatchery Manager
AHM - Assistant Hatchery Manager
SOF - Satellite Operations Foreman
HT - Hatchery Technicians
ST - Satellite Technicians
M&E - Monitoring and Evaluation

also aspects of hatchery management that need to occur to meet program goals. The Nez Perce Tribe, as hatchery managers, would be responsible for these actions and the success of the program.

Rights guaranteed in treaties to harvest fish in a manner consistent with a traditional livelihood would be furthered by improving the Tribe's ability to directly produce salmon.

Overall impact from implementation of this alternative on the Nez Perce Tribe would be high.

4.1.2 Use of Existing Facilities Alternative

4.1.2.1 Tribal Harvest

The Existing Facilities Alternative would result in fewer fish for harvest than the Proposed Action. Table 2-5 shows that 54 spring chinook and 487 fall chinook could be harvested at 20 years in the future. Because this alternative would not be very successful, supplementation would probably not proceed into other drainages.

4.1.2.2 Tribal Employment

The Existing Facilities Alternative would increase employment. Tribal members would be employed in construction and operation and management of the facilities. However, fewer tribal employees would be needed in this alternative because of the lack of facilities at Cherrylane. These include a half-time director of hatchery operations, full-time hatchery manager, assistant hatchery manager, and hatchery technician, and a part-time satellite technician.

4.1.2.3 Fisheries Management

This alternative would result in a more limited amount of fisheries management participation by the Nez Perce Tribe than would occur with the Proposed Action. The NPT would have input on incubation and rearing fish, however, the ultimate responsibility for scheduling and producing fish would be in the hands of the existing facilities managers. Novel incubation and early-rearing strategies would be undertaken only so far as their ability to be incorporated into the overall management and purposes of the facilities. The NPT would have to lobby with the hatchery managers for specific actions to occur, rather than simply make them based on the judgment of their own professionals and monitoring and evaluation results. At the satellite facilities, this alternative would be the same as the Proposed Action.

Overall impact from implementation of this alternative on the Nez Perce Tribe would be moderate.

4.1.3 No Action Alternative

4.1.3.1 Tribal Harvest

Under the No Action Alternative, tribal harvest would continue as described in Section 3.1.2, or diminish with restrictions from implementing the ESA. In most years, fall chinook harvest conducted in the Zone 6 fishery on the Columbia River would probably remain the most abundant catch. This run is supplemented by hatchery production in the upper Columbia River Basin. Spring chinook harvest in the Clearwater River should increase when Clearwater Fish Hatchery begins to return its mitigation numbers; the predicted harvestable return would number about 1,000 with a smolt-to-adult return rate of 0.20 percent. Present smolt-to-adult return for this hatchery has been about 0.10 percent. Additional harvest could also occur from returns to Dworshak and Kooskia National Fish Hatcheries. Current smolt return rate for these hatcheries average 0.09 percent for Dworshak and 0.08 percent for Kooskia. Assuming the salmon recovery efforts prove successful and return rates are doubled, these facilities could generate approximately 1,200 and 400 salmon, respectively, for harvest beyond their egg take needs.

In the short term, harvest would continue to focus on Zone 6, and three hatcheries: Rapid River, North Fork Clearwater, and Clear Creek. Success by the Clearwater Fish Hatchery would extend the spring chinook salmon run into sites for the satellite facilities: Walton Creek, in the upper Lochsa River drainage; and Red River and Crooked River in the upper South Fork Clearwater River drainage.

Under the No Action Alternative, without changes in stock production, chinook harvest would occur only during the early summer. Spring chinook is the only stock propagated in the basin. Though a small run of fall chinook is present in the Clearwater River, approved production strategies do not call for taking aggressive measures to increase the run to a harvestable level. Consequently, a fall chinook harvest is not expected.

4.1.3.2 Tribal Employment

The effects of the No Action Alternative would be no increase in employment prior to the initiation of the hatchery program. No employees would be hired to help operate and manage the program. In 1994, BPA contracted with Tribal members to assist in the gathering of data to develop this EIS. Whether Tribal employment levels would return to the levels that existed prior to the initiation of the hatchery program would depend on other factors unrelated to this EIS.

4.1.3.3 Fisheries Management

By implementing the No Action Alternative, fisheries management would proceed as it is. The Nez Perce Tribe is involved in all arenas of management involving Columbia Basin anadromous fisheries. The Tribe provides input on production, habitat, harvest and hydrosystem issues. Within the last 10-15 years, the Nez Perce, and other Columbia Basin tribes, have assumed a co-management role of the fisheries resource (see Section 1.6.7, **Columbia River Fish Management Plan**). However, the Tribe does not have the facility support to directly affect production within its own reservation, or its usual and accustomed fishing grounds.

There are three anadromous hatcheries within the Nez Perce Reservation. All are federally-funded facilities, and are managed by the USFWS and IDFG. The Nez Perce Tribe cooperates with these agencies on production issues, but decision-making has been assigned through Congressional Acts. Production from the hatcheries in the Clearwater River Subbasin also falls under the Columbia River Fish Management Plan (see Section 1.6.7). Species and production numbers follow this program closely.

The No Action Alternative does not provide the Nez Perce Tribe with any direct management of anadromous fish runs within the borders of its own reservation and does not meet the Tribe's need to restore salmon runs within its treaty lands.

4.2 Cultural Resources

Protection of cultural properties is guided by 36 CFR 800 "Protection of Historic and Cultural Properties," which allows for the acceptance of adverse effects when no other alternative is practicable, mitigative measures are taken into account, and the Advisory Council is given the opportunity to comment.

Effects of an undertaking that would otherwise be found to be adverse may be considered as not being adverse when a historic property is of value only for its potential contribution to archaeological, historical, or architectural research, and when such value can be substantially preserved through the conduct of appropriate research, and when such research is conducted in accordance with applicable professional standards and guidelines (36 CFR 800.9). Avoidance of an historic property would be considered as having no effect.

Analysts used these impact definitions to determine the level of impact for the alternatives.

- A **high** impact would occur if direct physical disturbance of a cultural resource site is certain unless adequate avoidance measures are taken.
- A **moderate** impact would occur if direct physical disturbance is possible.
- A **low** impact would occur if direct physical disturbance is highly unlikely, or indirect forms of disturbances occur.

4.2.1 Proposed Action

Under this alternative, judicious design and choice of alternative sites would avoid any direct impacts to the five cultural properties identified. Monitoring of site locations during construction would minimize potential straying onto sites while allowing for immediate recognition of previously unknown/ buried cultural deposits.

Most of these sites can be avoided by use of alternative locations or locating activity away from the cultural resource, therefore impacts would be low. In instances where avoidance is not feasible, mitigative plans would need to be developed in accordance with NHPA. Development should be coordinated with the Nez Perce Cultural Resource Program and the Idaho SHPO should be consulted.

The Sweetwater Springs site could be used if no subsurface excavation is done within the site. Archaeological monitoring of construction in this area should be performed by a trained representative of the Nez Perce Tribe Cultural Resources Program to ensure no resources are disturbed.

In those cases where avoidance is not feasible, specific mitigation plans may be developed to insure that the appropriate scientific information is collected prior to site disturbance. Such work would be carried out under the National Historic Preservation Act of 1966, as amended, and its implementing regulations, (36 CFR 800), and the Archaeological Resources Protection Act of 1979, as amended, and the Native American Graves Protection and Repatriation Act of 1990.

4.2.2 Use of Existing Facilities Alternative

This alternative would also have low impacts on cultural resources. The same satellite facilities, and Sweetwater Springs would be used, as well as the same monitoring and mitigative measures. The potential for impacts would be less than that in the Proposed Action because the Cherrylane facility would not be built.

4.2.3 No Action Alternative

Under the No Action Alternative, federal agencies would continue to comply with applicable laws and agreements as necessary.

4.2.4 Cumulative Impacts

No cumulative impacts are expected.

4.3 Geology and Soils

This section discusses the potential impacts of the alternatives on geology and soils. Analysts used soil survey data and published information to identify potential impacts. Impact levels of no, low, moderate, or high were used.

Analysts defined the impact levels using these definitions:

A **high** impact would occur under these conditions:

- Where road or facility construction and/or clearing are required on sites prone to slides or erosion with a high susceptibility to erosion.
- Soil properties or site features are so unfavorable or difficult that standard mitigation measure would not work.
- Accelerated erosion, sedimentation, or slides would create long-term impacts.

A **moderate** impact would occur under these conditions:

- Where road or facility construction and/or clearing takes place on soils with a moderate to high erosion potential.
- Soil properties and site features are such that a mitigation measure would be effective in controlling erosion and sedimentation with acceptable levels.
- Impacts would be primarily short term, with a significant increase in normal erosion rates for a few years following soil disturbance until erosion and drainage controls become effective.

A **low** impact occurs under these conditions:

- Where road and facility construction and clearing takes place on soils with a low to moderate erosion hazard, and the potential for successful mitigation is good using standard erosion and runoff control practices.
- Erosion and sedimentation levels would be held near normal during and following construction.

4.3.1 Proposed Action

4.3.1.1 Geologic Hazards

Seismic hazards have been identified for the Cherrylane site. Seismic hazards for this site would be considered when the facilities are designed. All facilities would be designed to withstand earthquake intensities of V or as identified by the local and state earthquake building codes. No seismic hazards were identified at the Sweetwater Springs facility.

No seismic hazards have been identified for the satellite sites. All other sites under this alternative are for monitoring or release purposes only and would not cause any permanent impacts to the surrounding geology or soils.

The Proposed Action would have low overall impacts on geology. No mitigation is necessary.

4.3.1.2 Soils

Construction and maintenance of hatchery facilities can impact soils in many ways. Disturbance of the ground surface and subsurface, and vegetation removal during site clearing, road building and facility construction increase the risk of soil erosion and may change soil physical characteristics. Areas most vulnerable include soils prone to erosion, mass movement or compaction, steep slopes, and areas where extensive clearing is required. Most impacts are from construction and would be short term. Impacts are greatest during and immediately after construction or until revegetation, drainage, and erosion controls are established. Long-term impacts could be caused by local changes in erosion and runoff rates from site or road construction. Site restoration and mitigation would reduce both short-and long-term impacts and the effect erosion, sedimentation, and soil compaction could have on other resources such as water, fisheries, and vegetation.

Stream channels adjacent or close to the North Lapwai Valley, Yoosa/Camp Creek, Newsome Creek and Mill Creek satellite sites would be altered by channel excavation and bank riprap used to establish intake structures, to place instream boulder anchors and perhaps bank anchors to support fish weirs, and to place tripods and fence panels for weirs.

River channels adjacent or close to Cherrylane, Luke's Gulch and Cedar Flats would be altered by channel excavation and bank riprap used to establish intake structures and fish ladders, to place instream boulder anchors and perhaps bank anchors to support fish weirs, and to place tripods and fence panels for weirs.

Stream channels in Meadow Creek, Boulder Creek, Warm Springs Creek, Johns Creek, Eldorado Creek, and Tenmile Creek would be altered to place instream boulder anchors and perhaps bank anchors to support fish weirs, and to place tripods and fence panels for weirs.

Central Incubation and Rearing Facilities — The primary construction activities at Sweetwater Springs and Cherrylane would include land disturbances to improve access, cut and fill on some sites, and pipe installation. Secondary activities would include minor grading, excavation, and placement of aggregate. These activities would not significantly change existing topography. In all instances, erosion control procedures and requirements would be implemented during all construction activities to limit impacts due to soil erosion and slope instability. Impacts to soils would be low.

Specific concerns for the Cherrylane site include a high erosion potential because of the soil characteristics in that region. Since the site is relatively flat and has been in agricultural production for some time, the erosion potential is considered to be minor. During access road improvements, specific requirements for road construction erosion control would be implemented to avoid any adverse impacts.

Satellite Facilities — The primary soil disturbance at all satellite facilities would result from road construction and improvement, and recontouring land for placing ponds. Easily erodible surface soils and steep slopes dominate this region, and the Luke's Gulch, Mill Creek, and Newsome Creek sites within the South Fork Clearwater River drainage are of particular concern. If borrow sites are needed for fill material for facilities on USFS land, they would be identified and approved by the USFS. During access road improvements and earth moving for ponds, silt barriers, water control, and ditches with hay bales for road construction erosion control would be used to minimize the potential for soil erosion. Other activities that may disturb soils include the construction of water supply conveyance facilities from the nearby stream to acclimation structures and construction of water intake facilities along streams. All instream work would have sufficient mitigation to reduce short-term water quality degradation to a minimum. No other disturbances to soils at the satellite facilities is anticipated. Impacts to soils would be low.

Spring Chinook Direct Release Sites and Weir Sites — Helicopters would be used to fly fish in to all direct release sites. No construction or effect on soils would occur. Minor instream disturbance should be expected at all weir sites within the South Fork Clearwater River, Selway, and Lochsa drainages, but the soil properties would not change.

Mitigation — Short-term construction related soil erosion would be controlled by standard quality construction practices. Erosion control measures such as sediment fences and straw bales would be used to control erosion during construction. These devices would be left in place until revegetation (with native grasses and forbs) of all disturbed areas has occurred. The contractor working in and around streams would be required to submit a construction dewatering and erosion control plan prior to initiating any work. This plan and its implementation would become part of the contractor's contract and incorporated into the permitting provision (see Chapter 5 for permit requirements).

4.3.2 Use of Existing Facilities Alternative

4.3.2.1 Geologic Hazards

Seismic hazards at Cherrylane would not have to be considered in this alternative because the Cherrylane facility would not be built.

4.3.2.2 Soils

Soil disturbance associated with construction and hatchery operations at Cherrylane would be eliminated with this alternative. Otherwise, impacts would be the same as the Proposed Action. Overall impacts are low.

4.3.3 No Action Alternative

Under the No Action Alternative, no soil disturbance would occur at any site. There would be no change in soils from existing conditions.

4.3.4 Cumulative Impacts

No significant, long-term adverse impacts on soils are expected from the Proposed Action or the Existing Facilities Alternative. Soil impacts would be localized and their effects would be manifest only at the individual sites. No cumulative impacts would occur.

4.4 Water Resources

The water resources section describes potential program-related impacts for groundwater and surface water quantity, temperature and water quality criteria, and streamflow diversions. The methods used to analyze impacts to groundwater include a review of hydrogeological analyses for production well development at the Cherrylane, North Lapwai Valley and Luke's Gulch sites. Methods used to analyze impacts for surface water include evaluation of stream gauge measurements for flow and water quality.

The water quality, flow requirements, and groundwater production were reviewed to determine levels of impact from each alternative. Each issue received an impact level of no, low, moderate, or high using the following definitions to determine impact levels:

A **high** impact is expected under these conditions.

- A high-quality water body that supports fish, waterfowl, and animal habitat, and/or human uses such as drinking water would be extensively altered so as to affect its uses or integrity.
- A facility is constructed with extensive clearing and road building in highly erodible soils near high-quality water bodies, without appropriate mitigation.

Table 4-2 Water Available and Water Needed

Facility	Total Available			Groundwater			Surface Water			
Water Available										
	cubic meters/min	gpm	cfs	cubic meters/min	gpm	cfs	cubic meters/min	gpm	cfs	
Cherrylane (1)	59,474.70	15,714,085	35011	18.9	5,000	11.4	59,455.70	157,090,850	35,000	
Sweetwater Springs	3.4	900	2.1	3.4	900	2.1	0.00	0	0	
Luke's Gulch (1)	681.2	179,982	401	1.7	450	1	679.50	179,532	400	
Cedar Flats (1)	5,096.20	1,346,493	3000	0	0	0	5,096.20	1,346,493	3,000	
N. Lapwai Valley (2)	94.3	24,907	55.5	2.5	670	1.5	91.70	24,237	54	
Yoosa/Camp (3)	11.6	3,052	6.8	0	0	0	11.60	3,052	6.80	
Mill (3)	10.7	2,828	6.3	0	0	0	10.70	2,828	6.30	
Newsome (3)	9.5	2,513	5.6	0	0	0	9.50	2,513	5.60	
Water Needed										
Facility	Total Needed			Groundwater			Surface Water			% Surface Water Needed
	cubic meters/min	gpm	cfs	cubic meters/min	gpm	cfs	cubic meters/min	gpm	cfs	
Cherrylane	30.3	8,000	18	18.9	5,000	11.4	11.4	3,000	6.8	0%
Sweetwater Springs	3.4	900	2	3.4	900	2.1	0	0	0	0%
Luke's Gulch	7.9	2,100	5	1.7	450	1	6.2	1,650	3.8	1%
Cedar Flats	10.2	2,700	6	0	0	0	10.2	2,700	6.2	0%
N. Lapwai Valley	8.3	2,200	5	2.5	670	1.5	5.8	1,530	3.5	6%
Yoosa/Camp	3.8	1,000	2	0	0	0	3.8	1,000	2.3	34%
Mill	1.1	300	1	0	0	0	1.1	300	0.7	11%
Newsome (3)	2.3	600	1	0	0	0	2.3	600	1.4	24%

Surface Water Available References
(1) - NPTH DEIS - Flow at greatest demand period for surface water by NPTH
(2) - USGS Data - 1974-94
(3) - Lowest flow measured over 5 years; 1990-95, NPT data.

A **moderate** impact is expected under these conditions.

- The quality of a water body would be affected locally, or if effects could be partially mitigated.
- Structures are located on erodible soils near a good-quality water body with mitigation, and any pollution that entered water is dispersed and diluted, not affecting overall water quality.
- Some removal of shade would affect the immediate habitat of water, but not the integrity of the water body as a whole.

A **low** impact would be expected under these conditions.

- Impacts to water quality could be almost completely mitigated.
- Facilities are near water bodies in stable soils and on even terrain, with little or no clearing.
- Structures are away from water banks and little or no sediments reach the water.

There would be **no impact** where water quality would be unchanged.

4.4.1 Proposed Action

The total water available and the total water needed for the Proposed Action are shown in Table 4-2.

4.4.1.1 Groundwater

Under the Proposed Action the main impacts to groundwater would occur at the hatchery sites and at the North Lapwai Valley and Luke's Gulch satellite sites. Discharges would meet federal and state water quality standards and guidelines, and would satisfy all permit requirements. Hatchery effluents would be routinely monitored to assure compliance with water quality standards. Overall impacts on groundwater quality are low and no mitigation is necessary. Potential impacts at specific facility sites are discussed below.

Central Incubation and Rearing Facilities — Groundwater production wells would be used at Cherrylane, and would not adversely affect groundwater quantity or quality at the site. Because of the small amounts of water used at this facility, the volume would be easily replaced by groundwater recharge. No conflicting groundwater uses have been identified. No adjacent domestic or agricultural wells have been identified that would be impacted by the proposal.

The Sweetwater Springs facility would use existing springs for facility operations with no significant effect. Other than delivery improvements, no changes in the spring source are proposed. No consumptive water use would occur and discharges would meet federal and state water quality standards. The facility would have no effect on the U.S. Bureau of Reclamation's Lewiston Orchard Project.

Satellite Facilities — Groundwater production wells would be used at Luke's Gulch. The drawdown created by the wells could cause groundwater levels to decline in nearby existing domestic and stock wells, with impacts greater in nearby dug wells than drilled wells. This volume would be easily replaced through groundwater recharge due to the nature of the soils and rivers nearby. Mitigation may be necessary for these impacts to nearby wells depending on severity. Use of groundwater at Luke's Gulch would not significantly or adversely affect groundwater quantity or quality at the site. If static water levels in any adjacent wells are affected, the Tribe would either lower the pump bowl setting or increase the well depth for the owner.

The use of groundwater at the North Lapwai Valley site is not anticipated to impact adjacent groundwater users. All fish would be released by the middle of May which is the beginning of the irrigation season in the Lapwai Valley area and the period of maximum seasonal recharge for the aquifer.

Spring Chinook Direct Release Sites and Weir Sites — These sites require no groundwater.

4.4.1.2 Surface Water

Construction of the central incubation and rearing facilities and satellite ponds would disturb the ground and add impervious surfaces to the sites, which may lead to increased or rerouted runoff and sediment carried into streams. Increased runoff is expected to be short-lived and is not expected to exceed a stream's ability to carry sediment away from the site. It is not expected to change a stream's substrate. Some bankside and riparian vegetation would be removed or disturbed that may affect shade on a very limited scale. No change in water temperatures is expected. Most construction activities would occur away from the channel, and would be mitigated by erosion control, removing the least amount of trees as possible, and revegetating the site after construction. Impacts would be low and short term.

Stream channels adjacent or close to the North Lapwai Valley, Yoosa/Camp Creek, Newsome Creek and Mill Creek satellite sites would be altered by channel excavation and bank riprap used to establish intake structures, to place instream boulder anchors and perhaps bank anchors to support fish weirs, and to place tripods and fence panels for weirs.

River channels adjacent or close to Cherrylane, Luke's Gulch and Cedar Flats would be altered by channel excavation and bank riprap used to establish intake structures and fish ladders.

Stream channels in Meadow Creek, Boulder Creek, Warm Springs Creek, Johns Creek, Eldorado Creek, and Tenmile Creek would be altered to place instream boulder anchors and perhaps bank anchors to support fish weirs, and to place tripods and fence panels for weirs.

Hatchery operations are expected to cause low impacts to water quality. Discharges of chemical and organic pollutants would meet federal and state water quality standards and guidelines, and would satisfy all permit requirements. Important physical properties and chemical constituents in hatchery effluent would be routinely monitored to assure compliance with water quality standards. Chemicals used to prevent or treat fish diseases would be handled, applied, and disposed of in accordance with state and federal regulations.

Hatchery practices would be conducted to minimize the amount of uneaten food and discharge of organic wastes into the natural environment. Adult fish carcasses would either be used for food fertilizer, or disposed of at local landfills. Satellite ponds would be cleaned at the end of the rearing cycle and wastes would be disposed of at local landfills. Effluent from the Cherrylane facility would be routed through effluent ponds where it can settle, be treated, and removed before the liquid is discharged. Once treated, effluent discharged from the settling ponds would rapidly dilute and disperse in the lower Clearwater River.

The amount of fish held at all satellite facilities is below the threshold limit for state and federal regulations that require water quality monitoring. The Tribe would monitor influent and effluent bimonthly during the operating period for total suspended solids, settled solids and dissolved oxygen. Spot sampling for nutrients may be implemented based on loading, water quality conditions observed or other criteria.

Central Incubation and Rearing Facilities — The quantity of water withdrawn from the Clearwater River at Cherrylane is insignificant relative to the amount of flow available (see Table 4-2). <u>Water used would be non-consumptive, and is expected to have no effect on water rights holders.</u>

Water discharged from the Cherrylane and Sweetwater Springs facilities is expected to be somewhat cooler than the receiving stream, since chillers would be used to maintain incubation and early rearing temperatures in the hatchery at below ambient levels. Thermal changes would be negligible because rapid mixing of hatchery and stream or river water downstream of production facilities should minimize temperature-related impacts.

Satellite Facilities — No impacts to surface water quantity are expected at Luke's Gulch or Cedar Flats, because the flows used are minor compared to the flow available. Water used would be non-consumptive, and is expected to have no effect on water rights holders. Water used at the North Lapwai Valley, Yoosa/ Camp Creek, Newsome Creek and Mill Creek sites would reduce ambient flows by 6 percent, 34 percent, 24 percent, and 11 percent respectively, for a distance of up to 300 m (984 ft) of stream (see Table 4-2). The Proposed Action states that no more than one half of either Yoosa or Camp creeks would be diverted for rearing purposes so as not to adversely impact instream habitat. Water needs are greatest in relation to overall streamflow during September for the spring chinook facilities and during May for North Lapwai Valley. Streamflow characteristics would not be changed upstream or downstream of the sites but stream transport capability would be decreased and water temperatures might be increased within the reach of altered streamflow. Therefore, impacts to surface water could be low to moderate.

Spring Chinook Direct Release Sites and Weir Sites — These sites require no additional surface water and depend on existing streamflow volume. At the weir sites, surface water impacts could be low to moderate due to installation of the weirs and potentially diverting water if a concrete sill is installed. Impacts would be short-term (see Section 4.3, **Geology and Soils**).

Mitigation — As mitigation, it is recommended that all facility sites be gauged for flow and temperatures to determine the amount of changes caused at the sites. Should they be determined to have adverse impacts, an adjustment in facility operations would be made.

4.4.2 Use of Existing Facilities Alternative

4.4.2.1 Groundwater

Because Cherrylane facility is not part of this alternative, this alternative would have fewer effects on groundwater than the Proposed Action. Impacts associated with the satellite sites at Luke's Gulch and North Lapwai Valley would be the same as the Proposed Action. Overall impact would be low.

4.4.2.2 Surface Water

Because the Cherrylane facility is not part of this alternative, this alternative would have fewer impacts on surface water quality caused by construction activities, the establishment of hatchery support structures (e.g., water intakes, fish ladder), and the release of chilled water used for incubation and rearing than the Proposed Action. The quantity of water withdrawn from the

Clearwater would also be less. Impacts caused by hatchery practices should be the same, as the same water quality standards would apply in both alternatives. All other water quality and quantity impacts would be the same as those described for the Proposed Action. Overall impacts would be low, and the same mitigation would apply.

4.4.3 No Action Alternative

This alternative would leave the area as is with no impacts to ground and surface waters. No mitigation would be necessary.

4.4.4 Cumulative Impacts

No cumulative effects are anticipated. Impacts would be limited to the facility sites and would not cause an overall change in conditions of either the receiving streams or the Clearwater River Subbasin. Surface water use would be non-consumptive so there would be little or no loss.

4.5 Floodplains

An impact would be expected to floodplains if facilities or permanent roads encroach on designated floodplains and increase the potential for flooding, or which might result in the loss of human life, personal property, or natural resources within the floodplain.

No impacts are expected where floodplains are avoided, spanned, or standard mitigation would effectively eliminate impacts.

4.5.1 Proposed Action

The proposed program would require the construction of structures adjacent to or in the floodplain (hatchery and satellite facilities) and/or within the active stream channel (weirs). In general, all facilities within the 100-year floodplain would be designed to be either temporary, non-obstructive to floodwaters, or both.

4.5.1.1 Central Incubation and Rearing Facilities

Intake and outlet structures for facility water supply and discharge at both the Cherrylane and Sweetwater Springs central incubation and rearing facilities would, of necessity, be located within the 100-year floodplain. Other hatchery structures and related site development at both sites would be outside the 100-year floodplain.

At Cherrylane, the inlet and outlet structures would be permanent structures located within the bank of the Clearwater River with adequate protection (riprap) to prevent bank erosion or structural damage during high river flows. They would be designed to cause no significant rise in flood elevation through the creation of a backwater. A detailed storm water and drainage study would be included as part of the facility design. As previously mentioned, no other site development would occur within the 100-year floodplain. As a result, there would be no impact on the floodplain of the Clearwater River at the Cherrylane site.

At Sweetwater Springs, the water collection system is within the 100-year floodplain. A storm water runoff analysis would be completed prior to designing the permanent structures. Any new structures that could sustain damage if unusual runoff occurs would be floodproofed. Improvements to this existing facility would have no impact on floodplains.

4.5.1.2 Satellite Facilities

FEMA has not mapped the areas where the satellite facilities are proposed. The 100-year flood elevation at each site was estimated.

The Luke's Gulch, North Lapwai Valley and Yoosa/Camp Creek sites are located outside the 100-year floodplain based on these estimates. The only construction within the 100-year floodplain would be for the inlet and outlet structures. These would be permanent structures located in the river bank with adequate protection (riprap) to prevent bank erosion or structural damage during high river flows. They would not contribute to any significant rise in flood elevation through the creation of a backwater. Though the North Lapwai Valley site has a high probability of flooding because it has a large, developed and channeled drainage area upstream, it was not inundated by the 1996 northern Idaho floods. The Yoosa/Camp Creek site would not be used during the normal high runoff period (March-early May). No impacts on floodplains are expected at these sites.

The Newsome Creek, Mill Creek and Cedar Flats sites would have facilities estimated to be within the elevation of the 100-year floodplain. Fill would be placed where necessary to support structures but would not create an elevated area that would divert or impede floodwaters. Inlet and outlet structures would be permanent structures and would be placed in the river bank with adequate protection (riprap) to prevent bank erosion or structural damage during high river flows. They would not create a backwater and would not contribute to any significant rise in flood elevation. Fish ponds at these sites would generally be low to the ground and would be repaired or replaced if damaged by floodwaters, rather than floodproofed. They would not contribute to any significant rise in the flood elevation. Displacement of floodwaters by structures is not expected to alter floodplain storage volume or cause a local increase in the flood stage. The Mill Creek and Newsome Creek sites would not be used during the normal high runoff period. No impacts on floodplains are expected at these sites.

Mobile trailers for facility personnel would be required at all satellite facilities. If possible, their placement would be outside the 100-year floodplain. In general, the trailers would be removed should flooding occur or threaten a satellite site. If placed within the floodplain, they would not impede the flow of floodwaters because they would be raised off the ground and any flooding would pass beneath them.

4.5.1.3 Spring Chinook Direct Release Sites and Weir Sites

No new construction or placement of structures within floodplains is planned for any direct release sites. Therefore, no impacts on floodplains are expected at any release site.

Weir sites would be within the active stream channel and would be designed to minimize impacts on stream hydraulics. Weirs would typically be installed by hand within the stream channel and would be designed to wash out in the event of a flood.

Permanent anchoring points on either stream bank would be required at each weir site. These could range from concrete anchors placed flush with the bank surface to steel members driven into the bank. In all cases the anchoring points would have adequate protection (through riprap or burial) to prevent bank erosion or structural damage during high river flows. They would not create a backwater and would not contribute to any significant rise in flood elevation. The weir anchoring structures would have no impact on floodplains.

A sill in the streambed would likely be required at some of the weir sites. Specific weir sites requiring a sill would be identified during the design phase. The sill would be placed along the bottom of the stream channel and would have a low vertical profile. No significant backwater would be created by the sill. No impact on floodplains would be expected.

4.5.1.4 Mitigation

While final facility design completed for each site would determine the actual risk of flooding and the facilities that need to be protected, a number of general conditions will be established for all sites.

- All facilities will be as high above active drainages as possible.
- No flood flow barriers will be built.
- Damage to riparian vegetation will be avoided where possible.
- Piping will be buried where possible.
- Electrical equipment will be portable where possible.
- Portable equipment will be removed at the end of the season.

4.5.2 Use of Existing Facilities Alternative

Without the Cherrylane facility, there would be no water inlet and outlet structures described in the Proposed Action. Otherwise all other effects and mitigation would be the same as described in the Proposed Action. No impacts are expected to the floodplain.

4.5.3 No Action Alternative

Under the No Action Alternative, no effects on floodplains would occur.

4.5.4 Cumulative Impacts

No cumulative impacts on floodplains are expected.

4.6 Fish

4.6.1 Proposed Action

Program activities would cause a variety of effects on the environment and its fisheries. Effects, both detrimental and beneficial, would come from four major sources:

- the design, siting, and construction of hatchery facilities;
- hatchery operations and management;
- fish interactions; and
- human-fish interactions.

Design, siting, and construction of hatchery facilities would, in the near-term, have an immediate effect on the local environment and associated biota. Most physical impacts would be away from the channel, and would be primarily limited to the hatchery facilities' sites. Effects of disturbances can be directly or indirectly transferred to the aquatic community in nearby streams.

Hatchery operations and management would produce water, fish, and environmental contaminants once facilities are built and begin operating. The probability that they would have adverse environmental consequences depends on the techniques used to propagate and release hatchery fish, the effort made to minimize or mitigate for unwanted impacts, and the characteristics of the receiving environment.

Fish interactions between hatchery-reared chinook, their wild counterparts, and other species of fish would create impacts. The primary types of interactions involving NPTH chinook and other species of fish are competition, predation (either preying on or being preyed upon by other species), reproduction (including genetic ***introgression***), and disease transmission. The strength and outcome of these types of interactions would depend not only on biological attributes of the species involved, but also on the carrying capacity of the environment.

Human-fish interactions created as a response or a consequence of the proposed program could impact targeted chinook and perhaps other fish populations. If successful, the NPTH may evoke certain responses from resource managers and users such as increased fishing opportunities and pressure on targeted and non-targeted stocks.

The broad categories of effects can be further broken down into associated ***causal factors*** shown in Table 4-3. They are described in detail in this section, and fisheries impacts are addressed in relation to these causal factors.

For Your Information

introgression *Loss of, or changes in, population identity including loss of diversity among populations, characteristics of adaptation with populations, or of other evolved features of genetic organization (may occur through crossbreeding or inadvertent effects of artificial selection).*

Causal factors *are subcategories of general impacts.*

Table 4-3
Categories of Impacts and Causal Factors Evaluated

Facility and Construction	Hatchery Operations and Management
Site Disturbances	Water Gains and Losses
Channel Alterations	Water Quality
Water Intake and Discharge Structures	Fish Traps, Live Boxes, Ladders, and Weirs
	Broodstock Selection and Maintenance
	Mating Protocols
	Incubation and Rearing Practices
	Fish Health Management
	Fish Releases
Fish Interactions	**Human-Fish Interactions**
Competition	Non-Tribal Management Actions
Predation	Fishing
Reproduction and Genetic Exchange	
Disease Transmission	

4.6.1.1 Method for Evaluating Impacts

A process based on expert consultation was used to determine the nature and extent of environmental impacts that may result from NPTH activities. The process was structured to elicit the best scientific judgment from a panel of experts familiar with the project and the associated environment. The process consisted of several steps:

- Impact Assessment Team **(IAT)** Selection
- Impact Assessment Strategy
- Scoring Impacts
- Team Review

Selection of an Impact Assessment Team — The team was composed of the following fisheries biologists, a resource manager, and an engineer familiar with the project and affected resources.

- William Blaylock - Aquatic biologist, Montgomery Watson
- John Colt - Engineer, Montgomery Watson
- Steve Cramer - Consulting fisheries biologist
- Dave Johnson - Fisheries biologist, NPT
- Ed Larson - Hatchery production manager, NPT
- Cleve Steward - Consulting fisheries biologist

Impact Assessment Strategy — Team members compiled and reviewed existing information relating to hatchery configuration, operations, and affected resources, including material developed for this program, that related to potential impacts of hatcheries and hatchery fish on the environment. The team facilitator conducted two meetings in which IAT members discussed project impacts and familiarized themselves with the assessment approach. The team used the causal factors of effects shown in Table 4-3 to independently evaluate and score the impacts on four categories of fish, using four levels of impact. The fish categories and impact levels are described below.

Fish Categories

Targeted chinook are the hatchery chinook produced by the NPTH and the wild populations from which they are drawn or introduced.

- For spring chinook, this includes hatchery fish released into Lolo, Newsome, Mill, Meadow, Boulder and Warm Springs creeks, fish produced by adults returning from the hatchery releases that spawn in the wild, and fish produced from any unsupplemented runs that occur in a stream before the Proposed Action begins.
- For fall chinook, this includes the hatchery fish released into the mainstem Clearwater River at Cherrylane and Lapwai Creek, the South Fork Clearwater at Luke's Gulch and the Selway River at Cedar Flats, fish produced by adults returning from outplants that spawn in the wild, and fish produced in the mainstem Clearwater River before the Proposed Action begins.

Non-targeted chinook are non-NPTH chinook (both hatchery or wild) originating within and outside the Clearwater River system encountered during outmigration, in the ocean, or on the return to the Clearwater River Subbasin.

- For spring chinook this includes fish encountered during outmigration, in the ocean, or in Clearwater River tributaries or hatcheries that were not derived from streams occupied by targeted spring chinook.
- For fall chinook, this category of fish includes those fish encountered during outmigration, while in the ocean, or during return to rivers other than the Clearwater that were not derived from outplants of targeted chinook.

Other salmon and trout includes steelhead, bull trout, cutthroat trout, and brook trout. Effects to this category of fish are primarily discussed relative to streams that are the focus of the targeted spring chinook populations.

Non-salmonids are all other fish species. Effects to this category of fish are discussed relative to streams and rivers that are the focus of the targeted spring and fall chinook populations.

Impact Levels

The concept of ***population viability*** was used as a measure of project related impacts. Here, viability is taken to mean the probability that the population would perpetuate itself into the future. This probability is a function of the fitness of individuals in the population, their abundance and genetic makeup, and the environment and if these individual fish are more or less likely to survive and spawn when exposed to the Proposed Action. For purposes of this assessment, population viability is indexed by the anticipated status (abundance) and trend of the population over time. Impacts were scored as none, low, moderate, and high based on the following criteria:

No impact would occur if the Proposed Action would not affect fish abundance and would result in no change from existing conditions.

A **low impact** would occur if the Proposed Action is likely to result in a small change in abundance, but the amount of change would fall within the normal range of year-to-year variability observed for the species, and therefore would not ultimately affect population viability.

A **moderate impact** would occur if the Proposed Action is likely to produce a moderate change in abundance. The amount of change would be similar in magnitude to the response exhibited under atypical conditions, such as during drought years or in years where run sizes are outside the normal range. Should conditions or impacts persist, population viability may be affected.

A **high impact** would occur if the Proposed Action is likely to cause a large change in abundance. The magnitude of the change would be similar to that caused by severe natural disturbances, such as a landslide occurring or being removed that would block or add to the range of accessible habitat. Population viability of the fish within the specific drainage would be affected.

Impacts were evaluated within different geographical and temporal scales. Because chinook salmon complete their life cycle by sequentially inhabiting tributary (spring chinook), mainstem, estuarine, and marine habitats, the nature and extent of impacts within these areas would be influenced by the scale of the associated system. Some impacts are limited to facility sites in the Clearwater River Subbasin. They would have relatively large direct and indirect effects. Other impacts would be distributed over larger geographic areas, defined by the migratory routes of the target species. In these cases, effects caused by the Proposed Action would be more of a cumulative nature and much harder to discern or predict.

Impacts were also assessed based on the premise that changes made to the salmon's environment as a result of overall recovery efforts will occur. These recovery efforts will result in wild spawning Snake River chinook salmon being able to return at a rate that, at the least, replaces themselves.

Scoring Impacts — After evaluators scored the impacts for each category of fish, the qualitative scores were assigned a numerical value, summed and averaged for an overall score. On individual evaluators tables, scores ranged from 0-3, with 0 equalling no impact and 3 equalling a high impact. Summary results of the impact scoring process are in Table 4-4.

Team Review — After the initial scoring, the IAT discussed the scores, identified and reconciled differences of opinion, and reached consensus on the level and type of impacts. There was broad agreement on most scores, so it was not necessary to repeat the scoring procedure.

4.6.1.2 Impacts

Siting and Construction of Hatchery Facilities — Hatchery facilities would necessarily be situated close to stream channels. The construction of NPTH facilities would have physical impacts that relate to site disturbances, channel alterations, and the placement of water intake, conveyance, and discharge structures.

Site Disturbances

Construction of the central incubation and rearing facilities and satellite ponds would disturb the ground and add impervious surfaces to the sites, which may lead to increased or rerouted runoff and sediment carried into streams. Increased runoff is expected to be short-lived and is not expected to exceed a stream's ability to carry sediment away from the site. It is not expected to change a stream's substrate. Some amount of bankside and riparian vegetation would be removed or disturbed which may affect fish cover, source of food, and shade on a very limited scale. Most construction activities would occur away from the channel, and would be mitigated by erosion control, removing the least amount of trees possible, and revegetating the site after construction.

Site disturbances may change the behavior and disrupt the distribution of individual fish adjacent to and downstream of the sites, but the overall biological impact to targeted chinook, other salmonids and non-salmonid populations is expected to be low.

Table 4-4 Summary Results of the Impact Scoring Process

Causal Factors	Targeted Chinook	Non-Targeted Chinook	Other Salmonids	Non-Salmonids
Siting and Construction of Hatchery Facilities				
Site Disturbances	Low	None	Low	Low
Channel Alterations	None	None	None	None
Water Intake and Discharge Structures	Low	None	Low	Low
Hatchery Operations and Management				
Water Gains and Losses	Low	None	Low	Low
Water Quality	Low	None	Low	Low
Fish Traps, Live Boxes, Ladders, and Weirs	Moderate	Moderate	Moderate	Low
Broodstock Selection and Maintenance	Moderate	Low	None	None
Mating Protocols	Low	Low	None	None
Incubation and Rearing Practices	Low	None	None	Low
Fish Health Management	Low	Low	Low	Low
Release Methods and Numbers	High	Moderate	Low	Moderate
Fish Interactions				
Competition	Low	Low	Moderate	Low
Chinook as Predator	Low	Low	Low	Low
Chinook as Prey	Low	Low	Low	None
Reproduction and Genetic Exchange	Moderate	Low	None	None
Disease Transmission	Low	Low	Low	Low
Human-Fish Interactions				
Non-Tribal Management Actions	Low	Low	Low	Low
Fishing	Low	Low	Low	Low

The amount of habitat and number of fish affected by these changes would be small relative to the total habitat available. No significant change in abundance or trend in fish populations is expected. Non-targeted chinook are not present in the receiving streams, and therefore would not be impacted.

No cumulative impacts from site disturbances at facility sites are anticipated. Impacts are expected to be localized and short-lived.

Channel Alterations

Stream channels adjacent or close to the North Lapwai Valley, Yoosa/Camp Creek, Newsome Creek and Mill Creek satellite sites would be altered by channel excavation and bank riprap used to establish intake structures, to place instream boulder anchors and perhaps bank anchors to support fish weirs, and to place tripods and fence panels for weirs. River channels adjacent or close to Cherrylane, Luke's Gulch and Cedar Flats would be altered by channel excavation and bank riprap used to establish intake structures and fish ladders. Stream channels in Meadow Creek, Boulder Creek, Warm Springs Creek, Johns Creek, Eldorado Creek, and Tenmile Creek would be altered to place instream boulder anchors and perhaps bank anchors to support fish weirs, and to place tripods and fence panels for weirs.

During construction, fish residing within the area of activity would be displaced, and some might be killed. Longer-term impacts caused by the structures may include disrupting the behavior and distribution of individual fish next to and downstream of the sites. (The operation of weirs and fish ladders and their effects on fish are discussed more fully in **Hatchery Operations and Management**.) But construction and placement of channel structures is not expected to incur significant biological impacts for targeted chinook, non-targeted chinook, other salmonids and non-salmonid populations. No change in abundance or trend in fish populations is expected. Impacts are expected to be localized and short-lived.

No cumulative impacts are anticipated by channel alterations at facility sites.

Water Intake and Discharge Structures

Water intake, conveyance, and discharge structures would be permanent fixtures at NPTH production sites. The structures would be screened to prevent fish from entering or leaving the facilities. Construction would disturb near-channel and in-channel areas, causing sediment delivery to the stream, removal or disturbance of streambank vegetation and disturbance of the stream substrate. Increased runoff is not expected to exceed a stream's ability to carry sediment away from the site and should not change the stream's substrate. The amount of bankside and riparian vegetation that would be removed or disturbed would be small.

If structure screens fail, non-hatchery fish may enter and hatchery fish may exit the facility. Unintentional releases of hatchery fish from screen failure are not expected. Any non-hatchery fish that enter the hatchery because of screen failure in the flow distribution system would either be reared along with hatchery fish, returned to the stream, or retained for broodstock.

Site disturbances may disrupt the behavior and distribution of individual fish adjacent to and downstream of the sites, but the overall biological impact to targeted chinook, other salmonids and non-salmonid populations would be localized and short-lived. The amount of habitat and number of fish affected by these changes would be small relative to the total habitat available. No significant change in abundance or trend in fish populations is expected. Impacts would be low.

Non-targeted chinook are not present in the receiving streams, and therefore would not be impacted.

No cumulative impacts are expected at facility sites.

Hatchery Operations and Management — The central incubation and rearing facilities at Cherrylane and Sweetwater Springs, and the six satellite rearing facilities would release water, fish, organic and inorganic wastes, and pathogens. The IAT considered the potential impacts of diverting water from nearby watercourses and the effects of changes in water quantity and quality on the receiving stream and associated biota. The team also assessed the impacts of management decisions and practices associated with collecting, mating, rearing chinook in a hatchery and subsequently releasing them into the natural environment.

Water Gains and Losses

The IAT compared the water requirements of the various hatchery facilities with the amount of water available and concluded that the potential for adverse fisheries impacts is greatest at the Yoosa/Camp Creek, Newsome Creek and Mill Creek sites (see Tables 2-1 and 4-2). These are smaller streams that would have their flows reduced by 34 percent, 24 percent, and 11 percent, respectively, for a distance of up to 300 m (984 ft) of stream. The amount of habitat available, passage conditions, and food production would be negatively impacted in these reaches, particularly during September, when water needs are greatest in relation to overall streamflow. Larger systems, such as Lapwai Creek, the Selway, South Fork Clearwater, and lower mainstem

Clearwater, would not be affected to any great extent since the amount of water withdrawn would be a small fraction of the total streamflow.

The IAT concluded that flow alterations caused by hatchery operations would not significantly affect the viability of any fish population. Because of the location and the relatively small area affected, fish are expected to move either upstream or downstream, or exist at smaller densities within the impacted segment. However, because a decrease of fish abundance within the impacted stream reaches is predicted for Yoosa Creek, Newsome Creek and Mill Creek, the impact to targeted chinook, other salmonids and non-salmonids for these sites was rated as moderate. No impact is expected on targeted chinook, other salmonids, and non-salmonids at other release and satellite sites. Consequently, the combined impact to these categories of fish from water gains and losses is rated low. No impact is expected on non-targeted chinook in any area.

Water diversions at all facility sites would not cause any change in status or trend of fish populations so no cumulative impacts are expected.

Water Quality

Discharges of chemical and organic pollutants would meet or exceed federal and state water quality standards and guidelines, and would satisfy all permit requirements. Important physical properties and chemical constituents in hatchery effluent would be routinely monitored to assure compliance with water quality standards. Chemicals used to prevent or treat fish diseases would be handled, applied, and disposed of in accordance with state and federal regulations.

Hatchery practices would be conducted to minimize the amount of uneaten food and discharge of organic wastes into the natural environment. Adult fish carcasses would be used for fertilizer, or disposed of at local landfills. Satellite ponds would be cleaned at the end of the rearing cycle and wastes would be disposed of at local landfills. At Cherrylane, effluent would settle and be treated in effluent ponds, and hatchery wastes would be removed before liquids are discharged into the lower Clearwater River. Effluent would rapidly dilute and disperse in the river.

Water discharged from the Cherrylane and Sweetwater Springs facilities is expected to be somewhat cooler than the receiving stream, since chillers would be used to maintain incubation and early rearing temperatures in the hatchery at below-ambient levels. Water released would mix rapidly with the stream and river water downstream of the facilities. Temperature changes would be minor.

Any water quality changes resulting from the proposed facilities may disrupt the behavior and distribution of individual fish adjacent to and downstream of the sites, but the overall biological impact to targeted chinook, other salmonids and non-salmonid populations is expected to be low. The amount of habitat and number of fish affected by these changes would be small relative to the total habitat available. Non-targeted chinook are not present in the receiving streams, and therefore would not be impacted.

No cumulative biological impacts to fisheries status or trend would result from the addition of nutrients from facility discharges.

Fish Traps, Ladders, and Weirs

Fish Traps — Juvenile fish that emigrate from Lolo Creek and Meadow Creek would be collected by rotary screw traps and held in live boxes until sampled. Depending on the amount of flow, 5-70 percent of the fish passing the trap on any given day can be captured. The capture efficiency approaches 70 percent during the fall when water is at base flow, and is 5 percent or less during spring runoff. Staff would check the traps daily, or more frequently if there is a pulse of migrating fish. Trapping, handling, weighing, measuring, and tagging these fish would cause mortality. The Nez Perce Tribe has operated screw traps at these sites since 1994. During this time, 50,124 fish were trapped, of which 369 were dead. No estimates of mortality were made after fish were released, but information from PIT tag studies shows an additional 2 percent might be expected to die shortly after release. Fish impacts on Lolo and Meadow creeks were rated as moderate for targeted chinook, other salmonids and non-salmonids. No impact is expected to the four fish categories at any other site.

The traps operated on Lolo and Meadow creeks would add to cumulative impacts to targeted chinook and other salmonids (particularly steelhead) that emigrate from these drainages. Traps are operated by other management agencies farther down in the Clearwater, Snake, and Columbia river systems, in addition to those operated on the fish bypass and transport systems at the mainstem dams. Repeated trapping and sampling of the same individual fish might cumulatively increase the rate of mortality.

Fish Ladders — Cherrylane, Luke's Gulch, and Cedar Flats facilities would be equipped with fish ladders so that managers may collect returning hatchery adults on an as-needed basis. No detrimental impacts are expected to be caused by the ladders themselves. However, non-hatchery fish may commingle with hatchery spawners and ascend the fish ladder as part of a group. Depending on the mating protocols, they may be kept in the facility to be spawned, or released to the river. If kept in the hatchery, their progeny would be returned to the rivers with fish reared at NPTH facilities. No impact is expected to occur to any of the four fish categories by the fish ladders.

Fish Weirs — Operating fish weirs may block, delay, or otherwise disrupt the movements and distribution of fish. These include returning adult chinook, late run steelhead, late run cutthroat trout, late run suckers, or early running bull trout. Juvenile life stages, and other fish species, are less likely to be affected. Weirs can stress, injure, or kill fish if improperly designed and operated. Weirs may also prevent adults that have temporarily strayed above the weir (dip-ins) from returning downstream and migrating to other areas to spawn.

As mitigation, several items are necessary. Vigilant monitoring and cleaning of weirs, and checking areas downstream of the weirs by snorkeling to determine if adults are holding up or spawning downstream is necessary. Handling protocols must be established for adults trapped. Downstream passage must be allowed using a downstream trap. Finally, corrective actions that favor the survival of naturally-reproducing adults must be immediately applied should problems occur with the weirs.

The IAT rated impacts of weir operation and overall effects of this category as moderate to targeted chinook, other salmonids and non-targeted chinook (fish returning to control streams - Johns Creek, Tenmile Creek, and Eldorado Creek, or straying fish). No impact is predicted for non-salmonids.

The proposed weirs would have cumulative impacts to spring chinook and other salmonids in the Clearwater River Subbasin. Under existing conditions, weirs are operated on several streams (Big Canyon Creek, Clear Creek, Crooked River, Red River, Walton Creek, Fish Creek, Running Creek, and historically, the upper Lochsa, and Brushy Fork Creek) in the Subbasin to conduct research and collect hatchery broodstock. Adding at least eight weirs would cause adverse impacts to be spread over a wider geographical range. Should the adverse impacts become the rule and not the exception, a decrease in run size and redistribution of spawning, perhaps to less favorable areas downstream, might occur.

Broodstock Selection and Maintenance

Two genetic resource assessments were completed as part of the Proposed Action (Cramer, 1995a; Cramer and Neeley, 1992). These resource assessments evaluated the effects of broodstock selection for NPTH activities in the Clearwater River Subbasin and made recommendations for broodstock sources (see Section 2.1.3.7, **Broodstock Source and Management**). The

Proposed Action would follow the recommendations, thus limiting potential detrimental effects on targeted and non-targeted chinook populations.

Broodstock maintenance activities can pose four types of genetic risk: extinction; loss of within-population genetic variability; loss of, or changes in, population identity; and domestication selection (Busack, 1991; Cramer and Neeley, 1992; Kapuscinski, et al., 1993). NPTH broodstock operations have the potential to simultaneously incur one or more of these risks. The threat of extinction of the targeted or non-targeted population poses a risk to very small populations. A reduction in genetic diversity within targeted populations can occur whenever the number of fish spawning in the wild or in the hatchery falls below certain levels or mating is not random. Loss of population identity can occur whenever genetically dissimilar fish are included in hatchery broodstock or wild spawning populations. The risk of domestication selection increases whenever broodstock collection accentuates differences between hatchery and wild components of the targeted populations.

The broodstock maintenance program developed for the spring chinook portion of the Proposed Action protects targeted populations from extinction, loss of genetic variability and domestication selection by using wild-to-hatchery spawner ratios that permit wild runs to build to sustainable levels within a reasonable period of time (see Section 2.1.3.7, **Broodstock Source and Management**, and Appendix C). Once well-established, wild fish from the targeted population would provide up to 50 percent of the hatchery broodstock. Until such time, variable wild:hatchery ratios would be permitted so that the percentage of wild fish in hatchery and naturally-reproducing populations increases as the number of returning wild fish increases. Regardless of escapement level, wild fish would be incorporated into hatchery broodstock at slightly higher percentages than in the naturally-reproducing population to provide added protection against the risk of domestication selection in the hatchery. To minimize the risk of extinction, proportionately greater numbers of hatchery fish would be allowed to spawn naturally if the wild population drops to critically low levels.

Fall chinook would not have the immediate benefit of cross-breeding wild and natural adults, but institutional regulations will protect adverse impacts from occurring to naturally-spawning fish. Allowing a portion of the fall chinook run to spawn in the environment would continue other efforts currently underway in the basin to supplement this stock upstream of Lower Granite dam (see Section 1.6.4, **Lower Snake River Fish and Wildlife Compensation Plan**).

Fish from Lyons Ferry, which is the egg bank program for the Snake River run, have been used to increase the return of naturally spawning fall chinook upstream of the hatchery. Fish were captured for the egg bank program from those bound for the Snake River and blocked by Hells Canyon Dam. They are probably more genetically similar to the historic Snake River population than those wild fish currently spawning. This is because out-of-basin fish have strayed into the Snake throughout the years and are assumed to have crossbred with Snake River origin fish in the wild.

The genetic effects of the supplementation efforts would largely depend on the broodstock maintenance program at Lyons Ferry, and eventually NPTH. When Lyons Ferry fall chinook outplanted from the NPTH acclimation sites return to spawn, the progeny would be considered to be wild fish, and these are protected by the Endangered Species Act. It is assumed that the hatcheries would be required to conduct their brood taking and spawning combinations from the entire portion of the run and encourage the integrity of the Snake River stock. Because Lyons Ferry serves as an egg bank, and is also being used to supplement a threatened species, it receives critical attention from NMFS on its husbandry techniques. These procedures and scrutiny would be carried forth on practices of NPTH. Hatchery practices would not be allowed to jeopardize the further existence of the species. Receiving such attention by the foremost experts in genetics would result in having as few adverse effects on the population of fall chinook currently spawning in the Clearwater as can be expected.

Despite actions taken to minimize impacts, broodstock selection and maintenance has the potential to adversely affect targeted and non-targeted chinook populations. IAT members projected that should they occur, they would have moderate impacts for targeted chinook, and low impacts for non-targeted chinook. Other salmonids and non-salmonids would not be affected.

The overall risks of change in genetic structure can affect any fish hatchery that releases fish to eventually spawn. Using broodstock recommended in the resource assessments and using the wild:hatchery ratios, the Proposed Action would decrease this potential for cumulative impacts to salmon populations.

Adult Holding and Spawning

Spawning fish in a hatchery entails risks that may affect targeted and non-targeted chinook populations. Most hatcheries experience a pre-spawning mortality rate of 10-15 percent of all adult fish captured. NPTH proposes to use higher flow rates in adult holding facilities than are commonly used by hatcheries to alleviate pre-spawning stress. Nonetheless, adult mortalities would occur. Unmarked strays (non-targeted chinook), possibly from listed populations, could also die if they find their way into the facilities.

IAT members rated the potential impacts to targeted and non-targeted chinook populations as low. Although individual adults would die, overall abundance of targeted populations is still expected to increase by the supplementation program. Straying of non-targeted chinook into NPTH facilities is not expected to be significant. No impacts are expected to other salmonid and non-salmonid populations.

The Proposed Action would add to adult mortalities caused by holding and spawning operations of other hatcheries in the Columbia River Basin. Because hatchery intervention is more likely to cause an increase in populations by decreasing mortality at younger ages, cumulative impacts are not expected to be significant.

Incubation and Rearing Practices

Rearing conditions and practices can strongly influence the physiological, morphological, and behavioral characteristics of hatchery fish. These characteristics in turn would affect the magnitude and types of interactions between hatchery and wild chinook and their ability to survive in the wild. The size of fish released is an important consideration since hatchery fish, if larger than wild fish, may enjoy a competitive advantage and reduce the survival of wild fish (Solazzi, et al., 1983). Hatchery fish that are too small are less likely to develop on schedule and have life history patterns that are consistent with the targeted population.

NPTH has been designed to incubate and rear fish under as natural conditions as possible to maximize their survival following release. Rearing density, temperature, light, water velocity, feeding, and other environmental attributes would be maintained at levels that foster the development and expression of wild-type behaviors and other survival related traits among hatchery fish. Because of the use of techniques to maintain wild-type characteristics among hatchery fish, the IAT ranked the potential impact on targeted populations as low. Non-targeted chinook, other salmonids and non-salmonids are not expected to be affected. Cumulative impacts are not expected.

Fish Health Management

Hatcheries may introduce diseases into the natural environment either by direct contact or through contaminated wastes. Free-living fish may be exposed to increased levels of pathogens and may contract diseases when they come in contact with pathogen-bearing water. Some past releases of hatchery fish have introduced pathogens into the natural environment, leading to novel or additional health risks for wild fish (Hastein and Lindstad, 1991; Hindar, et al., 1991). However, the extent of disease transmission from hatchery to non-hatchery fish is believed to be low since the pathogens responsible are already present in both groups of fish, and environmental conditions generally do not favor outbreaks of disease in the wild.

Nez Perce hatchery managers would guard against the transmission of disease from hatchery to wild fish and from hatchery fish to hatchery fish using many measures. These include screening broodstock for disease, disinfecting water before use where necessary, controlling water temperature to reduce infections, controlling incubation densities, controlling the incidence of disease in the hatchery, cleaning effluent where necessary, and by ensuring that fish slated for release into the natural environment have met strict fish health quality standards. Fish would be inspected before transfer to satellite facilities and again before they are released into streams. Common diseases such as bacterial kidney disease would be monitored routinely in hatchery and wild populations. Less common diseases would be monitored as necessary.

The annual operating plan would describe the comprehensive and detailed management of fish health and disease. Fish health technical services would be provided by either a federal agency (USFWS), or be developed by the NPT in accordance with Pacific Northwest Fish Health Protection Committee, IHOT, and NPT guidelines.

Disease control and monitoring practice would conform with standards developed by the Nez Perce Tribe Fish Health Policy (1994) and the Integrated Hatchery Operations Team. The Nez Perce Tribe Fish Health Policy defines policies, goals, and performance standards for fish health management, including measures to minimize the impacts to wild fish.

Fish rearing practices, waste removal, and prophylactic treatment of disease outbreaks within the hatchery would help maintain acceptable pathogen levels. Even if disease were to be transmitted, the overall impact would probably be negligible since wild fish are widely dispersed and tend to be disease-resistant. Consequently, the impact of transmitting diseases from hatchery to non-hatchery fish (all four categories of fish) is considered low. No cumulative impacts are anticipated.

Methods and Magnitude of Release

The location, method, timing, and magnitude of release would influence the frequency and kinds of interactions possible between hatchery chinook and resident fish. Releasing fish in the wrong place or at the wrong time can increase the potential for adverse interactions. Releasing too many fish may overwhelm the carrying capacity of the natural environment, depleting the amount food available. Selection of an inappropriate method of release may result in excessive concentrations of fish, increased stress, and lower survival of chinook and other species alike.

The design of NPTH considered carrying capacity and quality of the streams to be supplemented, the method to be used to transport and outplant hatchery fish, the time of year at which fish would be released, and the density and absolute number of fish to be released in each location. Habitat quality and quantity available for outplanting spring chinook were explicitly considered in establishing production and stocking goals. Each targeted stream would be outplanted with a number of hatchery chinook which, when added to the wild fish chinook, would not surpass 70-100 percent of the carrying capacity for that species.

The magnitude of release is probably the most important factor affecting status and trend of targeted chinook populations. Release number can result in an increase in populations similar to the most significant natural events.

Release methods were designed to impart “wildness” to released fish. NPTH would release spring chinook that do not have an extended period of residency typical of most hatcheries. By reducing hatchery residence time, natural selection would be given the opportunity to undo any damage caused by domestication selection in the hatchery. Acclimation strategies would allow juveniles to adjust to the natural environment and recover from stress caused by handling and transportation. This should lead to higher post-release survival and at the same time reduce the potential for adverse interactions between hatchery chinook and wild fish.

Subyearling smolt

Presmolt

The timing of hatchery releases would be calibrated to maximize use of available rearing habitat and to avoid overwhelming local resources. Subyearling smolts (fall chinook) would probably not interact to any great extent with their wild counterparts because they would be more likely to begin their downstream migration shortly after release. Spring chinook fry releases would be scheduled for times when food and temperature conditions favor rapid growth. Spring chinook presmolts would be released near the end of the growing season to minimize competition with resident wild fish. They would exit on their own from acclimation ponds over a period of several weeks, thus spreading their impact on resident biota over time.

The IAT concluded that the location, method, timing, and magnitude of release of chinook would have high biological impacts on targeted chinook, low impacts on non-targeted chinook and moderate impacts to other salmonids and non-salmonids. High impact was given to targeted chinook because this activity could cause a dramatic increase in population status and trend over time. Impact to non-targeted populations is not predicted to cause a long-term increase or decrease in their abundance or trend over time. A moderate impact was assigned to other salmonids and non-salmonids because a reduction in abundance of these fish populations could occur if supplementation becomes successful and chinook once again become the most common inhabitant of salmon streams.

Cumulative impacts expected include an increase in salmon populations and a redistribution of other fish populations based on resources available within the streams and rivers targeted for supplementation. Non-targeted chinook could also be affected (see **Fish Interactions** below).

Fish Interactions — As competitors, predators, prey, and disease vectors, NPTH chinook have the potential to alter trophic relationships and abundance of other fish populations in tributary, mainstem, and ocean habitats. Because of their complexity, impacts that derive from competition, predation, and reproduction/genetic exchange are discussed under separate headings below for targeted chinook populations, non-targeted chinook populations, resident salmonid species, and non-salmonid fish species. Disease-related impacts were discussed above in *Fish Health Management*.

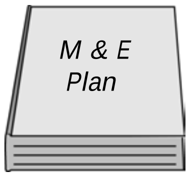
Competition

Targeted Chinook Populations — Competitive interactions would be greatest when hatchery and wild fish overlap in time and space, and contested resources are in short supply relative to demand. Food and habitat shortages are more likely in freshwater environments than in the ocean, and in rearing areas more often than in migratory corridors. In addition to affecting behavior, growth and survival, ***intraspecific*** competition may result in increased activity and stress, which in turn would predispose fish to higher levels of predation and disease (Sosiak, et al., 1979; Dickson and MacCrimmon, 1982; Suboski and Templeton, 1989).

For Your Information

Intraspecific *is within a species.*

As described above, the number of spring chinook outplanted each year would be calibrated so that the sum of hatchery and wild fish does not exceed the carrying capacity of the receiving stream. Additionally, competition would be contained by spreading hatchery releases out in time and space, and releasing many of the hatchery fish after the summer growing season when production bottlenecks typically occur. Hatchery fish released earlier would go into streams after wild chinook have emerged, dispersed, and established territories, so the potential for displacement of wild fish into suboptimal habitats would be low. Spring chinook would be reared in conditions that attempt to simulate those found in the wild, so they should not enjoy a size advantage (see Section 2.1.3.3, **Rearing Techniques**).



The M & E Plan recommends research to determine whether hatchery and wild spring chinook compete equally well for limited resources, and whether intraspecific competition appears to be an important factor regulating production within NPTH streams. This research is part of the adaptive management planned for this alternative. Answers to these questions would be used to modify rearing and release strategies to minimize adverse impacts and take full advantage of the production potential of the streams.

Fall chinook releases are not expected to compete with their wild counterparts. They would likely be larger than most subyearling migrants rearing in the Clearwater, but would also migrate sooner. Should the supplementation strategy be effective, it is predicted that there would be two pulses of migration by subyearling chinook from the Clearwater. An earlier outmigration period would occur by NPTH releases that are more closely aligned with the descending peak of runoff in June. A later subyearling outmigration pulse is expected from July to August that would result from natural spawning in the river by NPTH returning adults and non-NPTH adults.

The IAT concluded that the overall impact of competition on the targeted population would be low, and limited primarily to spring chinook in freshwater habitats. Cumulative impacts are not anticipated.

Non-Targeted Chinook Populations — The National Marine Fisheries Service has argued that effects of competition between hatchery and natural fish stocks in the mainstem and estuary habitats have posed a detriment to natural populations. Because much of the free-flowing nature of the Columbia and Snake River systems has changed to a series of reservoirs, the runoff timing, food resources, numbers of predators, competitors and exotic species have been altered. NMFS believes the carrying capacity for anadromous fish in these habitats has been reduced and that competition under conditions of reduced carrying capacity has resulted in detrimental impacts to wild anadromous stocks. The primary source for competition is the release of almost 200 million hatchery salmon and steelhead annually in the Columbia River Basin. Although NMFS also finds that there is little definitive information on carrying capacity and density dependent (competitive) effects within the mainstem, estuary, and ocean, it recommends a cap on hatchery production as a safeguard. The hatchery cap limits chinook production to the numbers produced in 1994 (20.2 million in the Snake River Basin) with the exception of production to support recovery of listed threatened or endangered stocks.

Competition between NPTH-produced chinook and non-targeted chinook populations would be limited to areas where they commingle and vie for the same resources. These areas would include the mainstem river, estuary, ocean, and, in the event that significant straying occurs, on spawning grounds in non-targeted tributaries.

The IAT evaluated the potential for direct and indirect effects and concluded that NPTH chinook would have a low impact on non-targeted chinook populations. The total number of hatchery and wild fish produced under NPTH would not exceed the natural production capacity of the Clearwater system, and therefore should not cause a disproportionate reduction in the amount of food and space available to commingled stocks.

Proposed hatchery releases of spring and fall chinook would cause cumulative impacts to non-targeted chinook, but the effects would not be detrimental to the recovery of endangered chinook stocks. Spring chinook proposed for release are within the production cap recommended by NMFS. The cap was made for hatchery production from 1994. In that year, the NPT raised approximately 485,000 chinook for outplanting. An additional 420,000 chinook were secured by the NPT and reared by IDFG at Clearwater Hatchery for the tribal outplanting. It is assumed that the production cap was a necessary measure to cause no further harm to chinook species, and would allow for rebuilding of the runs. Because NPTH spring chinook releases proposed are within the cap set in 1994 (as NPT production) they should not interfere with rebuilding of the runs, nor cause harm to the listed stocks.

Fall chinook releases are not expected to cause cumulative detrimental impacts. The fall chinook stock proposed for NPT, Lyons Ferry fall chinook, are considered part of the Snake River fall chinook ESU, and would therefore be excluded from the production cap. Propagation of these fish would be similar to propagation of listed spring chinook or sockeye salmon in other areas of the Snake River Basin (e.g., Eagle Creek Hatchery, McCall Hatchery, or Sawtooth Hatchery). These stocks of fish are propagated for recovery purposes. They are part of the group of fish that are proposed to be protected from competition by the production cap. Consequently, no adverse impacts are anticipated that can be attributed to competition by their production and release from NPTH.

Other Salmonid Species — Competition between chinook and other species of salmonids, primarily young steelhead, cutthroat, and bull trout, could be expected to have detrimental effects if stream resources (food and space) were limited. However, steelhead and bull trout populations have not been increasing in the streams proposed for outplanting or in the Clearwater River Subbasin as a whole. In fact, they are both being considered for listing under the Endangered Species Act. Their densities (see Table 3-7) do not suggest that they approach high levels of use in the outplanting streams, with the exception of steelhead in Boulder Creek. It is unlikely that the stream resources are so taxed that competition with chinook would detrimentally affect their populations. Furthermore, research has shown that juvenile chinook and steelhead occupy areas with different depths and velocities, thus limiting their direct competition for food or space (Everest and Chapman, 1972). Studies on bull trout/chinook interactions are more limited, but supplementation of hatchery chinook and steelhead did not produce long-lasting impacts on bull trout populations in three tributaries to the lower Snake River where the effects were evaluated (Underwood, et al., 1992).

Cutthroat and brook trout appear to have filled the ecological niche vacated by chinook when they were eliminated from the Clearwater River Subbasin. Young cutthroat and brook trout are found in relatively higher densities in the salmon habitat of upper Lolo Creek and Mill Creek. They may be cut off from resources to which they currently have access, and densities of these species may shrink as chinook become established in chinook habitats, but it is unlikely that the viability of these species would be threatened. Cutthroat are the dominant occupant of many of the smaller tributaries to Lolo Creek and Mill Creek, areas that are not preferred by larger anadromous species. It is unlikely that this condition would change.

The IAT determined that competitive interactions between chinook and other salmonids, primarily young cutthroat trout, would have moderate impacts. Due to their extensive use of mainstem habitats during outmigration, hatchery fall chinook are apt to interact less with these species and no impact is predicted.

Restoration of habitat use and reallocation of resources that existed prior to the elimination of salmon from salmon habitat could result and would be a cumulative impact.

Non-Salmonid Fish Species — The scientific literature contains few examples of direct competition for food and space between chinook salmon and non-salmonid species. Because they are generalists in their food preferences, chinook salmon may competitively interfere with other species that feed on aquatic invertebrates. Those species most apt to be affected are sculpins (*Cottus spp.)*, longnose dace (*Rhinichthys cataractae*), and redside shiner (*Richardsonius balteatus*).

The IAT rated potential competition-related impacts on resident non-salmonids as low. Although chinook may deplete food supplies in the short-term, especially in the immediate area of release, they are not expected to significantly reduce in number or otherwise lower the viability of resident fish species.

Restoring a salmon run and bringing in nutrients would be positive cumulative impacts.

Predation

Predation plays an important role in determining community structure and species abundance. Predators can reduce the abundance of prey species to the point that competition is inconsequential. NPTH chinook would fill the dual role of predator and prey in freshwater and marine ecosystems. Their impact on other species would depend on their respective trophic relationship, number, and spatial and temporal overlap. This section considers program-related impacts separately for prey and predator species.

NPTH Chinook as Predators — Chinook released by NPTH are unlikely to cause detrimental impacts to other fish species by acting as predators. Hatchery chinook would be released at times that favor the development of natural diets and feeding habits. They would establish feeding stations and prey on a variety of primarily invertebrate drift species. They are not expected to eat other fish until they attain a larger size (120 mm or so). For spring chinook, the gradual transformation to a fish-eating diet begins with their seaward migration as yearling smolts. Fall chinook begin their emigration at a smaller size, and thus do not begin to eat other fish until they have entered the ocean.

Chinook smolts actively feed during their downstream migration through the Snake and Columbia rivers. Their diets are dominated by local invertebrate species such as cladocerans, chironomids, and amphipods (Muir and Emmett, 1988). Although larger smolts may consume smaller fish, including other salmon, recent evidence suggests that fish comprise an insignificant fraction of the food consumed by migrating chinook salmon in the Snake and Columbia rivers (Muir and Coley, 1995).

The effects of NPTH chinook on predator-prey dynamics cannot be accurately predicted since little is known of the role of chinook in the ecology of the Columbia River estuary and Pacific Ocean. NPTH chinook would prey on other species of fish, but a change in status or trend of other species as a result of their predation is not expected <u>because the numbers of NPTH chinook would be very small compared to the numbers of other fish in the ocean.</u>

Overall, the potential impact of predation by NPTH fish on all categories of fish was rated as low. They are not expected to consume many fish while in freshwater and the effects of their predation on other fish in ocean is expected to be negligible.

Cumulative impacts are not anticipated for spring and fall chinook. The rationale described under cumulative competition effects for non-targeted chinook, that is, the hatchery cap, also applies here.

NPTH Chinook as Prey — Somewhat greater, but still minor impacts are expected from NPTH chinook as prey. Chinook would be released from NPTH facilities at sizes and under conditions that initially make them susceptible to predation. Populations of predator species such as bull trout, larger cutthroat, and northern squawfish should benefit from initial outplanting and an increase in run sizes due to supplementation.

Farther downstream, large concentrations of hatchery fish may adversely affect all four categories of fish by stimulating bird and fish predators at dams and river mouths. Shifts in predator type and abundance due in part to increased hatchery production have led to higher predation mortalities among wild juveniles during migration (Li, et al., 1987). The presence of hatchery fish may also affect the behavior of non-hatchery fish, increasing their vulnerability to predators in the process. If hatchery fish enable predator populations to expand, if they alter behavior patterns of non-hatchery fish, or if they physically displace or induce non-hatchery fish to use suboptimal habitats, then those fish populations may experience higher predation mortality.

On the other hand, hatchery fish would buffer non-hatchery fish from predation. Recently released hatchery fish often exhibit inappropriate competitive and foraging behaviors, and lack familiarity with their new surroundings, which may divert attention away from wild fish. The long-term increased forage base provided by supplemented runs could also buffer other prey populations.

The IAT determined that the direct and indirect impacts of chinook-as-prey on other fish resources would be low. The numerical abundance might stimulate and increase predator populations, but chinook would also be the principal prey for predators.

Reproduction and Genetic Exchange

Genetic introgression resulting from interbreeding among hatchery and wild chinook might lead to undesirable changes in the wild phenotype. The potential for adverse genetic impacts depends on the relative abundance of hatchery and wild fish, the extent of their reproductive interaction, their genetic compatibility and relative fitness, and the natural selection regime. The primary genetic impacts of concern are those that lower individual and population fitness.

Targeted Chinook Populations — The IAT concluded that reproductive and genetic impacts to the targeted population of spring chinook would be low. NPTH would use the spawning guidelines described in Section 2.1.3.7, **Broodstock Source and Management**. These practices should preserve the genetic integrity of wild populations. Rather than attempt to reproductively isolate hatchery fish from wild fish, the intent of the guidelines is to manage the reproductive contributions by members of both groups so that hatchery and natural production are fully integrated.

Genetic impacts to the targeted population of fall chinook could pose a moderate level of impact and would probably be more evident in the hatchery than in the wild. Potential to cross-breed and therefore eliminate some domestication effects would be limited. A gradual phasing-in of a program to increase the number of wild fish present in the hatchery population would occur in time, but would likely take a go-slow approach in the near term. Returns of wild fish over Lower Granite Dam are extremely low; any taking of these threatened fish for spawning in the hatchery would be limited and subject to agreement of the various management entities in the basin. Consequently, releases from NPTH would largely consist of hatchery-by-hatchery crossed fish. Risks posed to fish populations by hatchery programs operating with primarily hatchery broodstock, that is, domestication selection, would be inherent in this strategy.

An additional effect can be expected from the earlier fall chinook runs destined for the Selway River (Cedar Flats) and the South Fork Clearwater (Luke's Gulch). An earlier run upriver would expand the geographic range and spawn timing of fall chinook in the Clearwater. How such a change would affect the genetic blueprint of fall chinook is unknown. There would be no effects on the existing mainstem fall spawners in these river reaches because there are none presently. They may spawn with the primary fall chinook downstream of the North Fork Clearwater and encourage an earlier component of that run. On the other hand, they may also segregate into an earlier and later spawning population as is seen in other areas of the Columbia Basin. A principal example would be the spring and summer runs of chinook in the Salmon River. NMFS has determined that although the run timings and geographic locations of spawning differ, there is not enough genetic difference to separate the two runs of fish into different Evolutionarily Significant Units. Based on this premise, the adaptation or evolution of an earlier run of fish may be typical and consistent with different habitat characteristics. However, weighing the potential impacts on the conservative side, would require assessing a moderate level of impact to targeted chinook populations.

Non-Targeted Chinook Populations — Interbreeding between fish from targeted and non-targeted populations can have negative consequences if: (1) listed chinook are inadvertently collected for NPTH broodstock; and (2) NPTH chinook stray into other chinook-bearing streams or hatcheries. The incidental taking of non-targeted salmon would reduce the size of the naturally-reproducing population and would mix genetic material from two or more populations. If NPTH chinook stray, they might lower the reproductive success or long-term viability of recipient stocks. The potential for doing so depends on the genetic pedigrees involved and whether NPTH chinook interbreed or interfere with the reproduction of locally-adapted fish. As mitigation, all chinook released from NPTH facilities would be marked with fin clips, coded wire tags, PIT tags, visual implant tags or other forms of benign biological marks so that the hatchery fish can be readily identified and culled from other populations.

Impacts to non-targeted populations of spring chinook would be low. NPTH operations were designed to minimize gene flow (straying) into neighboring populations and vice-versa by using locally adapted populations as a source of broodstock. This should create greater homing fidelity than would otherwise be expected (McIssac and Quinn, 1988). NPTH spring chinook would also be acclimated within the streams that they are expected to return to as adults. The length of time spent acclimating to these streams should also increase their homing instinct.

No impacts are anticipated to non-targeted chinook from fall chinook releases. NPTH fall chinook would be derived from Snake River Basin stock. Should they stray, they are not expected to cause a loss of fitness to spawning populations in other mainstem areas (i.e., the Snake, Grande Ronde, Imnaha and lower Salmon rivers) because they are all the same stock.

Overall impact on non-targeted chinook stocks due to reproduction and genetic exchange is expected to be low. Cumulative impacts are not anticipated.

Other Salmonid Species — Cross-hybridization can cause deleterious effects by reducing fitness and the genetic contribution of all adults and producing sterile offspring. These occurrences are noted for brook trout:bull trout crosses and cutthroat:rainbow crosses in the Clearwater River.

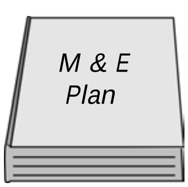
No impacts are predicted from the Proposed Action. Steelhead and cutthroat trout are spring spawners and so do not overlap in time with chinook salmon spawning from late August into September. Bull trout and whitefish are fall spawners, but tend to spawn at higher elevations and later in the year (October) than do fall chinook and spring chinook, respectively (Underwood, et al., 1992). The tendency to segregate temporally and spatially makes it unlikely that chinook would adversely impact the reproduction of any of these species. No cumulative impacts are expected.

Non-Salmonid Fish Species — No impacts are expected. There is no reason to believe that chinook salmon significantly affect the reproduction of non-salmonid species. No cumulative impacts are expected.

Human-Fish Interactions — This section assesses the effects on fish populations of human actions that are not directly linked to the operation and management of the Proposed Action, yet may influence activities and impacts in the future. The primary concern is with actions either prompted by or taken in response to the related changes in Clearwater chinook populations. These actions may exert pressure on NPTH chinook populations and, by extension, on non-targeted chinook, other salmonid, and non-salmonid populations. Most human-fish interactions of this type can be grouped into two categories: those related to natural resource management; and those related to fishing. The effects of external management initiatives, such as those imposed by the ESA or by forest management activities, are likely to be indirect, but could be significant. Fishing, on the other hand, is likely to cause impacts that are both immediate and direct in their effect. Because changes in either of these areas could produce significant impacts, they were included in the overall assessment of program impacts.

Non-NPT Management Actions

These management actions are decisions and actions taken by non-Nez Perce Tribal resource managers as a consequence of the development of the Proposed Action. The IAT assumed that future management actions would be consistent with NPTH goals, and are unlikely to be implemented if they pose a significant threat to fish resources. Therefore, the IAT assigned a low impact value to all resource categories. NPTH managers plan to coordinate activities with pertinent federal and state fisheries and natural resource agencies in the region to ensure efficiency and consistency across management agencies. Additionally, the M & E Plan calls for monitoring salmon recovery efforts, watershed development, mainstem hydrosystem operations, ocean and inriver harvest, and other management-driven activities to assess their potential impact on the Proposed Action.



Fishing

A primary goal of the NPTH program is to create opportunities to catch fish for recreation, sustenance, or cultural purposes. Some impacts may occur to targeted, non-targeted chinook and other salmonids as a result. Fall chinook, because they are exploited to a greater extent than are spring chinook in commercial and recreational fisheries, are likely to suffer greater impacts. Unless protected by blanket restrictions on harvest that are meant to protect endangered species, Clearwater River Subbasin chinook are likely to be harvested at higher rates as their numbers increase, thereby affecting non-targeted and targeted populations.

NPTH managers intend to control tribal harvest, and to encourage state and federal managers to control non-tribal harvest, at levels that do not adversely affect fish resources. Harvest in the Clearwater River would be a coordinated action between IDFG and the Nez Perce Tribe. Harvest levels would be based on adult returns, subject to spawning escapement and broodstock requirements. Surplus hatchery fish would be targeted, allowing weaker wild stocks to rebuild to self-sustaining levels. Fishing would be limited to carefully designated areas and times, using techniques that reduce its adverse effects on non-targeted stocks, including listed species. Such techniques may include run size forecasting, setting harvest rates that vary with in-season escapement estimates, fishing in terminal areas, selectively harvesting externally marked hatchery fish, imposing gear restrictions, and catch and release.

The IAT rated overall impacts of increased fishing pressure caused by a larger numbers of returning salmon as low. Incidental catches of non-targeted chinook, other salmonid species, and non-salmonid fish species would likely result in diminished numbers, but a significant decrease in the viability of the populations is not expected. It is premature to suggest that fishing restrictions would be imposed to protect trout in these areas. Restrictions would only be imposed if it is necessary to protect the fish that would be returning, and it is premature to say if this would happen.

Potential Impacts on Listed Species — Chinook originating in the Clearwater River would not interact with listed sockeye or spring/summer chinook until they enter the Snake/Columbia River migration corridor. They could interact with listed fall chinook in the lower Clearwater River.

The primary risks to listed species from NPTH fish are communication of infectious disease and competition for food. The potential magnitude of these impacts is hard to predict, but management precautions and the environmental conditions under which NPTH and listed fish would coexist make it unlikely that listed species would be impacted. Unless straying of listed fish increases significantly, there is little danger that their inadvertent taking in broodstock collection and harvesting activities would accelerate their demise. Predation on outmigrating smolts and interbreeding and genetic exchange resulting from straying of hatchery fish into other areas would pose minimal risk. Some of the same effects may occur in the Columbia River estuary, but conditions in the ocean make it unlikely that hatchery fish would impact listed fish either through competition, predation, reproduction, or disease transmission.

Overall, no to low impacts on listed species are expected from the Proposed Action. The construction and operation of the hatchery would have little or no impact to fish mortality of listed fish, and would not interfere with recovery actions or otherwise impede the recovery of spring/summer chinook and sockeye salmon. Threatened fall chinook populations would be supplemented and increased by the NPTH program. Any incremental loss of individuals of listed species would be offset by the restoration of viable, productive, and self-perpetuating populations of wild chinook in the Clearwater River.

The Proposed Action would be modified to address ESA concerns by imposing harvest restrictions that minimize impacts on endangered Snake River salmon. Potential impacts would be reduced by limiting the harvest of fall chinook as much as possible to ***terminal areas*** or by requiring use of selective gear that permits release and passage of listed species.

4.6.2 Use of Existing Facilities Alternative

4.6.2.1 Impacts

Siting and Construction of Hatchery Facilities — The impacts would be the same as for the Proposed Action except that the impacts from building the Cherrylane facility would not occur.

Hatchery Operations and Management — The impacts would be the same as for the Proposed Action except that the facilities used would be different. Slightly more water would be pumped, but all discharge requirements would be met (Miller, May 23, 1997). Fish would be trucked from Hagerman National Fish Hatchery, and this could increase the risk of disease in the fish and also increase the stress for the fish during the 10-13 hour drive. Four-six trips would be required.

In this alternative, the broodstock maintenance strategy also results in decreasing the natural existing run of spring chinook present in the drainage. The reason is that the existing facilities have a poor success rate at encouraging survival of fish, especially with parr and presmolt releases. Thus, implementing the broodstock maintenance strategy, which calls for bringing all wild fish into the hatchery when the run sizes diminish to less than 12 pair, would result in further decreasing that run size. As shown in Table 2-5, run size of natural spawners would be 0 after 20 years.

Maynard, et al. (1995, 1996a, and 1996b) discuss the lack of success by supplementation programs in restoring naturally-spawning populations using conventional hatchery practices. They found that present practices are geared towards mass production under unnatural conditions (high stress producing densities, open, uniformed concrete bottomed raceways with no structure, and surface fed) results in inappropriate, unsuccessful foraging behaviors and interactions by hatchery released fish. Mortality upon release is substantial (typically 50- 60 percent) and is not necessarily compensated by the increase in survival that fish accrue while in a conventional hatchery setting.

The Use of Existing Facilities Alternative would result in a larger number of fish produced in a conventional setting. Mortality would be born primarily by the hatchery released fish themselves. There may be an increase in predation on natural dwelling conspecifics because of the behavior of released fish, but detrimental interactions with the natural fish would not be significant enough to result in a change in population. Impacts to targeted populations would be low. Non-targeted chinook, other salmonids and non-salmonids are not expected to be affected.

Model results depicting run size at 20 years into the future are in Table 2-5. As can be seen the increase in naturally-spawning population is not expected to occur with Existing Facilities Alternative. The model shows an increase in only those fish incubated and reared at Sweetwater Springs and Cedar Flats and Luke's Gulch. Consequently, this alternative would have a moderate impact to targeted fish populations (fall chinook). For other populations and release sites, no to low impacts would occur.

Fish Interactions — Impacts from this alternative would be the same as the Proposed Action except that no increase or restoration in the naturally-spawning population is predicted to occur, so cumulative impacts do not exist.

Human-Fish Interactions — Impacts would be the same as in the Proposed Action.

4.6.3 No Action Alternative

Under the No Action Alternative most of the fisheries effects would not occur. It is expected that runs to Dworshak, Kooskia and Clearwater fish hatcheries would increase with measures taken under the salmon recovery efforts to enhance migration. Eventually salmon runs may be increased and restored in the streams targeted for spring chinook releases, but at a much slower rate that is dependent on straying and colonization. Natural rebuilding of salmon runs would gradually change the interactions between salmon and other fish, but also at a much slower rate. Whether salmon reclaim their dominant role in fish production in these streams would depend on their ability to recolonize underseeded habitat. Fall chinook would gradually be restored but their runs would be enhanced only by supplementation efforts upstream of Lyons Ferry Hatchery (see Section 1.6.4).

4.7 Wildlife

Analysts used these impact definitions for wildlife.

A **high** impact would occur under these conditions.

- Significant amounts of existing important wildlife habitat destroyed.
- Critical habitats are disturbed during breeding or winter stress periods.
- Threatened or endangered species are directly impacted.
- Heavy, uncontrolled human access is allowed.

A **moderate** impact would occur under these conditions.

- Important habitat outside of critical breeding or wintering periods is disturbed.
- A moderate amount of habitat is lost.
- Uncontrolled human access is light.

A **low** impact would be created by these conditions.

- Construction activities with only slight changes in habitat.
- Overall habitat loss is insignificant.
- Wildlife is displaced temporarily.
- Threatened and endangered species are not affected.

4.7.1 Proposed Action

Direct impacts from construction activities and operation of fish rearing and acclimation facilities can disturb wildlife, damage habitat and create temporary and/or permanent impacts to them. Prime impacts to wildlife include habitat damage or loss, increased human access into otherwise secure areas and human disturbance during construction. Clearing riparian or upland habitat creates the greatest potential impacts.

4.7.1.1 Waterfowl

The Cherrylane facility and lowland satellite facilities (Cedar Flats and Luke's Gulch) used by waterfowl are located in areas that have been previously disturbed and therefore pose no threat to waterfowl in the immediate and nearby areas. There is only transitory and occasional use of riparian habitats in the upriver areas where the rearing, acclimation and weir sites are proposed. No impacts are anticipated. The location of the central hatchery at Cherrylane, the satellite facilities at Cedar Flats and Luke's Gulch, and associated development activities pose no threat to waterfowl in immediate and nearby areas.

4.7.1.2 Upland Game Birds

Upland game bird habitat at Cherrylane, Sweetwater Springs and North Lapwai Valley has already been disturbed because of existing land uses. There may be additional disturbance caused by construction of hatchery facilities at these sites, but the overall quality and quantity of upland game bird habitat is not expected to change from the existing condition. Temporary displacement of upland game birds occupying the sites is expected during construction activities, but it is expected to be short term and would pose no significant impact to the population.

4.7.1.3 Aquatic Fur Bearers

Impacts to fur bearers are expected to be minimal and potentially beneficial. The central incubation and rearing facilities are not expected to cause impacts because they would be built in already disturbed streambanks, or bench areas away from denning habitat. In the upriver tributaries, construction activities associated with the satellite facilities may cause temporary animal displacement. But modification of habitat via construction is not expected to be significant because of the availability of adequate displacement habitat in adjacent aquatic and riparian areas.

Spring chinook satellite sites provide suitable habitat for fishers, which may be disturbed by construction activities. Should fisher activity be observed in the vicinity of the project, the Idaho Department of Fish and Game and the Nez Perce Tribe Wildlife Department would be consulted on means to avoid adverse impacts to fishers or on fisher habitat. As a result, impacts to fishers from program activities would be mitigated.

Beneficial effects are more likely to occur for some species because of the Proposed Action. If supplementation recovers salmon populations, the forage base for otter and mink would increase over a wide area. Problems could occur at the individual satellite sites because of the increase in forage. Mink and otter may be attracted to the rearing and holding ponds for feeding. If so, the facilities may require modification to prevent excessive predation.

4.7.1.4 Big Game

There is little or no potential for conflict at Sweetwater Springs or Cherrylane due to the existing developed conditions and low density of animals in the lower Clearwater River valley. There is some potential for conflict in upland areas. For facilities that require construction and operational activities, there may be some local, temporary displacement of animals during disturbance. However, the impact would be insignificant because the size of the facilities is small, facilities would be built along existing, open roadways, and there is ample displacement habitat in upland watersheds. Black bear may be attracted to adult holding ponds, so modifications, such as fencing, may be necessary to cope with them.

4.7.1.5 Raptors

Raptors that would be associated with the program area are the osprey, northern harrier and the bald eagle. The bald eagle is discussed in Section 4.7.1.7, **Threatened and Endangered Species**.

Overall impacts to osprey and their habitat is expected to be beneficial. Physical disturbance of nesting sites because of construction or operation of the facilities is not expected. Implementing the Proposed Action would result in an immediate increase of forage for these raptors by the addition of hatchery-produced smolts migrating in the mainstem. If supplementation proves effective, long-term benefits would also occur as production of naturally-spawning fish and their progeny increases in mainstem rivers.

No impacts to harriers, such as the marsh hawk, are expected. There may be some temporary displacement during construction of satellite facilities.

4.7.1.6 Other Wildlife

Other riparian-dependent species inhabit the lower Clearwater River corridor such as blue herons, kingfishers, dippers and raccoons. At Sweetwater Springs and Cherrylane, little or no conflict is expected with the construction of the facilities. Facilities would be away from the river and the existing disturbance patterns at the sites would minimize any additional conflict. In upland areas, development would temporarily disturb and displace these species. Impacts would be low because there is sufficient displacement riparian habitat.

Once facilities are constructed and in operation, there is some potential for conflict with some species such as the kingfisher, bald eagle and blue heron that might be attracted to fish rearing ponds and adult holding facilities. These facilities would have to be modified to minimize conflict.

If supplementation is successful and salmon populations recover, there could be a beneficial effect on wildlife that eat salmon. An increased food supply could lead to favorable growth and survival for such species as bald eagles, kingfishers, and blue herons.

4.7.1.7 Threatened and Endangered Species

Bald Eagle — The Proposed Action has three facility sites located within bald eagle winter habitat, but impacts to eagles are expected to be negligible. Construction and operation of the Cherrylane facility, and the Luke's Gulch and Cedar Flats satellite facilities would not disturb any eagle roost sites. The Clearwater River and U.S. Highway 12 lie in between the Cherrylane facility and the known roost site on Fir Island. Human activity and disturbance is already common at all three mainstem corridor sites, and this is not expected to change. Cherrylane has several residences, grain and hay farms, a tree farm and highway traffic occurring at the site. Luke's Gulch is across the river and just downstream from the community of Stites; highway traffic on State Highway 13 is common there also. Cedar Flats is also adjacent to year-round human activity. The Sweetwater Springs facility and other satellite facilities are located outside of mainstem river corridors occupied by bald eagles during the winter. Consequently, they pose no detrimental effects to bald eagles or their habitat.

The winter population of eagles on the Clearwater River could be affected if the Proposed Action recovers and sustains salmon populations. If supplementation is successful, tributary and mainstem salmon production would increase the potential food base for the eagles. The provision of a high quality prey base would undoubtedly increase the growth and survival of eagle populations in the lower Clearwater River Valley and would supplement carrion food sources of eagles along upper watershed areas.

Grizzly Bear — There would be no construction within the Selway Bitterroot Wilderness area. Construction and operations at the Cherrylane and Sweetwater Springs, and North Lapwai Valley and Luke's Gulch satellite sites are on private lands, well away from the proposed recovery area. The proposed program would not increase road density within the proposed experimental non-essential boundaries although there would either be access roads constructed or existing access roads improved at the Yoosa/Camp, Mill Creek, Newsome Creek, and Cedar Flats satellite sites. Access road construction and/or improvements would be less than 500 m (1,640 ft) for all sites combined. Human activity such as recreation, logging, dredge mining and administrative uses occur at these sites. Thus, the areas are already disturbed by human activities. Disturbance of vegetative forage would be minor and short-lived at the satellite sites (during construction). Fish forage may be increased in the streams outplanted with salmon, which would result in a beneficial effect. The Proposed Action would not affect the existing harvest management of grizzly bears, and so no effect would occur.

Gray Wolf — The only land use restriction recognized in the experimental rules for wolves is focused on denning and rendezvous sites. Seasonal restrictions could be placed around these sites to allow the pups to be undisturbed until they can move off with the pack. This restriction would be done on a case-by-case basis. If ongoing activities are not disruptive to the den site, the activity may be better off being left alone. Dens are dug in April and May, which could happen near some program facilities before the site is occupied for seasonal use (late May and June) by fisheries personnel. This would have to be evaluated on a case-by-case basis. After there are 6 breeding pairs this would not be an issue. Wolves tend to avoid human activity and would be unlikely to develop a den or rendezvous sites near program activity areas. No direct mortality is expected to occur to gray wolves due to the implementation of the Proposed Action.

Peregrine Falcon — There would be no impacts to the Peregrine falcon because populations are outside the program area.

Sensitive Species — Harlequin ducks have been observed in the Lochsa and Selway Rivers and their larger tributaries, but for the most part, they have been observed outside the areas where satellite facilities would be constructed. There is some potential that Harlequin ducks could be disturbed and displaced from their occupied habitats during construction and operation of satellite facilities. However, Harlequin ducks prefer pristine, low gradient, undisturbed habitats, which abound in adjacent areas. Therefore, it is unlikely that construction and operation of fish facilities would have a significant adverse impact on Harlequins. Prior to any construction activity, coordination with the Forest Service would take place with reference to occupied Harlequin habitat. If there is a conflict, it is highly probable that it can be resolved in favor of the species.

Coeur d'Alene Salamander — The Proposed Action poses a moderate level of potential impact on localized Coeur d'Alene salamander populations. Their preferred habitat is spring seeps, waterfalls, spray zones and riparian areas of small cascading streams. Satellite facilities at Yoosa/Camp Creek and Mill Creek have the greatest potential for impacting the salamander habitat. Seeps or cascades could be altered by water withdrawals causing individual salamanders in these areas to be displaced or killed. The primary measure to prevent impacting salamanders would be to conduct surveys in suspected salamander habitat prior to construction activities and to design means to avoid detrimental impacts. In any case, the Proposed Action is not expected to affect the status of the Coeur d'Alene salamander population because construction impacts are small relative to the overall distribution of the salamander.

4.7.2 Use of Existing Facilities Alternative

The impacts would be similar to the Proposed Action except that the impacts from the Cherrylane facility would not occur, and smaller salmon returns would impact those species that are predicted to have a beneficial effect from the supplementation program such as raptors, bald eagle, grizzly bear and other wildlife.

4.7.3 No Action Alternative

Under the No Action Alternative, land management would remain the same. There would be no additional construction of fish cultural facilities within the Clearwater River Subbasin. Management of salmon stocks would continue along existing strategies. New efforts of supplementation would not be initiated. Wildlife resources within the study area would possibly remain the same. However, if salmon stocks continue to decline towards extinction under the present management scenarios, riparian-dependent species such as kingfishers, dippers, osprey, otter, and bald eagles could also be potentially harmed in response to a continued reduction of their food supply.

The No Action Alternative would create no new direct impacts. Indirectly, if present management efforts are not successful, riparian-dependent wildlife that forage on fish could be subjected to reduced growth and survival.

4.7.4 Cumulative Impacts

No cumulative impacts on the wildlife resources of the area would occur.

4.8 Vegetation

Vegetation resources can be adversely affected by construction of hatchery facilities. Some impacts, such as those that occur only during construction, can be short term or temporary and have minimal lasting effects on vegetation. Other impacts occur from permanent removal of vegetation and may be considered long-term.

Program-related impacts can be further categorized as direct or indirect. Direct impacts, such as vegetation clearing, are generally immediate and confined to facilities areas. Indirect or secondary impacts, such as soil compaction, increased stream temperatures, and noxious week infestations, can occur outside the area and are not as evident.

Analysts used these impact definitions to determine the level of impact for the alternatives.

- A **high** impact would occur if a national or regional vegetation resource is lost or damaged and adequate mitigation cannot be provided.
- A **moderate** impact would occur if a regional or local vegetation resource is disturbed and mitigation might not provide full compensation.
- A **low** impact would occur if effects are easy to mitigate and the resource affected is relatively abundant or already disturbed.

4.8.1 Proposed Action

Construction of the facilities would cause a variety of short-term and long-term impacts on vegetation. The short-term impacts would result from disturbance of vegetation that would be able to grow back in one season. The long-term impacts would result in permanent removal of vegetation. Because many of the facility sites are located in riparian zones, removal of vegetation could have moderate impacts. A biological evaluation would be completed at all sites on USFS lands if necessary before construction. The Yoosa/Camp Creek site is a jurisdictional forested wetland. Removal of vegetation would have moderate impacts because it is a vegetation community that took many years to develop.

4.8.1.1 Central Incubation and Rearing Facilities

Construction of the river intake and discharge structures for the proposed Cherrylane hatchery would have minor impacts on riparian vegetation as a result of brush clearing, excavation, and placement of these structures. Disturbed riparian areas would be replanted following construction. Construction of the facility would have low impacts on vegetation because the site is disturbed and has been in agricultural production for many years.

Construction at the Sweetwater Springs would be largely confined to previously developed land and should have no effect on existing riparian vegetation. Impacts at this site would be no to low.

4.8.1.2 Satellite Facilities

Construction of satellite facilities would disturb the riparian zones for placement of the intake and outlet structures, subgrade preparation for the ponds, and the access road. In general, the intake structures would require a cleared area of approximately 18-27 m^2 (200-300 ft^2). In addition, a machinery working radius of approximately 12 m (40 ft) would be required around the intake site.

Impacts on riparian vegetation would be low at North Lapwai Valley, Cedar Flats, and Newsome Creek because the proposed sites have degraded riparian vegetation.

Some young Douglas firs would be removed from the Mill Creek site for construction of the facility. This vegetation type is plentiful and not unique to the area, therefore impacts would also be low.

Construction of the satellite facility at Yoosa/Camp Creek would result in the disturbance and removal of riparian vegetation for the intake and outlet structures, as well as removal of about 0.4-0.8 ha (1-2 acres) of forested wetland for construction of the facility and access road. Western red cedars and ladyfern dominate this wetland. The individual trees are considered old-growth, but the stand is not designated as an old-growth stand. Because of the removal of this habitat, impacts on vegetation would be moderate. Mitigation could replace the wetland, but it takes years to develop a forested wetland.

Construction of the satellite facility at Luke's Gulch would result in the disturbance and removal of riparian vegetation for the intake and outlet structures and the facility itself. Impacts would be low due to the small amount of riparian vegetation removed.

Operations at all the satellite facilities should have no other impacts on riparian vegetation.

4.8.1.3 Spring Chinook Direct Release Sites and Weir Sites

No impacts on riparian vegetation are expected at spring chinook direct release sites. Maintenance of existing access to the streams at the release sites would be required but this is not expected to produce any changes from existing conditions. Existing roads would be used for access. Where roads are not available, helicopters would be used to fly the fish to the release site.

Some minor clearing may be necessary at certain weir sites to gain access to the stream and clear the bank to install anchors for the weirs. This clearing would be limited in extent. Weirs would be installed and maintained by hand, with no use of machinery in the streams. Low impacts on riparian vegetation are expected.

4.8.1.4 Wetlands

The Yoosa/Camp Creek site is characterized as an undisturbed, forested jurisdictional wetland covering 0.6-0.8 ha (1.5-2 acres). This wetland stabilizes and intercepts sediment, acts as storage for floodwaters, and provides wildlife habitat. Development of this site would remove about 0.5 ha (1.2 acres) of wetland. Development would include installation of ponds and an access road. Impacts to the wetland would be moderate, depending on the number of trees removed and the amount of fill entering the wetland. A complete wetland delineation would be conducted to determine the amount of impacted area and mitigation strategies would be developed to have no net loss of wetland area and minimize impacts on any remaining wetlands. The amount of area impacted and mitigation strategies would be determined after final designs are completed. At that time locations for mitigation would be coordinated with the appropriate agencies and land managers.

At Luke's Gulch impacts to a seasonal wetland would be low. An access road would be built across the wetland which, depending on the length and amount of fill, could be authorized under an Army Corps of Engineers Nationwide Permit. Mitigation would be developed to minimize impacts. A wetland delineation would also be conducted.

4.8.1.5 Threatened and Endangered Species

There would be no impact to federally-listed or forest-listed threatened, endangered, or sensitive species. In order to germinate, the water howellia requires seasonally ponded wetlands such as sloughs and oxbows which dry out in the fall (Kibbler, 1997). Potential impacts to this plant would result from direct removal during construction, application of herbicide or by changing the hydrology of the area. However, there are no oxbows, glacial ponds or sloughs that would be disturbed by the Proposed Action. The Yoosa/Camp satellite site is not in an oxbow or a slough, but it is characterized as an undisturbed, forested jurisdictional wetland. Water howellia is not known to exist at the site, but the site would be surveyed mid-summer for presence of the plant prior to construction activities.

No other federally-listed plant species are know to occur in the vicinity of the various program areas. The USFS has management requirements designed to protect sensitive plant species on their land, though records indicate no sensitive species are on the proposed sites. There has been and would continue to be coordination with the USFS to avoid any possible impacts on plant communities.

4.8.2 Use of Existing Facilities Alternative

Impacts would be similar to the Proposed Action, but the impacts from the Cherrylane facility would not occur.

4.8.3 No Action Alternative

The No Action Alternative would create no impacts to vegetation.

4.8.4 Cumulative Impacts

No cumulative impacts to vegetation are expected.

4.9 Land Use

The following describes the environmental consequences of the alternatives to land use. Land use conflicts could be created if the proposed facilities are incompatible with existing land uses. See also Section 4.4, **Water Resources**, and Section 4.12, **Air Quality**.

Analysts used these impact definitions to determine the level of impact for the alternatives.

- A **high** impact would occur if the program changes existing land uses completely and permanently, and if there is little or no potential for mitigation.
- A **moderate** impact would occur if the program causes limited permanent changes in existing land uses or causes

extensive and lengthy temporary disturbances to existing land uses, and there is some potential for mitigation.

- A **low** impact would occur if the program leads to some brief, temporary disturbances to existing land uses that can be mostly mitigated.
- **No impact** would occur if the program does not trigger any changes in land use.

4.9.1 Proposed Action

The proposed Cherrylane, Sweetwater Springs, Luke's Gulch and North Lapwai Valley sites would change the existing land uses at those sites. The proposed satellite facilities, weir sites and control/treatment stream strategies located on national forest system lands are consistent with current forest plans. In addition, continued implementation of current and proposed activities identified in the forest plans, such as grazing, recreation, mining or timber sales would not be affected by the additional facilities and land uses proposed as long as forest plan standards are maintained; therefore, no amendments to forest plans are necessary.

4.9.1.1 Cherrylane

The current property owner, Cherrylane Ranches, has retained title to the 6 ha (14 acre) site, and issued BPA an option to lease the site for a period of 25 years, with an extension for an additional 25 years if BPA so chooses. Implementation of the proposed program would change the land use from agricultural to a governmental use. Construction of the facility would take 6 ha (14 acres) of prime farmland out of production. If BPA exercises its option and constructs the facility, it is unlikely this land would ever revert back to agricultural land.

The proposed use of the Cherrylane site would not conform to the existing zoning for the area; therefore, the county would normally require a conditional use permit to allow the change in use from agriculture to a hatchery facility (Clack, 1995). No conditional use permit would be required, however, because Nez Perce County, as a local government agency, would not have jurisdiction over BPA as a federal agency. BPA, would, however, meet or exceed all local government standards and requirements, as identified in Sections 4.0 and 6.0 of the Nez Perce County Zoning Ordinance. Section 3.8 of the Zoning Ordinance, entitled "Conditional Uses Permitted," states that, "...In an A zone all other uses may be permitted when authorized in accordance with standards and requirements in Sections 4.0 and 6.0." These requirements would become part of the proposed program (see **Mitigation**). Impacts would be moderate.

Because title to the proposed site would be leased, instead of being acquired in fee, the minimum lot size (8 ha [20 acres]) required by the county would not need to be adhered to.

Locating a fish hatchery immediately adjacent to a commercial seed cone operation may be incompatible if fugitive chemicals from the seed cone operation are allowed to drift onto the hatchery property. Potlatch applies herbicides and pesticides by air to its crop. Any herbicides and/or pesticides carried by wind or water onto the proposed hatchery facility could adversely affect hatchery stock. Herbicides could cause oxygen levels to be depleted in a watercourse and pesticides could introduce toxins that could kill hatchery stock.

Potlatch has requested assurance that the proposed hatchery facility would not prevent their use of pesticides and herbicides. In addition, the company has requested assurance that the proposed program would not affect the groundwater aquifer in a way that would jeopardize their water supply. To prevent any harm to the fish stock at the proposed hatchery facility, no pollutants should be allowed to migrate onto the proposed hatchery site.

Mitigation — BPA would meet or exceed the conditions stated in Section 4 and 6 of the Nez Perce County Zoning Ordinance with respect to obtaining a conditional use permit for the A Zone. These conditions include:

- landscaping would be provided (minimum of 5 percent) in the off-street parking area, as well as a three-foot landscaped buffer strip (including trees and shrubs) between U.S. Highway 12 and the proposed parking area that would serve the facility; and
- all signs used to notify the public of the proposed facility would conform to Section 4.11 of the Nez Perce County Zoning Ordinance, and the Idaho Department of Transportation requirements.

With respect to the prevention of airborne or waterborne pollutants from adversely affecting the hatchery stock at the proposed facility, Potlatch could take steps to assure that no pollutants are allowed to migrate onto the proposed site, if feasible. In addition, the Idaho Department of Health and Welfare, Division of Environmental Quality could be consulted for advice about how to prevent insecticides or herbicides used by the company from impacting the proposed hatchery facility. If the chemicals used by Potlatch are found to threaten the survival of hatchery or broodstock, and cessation of the use of these chemicals would prove to be infeasible to the continued operation of seed orchard facility, the proposed hatchery site could be moved an appropriate distance east, to provide a buffer between the hatchery facility and Potlatch, and a barrier could be provided, such as a row of poplar trees so as to prevent, or at least to inhibit fugitive sprays from migrating onto the proposed hatchery site.

4.9.1.2 Sweetwater Springs

The proposed use of the Sweetwater Springs site is not an allowed use in the AR Zone. Normally a conditional use permit would be required to construct the proposed facility at the site. Because BPA is a federal agency, and local governments do not have jurisdiction over federal agencies, no conditional use permit would be required. BPA would, however, observe those conditions that would be imposed in the granting of a conditional use permit for the proposed facility, as contained in the Nez Perce County Zoning Ordinance.

For BPA to construct facilities at Sweetwater Springs, IDFG would need to either sell all or a portion of the site to BPA, or the agency would need to issue a land lease to BPA. As of the date of this draft document, no sale or lease has been prepared. Impacts would be moderate.

Mitigation — BPA would meet or exceed the conditions as stated in Section 4 and 6 of the Nez Perce County Zoning Ordinance with respect to obtaining a conditional use permit for the AR Zone, as stated for the Cherrylane facility, above. BPA, however, would not need to obtain a conditional use permit for the proposed facility.

4.9.1.3 Luke's Gulch

No land use conflicts are anticipated as a result of siting the proposed facility on tribal lands adjacent to the parcel on private land. If security becomes an issue following development of the proposed facility, a gate would be installed, and the affected landowner adjacent to the proposed facility would be given a key. Impacts would be moderate.

4.9.1.4 Cedar Flats

No land use conflicts are envisioned with respect to siting the proposed satellite facility at Cedar Flats as long as no liquid fuel other than propane and other toxicants are stored on the site and no refueling is done within the Riparian Habitat Conservation Area. If no alternatives are available, refueling must be approved by the USFS, and the Tribe would procure a spill containment plan from the land manager prior to refueling on site. Impacts would be low.

4.9.1.5 North Lapwai Valley

To convert the land from an agricultural use to one of a governmental use, the land use would change from agriculture to "public." Implementation at the Lapwai site would convert about 0.5 ha (1.2 acres) of agricultural land to non-agricultural use. This change would likely be permanent. Impacts would be moderate.

4.9.1.6 Yoosa/Camp Creek

No land use conflicts are anticipated with siting the proposed facility. Impacts would be low.

4.9.1.7 Mill Creek

No land use conflicts are anticipated with siting a satellite facility on lower Mill Creek. The Hungry Mill Timber Sale Draft Environmental Impact Statement (DEIS), November 1993, includes logging west of the site in all four of its alternatives. This method of logging would minimally impact the fishery habitat of Mill Creek and would appear to not significantly impact the water quality as habitat for salmon. The DEIS stated, however, "...Adverse effects on fish habitat and water quality caused by timber harvest and related activities can be mitigated, but cannot entirely be avoided." Impacts would be low.

4.9.1.8 Newsome Creek

Impacts would be low. Siting the satellite facility downstream of the abandoned Haysfork Gloryhole would be feasible from a land use standpoint only if the sediment expected to enter Newsome Creek in a year or so would be found not to adversely affect water quality to the detriment of the proposed facility, or if the water quality would be found to be detrimental to the fish, that the proposed South Fork Clearwater River Habitat Enhancement Project (Project 84-5) be approved, funded and implemented, prior to the proposed facility at Newsome Creek becoming operational. This proposed rehabilitation project is purported to provide a 50-year sediment storage capacity based on the current sediment accumulation rates (Leidenfrost, 1995). The project is scheduled to be completed in 1997. See also Section 4.4, **Water Resources**.

4.9.1.9 Spring Chinook Direct Release Sites and Weir Sites

No land use conflicts are anticipated with the spring chinook direct release sites or weir sites proposed. The location of the weir on Meadow Creek would be more than 425 m (1/4 mile) from the Selway River, a Recreational River under the Wild and Scenic River Act of 1968. No impacts are expected.

4.9.2 Use of Existing Facilities Alternative

Impacts would be similar to the Proposed Action, but the impacts from the Cherrylane facility would not occur.

4.9.3 No Action Alternative

If the No Action Alternative is implemented, there would be no change in land use, and no net loss in the amount of hay produced in the area.

4.9.4 Recreation

The proposed program would have a positive impact on recreational fishing in the area; however, this is not expected to occur until after the runs of chinook salmon have reestablished themselves in the Clearwater River Subbasin. Runs are expected in 15-20 years following program implementation. Prior to the onset of any recreational fishing for these returning salmon, the state of Idaho and the Nez Perce Tribe would set specific seasons and bag limits for each chinook run. The fish are expected to return to the Clearwater River Subbasin from June through November each year. Although it is not known at this time what the seasons and bag limits would be, any season and bag limit would be considered a positive impact to recreational fishers in the area.

4.9.4.1 Cherrylane

No adverse impacts to the recreation resource in the vicinity of the Cherrylane facility are envisioned as a result of constructing and operating the primary incubation and rearing facility at Cherrylane. Fishing for steelhead in the vicinity of the proposed site would be unaffected. After the salmon have reestablished themselves in the Clearwater River, a recreational fishery would likely be created that would attract recreationists to the area from June through November each year, a positive impact on the recreational resource.

Siting of the proposed hatchery facility at Cherrylane would not affect the gathering of sillimanite along the Clearwater River by recreationists.

4.9.4.2 Sweetwater Springs

No adverse impacts to the recreation resource in the vicinity of Sweetwater Springs is anticipated as a result of the construction and operation of the secondary hatchery facility at Sweetwater Springs. Reintroducing chinook salmon to the area would provide increased recreational opportunities to anglers who visit the area.

4.9.4.3 Cedar Flats

The facilities planned for this site would be designed with the USFS so they would not affect Selway River float boaters as they pass by. No adverse impacts to the recreation resource are envisioned as a result of constructing the satellite facility at Cedar Flats. Reintroducing chinook salmon to the area would provide increased recreational opportunities to anglers who visit the area. Water intake structures extended into the Selway River would be designed to have no effect on float boaters on the Selway River.

4.9.4.4 Luke's Gulch, North Lapwai Valley, Newsome Creek, Mill Creek, and Yoosa/Camp Creek Sites

No adverse impacts to recreation would be created by constructing facilities at these sites. Reintroducing chinook salmon to the area should provide increased recreational opportunities (after the runs establish themselves) to anglers who visit the area.

4.9.4.5 Spring Chinook Release Sites and Weir Sites

The Tribe will work with the USFS to minimize impacts to wilderness resources from helicopter trips. Impacts would be low due to the low number of trips required, release sites are located on the edge of the wildernesses, the amount of time the helicopters would be in the wilderness, and the fact that the helicopter would not land in the wildernesses unless an emergency occurs. The Tribe would consult with the USFS on final location of weir sites to avoid conflicts with recreation and other resources. Reintroducing salmon would create no adverse impacts to recreation. Salmon would provide increased esthetic benefits and fishing opportunities for recreationists.

4.9.5 No Action Alternative

The recreation resource would be negatively affected by not having the spring and fall runs of chinook salmon reestablished in the vicinity. Fewer fish would likely result in fewer numbers of fishing days for the recreationist, and fewer fish for the Nez Perce Tribe. Also, there would be no increase in the number of facilities in the area used by the recreationist.

4.9.6 Cumulative Impacts

No cumulative impacts on land use in the area are expected. It is not anticipated that any future limitations would be placed on existing recreation opportunities from the action alternatives.

4.10 Socioeconomics

Analysts used these impact definitions to determine the level of impact for the alternatives.

- A **high** impact would change current socioeconomic conditions and likely create adverse effects that could not be mitigated: regional reduction of quality or quantity of social or economic resources; a significant reduction of long-term economic productivity; or consumption of significant amounts of non-renewable resources.
- A **moderate** impact would change current socioeconomic conditions, but the effects could be mitigated: local reduction of social or economic resource; a marginal reduction of long-term economic productivity; consumption of moderate amounts of non-renewable resources.
- A **low** impact would create a small change in current socioeconomic conditions. No mitigation would be necessary.

4.10.1 Proposed Action

4.10.1.1 Short-term Construction Impacts

To implement the proposed program, the Nez Perce Tribe would likely put out an invitation for bid for a general contractor/construction manager in the Lewiston/Boise/Spokane/Salt Lake City areas. The proposed facilities are anticipated to cost approximately $17 million, with an annual operating and maintenance budget of $1-1.5 million over its twenty-year life. The total cost, therefore, is estimated to range from $30 to $40 million.

It has been estimated that construction of the Cherrylane facility on the Clearwater River and the facility at Sweetwater Springs would require half of the program budget to be spent on construction wages and half to be used for supplies and equipment. Construction of the satellite facilities and the weirs would likely be more labor intensive, and, therefore, would require a higher proportion of the budget to be spent on labor, about 60 percent of the construction cost. While the general contractor could originate from outside the local area, it is anticipated that a number of the subcontractors needed to construct the facilities would be employed locally.

It is also likely that the major purchase of supplies and equipment for the proposed program would be purchased locally. Normally federal funds used to purchase supplies and materials by tribal members for a federal project would be exempt from state sales taxes; however, federal dollars used to purchase supplies and equipment by contractors would not be exempt. The state of Idaho currently assesses a 5 percent sales tax on goods and services purchased within the state. Although the entire state would benefit from any sales tax collected, the amount that would be returned back to the local jurisdictions from which the tax originated would be insignificant. There is no extra benefit paid directly to the city or county in which the additional tax is generated. The city or county in which the sales transactions occurred would benefit, however, in that its sales tax allocations would increase as would all other local government entities in the state sales tax allocations increase when the statewide sales tax collections increase (Husted, 1995).

While it is possible that the general contractor could originate from outside the local area, it is likely that a number of the subcontractors that would be needed for the proposed program would be hired locally. Employment of the local population, especially among tribal members, would benefit the local economy, and also would help improve the high unemployment situation in the local area, particularly among the Native-American population. With respect to the employment of non-local construction workers and in addition to the non-tax benefits from the local purchase of supplies and equipment in the local area, the non-local construction work force would purchase food, lodging and other consumer goods while employed in the area. Non-local construction workers usually spend 40 percent of their net pay locally (Mountain West Research Inc., 1982). It is important to note that following project completion, it is expected that most, if not all, outside contractors would leave the area.

<u>Construction impacts would be low.</u>

4.10.1.2 Long-term Employment Impacts

Proposed facilities would require full-time permanent, and full and part-time temporary and seasonal workers. It is expected that most of these positions would be filled by tribal members. Federal contracting on reservations require that Native-American preference be given in employment for hiring, promotion, training, and all other aspects of employment, as well as in subcontracting (Indian Self Determination Act, 93-638).

The Cherrylane facility would require seven or eight full-time employees and one part-time seasonal employee. Staffing of the Sweetwater Springs facility would require two full-time and two part-time workers. The satellite facilities would need to be staffed when fish are in the facilities. Staffing would be necessary to provide both husbandry and security for the salmon, particularly for the adult fish. Staffing of the satellite facilities then would require the hiring of temporary employees on a seasonal basis. It would be necessary to hire approximately 15 temporary workers to satisfy this need.

Total employment to operate all of the proposed facilities for the proposed program would, therefore, require the employment of approximately 30 people, half full-time and half part-time. This would be a positive impact in the area, and help reduce the high unemployment in the four county area, particularly with respect to the Native-American population.

4.10.1.3 Property Tax Impacts

The proposed program would increase property taxes collected by Nez Perce County for the Cherrylane facility. Although the proposed facilities themselves would be owned and maintained by the federal government, and would, therefore, be exempt from paying local property taxes, private land upon which the facilities would be located would be reassessed based on the proposed new use. This difference is substantial. Agricultural land (in agricultural use) in the Cherrylane area is currently valued at $3-400 an acre, while land for the proposed use would take on a higher value, about $10,000 an acre for the 5 ha (12 acre) site (Schieflebein, 1995). This increase in valuation would increase property taxes from the 1994-95 tax role of approximately $40 per year to $1,200 - $1,300 per year. This increase in property taxes received by the county would be a positive impact.

4.10.1.4 Economic Impacts

The proposed program would have positive economic impacts:

- the wages paid and the profits produced by the purchases of supplies and materials;

- the funds that would be spent by those who would be employed who had either been unemployed, or who had been employed elsewhere;
- the increase in local property and state sales taxes; and
- the increase in the number of recreationists that would be attracted to the area because of the runs of spring and fall chinook that would return to the local area from June through November each year, following the reestablishment of the runs. The recreationists would add to the local economy through their purchases of goods and services, primarily consumer goods while in the local area. See also Section 3.9.4, **Recreation**.

4.10.2 Use of Existing Facilities Alternative

Impacts would be similar to the Proposed Action, but fewer benefits would be realized because the cost of the project is lower. Impacts would be low.

4.10.3 No Action Alternative

Implementation of the No Action Alternative would not bring back runs of spring and fall chinook to the Clearwater River Subbasin for present and future generations. The state of Idaho would not benefit as a result of the increase in sales taxes collected by the state. Local business in the area would not benefit as a result of the construction and operation/maintenance of the proposed facilities over the 20-year life of the proposed program. The positive impacts to the employment market in the area would not occur. Also, there would be no increase in tribal employment.

4.10.4 Cumulative Impacts

No cumulative impacts on socioeconomics in the area are expected.

4.11 Visual Resources

This section includes a description of the impacts to existing visual resources in the program area. Analysts used these impact definitions to determine the level of impact for the alternatives.

- A **high** impact would occur if a large number of people highly sensitive to their surroundings see the facilities in foreground or middle ground views; the facilities dominate views and/or appear uncoordinated or chaotic; or the area is officially recognized for its scenic or recreation values and facilities conflict with these values.

- A **moderate** impact would occur if a large number of people see the facilities but the facilities are not dominant elements in the landscape, views are partially screened, are seen for short periods and/or most views are in the middle ground; scarring from clearing or roads is evident but not extensive; or the facilities conflict with prevailing land patterns but are seen by few people or for short periods.
- A **low** impact would occur if few viewers see the facilities because they are isolated, screened or seen at a distance; existing conditions have impacted the area; clearing and roads do not detract from the setting; views are short-lived; or no visually sensitive resource would be affected.

4.11.1 Proposed Action

4.11.1.1 Cherrylane

The facilities would be visible from a nearby residence and from other residences. Motorists traveling along Highway 12 from west to east would have their views screened by the trees in the tree farm next to the site. Motorists travelling east to west would have brief views of the site. People traveling on or near the river would have their views screened by riparian vegetation. The impact is lessened by the large scale of the surrounding hills and ridges that edge the valley. Impact level would be moderate.

Mitigation — The Nez Perce Tribe would work with the owner of the nearest residence and screen as much of the facility as possible from the residence.

4.11.1.2 Sweetwater Springs

Because the site is in a deep canyon, along a creek and road with only occasional recreation use and farm use, the impact to the visual resource is low. The site cannot be seen from the nearest county road, and cannot be seen from any residences. Piping needed by the expanded facility would be screened by riparian vegetation. No riparian vegetation would be removed. The facilities would be screened by the surrounding rolling hills. Impact level would be low.

4.11.1.3 Luke's Gulch

To reach the site, an access road would be cut along the steep incline behind the site. Some pine and fir trees on this hill would be removed. At the site, some pine and fir trees would be removed for the ponds and trailer. Some vegetation along the existing road above the site may need to be removed. Building the access road on the hill above the site would create a change in the view from the river and highway. The road cut would be partially screened by trees left at the site. The facilities would be screened from the existing residence by trees and by the slope of the hill. Views from the highway in both directions would be brief. Impacts can be reduced by leaving as much vegetation in place as possible.

Anglers fishing along the bank in this area would have the nearest views. Impacts would be low to moderate.

4.11.1.4 Cedar Flats

On-site discussions with a USFS landscape architect, an easement administrator, other USFS employees and the NPT will determine the appropriate mix of natural vegetation and berming to assure that there is adequate screening for the proposed facilities. Any natural or other screens used would be compatible with the Recreational River designation and easement requirements of the Wild and Scenic Rivers Act. The house trailer and storage unit would be located at the Fenn Trailer Court, which is away from the site. Motorists on the road would have their views of the facility screened by existing trees. Impacts would be moderate.

4.11.1.5 North Lapwai Valley

During the summer existing trees would provide some screening of the facilities. The facilities would be seen from U.S. Highway 95 and several nearby residences. The views from the highway would be short-lived. No visually-sensitive resource would be affected. Impacts to the residents of the homes nearby could be mitigated by screening their foreground views. Impacts would be moderate because the facilities conflict with existing land patterns but would be visible to few people or for short periods.

The Nez Perce Tribe is considering putting an interpretive sign along the highway in conjunction with the National Historical Park to explain the purpose of the facilities. Screening could be increased for nearby residents.

4.11.1.6 Yoosa/Camp Creek

The facilities would be built among and screened by cedar trees. The trailers and fences used on the site would be of muted or natural colors and would be screened from view from the Nee-Me-Poo National Historic Trail. Travelers along Forest Road #103 would have brief views of the facilities. The area is relatively isolated. Impacts would be low.

4.11.1.7 Mill Creek

The proposed facilities would be screened by the fir trees at the site. Motorists using the road would see the facilities briefly. Impacts would be low.

4.11.1.8 Newsome Creek

Because the site has been disturbed by mining, there are no visually-sensitive resources in this area. The proposed ponds would be compatible with ponds left from mining. The Forest Service has improved the habitat of the stream by putting logs and other structures in the streambed, and the facility would not conflict visually with these efforts.

Forest Service Road 1853, used to access the site, is used by residents of Newsome, which is about 1.6 km (1 mile) up the road, and also by campers and other recreationists. The facilities would be visible from the road. Because the streambank has been disturbed, no vegetation is available to screen the facilities, but some could be planted if necessary. Expected impacts would be low.

4.11.1.9 Spring Chinook Direct Release Sites and Weir Sites

The proposed spring chinook direct release sites are in remote national forestland. The Tribe would consult with the USFS on final location of the proposed weir sites to avoid conflicts with recreation and other resources. No impacts are expected.

4.11.2 Use of Existing Facilities Alternative

Impacts would be similar to the Proposed Action, but the impacts from the Cherrylane facility would not occur.

4.11.3 No Action Alternative

In the No Action Alternative, no changes are made to visual resources. No impacts would be expected.

4.11.4 Cumulative Impacts

No cumulative impacts to visual resources are expected.

4.12 Air Quality

New source performance standards were developed for new industrial developments that would be emitting large amounts of air pollutants. Such standards are not applicable for the proposed program because fish hatcheries and their associated satellite facilities do not emit large amounts of air pollutants.

Analysts used these impact definitions to determine the level of impact for the alternatives.

- A **moderate** impact would create an effect that could be partially mitigated or cause a local reduction in air quality; or create a possible, but unlikely risk to human health or safety.
- A **low** impact would create an effect that could be mitigated; reduce the air quality only near the site of the action; or create very unlikely health and safety risks.
- **No impact** would create no or fewer impacts than the low impact level.

4.12.1 Proposed Action

4.12.1.1 Central Incubation and Rearing Facilities

Short-term construction activities and longer-term operations would create short-term and long-term air pollutant emissions at Cherrylane and Sweetwater Springs.

Site clearing and excavation would create ***particulates*** (dust) for a short time near the construction site at Cherrylane. Major earth-moving and heavy construction activities would continue for 6 to 8 months. Impacts would decrease as construction is completed. Vehicles used for construction would also emit pollutants in the local area. Typical vehicle exhaust contains the following pollutants: ***carbon monoxide***, ***volatile organic compounds***, ***nitrogen oxides***, ***sulfur oxides***, and particulates. The levels produced would be minor and are expected to have no impact on air quality. Impacts to local air quality would be low. No air quality standards would be exceeded.

Construction activities at Sweetwater Springs would produce fewer particulates and vehicle emissions compared to Cherrylane since the Sweetwater Springs facility requires only modifications to its existing facilities. Overall air quality impacts from construction activities at Sweetwater Springs are low.

Operation of both Cherrylane and Sweetwater Springs would create vehicle exhaust emissions from facility operators driving to and from the sites. These impacts would be long term, but minor. Overall impacts to the air quality at the central hatcheries would be low.

4.12.1.2 Satellite Facilities

Construction of satellite facilities would produce the same kinds of impacts to air quality as described for the Cherrylane and Sweetwater Springs. Fewer pollutants and particulates would be expected since the surface area to be prepared at each satellite site is small and the time needed for construction would be shorter. No impacts to air quality are expected.

During operation, vehicle exhaust emissions would be released as vehicles travel to and from the satellite sites. No impacts to air quality are expected. At Luke's Gulch a generator would be used for the pump station. The on-site generator would operate two months of the year and would cause low impacts to air quality in the area.

4.12.1.3 Spring Chinook Direct Release Sites and Weir Sites

Vehicles used as workers travel to and from the sites are the only expected source of pollutants. No impacts on air quality are expected.

4.12.2 Use of Existing Facilities Alternative

Impacts would be similar to the Proposed Action, but the impacts from the Cherrylane facility would not occur.

4.12.3 No Action Alternative

No impacts to air quality are expected from the No Action Alternative.

4.12.4 Cumulative Impacts

No cumulative impacts to air quality are expected.

4.13 Public Health and Safety

4.13.1 Proposed Action

Development of facilities for the Proposed Action would not impact the levels of police, fire, and health services that exist throughout the Clearwater River area. Most personnel operating the facilities would be local and already use these services. Construction contractors may slightly impact these services in the unlikely event of the need for law enforcement or medical attention.

On-site security is planned for all facilities during construction and operation. This would minimize potential cases of vandalism. Fire protection for the facilities during construction and operation would use the on-site facility water source. Local health facilities are available if an accident occurs. Helicopter services are available to transport injured individuals to emergency care facilities.

The presence of new facilities and workers in otherwise rural and forested areas would increase the risk of fire.

4.13.2 Use of Existing Facilities Alternative

Impacts would be similar to the Proposed Action, but the impacts from the Cherrylane facility would not occur.

4.13.3 No Action Alternative

No development would occur and the possibility of fire introduced to an area as a result of that development would not occur.

4.13.4 Cumulative Impacts

No impacts are expected.

4.14 Comparison of Alternatives

The Proposed Action would have greatest impact on the Nez Perce Tribe and would provide the greatest amount of tribal harvest, employment, and management autonomy for the Tribe. The Existing Facilities Alternative would have lesser impacts and the No Action Alternative would result in no change in tribal harvest and management, and would create a loss in employment.

Potential for disturbance of cultural resources is greatest in the Proposed Action, less in the Existing Facilities Alternative and the least in the No Action Alternative. In any action alternative, the impact would be low because of monitoring and the ability to apply mitigative plans.

Impacts on geology and soils are expected to be low and short-lived for the Proposed Action and the Existing Facilities Alternative. Because of the additional construction at Cherrylane under the Proposed Action, impacts are expected to be greater in magnitude than for the Existing Facilities Alternative, but would still be low. No impacts are expected from the No Action Alternative.

Impacts to groundwater and surface water quantity and quality would be low for the Proposed Action and the Existing Facilities Alternative, although more groundwater would be used in the Proposed Action. No impacts to groundwater or surface water would result from implementation of the No Action Alternative.

Cherrylane is located outside the floodplain. Impacts from both action alternatives would be the same and are expected to have no effect on the floodplain. Although water collection systems and some satellite sites are within the 100-year floodplain, no rise in flood elevation, displacement of flood waters, storage volume or local increase in flood stage would be caused by either alternative. No impacts to the floodplain are expected from the No Action Alternative.

Eighteen categories of impacts were evaluated for the fisheries resource and they ranged in magnitude from none to moderate. The greatest impacts would occur from implementation of the Proposed Action. This alternative has the greatest potential for restoring naturally-spawning and rearing populations of salmon in the Clearwater Subbasin than the other alternatives. As a result, the aquatic ecosystem could return more toward a dependence on salmon as a principal component of the ecosystem.

The action alternatives would result in the same short-term level of displacement and disturbance on individual wildlife species during construction. The Proposed Action has the greatest potential for beneficial impacts to those species dependent on fish for forage. The No Action Alternative will do nothing to improve the availability of forage, thus posing some detrimental impacts in comparison, although this alternative would not cause habitat disturbance by construction activities.

Moderate impacts are expected to vegetation as a result of either action alternatives and would stem from the removal of riparian vegetation for satellite and central incubation and rearing facilities construction. Impacts to the wetland at Yoosa/Camp Creek site would be moderate, depending on the number of trees removed and the amount of fill entering the wetland. The amount of area impacted and mitigation strategies would be determined after final designs are completed. At that time locations for mitigation would be coordinated with the appropriate agencies and land managers. At Luke's Gulch impacts to a seasonal wetland would be low. The No Action Alternative would have no impacts on vegetation.

Land use would change at all sites affected by implementation of the action alternatives. Moderate levels of impacts are assessed for those sites at which land use changes from agriculture to fish production (Cherrylane, North Lapwai Valley, Luke's Gulch). Land use changes at other satellite sites would be low. Impacts would be smaller in magnitude in the Existing Facilities Alternative than the Proposed Action because of the elimination of the Cherrylane site. No impacts are expected with the No Action Alternative.

Recreational use changes would result from an increase in fishing associated with larger fish runs in the action alternatives. Again, greater change in fishing might be expected with the Proposed Action. No changes would result from the No Action Alternative.

Socioeconomic impacts resulting from short-term construction, long-term employment, changes in property and sales taxes and the revenue brought in by greater fishing opportunities would be beneficial and greater with implementation of the Proposed Action than the Existing Facilities Alternative. No economic impacts would be accrued with the No Action Alternative.

Moderate impacts to visual resources would occur at Cherrylane, Luke's Gulch, and North Lapwai Valley. Low impacts are expected at the other satellite sites and at Sweetwater Springs. Because of the inclusion of Cherrylane, greater impacts are expected from the Proposed Action than the Existing Facilities Alternative. No impacts are expected from the No Action Alternative.

Low impacts to air quality are expected from implementation of the action alternatives and would be caused by vehicle emissions, construction activities and pumps. No impacts are expected from the No Action Alternative.

An increase risk of fire caused by new facilities and workers in otherwise rural and forested areas could result from the implementation of the action alternatives. Because of the inclusion of Cherrylane, greater impacts would occur from the Proposed Action than the Existing Facilities Alternative. No impacts are expected from the No Action Alternative.

Table 2-7 provides a summary and comparison of the environmental consequences of each alternative. Table 2-8 provides a comparison of the alternatives against the purposes defined for the program.

Chapter 5 Environmental Consultation, Review, and Permit Requirements

In this Chapter:

- Laws and procedures to be met
- Actions taken
- Consultations

Several federal laws and administrative procedures must be met by the alternatives. This chapter lists and briefly describes requirements that will apply to elements of this project, actions taken to assure compliance with these requirements, and the status of consultations or permit applications.

5.1 National Environmental Policy Act

This EIS was prepared according to NEPA (42 USC 4321 et seq.). NEPA is a national law for protection of the environment. NEPA applies to all federal projects or projects that require federal involvement. BPA will take into account potential environmental consequences and will take action to protect, restore, and enhance the environment.

5.2 Endangered and Threatened Species

The Endangered Species Act (16 USC 1536) provides for conserving endangered and threatened species of fish, wildlife and plants. Federal agencies must ensure proposed actions do not jeopardize the continued existence of any endangered or threatened species, or cause the destruction or adverse modification of their habitat. When conducting any environmental impact analysis for specific projects, agencies must identify practicable alternatives to conserve or enhance such species.

Possible impacts of the proposed facilities to known or suspected occurrences of state or federal threatened, or endangered species are discussed here and in Chapter 4 of the Final EIS.

5.2.1 Federal List

BPA asked the USFWS and NMFS to list the threatened and endangered species occurring within the vicinity of the proposed project. Five federally-listed threatened and endangered animal species potentially occurring within the project vicinity were listed: the bald eagle, the grizzly bear, the Gray wolf, Snake River sockeye salmon, and Snake River chinook salmon. No proposed species were listed (see Appendix E for copies of the letters from the USFWS).

USFWS and NMFS require that a biological assessment be prepared if threatened or endangered species might be impacted by a federal action. BPA and the Tribe will continue to consult with both agencies on impacts to listed species. Two Biological Assessments are part of this Final EIS (see Appendices And B).

Potential impacts to species are discussed in Section 4.7.1.7, **Threatened and Endangered Species**.

There is one documented location of a *Howellia aquatilis* (water howellia) in Idaho, in Bonner County (Blair, 1997). In order to germinate the plant requires seasonally ponded wetlands such as sloughs and oxbows which dry out in the fall (Kibbler, 1997). No sloughs or oxbows are present in the project area. No other federally-listed plants occur in the program study area.

5.2.2 State List

The IDFG lists the following threatened and endangered species potentially occurring in the project area: spring/summer/fall chinook salmon; bald eagle; peregrine falcon; and gray wolf. Cutthroat trout, steelhead, and bull trout are listed as priority species.

5.3 Fish and Wildlife Conservation

The Fish and Wildlife Conservation Act of 1980 (16 USC 2901 et seq.) encourages federal agencies to conserve and promote conservation of non-game fish and wildlife species and their habitats. In addition, the Fish and Wildlife Coordination Act (16 USC 661 et seq.) requires federal agencies undertaking projects affecting water resources to consult with the USFWS and the state agency responsible for fish and wildlife resources.

Currently, BPA is consulting with the USFWS and IDFG. BPA has also requested a formal consultation with NMFS.

Mitigation measures designed to conserve fish and wildlife and their habitat are in Chapter 4.

5.4 Heritage Conservation

Congress passed many federal laws to protect the nation's cultural resources. These include the National Historic Preservation Act, the Archeological Resources Protection Act, the American Indian

Religious Freedom Act, the National Landmarks Program, and the World Heritage List. Preserving cultural resources allows Americans to have an understanding and appreciation of their origins and history. A cultural resource is an object, structure, building, site or district that provides irreplaceable evidence of natural or human history of national, state or local significance. Cultural resources include National Landmarks, archeological sites, and properties listed (or eligible for listing) on the National Register of Historic Places.

Construction, and operation and maintenance of proposed facilities could potentially affect historic properties and other cultural resources. A cultural survey of each site and access roads has been done to determine if any cultural resources are present and would be impacted. Five prehistoric sites have been identified.

The National Historic Preservation Act of 1966, as amended, requires that the agency official consider the effects an undertaking may have on historic properties and provide an opportunity for the State Historic Preservation Officer (SHPO) and/or the Advisory Council (AC) to comment on such effects. BPA and BIA are jointly consulting with SHPO and AC on this specific project. If any alternative would affect a historic property, specific mitigation plans would be developed and reviewed by the SHPO and AC. All excavation on federal lands must be done under an Archaeological Resource Protection Act of 1979. Excavation on non-federal lands may require permits or approvals from private landholders, the state of Idaho, or the Nez Perce Tribe depending on land status. Further, all excavation is bound by the Native American Graves Protection and Repatriation Act of 1990.

Research identified five sites within the study area. All sites are prehistoric and possess characteristics that appear to make them eligible for inclusion in the National Register of Historic Places under Criterion d, scientific information. Cherrylane, Sweetwater Springs, North Lapwai Valley, Cedar Flats, and Luke's Gulch sites had artifacts.

The Sweetwater Springs site may have artifacts that are 9,000 years old, with three possible prehistoric occupations of the site.

If sites cannot be avoided, BPA will work with the State Historic Preservation Officer of Idaho to determine if those sites are eligible for a listing under the NRHP. If they are, effects will be evaluated and appropriate mitigation measures initiated.

If previously unidentified cultural resources are found during construction which would be adversely affected by the proposed project, BPA would follow all required procedures set forth in the following regulations, laws, and guidelines: Section 106 (36 CFR Part 800) of the National Historic Preservation Act of 1966 as amended (16 USC Section 470); the National Environmental Policy

Act of 1969 (42 USC Sections 4321-4327); the American Indian Religious Freedom Act of 1978 (PL 95-341); the Archaeological Resources Protection Act of 1979 (16 USC 470a-470m); and the Native American Graves Protection and Repatriation Act of 1990 (PL 101 -601).

5.5 State, Areawide and Local Plan and Program Consistency

The proposed action alternatives would be consistent with the Nez Perce County Comprehensive Plan and the Clearwater and Nez Perce National Forest Plans. The Nez Perce County Comprehensive Plan is applicable to all parts of the county, except incorporated communities, federal lands and Nez Perce tribal lands. Forest plans guide natural resource management activities and establish management standards for areas within national forests.

The proposed satellite facilities, weir sites and control/treatment stream strategies, located on national forest system lands, are consistent with the current forest plans. In addition, continued implementation of current and proposed activities identified in the forest plans, such as grazing, recreation, mining or timber sales would not be affected by the additional facilities and land uses proposed in the EIS, as long as forest plan standards are maintained; therefore, no amendments to the forest plans are necessary. The Tribe would work with the USFS while designing and locating the proposed facilities. Special use permits would be obtained and USFS PACFISH management objectives would be met.

The Use of Existing Facilities Alternative would be inconsistent with the *Comprehensive Land Use Plan of Clearwater County, Idaho*. This Plan, adopted in 1962 and amended in 1992, identifies goals and objectives that reflect the needs of Clearwater County. In the Land Use and Natural Resources Section, the Plan identifies a goal: "... provide a variety of long-term beneficial uses of all the land within Clearwater County to promote proper, orderly growth, and economic stability." Policy C of this goal "Oppose any plans that include introducing, or reintroducing any endangered, or threatened species into or near Clearwater County." The Use of Existing Facilities Alternative would partially be located in the county and would be inconsistent with this policy.

5.5.1 Proposed Central Incubation and Rearing Facilities

Two central incubation and rearing facilities would be built for hatchery stock in the Proposed Action. The Cherrylane facility is proposed for a site on private land on the Nez Perce Reservation, and the Sweetwater Springs facility is proposed for a site on state land off of the reservation. Both of these facilities would be within unincorporated Nez Perce County. The Nez Perce County Comprehensive Plan identifies, as one of its goals, to conserve natural resources so as to provide for future as well as present needs.

5.5.2 Proposed Satellite Facilities, Spring Chinook Direct Release and Weir Sites

The Proposed Action and the Use of Existing Facilities Alternative propose six satellite rearing facilities for supporting production capacity at Cherrylane and Sweetwater Springs. Four of these facilities are located in the two national forests, that is, one in the Clearwater National Forest (Yoosa/Camp Creek) and three within the Nez Perce National Forest (Mill Creek, Newsome Creek and Cedar Flats). Luke's Gulch is located on tribal land on the Nez Perce Reservation. Three spring chinook direct release sites and 11 weir sites are proposed in the national forests.

One of the goals of the Nez Perce National Forest Plan is to "... provide and maintain a diversity and quality of habitat that *ensures* a harvestable surplus of resident and anadromous fish species." The forest plan specifies that the fish habitat potential be increased to 87% throughout the forest through four measures:

- direct habitat improvement,
- soil and water resource improvement,
- use of fish/water quality objectives for individual drainages; and,
- maintenance of current high habitat levels in areas designated to remain roadless.

The forest plan points out that these improvement measures would benefit sensitive fish species (such as chinook salmon). The Clearwater Forest Plan identifies a similar goal to "... manage the forest's streams to achieve optimum levels of fish production."

The goal of the action alternatives is to produce enough salmon returning to spawn, within 20 years following project initiation, so that some salmon could be harvested. This goal supports the finding that the proposed project is consistent with these forest plans.

5.5.3 Water Appropriation

The U.S. has filed for reserved water rights for the Nez Perce Tribe; however, it is anticipated to be years before these water rights are adjudicated by Idaho state courts. Before any surface waters could be used for the alternatives, these rights need to be granted. The Nez Perce Tribe is presently working with the state of Idaho in an attempt to use the water in advance of the anticipated court degree. In the absence of the Tribe being granted the use of the water, BPA would apply for water rights for Cherrylane, Sweetwater Springs and each satellite facility requiring one. No water rights would be needed for the spring chinook direct release sites and weir sites.

Although there is a moratorium within the Clearwater River Subbasin at the present time, surface water used for hatchery facilities is considered nonconsumptive. Furthermore, the purpose of the moratorium is to conserve surface water for the fish, and since the purpose of the NPTH is to restore salmon runs in the Clearwater River Subbasin, the proposed water rights would likely be exempt from the moratorium. BPA would not proceed with expending the funds necessary to construct the proposed facilities without first obtaining the appropriate water rights to operate these facilities. The water rights would be obtained for both surface water and groundwater. Until water rights could be obtained, BPA and the Tribe would discuss a waiver for the moratorium with the Idaho Department of Water Resources.

5.6 Farmland Protection Policy Act

The Farmland Protection Policy Act (7 USC 4201 et seq.) directs federal agencies to identify and quantify adverse impacts of federal programs on farmlands. The Act's purpose is to minimize the number of federal programs that contribute to the unnecessary and irreversible conversion of agricultural land to non-agricultural uses.

The Proposed Action is in accordance with the Farmland Protection Policy Act, (7 USC 4201 et. seq.). The Sweetwater Springs and North Lapwai Valley sites would not affect any prime, unique, or other important farmland as designated by the Natural Resources Conservation Service (Gariglio, 1995).

The proposed hatchery site at Cherrylane is located on soils designated by the NRCS as prime farmland. The proposed hatchery has special siting requirements that this location satisfies. Site requirements include proximity to the Clearwater River, level terrain, and land availability. Alternative sites do not meet the siting requirements or do not affect farmland of lower relative value than the Cherrylane site. In addition, evaluation of the proposed site according to criteria set forth in the Act show the site to score relatively close to those sites which are to be given minimum consideration for protection.

5.7 Recreation Resources

BPA reviewed the Wild and Scenic River inventory of listed and proposed rivers (16 USC Sec. 127 (b)) qualifying for Wild, Scenic, or Recreational River status to determine the status of proposed sites for the program. The portion of the Selway River adjacent to the Cedar Flats site, and the mouth of Meadow Creek, are designated as a Recreational River in the Wild and Scenic Rivers system. The Selway River drains the Selway-Bitterroot Wilderness of northeastern Idaho. The proposed Cedar Flats facility is in the viewshed for the recreation use which occurs above the Ranger Station, including access to wilderness trailheads. The river is used by float boaters primarily during the spring and summer seasons. Other recreational activities along the river include camping, fishing, swimming, photography, hiking and driving for pleasure.

A National Historic Trail was identified in the National Trail System (16 USC Sec. 1242-1245) on Trail No. 40 (the Nee-Me-Poo Trail) in the area of the Yoosa/Camp Creek site.

5.8 Floodplain/Wetlands Assessment

In accordance with U.S. Department of Energy regulations on Compliance with Floodplain/ Wetlands Environmental Review Requirements (10 CFR 1022.12), an assessment of program impacts on floodplains and wetlands has been prepared. BPA published a notice of floodplain/wetlands involvement for this program in the *Federal Register* on April 29, 1994.

5.8.1 Project Description

The purpose and need for the proposed program are described in Chapter 1. Locations of 100-year floodplains were determined from Flood Insurance Rate Maps published by the Federal Emergency Management Agency, U.S. Department of Housing and Urban Development. For those facility and weir sites not mapped by FEMA, the 100-year flood elevation was estimated and compared to the elevation at the site. Analysts reviewed flood frequencies using existing U.S. Geological Survey stream gauge records at stream locations as close to each site as possible to determine channel characteristics at each site: slope; channel roughness; bottom width, and top width. The data were used to determine the channel's flood capacity using existing topographic maps of the area.

Wetlands that would be affected by the proposed program were identified from National Wetlands Inventory maps prepared by the U.S. Fish and Wildlife Service, and from field inspections. Wetlands are generally considered a unique resource in the United States because of the limited total acreage of unaffected wetland habitat in comparison to total upland habitat. In acknowledgment of the value of wetland resources, jurisdictional wetlands have been placed under federal protection through Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbor Act. Section 404 is jointly administered by the Army Corps of Engineers and the Environmental Protection Agency, and covers all fills placed in "...waters of the United States, including lakes, rivers, streams, marshes, swamps and bogs." Section 404 permits cover stream alterations and diversions, and a wide variety of other land disturbing activities that take place in, or affect, these waters. As of September 1993, Section 404 also covers drainage, excavation and other procedures that affect wetlands. All necessary permits/conditions required for project activities to take place would be obtained or complied with.

Federal policy for determining mitigation for impacts to wetlands, which requires a Section 404 permit, was developed in the Memorandum of Agreement (MOA) between the EPA and the Corps. The MOA expresses the goal of no overall net loss of wetland functions and values and defines the sequence of review for wetland mitigation. The review of projects under the MOA involving activities impacting waters of the United States is predicated on the Council of Environmental Quality (CEQ) regulations as 40 CFR 1508.20 which defines mitigation to include: (1) avoidance of impacts, (2) minimizing impacts, (3) rectifying impacts, (4) reducing impacts over time, and (5) compensation for remaining impacts.

5.8.2 Floodplain/Wetlands Effects

Floodplain impacts are discussed in Chapter 4. Based on preliminary engineering design, three satellite facilities and 11 weirs would be placed within the 100-year floodplain.

Intake and outlet structures for facility water supply/discharge at all facilities would be located within the 100-year floodplain. These would be permanent structures located in the riverbank with adequate protection to prevent streambank erosion or structural damage during high river flows. They would not contribute to any significant rise in flood elevation through the creation of a backwater.

Five of the satellite facilities would have fish acclimation ponds within the 100-year floodplain, including Newsome Creek, Cedar Flats, and Mill Creek. The ponds would generally be low to the ground offering little resistance to floodwaters and thereby would not contribute to any significant rise in the flood elevation. Ponds would be repaired or replaced if damaged by floodwaters.

Mobile trailers for facility personnel would be required at the three satellite facilities listed above. If possible, their placement would be outside the 100-year floodplain.

Eleven weirs would be placed within the stream channel as part of the action alternatives. Their purpose is for adult broodstock collection or monitoring and evaluation. Weirs would be placed within the active stream channel and would be designed to minimize changes in stream hydraulics and to wash out in the event of a flood. Permanent anchoring points on either streambank would be required at each weir site. These could range from concrete anchors placed flush with the bank surface to steel members driven into the bank. The anchoring points would have adequate protection to prevent bank erosion or structural damage during high river flows. A sill in the streambed would likely be required at some of the weir sites. Specific weir sites requiring a sill would be identified during the design phase. The sill would be placed along the bottom of the stream channel and would have a low vertical profile. It would not create a backwater and would not contribute to any significant rise in flood elevation. No impact on floodplains would be expected.

Placement of structures and improvement of access roads in the floodplain would not significantly increase the risk of flooding or flood damage. Displacement of floodwaters by structures is not expected to alter floodplain storage volume nor cause a local increase in the flood stage. Soil and vegetation disturbance at structure sites would not adversely impact the floodplain. Fill would be placed where necessary to support structures but would not generally create an elevated area that would divert or impede floodwaters.

The Yoosa/Camp Creek site has been identified as a possible jurisdictional wetland. The site is forested with the dominant community type being western red cedar-ladyfern. The soils are dark brown silty loams with decomposed organic material in the top 0-25 cm (0-10 inches). Three soil test pits were dug during field investigations of the site. The soils display characteristics of seasonal saturation and anaerobic conditions. Hydrology indicates a perched water table.

Development of the Yoosa/Camp Creek satellite facility would result in the removal of approximately 0.5 ha (1.2 acres) of forested wetland. A wetland delineation would be conducted to determine exact boundaries and total area impacted. The cedar trees are old but the stand is not considered old growth. The wetland provides good wildlife habitat and helps stabilize the sediment. The soils hold water and trap sediments in the event of a flood. These values would be lost with the removal of the vegetation. Mitigation would be developed with the Corps and the state to replace the wetlands impacted by the project. A mitigation plan would also be developed to insure impacts to remaining wetlands would be minimized to the fullest extent possible during construction. The plan could include minimizing the number of trees cut and using sediment barriers during earth-disturbing activities.

Development of the Luke’s Gulch satellite facility would require access road improvements across a wet area that receives surface water flow from upslope springs. The area affected would be less than 0.2 ha (0.5 acre).

Permits would be required from the Corps for these activities (see Section 5.12, **Discharge Permits under the Clean Water Act**).

5.8.3 Alternatives

Under Executive Orders 11988 and 11990, developments on floodplains and in wetlands are discouraged whenever there is a practical alternative. Because the proposed project requires being next to creeks and rivers, there are no practical alternatives.

The No Action Alternative would not directly impact wetlands or floodplains.

5.8.4 Mitigation

Mitigation for site-specific impacts is discussed in Chapter 4. Mitigation for wetland impacts at the Yoosa/Camp Creek site would be discussed with the Corps and the state and could potentially include replacement, enhancement or creation of wetlands.

5.9 Global Warming

In a worst case scenario, proposed construction would clear about 2-4 ha (5-10 acres) of forest, releasing about 300-600 kilograms (660-1320 lb) of carbon to the atmosphere fairly rapidly through debris burning or decay. This carbon release would be partially mitigated by replanting cleared areas with native vegetation and by using harvested logs for lumber or for utility poles. Clearing would have no impact on global warming.

The amount of vehicle exhaust released during and after construction would have no impact on global warming.

5.10 Pollution Control at Federal Facilities

Several pollution control acts apply to this project:

5.10.1 Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act (RCRA), as amended, is designed to provide a program for managing and controlling hazardous waste by imposing requirements on generators and transporters of this waste, and on owners and operators of treatment, storage, and disposal (TSD) facilities. Each TSD facility owner or operator is required to have a permit issued by EPA or the state. Construction and maintenance activities in BPA's experience have generated small amounts of hazardous waste. These typically include: solvents, pesticides, paint products, motor and lubricating oils, and cleaners.

The proposed project would not generate large amounts of solid waste. Small amounts of listed hazardous wastes may be generated by the project. These materials would be disposed of according to state law and RCRA.

5.10.2 Toxic Substances Control Act (TSCA)

This Act is intended to protect human health and the environment from toxic chemicals. Chemical usage would be restricted to the central incubation and rearing facilities. All chemicals to be used have been used at other existing fish hatcheries. Their manufacture and use is in accordance with TSCA. This program would comply with the Act.

5.10.3 Federal Insecticide, Fungicide and Rodenticide Act (FIFRA)

This Act registers and regulates pesticides. There would be no insecticides or rodenticides used in the alternatives, however formalin, which is a fungicide, will be used to treat eggs during incubation in accordance with the Act.

5.11 Noise Control Act

Local, state and federal regulations and guidelines protect residents and workers from excessive noise. The Federal Noise Control Act of 1972 (42 USC 4901) requires that federal entities, such as BPA, comply with state and local requirements regarding noise. However, there would be no noise impacts that would exceed state and local requirements, only usual noise such as generators, trucks, people and construction.

5.12 Discharge Permits under the Clean Water Act

The Clean Water Act (CWA) regulates discharges of dredged or fill material into waters of the United States.

BPA would acquire National Pollutant Discharge Elimination System (NPDES) permits from EPA, Region 10, as required, for the point discharge of any pollutant regulated under the CWA (33 USC 1251 et seq.) to the Clearwater River or its tributaries from NPTH facilities. Under Section 401 of the CWA, a federal permit to conduct an activity that results in discharges into navigable waters is issued only after the affected state certifies that existing water quality standards would not be violated if the permit were issued. The EPA and the state of Idaho (ID Code 39118) recognize five different categories of aquaculture facilities for processing cold water fish. The NPTH facilities fall into the bottom range for a Type C facility. However, facilities under 9070 kg (20,000 lb) annual production are currently excluded from NPDES requirements (40 CFR, Part 122). Based on this classification, only the Cherrylane facility with a fall chinook on-site production of about 9070 kg (20,000 lb) could be regulated under the federal/state water quality permitting program. The current Cherrylane proposal would use off-line treatment of cleaning flow. Solids would be collected either by a decant system off the raceway or by microscreens from the fall chinook holding/ acclimation ponds.

Section 402 of the Clean Water Act authorizes storm water discharges associated with industrial activities under the NPDES. The Environmental Protection Agency, Region 10, has a general permit for federal facilities for discharges from construction activities. BPA would issue a Notice of Intent to obtain coverage under the EPA general permit and would prepare a Storm Water Pollution Prevention Plan (SWPP). The SWPP Plan would help ensure that erosion and control measures would be implemented and maintained during construction. The SWPP Plan would address Best Management Practices for stabilization practices, structure practices, storm water management, and other controls.

Wetland management, regulation, and protection is related to several sections of the CWA, including Sections 401, 402, and 404, as well as a combination of other laws originally written for other uses. These are: The Coastal Zone Management Act, the Endangered Species Act, Historic Preservation Act, Rivers and Harbors Act, and the Wild and Scenic Rivers Act. Section 404 of the CWA (33 CFR 320-330) requires either review by the managing agencies or certification of consistency.

Compliance with these regulations is ensured by General Conditions for Nationwide Permits (***NWP***). Section 404 Conditions must also be complied with. The activities proposed by this project would most likely be authorized by the Corps' NWPs (33 CFR 330) under CWA Section 404, but would require notification and possibly State 401 water quality certification. The following NWP's could apply to the project:

NWP # 7 - Outfall Structures

NWP # 13 - Bank Stabilization

NWP # 14 - Road Crossing

NWP # 18 - Minor Discharges

NWP # 33 - Temporary Construction, Access and Dewatering

All conditions for NWP's under Section 404 would be met. See Section 5.8 for the Floodplain/Wetlands Assessment.

5.13 Underground Injection Permits under the Safe Drinking Water Act

The Safe Drinking Water Act (42 USC Sec. 300f et seq.) is designed to protect the quality of public drinking water and its sources. In the state of Idaho, the Department of Health and Welfare, Division of Environmental Quality is responsible for implementing the rules and regulations of the Act. The proposed program would be designed to comply with local ordinances and laws and state water quality programs so as not to degrade the quality of aquifers nor jeopardize their use as a drinking water source.

A public drinking water permit would be required for Cherrylane and other facilities.

5.14 Permits from the State

A Stream Channel Alteration Permit would be required for all instream construction. This includes intake and outlet pipes placed within stream channels. EPA will coordinate with IDFG, the State Department of Water Resources and the Corps to determine what permit (Corps and Water Resources joint permit) forms will be required.

BPA would request 401 water quality certification from the Idaho Division of Environmental Quality for program activities.

Chapter 6 List of Preparers

BAUER, JERRY A., Fish Biologist/Bonneville Power Administration. Responsible for: Technical Review. Education: B.S. Fish and Wildlife. Experience: 44 years of experience in fisheries management, habitat, harvest, research and artificial propagation (hatcheries).

BLAYLOCK, BILL, Environmental Scientist/Montgomery Watson. Responsible for: EIS Technical coordination and review of physical and natural resource descriptions and impact analysis, author of riparian vegetation and air quality sections. Education: B.S. Biological Sciences, M.S. Biological Sciences. Experience: 15 years experience in environmental impact analysis, environmental planning and NEPA documentation.

BOORSE, DAWN, Environmental Specialist/Bonneville Power Administration. Responsible for: Coordination of Chapter 10 Comments/Responses. Experience: 5 years experience in environmental analysis and NEPA process.

BROWN, BECKY, Engineer/Montgomery Watson. Responsible for: Floodplain analysis. Education: B.S. Engineering. Experience: 9 years experience in hydraulic modeling.

COLT, JOHN, Engineer/Montgomery Watson. Responsible for: Water, space, and life support requirements for salmonid artificial production and supplementation. Education: B.S. Geophysical Engineering, M.S. Environmental Engineering, Ph.D. Environmental Engineering. Experience: 21 years experience in water quality research, development of water quality criteria, water quality maintenance, and fisheries facility planning.

CONCANNON, KATHLEEN, Writer-Editor/Concannon Creative Services. Responsible for: Writing and editing the EIS and visual resources section. Education: B.S. Geology. Experience: 20 years experience in environmental analysis, resource planning, NEPA process, and technical writing.

CRAMER, STEVE, Fish Biologist/S.P. Cramer & Associates, Inc. Responsible for: Fisheries analysis, genetic risk assessment, ESA impacts, species interactions. Education: B.S. Fisheries Science, M.A. Fisheries Science. Experience: 21 years experience in salmonid fisheries research.

CROCKETT, BECKY, Environmental Scientist/Montgomery Watson. Responsible for: EIS technical coordination. Education: B.S. Environmental Science. Experience: 12 years experience in environmental impact analysis, environmental planning, and NEPA documentation.

CRYER, ED, Engineer/Montgomery Watson. Responsible for: Preliminary engineering for salmonid artificial production and supplementation. Education: B.S. Environmental Biology, M.S. Environmental Biology, M.S. Civil Engineering. Experience: 27 years experience in environmental engineering and planning water resource projects.

HECKMAN, LORA, Environmental Engineer/Montgomery Watson. Responsible for: Technical data compilation for geology and soils, and floodplains analyses. Education: B.S. Environmental Engineering. Experience: 2 years experience in environmental engineering on water projects.

JAMES, CHARLES D. III, Archaeologist/Bureau of Indian Affairs. Responsible for: Cultural Resources. Education: M.A. Anthropology. Experience: 26 years of experience in historic and prehistoric archaeology, history, Cultural Resource Management, historic preservation.

JOHNSON, DAVID, Senior Monitoring and Evaluation Biologist/Nez Perce Tribe. Responsible for: Author of Nez Perce Tribe section and provided technical review, NPTH objectives and requirements. Education: B.S. Biology, M.S. Biology. Experience: 13 years experience in fish biology.

KELLEHER, LESLIE, Biologist/Bonneville Power Administration. Responsible for: Project environmental coordination and completion of environmental impact statement. Education: B.A. Biology, M.A. Secondary Education/Environmental Science. Experience: 5 years experience in general environmental analyses, vegetation, floodplain and wetland analyses, and NEPA process.

LARSON, ROY E., Director of Natural and Hatchery Production/Nez Perce Tribe. Responsible for: Coordinating project for the Nez Perce Tribe, Technical advice and review. Education: B.S. Agriculture, M.S. Veterinary Science. Experience: 16 years experience in fisheries development and restoration, administration aquaculture and hatchery operations, and fish health management.

LEVY, STEVE, Fish and Wildlife Project Manager/Bonneville Power Administration. Responsible for: Coordination of NPTH project. Education: M.S. Environmental Studies. Experience: 20 years experience in natural resource management.

LYNARD, GENE, Environmental Specialist/Bonneville Power Administration. Responsible for: Land use, socioeconomics and recreation. Education: B.A. Geography, M. of City and Regional Planning. Experience: 18 years experience in land use development economics, and facility and environmental planning.

LYONS, JASON, Cultural Resources Archaeologist/Nez Perce Tribe. Responsible for: All aspects of Cultural Resources Management. Education: B.S. Anthropology. Experience: 4 years in all phases of archaeological excavation, survey and management.

MORROW, BOB, Environmental Scientist/Montgomery Watson. Responsible for: Contributing author for water resources, geology and soils, and floodplains analyses. Education: B.S. Biological Sciences. Experience: 13 years experience in environmental impact analysis, aquatic ecology, and NEPA documentation.

STEWARD, CLEVELAND, Fisheries Biologist/Steward Consulting. Responsible for: Fisheries analysis. Education: B.S. Wildlife, Aquatic Option, M.S. Fisheries. Experience: 17 years experience in aquatic resources, with emphasis on water management, watershed impacts, fisheries research and management.

TEDRICK, DOUG, Fish Biologist/Bureau of Indian Affairs. Responsible for: Technical review. Education: B.S. Biological Sciences. Experience: 10 years experience in natural resource management.

THIEMANN, ROB, Engineer/Montgomery Watson. Responsible for: Water quantity analysis for facility sites. Education: B.S. Mechanical Engineering. Experience: 4 years experience in the planning and design of fish production facilities.

WALKER, GRANT, Nez Perce Tribal Hatchery Manager/Nez Perce Tribe. Responsible for: Hatchery management, technical data, advice and review. Education: B.A. Biology. Experience: 13 years hatchery management, 5 years fisheries development and restoration.

Chapter 7 List of Agencies, Organizations, and Persons to Whom Copies of the EIS are Sent

The mailing list contains affected landowners, Tribes, local, state, and federal agencies, utility customers, public officials, interest groups, resource developers, members of the public and the media. They have directly received or have been given instructions on how to receive all project information made available so far including the Draft EIS, and will have an opportunity to review the Final EIS.

7.1 Federal/Regional Agencies

US Army Corps of Engineers

US Environmental Protection Agency

USDA Forest Service

- Clearwater National Forest
- Nez Perce National Forest
- Salmon National Forest

USDA Natural Resources Conservation Service

USDOC National Marine Fisheries Service

USDOE Federal Energy Regulatory Commission

USDOI Bureau of Indian Affairs

USDOI Bureau of Land Management

USDOI Bureau of Reclamation

USDOI Fish and Wildlife Service

USDOI National Biological Service

Northwest Power Planning Council

Columbia River Inter-Tribal Fish Commission (CRITFC)

7.2 Foreign Agencies

Ministry of Environment, Canada

7.3 States

State of Alaska

- Department of Fish and Game

State of California
- Department of Fish and Game
- Department of Water Resources

State of Idaho
- Division of Environment
- Division of Natural Resources
- Department of Fish and Game
- Department of Health and Welfare
- Department of Lands
- Department of Water Resources
- Office of Attorney General

State of Montana
- Department of Fish, Wildlife, and Parks

State of Oregon
- Department of Fish and Wildlife

State of Washington
- Department of Ecology
- Department of Fish and Wildlife
- Wildlife Commission

7.4 Local Governments

City of Lewiston

County of Ada

County of Boise

County of Clearwater

County of Idaho

County of Latah

County of Lewis

County of Nez Perce

County of Asotin, WA

County of Pend Oreille, WA

County of Spokane, WA

County of Walla Walla, WA

County of Whitman, WA

7.5 Tribes

Nez Perce Tribe

Shoshone-Bannock Tribes

Kalispel Indian Commission

Nisqually Indian Tribe

Confederated Salish and Kootenai Tribes

Confederated Tribes and Bands of Yakama Indian Nation

Confederated Tribes of the Shoshone Paiute

Confederated Tribes of Umatilla Reservation

Confederated Tribes of Warm Springs Council

7.6 Libraries

Boise State University Library

Lewis and Clark State College Library, Lewiston, ID

University of Idaho Library, Moscow, ID

Colorado State University Library, Fort Collins, CO

University of Wyoming Library, Laramie, WY

Hatfield Marine Science Center Library, Newport, OR

International Game Fish Association Library, Pompano Beach, FL

Moscow Latah County Library, Moscow, ID

British Columbia Ministry of Agriculture and Fisheries Library

Human Ecology Research Library, Los Angeles, CA

Montana State Library, Helena, MT

Tacoma Public Library, Tacoma, WA

State of Idaho Library, Boise, ID

State of Idaho Supreme Court Law Library, Boise, ID

City of Boise Public Library

City of Spokane Public Library

Columbia River Inter-Tribal Fish Commission Library

Southwestern Idaho Regional Library System

7.7 Utilities

Chelan County PUD, WA

Douglas County PUD, WA

Inland Power and Light, WA

Seattle City Light, WA

Skagit System Coop, WA

Tacoma Public Utilities, WA

Washington Water Power Company, WA

West Kootenai Power and Light Company, WA

Idaho Power Company, ID

Salmon River Electric COOP, ID

Mid Columbia PUD, OR

Montana Power Company, MT

7.8 Elected Officials

Governor Phil Batt

Governor Gary Locke

Governor John Kitzhaber

Senator Larry Craig

Senator Dirk Kempthorne

Representative Helen Chenowith

Representative Michael Crapo

Representative George Nethercutt

7.9 Interest Groups/Businesses

American Fisheries Society

Aquafood Business

Aquatic Research Institute

Aqua Sierra

Aquatic Ecosystems

Battelle Pacific Northwest Laboratory

Big Bend Economic Development Council

Citizens Utility Board of Oregon

Columbia Basin Fish & Wildlife Authority

Committee for Idaho's High Desert

Common Sensing, Inc.

Connecting Point

Direct Service Industries, Inc.

Eagle Creek National Fish Hatchery

Evergreen Legal Services

Environmental Defense Fund

Fish Protection, Inc.

Fisheries Experiment Station

Flathead Basin Commission

Forestry Sciences Laboratory

Friends of the Earth

Hells Canyon Guide Service

Ichthyological Association, Inc.

Idaho Association of Soil Conservation Districts

Idaho Conservation League

Idaho Mining Association

Idaho Sportsmen Coalition

Idaho Steelhead & Salmon Unlimited

Idaho Water Users Association, Inc.

Idaho Wildlife Federation

Intermountain Forest Association

International Game Fish Association

Kaiser Aluminum and Chemical Corporation

Lafferty Transportation Company

LaSalle Construction

Mattole Salmon Group

North Coast Environmental Center

Northwest Business for Fish

Northwest Conservation Act Coalition

Northwest Environmental Defense Center

Northwest Fly Fishers

Northwest Indian Fisheries Commission

Northwest Timber Workers Association

Lewiston Orchards Irrigation District

Oak Ridge National Laboratory

Ocean Star International

Oregon Salmon Commission

Oregon Trout

Orofino Chamber of Commerce

Pacific Fishery Management Council

Pacific Northwest Utilities Conference Committee

Potlatch Corporation

Public Power Council

Rangen Aquaculture Research Center

Ranger, Inc.

Resource Organization on Timber Supply

Richland Rod & Gun Club

Sierra Club

Sultan Sportsman Club

Sverdrup Corporation

Trout Unlimited

Warm Springs Fish Hatchery

Wildstone Resources

Yakima River Alliance

7.10 Media

Clearwater Tribune

KOZE Radio

KQVE Radio

7.11 Others

Universities, consultants and private individuals are also on the list.

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Chapter 9 Glossary and Acronyms

This chapter contains a list of acronyms, abbreviations, and technical terms used in this EIS. Words that would be defined in a desk-size dictionary (for example, the College Edition of the American Heritage Dictionary) are not included.

Acronyms

BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BPA	Bonneville Power Administration
CBFWA	Columbia Basin Fish and Wildlife Authority
CEQ	Council of Environmental Quality
CFR	Code of Federal Regulations
cfs	cubic feet per second
cm	centimeter
Corps	U.S. Army Corps of Engineers
Council	Northwest Power Planning Council
CRFMP	Columbia River Fish Management Plan
CWA	Clean Water Act
dBA	decibels (A-weighted)
DEIS	Draft Environmental Impact Statement
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
FEMA	Federal Emergency Management Agency
FIFRA	Federal Insecticide, Fungicide and Rodenticide Act
ft	feet
gpm	gallons per minute
ha	hectares
IAT	Impact Assessment Team
IDFG	State of Idaho, Department of Fish and Game
IHOT	Integrated Hatchery Operations Team

IHS	Indian Health Service
ISG	Independent Scientific Group
ISS	Idaho Supplementation Studies
m	meter
mm	millimeter
m^3/min	cubic meters per minute
LSRCP	Lower Snake River Compensation Plan
M & E Plan	Monitoring and Evaluation Plan
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NFMA	National Forest Management Act
NMFS	National Marine Fisheries Service
NOI	Notice of Intent
NPT	Nez Perce Tribe
NPTEC	Nez Perce Tribal Executive Committee
NPTH	Nez Perce Tribal Hatchery
NPTH GRA	Nez Perce Tribal Hatchery Genetic Risk Assessment
NRCS	U.S. Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWP	Nationwide Permits
RCRA	Resource Conservation and Recovery Act
RHCA	Riparian Habitat Conservation Area
RMO	Riparian Management Objective
SDM	Smolt Density Model
Selway GRA	Selway Genetic Resource Assessment
SHPO	State Historic Preservation Office
SWPP	Storm Water Pollution Prevention Plan
TSCA	Toxic Substances Control Act
USBR	U.S. Bureau of Reclamation

USDOE	U.S. Department of Energy
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VQO	Visual Quality Objectives

Technical Terms

acclimation Allowing fish to adjust to environmental variables. Older hatchery practices resulted in high mortalities because the young fish were released directly from the hatchery, without a chance for them to adjust to the natural stream environment. Acclimation is a process which is used to allow the fish to gradually adjust to a more natural environment and imprint on the area in which the acclimation site is located, rather than on the hatchery, so that the fish will return to the area to spawn.

acclimation site Sites at which young fish are held in artificial ponds to allow them to imprint so that they return to that place to spawn.

adaptation Genetic change over generations through natural selection that results in a population better suited to its environment.

adaptive management Using management actions as part of an experimental design to refine understanding concerning scientific questions. As a result of these experiments, management should adapt, resulting in improved response to environmental problems. (*Return to the River*, ISG, 1996).

adfluvial A fish that spawns in a river and rears in lakes.

aggregate Multiple fish stocks within a species or race.

anadromous fish Fish that migrate from fresh to saltwater when young, spend the majority of their adult life in the ocean, and then return to their ancestral drainage to spawn.

backwater The water level controlled or determined by a downstream obstruction.

bankfull flow Considered to represent the dominant discharge associated with channel-forming events.

biological opinion Document stating the opinion of the U.S. Fish and Wildlife Service or the National Marine Fisheries Service on whether a federal action is likely to jeopardize the continued existence of listed species, or result in the destruction or adverse modification of critical habitat.

biomass Total weight of organisms per unit volume.

bottomland Nearly level land on the bottom of a valley that has a stream running through it. Subject to flooding and often referred to as a floodplain.

breaklands A landform of the region that is relatively steeply sloping, typically has basalt outcrops, and represents a transitional zone between the valley bottoms and upland basins.

broodstock Fish that will be spawned to create hatchery stock.

carbon monoxide An odorless and colorless gas formed from one atom of carbon and one atom of oxygen.

carrying capacity The maximum number or biomass of fish that could potentially be supported by a given habitat, as determined by prevailing physical, chemical, and biological conditions.

chinook (*Oncorhynchus tshawytscha*). Also called king, tule, or brights.

coho (*Oncorhynchus kisutch*). Also called silver salmon.

Columbia River Basin The drainage of the Columbia River which includes parts of Canada, the Pacific Northwest, and parts of Montana, Wyoming, and Nevada.

critical habitat Minimum amount of habitat necessary for survival and enough area for the species to expand and recover to healthy population levels.

cumulative impact Cumulative impacts are created by the incremental effect of an action when added to other past, present, and reasonably foreseeable future actions.

domestication selection Natural selection for traits which affect survival and reproduction in a human-controlled environment.

donor stock Specific stock from which broodstock are chosen.

egg-eyeing station Place where eggs are incubated.

egg take The number of eggs needed to produce the next generation of adults.

escapement Fish that are allowed to spawn naturally.

evolutionarily significant unit A population or group of populations that is considered distinct (and hence a “species”) for purposes of conservation under the ESA. To qualify as an ESU, a population must: (1) be reproductively isolated from other conspecific populations; and (2) represent an important component in the evolutionary legacy of the biological species.

eyed-eggs Life stage of a fertilized egg between the time the eyes become visible and hatching occurs.

facility Fish culture facility used for incubation and rearing of salmon and steelhead.

fault zones An area where two moving geologic formations come in contact with one another.

fingerling Juvenile salmonid; usually refers to presmolt fish.

floodplain Nearly level lands, consisting of stream sediments, that borders a stream and is subject to flooding unless protected artificially.

fry Juvenile salmonid life stage following absorption of yolk sac.

gamete A sex cell (i.e., sperm or egg cell).

gloryhole A term used for an hydraulic placer mine.

gneiss A banded metamorphic rock with the same composition as granite.

harvest augmentation Producing fish principally for harvest.

Heath tray A particular type of container for holding fertilized eggs in a fish hatchery during the period of incubation.

homing Navigational behavior that guides species during migrations.

igneous rock Rock that has been formed by the cooling of molten mineral material. (Examples: granite and basalt).

imprinting The physiological and behavioral process by which migrating fish assimilate environmental cues to aid their return to their stream of origin as adults.

infiltration gallery A water collection structure located in the gravels beneath the riverbed which allows collection of silt-free water.

introgression Loss of, or changes in, population identity including loss of diversity among populations, characteristics of adaptation with populations, or of other evolved features of genetic organization (may occur through crossbreeding or inadvertent effects of artificial selection).

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

jump start Starting or setting in motion a stalled system or process.

jurisdictional wetlands Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

landslide Any mass-movement process characterized by downslide transport of soil and rock, under gravitational stress, by sliding over a discrete failure surface; or the resultant landform. Can also include other forms of mass wasting not involving sliding (rockfall, etc.).

loam Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

loess Fined grained material, dominated by silt-sized particles and deposited by wind. The particles originated from the ground-up rock and debris from glaciers, trapped and carried in ice, and deposited during ice melt.

long-term genetic fitness A measure of the ability of a population to survive natural selection over a number of generations.

mainstem The main section of a river.

mass failure An event occurring on steep slopes with physical characteristics that allow failure of stable landforms. Soil properties may include low permeability, high water content, and high slope resulting in large scale failure and movement of surface material.

mass wasting The slow downward slope of rock debris.

mitigate To take steps to lessen the effects predicted for each resource, as potentially caused by the proposed action or alternatives. Steps may include reducing the impact, avoiding it completely, or rectifying or compensating for the impact.

modification and **maximum modification** The VQOs that apply to less visually-sensitive areas where changes can dominate the natural landscape but should look natural from a long distance.

natal Of or relating to the place of one's birth.

naturally reproducing Adult fish spawning in a stream or river regardless of how parents were spawned, specifically if spawned at a hatchery.

nitrogen oxides A group of compounds consisting of various combinations of nitrogen and oxygen atoms.

nominal Current value; not adjusted for inflation as in real dollars.

nonrenewable A commodity or resource that is exhaustible or not replaceable.

omnivorous Eating both plant and animal substances.

100-year floodplain That portion of a river valley adjacent to the stream channel which is covered with water when the stream overflows its banks during a 100-year flood event. A 100-year flood event is one that has a 1 in 100 chance of happening in any given year.

outplant Outplanting is the process by which artificially propagated fish are released into a natural system.

ozonation The process of using ozone gas as an oxidizing agent to kill disease-causing organisms in a water supply.

Palouse steppe A landform of the region consisting of the upland rolling hills and river drainages that lie at an elevation above the valley bottom and breaklands.

parr Juvenile salmonids develop bar-shaped marks on their sides called parr marks between becoming fry and smolting.

partial retention The VQO that applies to areas where activities may be evident but must remain subordinate to the natural landscape. These visually sensitive areas are along major state and federal highways, wild and scenic river corridors, and other high public use areas.

pathogen A disease-causing agent.

permeability The quality of a soil horizon that enables water or air to move through it. Terms used to describe permeability include; very slow, slow, moderately slow, moderate, moderately rapid, rapid, very rapid.

pH The symbol for the chemical measurement of the acidity or alkalinity of a solution.

PIT tag Short for passive integrated transponder, it is used to identify individual fish for monitoring and research. This miniature tag has an integrated microchip that contains information about the specific fish in which it is placed, and transmits that information from within the live fish.

piscivorous Fish eating.

placer A place where a deposit is washed to remove its mineral content.

population A group of individuals of a species living in a certain area.

population viability The overall condition and long-term probability of survival of the fish population.

predation The harm, destruction, or consumption of a prey organism by an animal predator.

preservation The VQO that applies to wilderness and other special areas where the natural landscape should be unaltered by forest management activities.

presmolts Juvenile spring chinook salmon that are 100-150 mm (4-6 inches) long in the fall. They smolt and migrate to the ocean the following spring.

production Number of individuals produced from a natural environment or fish culture facilities.

province An area of land less extensive than a region and having a characteristic plant and animal population.

race A group of individuals within a species, forming a permanent variety; a particular breed.

raceway Holding area or rearing facility for juvenile or adult salmonids in a hatchery.

ravel Downslide movement of noncohesive soil or rock particles under the influence of gravity. A form of soil creep.

recreational river A Wild and Scenic Rivers Act of 1968 designation that has specific criteria for the level of development.

redd A salmon nest.

reproduction The process of forming new individuals of a species by sexual or asexual methods.

retention The VQO that applies to areas where activities should not be evident to the casual forest visitor.

riparian habitat The zone of vegetation which extends from the water's edge landward to the edge of the vegetative canopy. Associated with watercourses such as streams, rivers, springs, ponds, lakes, or tidewater.

salmonid Belonging to the family salmonidae, i.e., salmon, trout, steelhead, whitefish.

satellite facility Fish culture facility used for rearing and acclimation of juvenile salmon or holding of adult broodstock.

schist A metamorphic rock consisting of laminated, often flaky parallel layers.

seine A large net used to catch fish.

seismicity Earthquake activity.

sensitive species Those plants and animals identified by the Regional Forester for which population viability is a concern as evidenced by significant current or predicted downward trend in populations or density and significant or predicted downward trend in habitat capability.

silt Individual mineral particles in a soil that range in diameter from the upper limit of clay (0.002 mm) to the lower limit of very fine sand (0.05 mm).

silty-loams A mixture of silt and loam particles consisting of clay and sand mineral particles that range in diameter from less than 0.002 mm to 0.05 mm.

slump Deep, rotational landslide, generally producing coherent movement (back rotation) of blocks over a concave failure surface. Typically, slumps are triggered by the buildup of pore water pressure in mechanically weak materials (deep soil or clay-rock rock).

smolt Juvenile salmon undergoing metamorphosis into a saltwater fish, usually during the downstream migration period.

species A group of interbreeding individuals not interbreeding with another such group; similar, and related species are grouped into a genus.

species of special concern Native species that are either low in number, limited in distribution, or have suffered significant population reductions due to habitat losses. The list includes three categories of species:

a. Species which meet one or more of the criteria above and for which Idaho presently contains, or formerly constituted, a significant portion of their range (i.e. priority species);

b. Species which meet one or more of the criteria above, but whose populations in Idaho are on the edge of a range that falls largely outside the state (i.e. peripheral species);

c. Species that may be rare in the state but for which there is little information on their populations status, distribution, and/or habitat requirements (i.e., undetermined status species).

steelhead The sea going rainbow trout, reclassified as a Pacific Salmon in 1989.

stock A distinct management or genetic unit of fish.

subbasin Subdivision of a larger drainage basin. The drainage or catchment area of a stream which along with other subbasins make up the drainage basin of a larger stream.

substrate The material comprising the bed of a stream.

subyearling smolts Juvenile salmonids that physiologically mature and migrate to the ocean when less than one year old; e.g., certain stocks of fall and summer chinook.

sulfur oxides Various combinations of sulfur and oxygen; one of the most common being sulfur dioxide, which is a gas at normal temperatures and pressures in the atmosphere. Sulfur oxides combine with particulates and moisture to produce acid rain.

supplementation 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 while keeping the ecological and genetic impacts on non-target populations within specified biological limits.

sympatric Coextensive distribution among animal and plant species.

terminal areas Harvest in the spawning streams to which adults return as opposed to harvest in the mainstem river.

terrace An old alluvial plain, ordinarily flat or undulating, bordering a river, lake or the sea. Stream terraces are frequently called second bottoms, as contrasted to floodplains, and are seldom subject to overflow.

thermal regime Temperature regime.

tribal land Land that is collectively owned by the Nez Perce Tribal Government.

volatile organic compounds (VOC) Compounds containing carbon that evaporates readily at normal room temperature and pressure. VOCs react with sunlight to form ozone.

water hardened Water hardening is the process of placing fertilized eggs in water so that the egg absorbs the water that accumulates in the space between the egg yolk and outer membrane.

weir A fence or a barrier placed in a stream to catch, retain or count fish.

wild fish A fish that has not spent any part of its life history in an artificial environment and are the progeny of naturally-reproducing salmon regardless of parentage.

wild and scenic river A river within the national wild and scenic river system that offers outstanding scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values designated by Congress under the Wild and Scenic Rivers Act of 1968 for preservation of their free-flowing condition.

within population variability The quantity and variety of alleles, chromosomes, and arrangement of genes on the chromosomes that are present in populations.

zone 6 The Treaty Indian Set-Net fishery from Bonneville Dam to McNary Dam, 140 miles of river open to commercial fishing. Zones 1-5 are the drift gill-net fishery from Astoria to Bonneville Dam, 140 miles open to commercial fishing.

Chapter 10 Comments and Responses

BPA sent the Draft EIS to the public for comments on the Proposed Action and alternatives. The Draft EIS was distributed to agencies, groups, individuals and libraries in June 1996 (see Chapter 7). A 45-day public review period ended on August 16, 1996. Two public meetings with an open house format were held in Boise and Lapwai, Idaho to review and receive comments on the Draft EIS. An additional comment period was opened on December 13, 1996 and ended January 27, 1997. This chapter records and provides responses to the comments on the Draft EIS. This Final EIS also provides updated information developed as a result of the comments received on the Draft EIS.

This chapter contains the written comments from letters and comment sheets, and oral comments from public meetings and telephone calls. Letters and calls were recorded in the order they were received. Separate issues in each letter were given separate codes, for example, 01-01, 01-02, etc. Comments from the public meetings were coded similarly. BPA, BIA and the Nez Perce Tribe prepared responses to the individual issues. This chapter contains the coded comment letters on the left side of the page with the coded responses given on the right side of the page.

BONNEVILLE POWER ADMINISTRATION

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG#: NEZP-02-001
RECEIPT DATE: JUN 26 1996

Nez Perce Tribal Hatchery Program

"I'd Like to Tell You..." JUN 26 1996

1. Please be sure your environmental studies include (for example, impacts on water quality)
01-01 Potential impacts to native, wild fish, both resident & anadromous.
01-02 Cost/Benefit ratio of the project & who will get the benefits.

2. My environmental concerns about the Nez Perce Tribal Hatchery Program are
01-03 Is this just a short-term program attempting to revive a native run, or do you propose to continue the program beyond the 10 year time frame of Phases 1 + 2?

3. Other alternatives I'd like you to consider
01-04 Consider recommendations in the enclosed report "Better Roles for Fish Stocking in Aquatic Resource Mgmt" White, et al, 1995

4. I need more information about
01-05 where will the brood stock come from & what will be the effects on that particular population?

5. I have these other comments
01-06 If the primary cause for the decline of anadromous fish in Idaho is the hydropower system, how will this proposed project help to correct this underlying cause?

☐ Please put me on your project mailing list. (You are already on the mail list if you received this in the mail.)

Name Jim Myron, Conservation Director - Oregon Trout
Address 117 SW Front Av Portland, OR 97204
(ATTACHMENT INCLUDED)

Please mail your comments by August 16, 1996 to:

Bonneville Power Administration
Public Involvement Office - CKP
P.O. Box 12999
Portland, OR 97212

6-21-96

BONNEVILLE POWER ADMINISTRATION

01-01

Impacts to native wild fish are described in Section 4.6, Fish.

01-02

Thank you for your comment. BPA feels a cost/benefit analysis for the Nez Perce Tribal Hatchery Program would be problematic at this point given the many uncertainties regarding adults returning to the system and issues related to that effort. Additionally, it would be difficult to quantify the economic benefits from a major project goal.

We acknowledge that costs associated with fish protection and restoration efforts may appear high. In most cases this correlates to the extent of current damage to the existing resource(s). Total construction costs for the Cherrylane and Sweetwater Springs hatchery facilities as well as the six satellite facilities are estimated to be approximately $16 million. The amount of funds expended to date on the Nez Perce Tribal Hatchery Project is between $5-$6 million. The latter figure includes costs incurred since 1983 for a myriad of activities including, but not limited to, project planning, coordination, research, site selection, preliminary design studies, and environmental impact analysis.

01-03

The third phase of the program (after 10 years) would be based on the first and second phases of the program (see Section 2.1, Proposed Action).

01-04

Comment noted.

01-05

Initial broodstock sources are described in Section 2.1.3.7, Broodstock Source and Management. Effects on these hatchery populations would be determined on an annual basis by NPT and other fishery agencies during negotiation for broodstock acquisition.

01-06

The EIS recounts the history of the Clearwater River's anadromous fish and their extirpation by non-Federal dams in the early twentieth century. Research and history show that federal dams alone are not responsible for the decline of the Clearwater salmon runs. Although continuing mainstem passage is fundamental to the long-term success of the NPTH program, it is a difficult issue to analyze in the context of this EIS and is outside the scope. Section 1.7 lists several on-going efforts that address mainstem passage.

BONNEVILLE POWER ADMINISTRATION

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG#: NEZP-02-002
RECEIPT DATE: JUL 02 1996

Nez Perce Tribal Hatchery Program

"I'd Like to Tell You…"

1. Please be sure your environmental studies include (for example, impacts on water quality)

02-01 | 02-02 | 2. My environmental concerns about the Nez Perce Tribal Hatchery Program are DOES THE TRIBE HAVE THE EXPERTISE TO SAFELY & ECONOMICALLY MANAGE & OPERATE A HATCHERY? WHAT IS THE RISK OF INTRODUCING DISEASE AS THE FISH ARE RELEASED.

02-03 | 3. Other alternatives I'd like you to consider SINCE ONLY 1 OF 4000 SMOLTS THAT ENTER THE OCEAN WILL RETURN AS A SPAWNING ADULT, WHAT DO YOU INTEND TO DO TO IDENTIFY AND AMELIORATE THOSE EVENTS OCCURRING IN THE OCEAN THAT ARE DEVASTATING THESE SALMON.

02-04 | 4. I need more information about YOUR STATEMENT IN THE JUNE 20, 1994 FYI "SALMON ONCE HAD A MAJOR ROLE IN THE ECOSYSTEM…. THEIR LOSS WILL CONTINUE TO HAVE DRAMATIC EFFECTS". PLEASE DEFINE "MAJOR" AND THE "DRAMATIC EFFECTS".

02-05 | 5. I have these other comments PLEASE INCLUDE YOUR ANALYSIS OF BARGING AND WATER SPILLING IN THE EIS.

☐ Please put me on your project mailing list. (You are already on the mail list if you received this in the mail.)

Name

Address

Please mail your comments by August 16, 1996 to:

BIG BEND ECONOMIC DEV. COUNCIL
226 W. Third Avenue
Moses Lake, WA 98837
Ph 509 765-1721
FAX 509 766-0452

Bonneville Power Administration
Public Involvement Office - CKP
P.O. Box 12999
Portland, OR 97212

BONNEVILLE POWER ADMINISTRATION

02-01

Yes. The Tribe employs many professional fishery biologists and hatchery operations experts with many years of experience in the Northwest and other parts of the country.

02-02

Section 4.6.1.2, Impacts, discusses the risk of introducing disease as fish are released.

02-03

These events are outside the scope of the EIS, but are noted in the EIS. See also a new adult return section, Section 2.1.3.5.

02-04

The role of salmonids and the effect of their loss is described in Section 1.1.1.1, The Clearwater River Fish Community.

02-05

As noted above, some actions and events that occur are outside the scope of this EIS. However, you may find the information you seek in the SOR EIS.

BPA F 1210.02
(04-91)
(Previously BPA 1508)

U.S. DEPARTMENT OF ENERGY – BONNEVILLE POWER ADMINISTRATION
800 TELEPHONE LOG

LOG NO.
DATE 7/9
TIME

NAME JOHN PERKINS
FIRM (IF APPLICABLE)
ADDRESS

IDAHO

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG#: NEZP-02-003
RECEIPT DATE:
JUL 09 1996

PHONE NO. 208-388-1633
CALL RECEIVED BY Jean

INFORMATION REQUESTED/COMMENT:

03-01 REJECT PLAN BY NEZ PERCE TRIBE BECAUSE DON'T THINK THERE SHOULD BE ANY TROUGH (?) INTRO-DUCTIONS FROM DRAINAGE TO DRAINAGE

IS WILDLIFE BIOLOGIST & UNDERSTANDS WILDLIFE GENETICS

03-01
Comment noted.

BONNEVILLE POWER ADMINISTRATION

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG#: NEZP-02-004
RECEIPT DATE: JUL 19 1996

Nez Perce Tribal Hatchery Program JUL 19 1996

"I'd Like to Tell You..."

1. Please be sure your environmental studies include (for example, impacts on water quality)

04-01 – Potential or minimum predicted survival of released young salmon and predicted annual returns of adults.

2. My environmental concerns about the Nez Perce Tribal Hatchery Program are

04-02 Downstream water quality impacts;
04-03 impacts to naturally-occurring salmon populations (i.e., by induced behavior and genetics in hatchery fish);
04-04 and whether sufficient passage and downstream rearing habitat exist for supporting effective hatchery
04-05 product. Also, concerned about long-term, cost-effectiveness (feasibility) of this project.

3. Other alternatives I'd like you to consider

04-06 Hatchery production used in conjunction with downstream habitat restoration; at least on a limited scale, or improvement of rearing habitat.

4. I need more information about

04-07 This project's conflicts, if any, with present bull trout restoration concerns/projects.

5. I have these other comments

04-08 Not sure whether intensive disease control (e.g., use of ozone) in hatchery facility is beneficial for maintaining "wild" behavior and disease resistance in the wild. Maybe best to allow those fish most adaptable, or naturally resistant in the hatchery to be "selected for", thereby producing healthier stocks in the wild. These measures may be taken near outflows however to protect wild fish downstream from disease associated with the hatchery.

☐ Please put me on your project mailing list. (You are already on the mail list if you received this in the mail.)

Name Tony Byrne, Plateau Ecosystems Consulting, Inc.
Address 5255 Marshall St., Ste. 203, Arvada, CO 80002

Please mail your comments by August 16, 1996 to:

Bonneville Power Administration
Public Involvement Office - CKP
P.O. Box 12999
Portland, OR 97212

BONNEVILLE POWER ADMINISTRATION

04-01

Predicted annual returns of adults in the Proposed Action are displayed in Table 2-2. A discussion of survival rates of released salmon is presented in a new section, 2.1.3.5, Adult Returns.

04-02

Sections 4.4, Water Resources, and 4.6, Fish, describe water quality impacts.

04-03

Effects on fish are described in Section 4.6, Fish.

04-04

See responses to 01-06, and 02-03.

04-05

See response to 01-02.

04-06

Section 2.4.2, Natural Habitat Enhancement and Restoration, contains new information about important habitat restoration projects in the area.

04-07

Bull trout have been proposed for listing as a threatened species. No formal federal restoration effort has yet been developed. However, effects on bull trout are described in the biological assessment (see Appendix B). In addition, a description of the relationship of the state of Idaho's bull trout conservation plan with NPTH is presented below.

Idaho Governor Phil E. Batt has proposed a State of Idaho Bull Trout Conservation Plan 1996. The conservation plan focuses on bull trout recovery within select key watersheds. Most proposed NPTH treatment and control streams (with the exception of Lolo and Eldorado Creek) are within the key watershed areas. Principal conservation activities have not yet been developed, but the plan indicates that they would focus on alleviating human-caused habitat related impacts such as sediment sources, bank cover and stability, migration barriers and poaching. The plan does state that the loss of anadromous fish runs has led to a lack of prey for bull trout. Consequently, supplementation of chinook could increase that prey base serving to enhance bull trout populations.

04-08

The Cherrylane facility would be located downstream of three other hatcheries with known disease histories. Disease often occurs if water is used below another facility. For that reason, groundwater and surface water may be treated with ozone to insure that fish will be protected until their immune systems can defend them against disease.

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG#: NEZP-02-005
RECEIPT DATE: JUL 19 1996

JUL 19 1996

P.O. Box 1560
Orofino, ID 83544
July 13, 1996

Bonneville Power Administration
Public Involvement Office-CKP
P.O. Box 12999
Portland, OR 97212

Gentlemen:

Thank you for sending me a copy of the Draft EIS and Summary for the Nez Perce Tribal Hatchery. The following are my ideas and comments:

05-01 1. Why not use fish from the existing State and Federal hatcheries to try these experiments. This could be done quicker with less cost.

05-02 2. What would this project do to the Dworshak Reservoir? I can see increased drawdowns which will destroy one fish species to help another.

05-03 3. Nets may not target endangered fish but they kill them just as dead. To build new hatcheries before nets are eliminated is a waste of money. I propose that all fish be caught and sorted at the first dam on the Columbia River. Below the first dam only single barbless hook and line could be used.

05-04 4. To build a hatchery at Cherry lane would be a waste of prime farm land. This land grows some of the best sweet corn in the country. If we must build a hatchery build it on reclaimed or waste land.

05-05 5. Can fish get over Selway Falls? I doubt fish can jump that high. I doubt that a fish ladder could be constructed in a Wild and Scenic River. One recent Wilderness bill proposed Meadow Creek drainage be included as wilderness. Doubt that this use is compatible with wilderness.

05-06 6. In todays cost if my math is correct each fish that returned would cost in excess of $1500. I can't afford that. The Northwest can't afford to keep raising power cost so all these fishery biologist can have more toys to play with.

05-07 7. There is no way to know if this hatchery and this method of fish management will work. It is a gamble at best. If the tribe wants to gamble let them use the profits from their own gambling halls and not increase the national debt or raise my electric rates.

05-08 8. Satellites release sites in Grizzly Bear recovery area are a problem. A fed bear is a dead bear. Any Park Ranger will tell you that!

05-09 9. If the existing hatcheries don't work close them down, change the management or let the tribe run them. I agree that the existing hatcheries must be held accountable.

05-10 10. Many people claim that all hatcheries should be closed down. Why are we proposing new hatcheries if this is the case?

05-11 In summary it is my opinion that the proposed Nez Perce Tribal Hatchery is a illconceived proposal that will do nothing to re-establish Chinook runs in the Clearwater drainage and may in fact harm other species as well as waste both taxpayers and ratepayers money. Please cancel this project.

Sincerely

Lynn B. Card

Lynn B. Card

05-01

Using existing facilities is now being considered as an alternative. Please see Section 2.2, Use of Existing Facilities Alternative, for additional information.

05-02

Dworshak is already used to provide water for anadromous fish passage. This project would not change operations at Dworshak Reservoir.

05-03

Comment noted. However, harvest regulations are outside the scope of this EIS.

05-04

Hatcheries require relatively flat sites close to sufficient water in order to operate. The Cherrylane site is a feasible site for a hatchery. It is of sufficient size, it is close to an adequate water supply, and it is available.

The Cherrylane site is developed agricultural land presently used for hay production. After the hay crops have been harvested, the site is used for fall pasture. Sweet corn may still be grown at Cherrylane by the landowner.

05-05

There is already an existing fishway built into the canyon wall at Selway Falls. The fishway improved passage, but salmon have always passed the falls and spawned in the upper Selway.

With respect to releasing spring chinook, Meadow Creek is designated a roadless area, not a wilderness area. With respect to releasing spring chinook, Section 2.1.3.4, Release Techniques, states that Meadow Creek is one of the three creeks that are proposed for spring chinook release sites. The fish would be distributed by helicopter throughout the reaches of accessible spring chinook habitat. According to the Wilderness Act, aircraft can be used to propagate fish if authorized by the wilderness manager of the forest in question. The Tribe would work with the USFS to minimize any impacts from the helicopters to the wilderness resource.

05-06

Comment noted.

05-07

Comment noted.

05-08

Impacts to grizzly bears are discussed in Section 4.7.1.7, Threatened and Endangered Species, and in the Biological Assessment (see Appendix A).

05-09

Comment noted.

05-10

Section 1.1.1.2, Hatchery Fish Production in the Clearwater Subbasin, describes the technological need to increase runs of naturally-reproducing salmon with the aid of hatcheries.

05-11

Comment noted.

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG#: NEZP-02-006
RECEIPT DATE: JUL 24 1996
(Previously OF 271)

U.S. DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION
CONVERSATION RECORD

To: Leslie Kelleher - ECN

Electronic Version Approved by CGIR- 04/29/94

TIME	8:55 a.
DATE (MM/DD/YY)	7/18/96
LOCATION OF VISIT/CONFERENCE	Telephone
NAME OF PERSON(S) CONTACTED OR IN CONTACT WITH YOU	Don Kirby, Lewiston, Idaho
ORGANIZATION/OFFICE	
TELEPHONE NUMBER	(208)-746-9891
TYPE	☐ Visit ☐ Conference ☒ Telephone ☒ Incoming ☐ Outgoing ☐ Other (Specify)

CC: ROUTING

NAME	ORG. CODE	INITIALS
Stockland	EWN	
Bauer	EWN	
Austin	EWN	

SUBJECT
Cherry Lane Facility

SUMMARY
06-01 Mr. Kirby's initial comment was that the Cherry Lane property is zoned A/R in 5 acre parcels not A in 20 acre parcels as portrayed in the DEIS. He had 2 major concerns - 1) He said the Kirbys were led to
06-02 believe that there would be no fish ladder at the Cherry lane facility. The fish were to be reared there, only, & then outplanted. This (the ladder) is unacceptable to the Kirbys.
06-03 2) Would a ladder allow fishing at said ladder by certain groups (Native Americans) and preclude fishing by others? (Answer is yes.) It seems there (over)

ACTION REQUIRED

SIGNATURE	TITLE	DATE (MM/DD/YY)
Jodi Stockland	Fishery Bio.	7/18/96

ACTION TAKEN

SIGNATURE	TITLE	DATE (MM/DD/YY)

06-01

The 12-acre Cherrylane site is located in two zoning districts within Nez Perce County: Agriculture (A) and Agriculture/Residential (A/R); however, 95% of the property, i.e., that which is located in Section 34, T37N, R3W, is zoned A (20-acre minimum). The remainder of the property, located in Section 35, is zoned A/R, five-acre minimum (Ruse, December 1996).

06-02

The proposed project has always included a fish ladder at Cherrylane. However, a lack of detail in preliminary drawings and the fact that all but one of the proposed releases of fish produced at Cherrylane occur at satellites may have caused this misunderstanding.

06-03

Section 2.1.4, Harvest Management, discusses how harvest management would be coordinated with other fisheries agencies in the basin. The intent of increasing runs of salmon is not for the purpose of excluding harvest of steelhead.

06-03 (cont.) is prime fishing (steelhead) at the "Cherry Lane Hole". The hatchery would cause that to be lost to sport fishing individuals.

06-04 He feel the whole project was wonderful but his concern is his neighborhood. He stated that this could cause a divisive and potentially explosive situation with the tribe.

06-05 Although there is income involved, he stated that he would much rather look at a hay field than a hatchery.

06-04

Comment noted.

06-05

BPA will attempt to ensure that the Cherrylane facility is aesthetically pleasing.

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG#: NEZP-02-007
RECEIPT DATE:
AUG 05 1996

AUG - 1 1996

Dan Magers

Post Office Box 427 • New Meadows, ID 83654 • Telephone 208-347-2611 • Fax 208-347-2646

BPA - Public Involvement - CKP
Post Office Box 12999
Portland, Oregon 97212

Re: Nez Perce Tribal Hatchery Program

BPA should probably fund the Nez Perce Tribal Hatchery Program for a variety of reasons.

07-01 First of all, most previous efforts by the political process (BPA) have failed to restore Snake River salmon runs. Second, the tribes have complained for decades about State and Federal handling of rebuilding efforts. Third, new ideas and techniques would be employed in a new facility. For all these reasons, the Nez Perce should have their turn at the plate.

07-02 However, if BPA is going to continue business as usual with its flow regimes and generating priorities a hatchery built on every tributary in Idaho would not restore upper basin salmon runs. Perhaps if some flexibility and "investment in flows" with drawdown were implemented, there would be no need for more glitzy, highly visible, politically correct, production facilities.

I personally would prefer some dull, boring invisible, politically neutral, mainstem velocity to get the zillions of smolt that we are already manufacturing to the ocean.

Sincerely,

Dan Magers

07-01
Comment noted.

07-02
Comment noted. See Section 1.7.

B O N N E V I L L E   P O W E R   A D M I N I S T R A T I O N

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG#: NEZP-02-008
RECEIPT DATE: AUG 15 1996

Nez Perce Tribal Hatchery Program

"I'd Like to Tell You…"

08-01 1. Please be sure your environmental studies include (for example, impacts on water quality) I simply hope that affluents are minimal and that if any it is purified to protect downstream flows of water.

2. My environmental concerns about the Nez Perce Tribal Hatchery Program are

08-02 3. Other alternatives I'd like you to consider — You have a partial solution to predators with the ~~squaw~~ squawfish catch program — any chance "squaw-toxin" could be used too? The pools behind the dams also cause ideal breeding conditions for walleye — I would think anadromous fish runs could be improved by reducing walleye populations as well.

4. I need more information about

08-03 5. I have these other comments I want very much to see the salmon/steelhead runs return and am available should you or the tribe need me.

☒ Please put me on your project mailing list. (You are already on the mail list if you received this in the mail.)

Name Dave Clark
Address 1722 Lambert Dr. #6
Clarkston, WA 99403
Phone 509 751-1266

Please mail your comments by August 16, 1996 to:

Bonneville Power Administration
Public Involvement Office - CKP
P.O. Box 12999
Portland, OR 97212

BONNEVILLE POWER ADMINISTRATION

08-01
Effluent releases would be minimal. See Section 5.12, Discharge Permits under the Clean Water Act, for a discussion of wastes.

08-02
Comment noted.

08-03
Comment noted.

08/16/96 15:13 ☎12084768329 CLEARWATER N F 002/004

United States Department of Agriculture | Forest Service | Clearwater National Forest

File Code: 2610

Date: August 16, 1996

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG#: NEZP-02-009
RECEIPT DATE:
AUG 20 1996

Subject: Nez Perce Tribal Hatchery DEIS - Comments

To: Leslie Kelleher, Bonneville Power Adminlstation

We have reviewed the Draft Environmental Impact Statement for the Nez Perce Tribal Hatchery Program and have the following comments. Reviews were conducted by district (Pierce Ranger District) personnel and various resource specialists and staff in the Supervisor's Office.

09-01 Generally the Bonneville Power Administration, Bureau of Indian Affairs and Nez Perce Tribe should be commended on the excellent work in the preparation of the DEIS. The document showed professional qualities in the format, information presented and the overall readability. The following comments are outlined by Chapter, specific subheadings and page numbers to facilitate your responses in the FEIS.

CHAPTER 2

09-02 Section 2.1.2.4, pages 2-24 to 2-26: A site specific NEPA analysis will still need to be done by the Tribe to secure the special use permit required for construction of the satellite facility. The DEIS is not specific enough about construction or operations at this site to understand the potential impacts or necessary mitigation. Situations like construction within Pacfish RHCA, borrow sources, material sources, erosion control, chemical use, operational details, etc. need to be analyzed in detail for this site. This information can be tiered to this EIS for any site specific decisions needed later for the special use permit.

09-03 The DEIS notes that alternate routes may be required to access the facility when the Forest Service has restricted traffic on road #100 during spring breakup. The logical route includes Forest roads #519, 514, 500, and 520. Use of the alternate route when road #100 is restricted may require sawing out windfalls and snowplowing; both of which would be the responsibility of the tribe and could be authorized under special use permit.

CHAPTER 3

09-04 Section 3.4.2.2, page 3-17: The DEIS notes that streamflows for Camp and Yoosa creeks was estimated using data from Fish Creek and that due to differences in precipitation and and runoff, the actual streamflows could differ significantly from predicted. We recommend that stream discharge data from the Lolo Creek station (@ Section 6 Bridge) be used instead of Fish Creek. The Lolo Creek station has been in operation for a longer time period and would provide a better reference for estimating flows for Yoosa and Camp creeks. The DEIS also states that no more than half the streamflow will be diverted from Camp and Yoosa creeks so as not to adversely impact instream habitat. What are the estimated stream flows for the Camp/Yoosa site? What will happen if streamflows are in fact, considerably less than estimated?

09-05 There is no detailed discussion of the quality of water in Yoosa and Camp creeks vs. the quality of water required in the satellite facility. The only mention seems to be a general statement that "water temperatures at Yoosa/Camp Creek are low due to the elevation and forest cover and are expected

Caring for the Land and Serving People

09-01
Thank you for your comment.

09-02
Comment noted. Chapter 5 addresses consultation and permit requirements. Section 5.5, State, Areawide and Local Plan and Program Consistency, states "The Tribe would work with the USFS while designing and locating the proposed facilities. Special use permits would be obtained, and USFS PACFISH management objectives would be met."

09-03
Comment noted.

09-04
Flows from the Section 6 bridge have been used in this revision.

Table 4-12 shows the estimated flow available from Yoosa/Camp creeks. It is based on the lowest flow measured over 5 years 1990-95 from NPT data.

Should flows fall below this amount, NPTH demands would not exceed 50% of the stream flow. Measures to counter low flows could include adjusting production capacity in the rearing ponds by releasing fish prior to the fall.

09-05
The existing water quality within streams on national forests is sufficient for purposes of NPTH. The watersheds in which activities are proposed are currently managed for their anadromous fish resources by Forest Plan standards and internal direction (e.g., Clearwater National Forest Desired Future Conditions analysis and PACFISH). These standards, guidelines, and directions incorporate thresholds for sediment and water temperatures, along with other habitat components. Additionally, both Forests must meet Idaho Water Quality standards, which have defined water temperatures necessary to protect fisheries.

Short-term high sediment events would be considered in the final design.

09-05 to be ideal for rearing during the operational months of the facility..." Water quality in Yoosa and Camp creeks should not be anticipated to exceed standards established in the Forest Plan or the requirements of the Clean Water Act. If the satellite facility requires water that exceeds these standards, then it is incumbent on the developer to provide design features such as specialized intakes, settling devices, etc. as necessary to obtain it. Will the facility be equipped to obtain water of the necessary quality when suspended sediment levels in Camp and Yoosa creeks experience short term peaks as a result of summer thunderstorms or spring runoff? There is no discussion of this situation in the DEIS.

09-06 Section 3.9, page 3-56: The DEIS noted that "only Nez Perce County has a comprehensive plan and a zoning ordinance". The Forest has a copy of a comprehensive plan for Clearwater County. We suggest the authors obtain a copy from the County.

09-07 Section 3.9.2.4, pages 3-57 to 3-58: A portion of the Yoosa/Camp creek site is indeed in management area M2 as stated in the DEIS. The Forest Plan delineated riparian areas (M2) as 100 feet on either side of the stream. The description within this section needs to cover M2 and E1. The description of the management area in the DEIS is of E1. The M2 management area is associated with riparian areas, wetlands, floodplains, etc. E1 emphasizes optimum sustained production of wood products and is the largest management area on the Forest. Most of the area surrounding area (other than the stringers of M2 along riparian areas) is E1.

09-08 Section 3.11.4.4, pages 3-70 to 3-71: There is no visual quality objective (VQO) from road 103 as it is not a visual travel corridor. The only applicable VQO in the area is from the Nee-Me-Poo National Historic Trail which is correctly stated as modification for areas in the middle ground as viewed from the trail. Modification means that man's activity may dominate the characteristic landscape but should appear as a natural occurence in the foreground and middle ground.

CHAPTER 4

09-09 Section 4.8.1.4, page 4-53: The DEIS states that a complete wetland delineation would be conducted to determine the amount of impacted area and mitigation strategies would be developed to have no net loss of wetland area and minimize impacts on remaining wetlands. How and where would such mitigation be accomplished if, in fact, it is required?

09-10 Section 4.9.1.6, page 4-58: The DEIS states that "any proposed road associated with the timber sale at Camp Creek would need to be constructed so as to avoid siltation of Camp Creek." It is outside the scope of this DEIS to prescribe management of the National Forest. Operations in Camp Creek as well as elsewhere on the Forest will be conducted to meet applicable Forest Plan standards regarding sediment.

As noted above, the reviewers expressed that the DEIS was a very good document. We appreciate the opportunity to comment on the DEIS. If you have any questions, please contact Pat Murphy or Doug Gochnour at the Supervisor's Office.

James L. Caswell

JAMES L. CASWELL
Forest Supervisor

cc: Pat Murphy
Doug Gochnour
Dave Johnson, Nez Perce Tribe

Caring for the Land and Serving People

09-06

The commentor is correct. Clearwater County does have a comprehensive plan and a zoning ordinance and BPA has obtained copies of these documents. BPA appreciates the comment, and has revised the text in the Final EIS.

09-07

The commentor is correct. The Yoosa/Camp Creek site is located in both the M2 and the E1 Management areas, and the description given in the Draft EIS is for the E1, not for the M2 area, as is indicated in the Draft EIS. BPA regrets the error, and has revised the text in the Final EIS.

09-08

The commentor is correct. BPA has corrected the text in the Final EIS.

09-09

The amount of area impacted and mitigation strategies would be determined after final designs are completed. At that time locations for mitigation would be coordinated with the appropriate agencies and land managers.

09-10

Comment noted. The text has been changed in the Final EIS.

06/16/96 15:14 ☎12084768329 CLEARWATER N F 004/004

Ed Larson, Nez Perce Tribe
DG copy to Scott Russell - Nez Perce Forest
DG copy to Rick Edwards - D1
DG copy to Doug Gober - D1
DG copy to Diana Jones - S0
DG copy to Dallas Emch - S0
DG copy to Dick Jones - S0

Caring for the Land and Serving People

Potlatch

Potlatch Corporation

P.O. Box 1016
Lewiston, Idaho 83501-1016
Telephone (208) 799-0123

August 13, 1996

AUG 20 1996

Public Involvement Manager - CKP
Bonneville Power Administration
POBox 12999
Portland OR 97212

Dear Public Involvement Manager,

Thank you for the opportunity to comment on the proposed Nez Perce Tribe (NPT) Hatchery Program and to express our concerns. Potlatch supports the goal of re-establishing naturally spawning salmon in the Clearwater Basin. However, we do have some concerns about the proposal. Our concerns lie in five areas: 1) implications for the management of our Cherrylane Seed Orchard which is adjacent to a proposed hatchery; 2) possible impacts on land management flexibility and costs for our forest lands; 3) the relationship of the proposal to the Snake River adjudication issue; 4) lack of description of release practices and their effects on other fish; and 5) socioeconomic analysis in the DEIS.

10-01 As we have stated earlier, and is acknowledged in the DEIS, we would like some assurance that we could continue to manage our Cherrylane Seed Orchard for seed production. In particular, spraying insecticides and herbicides is a necessary part of managing a successful seed orchard. The DEIS suggests that we consult with the Idaho Division of Environmental Quality to determine how to prevent the pesticides from impacting the hatchery. It goes on to say..."If the chemicals used by Potlatch are found to threaten the survival of hatchery or broodstock, and cessation of the use of these chemicals would prove to be infeasible to the continued operation of seed orchard facility, the proposed hatchery site could be moved an appropriate distance east, to provide a buffer between the hatchery facility and Potlatch...." We already take the recommended precautions to prevent pesticide drift. However, it seems prudent to leave a buffer between our facility and the hatchery to provide additional protection for both of us. We request this be done.

10-02 It is not clear to us how and where our land management might be affected by the proposal. However, it is clear that if the program is successful, salmon will use many streams where they are now absent. We intend to manage our lands so as to protect stream habitats and water quality with or without salmon. However, if special restrictions are imposed because of salmon, we would be concerned. In particular, if "PACFISH" type buffer strips and management were required at a future point in time, we would be adamantly opposed. We would like to work cooperatively with the NPT to design management practices which protect stream habitats and water quality at minimum cost and impact on our forestry operations.

10-01

Comment noted. The exact location for a facility at Cherrylane would be determined after the Record of Decision.

10-02

PACFISH buffer strips are already required on National Forest lands (see Section 1.6.9). The proposed spring chinook outplant sites and satellites for NPTH are on National Forest lands. Fall chinook would be released into the mainstem Clearwater River and ESA regulations, in regards to critical habitat, already apply to the lower Clearwater.

Public Involvement Manager - CKP
August 13, 1996
Page 2

10-03 We are currently involved in attempting to maintain the viability of our operations in the Clearwater Basin which are threatened by the instream claims of the NPT and the government. This proposal should explicitly address instream flow claims and the water diversions necessary for the hatcheries. The current NPT instream flow claims exceed the natural flow of the rivers on the average eight out of ten years. Would the hatcheries be closed when instream flows are not being met? It seems ironic that a proposal to withdraw water from the Clearwater River is being made by the same parties who seemingly are trying to prevent anyone else from doing the same thing.

10-04 The NPT presently operates a hatchery owned by the State of Idaho. Within the past two years, this hatchery has been used to raise coho salmon that were subsequently released in the Potlatch River basin on Potlatch Corporation lands. This was done in spite of the fact that best available knowledge indicates that coho were never present in this river system. Furthermore, this system currently supports a small wild steelhead run -- and this fish is currently under ISA review. The indiscriminate growth and release of fish is a major concern to Potlatch. Given the NPT demonstrated record of freely distributing fishes, and the unwillingness of regulatory agencies to challenge the NPT on these actions, the EIS is incomplete in failing to address the effects or large releases of exotic fishes on stream ecosystems.

10-05 Finally, the socioeconomic analysis in the DEIS is severely lacking. It fails to include impacts associated with management restrictions on landowners and water users in anticipation of and following re-establishment of salmon runs. The EIS should either impact these employment and other social costs and dollar impacts, or should state that no actions or proposals will be forthcoming which would have negative impacts. The latter seems unlikely, particularly in view of the drastic impacts associated with instream flow claims which are essentially claimed to be necessary for the objectives of this proposed project to be accomplished.

If you have any questions, please call Larry Streeby at (208) 799-1121.

Sincerely,

David T. Pritchard

David T. Pritchard, Jr.
Resource Manager

DTP/jk

xc:
Rick Kelly
Kevin Boling
Larry Streeby

10-03

The Snake River Basin adjudication process and instream flow claims made as a result are outside the scope of this proposal. With regard to water withdrawal for NPTH, it would be non-consumptive and returned to the river or streams near the site of removal. Additional groundwater pumped by the hatchery would also be returned to the river which would add to river surface flow. The percentage of total river and stream flow used by the NPTH and groundwater used is displayed in Table 4-2.

10-04

The best knowledge available to NPT biologists indicates that salmon were present in the Potlatch River. Whether they were coho is unknown, but oral descriptions indicate the size and color to be consistent with coho.

A Biological Assessment addressing the effects on listed stocks of salmon was submitted to NMFS prior to the coho outplant in 1995. NMFS concurred with the finding that the actions were not likely to adversely affect any listed or proposed for listing anadromous stocks. At the time, steelhead were not proposed for listing. In 1996, coho were again outplanted in Potlatch River by the NPT and a Biological Assessment was again submitted to NMFS. NMFS again concurred with BIA findings that the outplant was not likely to adversely affect listed or proposed for listing stocks which now included Snake River steelhead.

The NPT, as co-manager of fisheries resources and as a regulatory agency, coordinates with other regulatory agencies on the coho outplant as well as other fisheries issues. The effects of NPTH releases on stream ecosystems are described in Chapter 4, Environmental Consequences.

10-05

Section 4.4.1.1, Groundwater, states that the main impacts to groundwater would occur at the two hatchery sites and at the North Lapwai Valley and Luke's Gulch satellite sites. All discharges would meet federal and state water quality standards and guidelines, and would satisfy all permit requirements. Hatchery effluents would be routinely monitored to assure compliance with water quality standards. The overall impacts to groundwater would be low and no mitigation is required.

With respect to impacts to surface water, the EIS states that a number of stream channels would be altered by channel excavation and rip rap used for intake structures, fish ladders and equipment used to anchor fish weirs. The EIS recommends that all facility sites be gauged for flow and temperature to determine the amount of changes caused at the sites. Should they be determined to have adverse impacts, an adjustment to facility operations would be made.

Section 5.14, Permits from the State, states that a stream channel alteration permit would be required for all instream construction. This includes intake and outlet pipes placed within stream channels. EPA would coordinate with IDFG, the State Department of Water Resources, and the Corps to determine what permit (Corps and Water Resources joint permit) forms would be required.

With respect to underground injection permits, the proposed project would be designed to comply with local laws and ordinances and state water programs so as to not degrade the quality of aquifers or jeopardize their use as a drinking water source. It can be stated, therefore, that no actions or proposals would have negative impacts on water users permittees as long as these users do not negatively impact the hatchery facility or the hatchery operations.

With regard to management restrictions on landowners and water users in anticipation of and following the re-establishment of the fish runs, Section 1502.22 of the CEQ Regulations states, with regard to incomplete or unavailable information, "When an agency is evaluating reasonable foreseeable significant adverse affects on the human environment in an environmental impact statement, and there is incomplete or unavailable information, the agency shall always make clear that such information is lacking." The information requested by the commentor is not available.

DEPARTMENT OF THE ARMY
WALLA WALLA DISTRICT, CORPS OF ENGINEERS
201 NORTH THIRD AVENUE
WALLA WALLA, WASHINGTON 99362-1876
August 16, 1996

Reply To Attention Of:

AUG 20 1996

Planning Division

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG#: NEZP-02-011
RECEIPT DATE:
AUG 21 1996

Bonneville Power Administration
Public Involvement Office - CKP
P.O. Box 12999
Portland, Oregon 97212

Dear Sir:

We have reviewed the Nez Perce Tribal Hatchery Program Draft Environmental Impact Statement (EIS) and offer the following comments:

11-01 1. Abstract, 2nd paragraph - Since Snake River spring/summer and fall chinook are the only stocks involved that would be subject to genetic risk, and these stocks are listed as threatened, the reference to endangered species should probably be removed.

11-02 2. Page 1-1, Section 1.1 - Need for Action - This section should mention that Snake River salmon populations have declined to the point that they have been listed under the Endangered Species Act.

11-03 3. Page 1-1, Sidebar - This is not the standard definition of wild salmonids. Wild salmonids are produced by wild parents; progeny of hatchery parents that spawn in the wild are usually referred to as natural.

11-04 4. Page 1-12, Sidebar - The National Marine Fisheries Service term is Evoluntionarily significant unit, not Evolutionary.

11-05 5. Page 1-15, Section 1.6.4 Lower Snake River Fish and Wildlife Compensation Plan (Additional Mitigation of Upstream Spawning) - Please identify the Lower Snake Compensation Plan (Comp Plan) as a Corps of Engineers program and that the Corps was directed to work with the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, and state and tribal hatchery managers to develop additional fall chinook facilities. Please correct the last statement of the first paragraph to indicate that acclimation facilities (not necessarily "temporary" facilities) are being considered on the Snake and Clearwater Rivers only. The Corps recently distributed a draft Environmental Assessment describing the impacts of developing two fall chinook acclimation facilities: one on the Clearwater River at the confluence with Big Canyon Creek in 1997, and one on the Snake River at one of two sites about 20 miles south of Clarkston, Washington, in 1998.

11-01
Comment noted.

11-02
Comment noted.

11-03
The definition has been clarified in the document.

11-04
Comment noted. The text has been corrected.

11-05
The text has been changed.

-2-

11-06 6. Page 1-16, Section 1.6.4, top paragraph - The facility set up by the Corps at Pittsburg Landing was an acclimation facility, not a rearing facility as the fish were there only long enough to acclimate to river conditions and to imprint on the site location. (Also, please correct the spelling of "Pittsburg" Landing.)

11-07 7. Page 1-16, Section 1.6.4, second paragraph - Only one acclimation facility is being considered for the Clearwater River under the Comp Plan - Big Canyon Creek. This facility is to be operational in early spring 1997. However, on several occasions tribal fish hatchery biologists have indicated that once the Nez Perce Tribal Hatchery is constructed at Cherrylane, fall chinook acclimation activities will be transferred from the temporary facilities at Big Canyon to the Cherrylane tribal hatchery and the equipment from the Big Canyon site will be available for use elsewhere.

11-08 8. Page 2-5, Section 2.1, Proposed Action, 4th bullet item - Please define "natural living fish".

11-09 9. Page 2-7, Section 2.1.1.1 Cherrylane, 1st paragraph - Instead of "fall chinook eggs would be spawned" shouldn't the sentence read "fall chinook would be spawned"?

11-10 10. Page 2-7, Section 2.1.1.1 Cherrylane, 2nd and 3rd paragraphs - This section should include a discussion of how the Comp Plan fall chinook acclimation activities will be incorporated into the Cherrylane hatchery operation (see comment 4). This section should also discuss which age class of fall chinook, yearling or subyearling, will be released. Currently, yearling fall chinook are being acclimated at the Comp Plan facilities because the agencies involved, including the tribe, have agreed that yearlings have better survival and therefore are the preferred age class to release.

11-11 11. Page 2-7, Section 2.1.1.1 Cherrylane, 3rd paragraph - This paragraph states that the fall chinook will be released as subyearlings. Based on the current agreement for the Comp Plan that yearlings need to be released now because of their higher survival, will yearling fall chinook be released initially under the tribal hatchery program?

11-12 12. Page 2-8 - The label for Highway 12 needs to be reversed.

11-13 13. Page 2-9, Page 2-7, Section 2.1.1.1 Cherrylane, first full paragraph - This reads as if all adult fall chinook returning to the Clearwater River would be held at Cherrylane. Won't some of those fish be allowed to spawn naturally? How does the tribe intend to capture all the returning adults? How would wild fall chinook salmon entering the hatchery be distinguished and handled? Of the 1,020 adults needed for maximum egg take, how many would be male and how many would be female?

11-06
The text has been changed.

11-07
The text has been changed.

11-08
The text has been changed.

11-09
Comment noted. The text has been changed.

11-10
Section 1.6.4, Lower Snake River Fish and Wildlife Compensation Plan (Additional Mitigation of Upstream Spawning), addresses this issue. Section 2.1, Proposed Action, states that subyearling smolts are the proposed age class for fall chinook released by NPTH.

11-11
Section 2.1, Proposed Action, states that subyearling smolts are the proposed age class for fall chinook released by NPTH.

11-12
Comment noted. The figure has been corrected.

11-13
Section 2.1.3.7, Broodstock Source and Management, states that a portion of the hatchery-derived and wild fall chinook returns would be captured for broodstock, and others would be allowed to spawn.

Capture methods are discussed in the revised Section 2.1.3.6 on Adult Collection.

Fish would be marked to distinguish hatchery origin.

A 50:50 male to female sex ratio was used in model predictions.

-3-

11-14 14. Page 2-32, Section 2.1.3.3 Rearing Techniques - The beginning of Chapter 2 states that the tribal hatchery is "to assist the recovery of Clearwater chinook populations to sustainable levels". The information in section 2.1.3.3 does not seem to support this. This section states that the growth of fall chinook will be accelerated so the subyearlings will mature earlier and can emigrate earlier. However, if the returning adults are allowed to spawn naturally, their progeny in the lower Clearwater River would not experience accelerated growth and would emigrate during the later period when their survival would be lower. Based on studies conducted by the U.S. Fish and Wildlife Service, it appears that survival of the naturally produced juveniles would not be high enough to sustain the population without continued artificial propagation, therefore this hatchery program would not accomplish its stated purpose of assisting with salmon recovery.

11-15 15. Page 2-39, Section 2.1.3.6 Broodstock Source and Management - How will the tribe determine if the wild stock declines to 12 pairs - through redd counts? Are all hatchery fish to be marked?

11-16 16. Page 2-41, Section 2.1.5 Monitoring and Evaluation Plan, 2nd paragraph - Success of the summer and fall chinook program cannot be readily determined. There are too many factors not under control of the hatchery program that affect salmon survival. If ocean conditions or migration conditions, for example, are more favorable one year, there may be more adults returning, but it doesn't mean the hatchery program was the reason the adults returned.

11-17 17. Page 2-43, Section 2.3.2 Use of Existing Production Hatcheries - It's not exactly correct to say the Comp Plan hatcheries have not met their goals. The hatcheries were built to accommodate the production figures stated in the 1975 Comp Plan Special Report. However, since the hatcheries have been turned over to U.S. Fish and Wildlife Service for operation, the hatcheries have not necessarily been operated to produce the numbers of fish listed in the 1975 Special Report.

11-18 18. Page 2-44, Section 2.3.3 Natural Habitat Enhancement and Restoration - The statement "Without supplementation, seeding levels may never reach a point at which natural populations could be self sustaining." is not necessarily true for fall chinook in the Clearwater River. Unless natural habitat conditions (i.e. water temperature) improve, it appears unlikely that fall chinook populations will be self-sustaining (see comment 11). This statement in the EIS also implies that supplementation will succeed. Supplementation is an unproven technique and cannot be assumed to be successful at this time.

11-14

True, survival would be lower. However, increasing opportunities to survive and return adults can be enhanced by a hatchery program. When adults return and spawn, their progeny would not have that benefit. An improvement in passage conditions is needed for these fish to accrue the same benefit.

Table 3-3 shows that 23% of the fall chinook spawning upstream of Lower Granite has occurred in the Clearwater; this is without direct artificial propagation efforts. Although juvenile fall chinook produced naturally in the Clearwater do face difficult conditions migrating through the series of mainstem reservoirs because of their late emergence timing, adults are consistently returning to the Clearwater to spawn. An increase in the spawning run and juvenile production of Snake River fall chinook salmon in the Clearwater River Subbasin would most certainly assist in salmon recovery.

11-15

Run forecasting in conjunction with baseline data on return rates to each stream would be used to predict if the runs are likely to drop below 12 pairs. Hatchery fish would be marked.

11-16

True. The M&E Plan discusses this in more detail.

11-17

The LSRCP hatcheries have not met their goal for chinook salmon. This is discussed in Section 1.1.1.2, Hatchery Fish Production in the Clearwater River Subbasin, and in Section 2.2, Use of Existing Facilities Alternative.

11-18

See response to 11-14, second paragraph.

11-19

Comment noted.

-4-

11-19 19. Page 3-1, Section 3.1.1, Background - Much of this section does not appear to be relevant to this hatchery program. As presented, much of this information such as the descriptions of Indian wars or tribal government structure does not have any bearing on the environmental impacts of the proposed project.

11-20 20. Page 3-20, Section 3.6 Fish - There does not appear to be a subsection describing threatened and endangered fish species. This should be added as Section 5.2.1 states that there are listed species of salmon in the project area.

11-21 21. Page 3-22, Table 3-2 - If the presence of native summer chinook and coho in the Clearwater drainage is unknown, how can they be considered to be extinct now?

11-22 22. Page 3-24, Section 3.6.1.1 Causes of Change in the Fish Community, 2nd paragraph - This paragraph reads as if the Snake and Columbia River dams are THE main reason for the decline of salmon numbers. While the dams have certainly played a part in the decline of Columbia basin salmon, they are not the only reason and are arguably not the main reason. Overharvest had caused declines in salmon numbers before the first hydroelectric dams were constructed. This paragraph should be rewritten to reflect that many factors (dams, harvest, habitat destruction, ocean conditions, etc.) have contributed to salmon decline.

11-23 23. Page 3-29, Section 3.6.2.1 Chinook Salmon, 2nd paragraph - Please correct the temperatures. It does appear that 14 degrees C can be equivalent to 37 degrees F.

11-24 24. Page 4-4, Section 4.1.2.2 Tribal Employment - The effects of the No Action Alternative on tribal employment would be "no increase" because no additional employees would be hired. There would also be a return to employment levels that existed prior to initiation of the hatchery program and EIS.

11-25 25. Page 4-34, Section 4.6.1.2 Impacts, 4th paragraph - Cumulative impacts could include an increase in salmon populations, but not necessarily naturally spawning populations. See comment 11.

11-26 26. Page 4-36, Section 4.6.1.2 Impacts, last paragraph - See comment 1.

11-27 27. Page 4-41, Section 4.6.1.2 Impacts, 1st paragraph - The text description of potential impact of mid-Columbia summer chinook on listed Snake River fall chinook is probably understated, although the "moderate" categorization is probably accurate.

11-28 28. Page 4-44, Section 4.6.1.2 Impacts, last paragraph - Change the status of fall chinook to threatened rather than endangered.

11-20

Effects on threatened and endangered species are specifically addressed in the Biological Assessments, Appendices A and B.

11-21

Presence of fish in the Clearwater River prior to the building of Lewiston Dam has been inferred from interviews with people present before then.

11-22

The text has been changed.

11-23

Comment noted. The text has been corrected.

11-24

Comment noted. The effects of the No Action Alternative would be no increase in employment prior to the initiation of the hatchery program. BPA contracted with the NPT to gather data to develop the EIS for this proposed project. Whether Tribal employment levels would return to the levels of employment that existed prior to the initiation of the hatchery program if the No Action Alternative were selected would depend on other factors unrelated to this EIS.

11-25

See response to 11-14.

11-26

Summer chinook production has been dropped from consideration.

11-27

Summer chinook production has been dropped from consideration.

11-28

Comment noted. The text has been corrected.

-5-

11-29 29. Page 4-44, Section 4.6.1.2 Impacts, last paragraph - The hatchery program would not necessarily increase threatened fall chinook populations. Fall chinook from Lyons Ferry are part of the ESU, but are not considered to be part of the listed Snake River stock. If the fall chinook released in the hatchery program were to spawn naturally, their progeny would be considered part of the listed stock even though they would not be considered to be wild fish. If these progeny were then able to return and spawn naturally themselves, this project could be considered to be increasing the population of the endangered fall chinook. However, as stated in our comment 11, it seems unlikely that a naturally spawning population would be self-sustaining given the habitat conditions. What this project would probably do is increase the number of adults returning over Lower Granite Dam as long as the hatchery continues to release juveniles.

Thank you for the opportunity to comment on this project. If you have any questions, please contact Ms. Sandy Simmons at 509-527-7265.

Sincerely,

Sandra L. Simmons

for Carl Christianson
Chief, Environmental Resources Branch

11-29
See response to 11-14.

IDAHO FISH & GAME
600 South Walnut / Box 25
Boise, Idaho 83707-0025

August 16, 1996

Phil Batt / Governor
Jerry M. Conley / Director

AUG 20 1996

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG#: NEZP-02-012
RECEIPT DATE:
AUG 21 1996

Bonneville Power Administration
Public Involvement Office - CKP
P.O. Box 12999
Portland, OR 97212

Dear Bonneville Power Administration:

Enclosed are the Idaho Department of Fish and Game's (IDFG) technical comments to the Nez Perce Tribal Hatchery Program Draft Environmental Impact Statement (DEIS). There are two sets of comments, one general and one specific to the "Summary."

12-01 In 1989, the Idaho Fish and Game Commission agreed in concept with the Nez Perce Tribal proposal to develop satellite facilities pursuant to development of specific management plans that addressed production and harvest of natural and hatchery stocks of salmon. The DEIS is a good conduit for bringing many of the planning issues to the forefront. We offer our comments in the spirit of identifying our concerns so that we can jointly work with the Nez Perce Tribe to address them and move forward in our common effort to restore Snake River spring, summer, and fall chinook to viable and sustainable levels.

Sincerely,

Ed Bowles

for Steven M. Huffaker, Chief
Bureau of Fisheries

Enclosure

c: Larson, NPT
Cochnauer, IDFG
Hassemer, IDFG

Keeping Idaho's Wildlife Heritage
An Equal Opportunity Employer

12-01

Thank you for your comment.

Idaho Department of Fish and Game General Comments to Nez Perce Tribal Hatchery Program Draft Environmental Impact Statement, August 1996

Idaho Department of Fish and Game's (IDFG) major issues of concern are 1) Broodstock (selection, coordination, and collection, including stock transfer); 2) Disease management; 3) Harvest management; and 4) Production coordination. These elements of concern are reflected in our general comments regarding the Draft Environmental Impact Statement (DEIS) for the Nez Perce Tribal Hatchery (NPTH) proposal. We anticipate further discussion with the Nez Perce Tribe through the DEIS and other forums to fully address these issues.

12-02

- The general tone of the DEIS is that the proposal represents all new technology that will miraculously work. The strategy of a central incubation with acclimation facilities is similar to Clearwater Hatchery, on-line since the early 1990s.

Experiments using natural rearing techniques have already been implemented in some Idaho programs - but qualified successes remain elusive. All of the "proposed actions" on page S-11 have been conducted in the Clearwater Basin, but on more limited scale than the NPTH proposal. The Nez Perce Tribe's incorporation of "natural rearing" strategies into their production proposal is commendable. Their proposal incorporates many techniques proposed in the literature to try to make hatchery fish more adept in the natural environment. Unfortunately, the DEIS misleads the reader to believe that the hatchery proposal will "fix" the problem of declining natural runs. Considerable survival benefits appear to be applied to the proposed strategies. Our experience to date has not supported conclusions about expected survival benefits from subsmolt (or smolt) releases, even with improvement in rearing techniques. The DEIS would be improved by scientific references supporting the survival assumptions as an effect of the proposed innovative techniques.

We suggest an analysis of the smolt-to-adult return (SAR) for Broodyear (BY) 1995 jacks to serve as an indication of a likely SAR under current (at least through 1999) mainstem conditions. It may be more prudent to phase in the NPTH program, utilize flexibility with other programs, and emphasize fixing limiting factors such as mainstem passage problems as a precursor or complementary to full implementation of NPTH.

12-03

- Reaching program goals within 20 years should be couched in terms of the assumptions used and not stated as fact. If NPTH is truly a supplementation program, then presumably, self-sustaining

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12-02

The purpose of the EIS is to explain the environmental effects. The assumptions are stated in the document.

The success of the NPTH, other upriver hatchery or natural runs of salmon, whether the salmon are listed or not, ultimately depends on the salmon recovery efforts (including the Snake River Recovery Plan, the Tribal Restoration Plan and the Fish and Wildlife Program of the Northwest Power Planning Council). The NPTH was designed assuming the regional salmon recovery efforts would be successful, and that actions taken by NPTH to jump start populations in underseeded habitat would be simultaneously aided by coordinated efforts down river to improve passage conditions.

The survival rates calculated for various stages of development are explained in greater detail in the new Section 2.1.3.5, Adult Returns. BPA believes they are accurate, defensible predictors for survival.

Scientific references supporting the survival assumptions as an effect of the proposed innovative techniques have been included in Section 2.1.3.3, Rearing Techniques.

The model used to predict returns in Table 2-2 assumes the salmon recovery efforts have worked and that smolt-to-adult survival rate is double what it is currently (0.4% vs. 0.2%) such that a replacement rate of 1:1 is achieved.

12-03

NPTH relies on the assumption that salmon recovery efforts will work. The time period of 20 years was used to show how NPTH would work toward meeting the purpose and need.

If the proposed project is successful, production may expand to other drainages. Expansion would be evaluated in further environmental documents as necessary.

12-03 (cont.)

fish populations would render NPTH irrelevant if goals are reached. Perhaps this should be addressed in the DEIS.

12-04

■ There is question regarding the necessity of an additional central incubation facility for spring chinook production. There may be flexibility within the current hatcheries in the Clearwater Basin to act as central incubation facilities if the necessary satellite facilities to rear presmolts were developed. Submolt capacities of existing stations should be displayed as part of an alternative to meet NPTH production plans. State and federal management agencies have worked with the Nez Perce Tribe to incorporate their direction for offsite spring chinook releases in the Clearwater Basin, when Snake River Basin broodstock has been available. For the period 1990-96, a total of 3.17 million spring chinook smolts were released in the Clearwater drainage to augment areas with natural production components, a goal of NPTH. From 1989-95, another 3.32 million fingerlings or presmolts were also released. Availability of appropriate broodstock, as agreed to previously (Whitman, 1989) and in the DEIS, and acclimation facilities has been primary limitations to the NPTH spring chinook proposals. The broodstock limitation will not change just because NPTH comes on line because it is initially dependent on broodstock from sources other than its treatment tributaries.

12-05

■ The DEIS should examine the effects to the current steelhead fishery in the Clearwater River if a substantial number of fall chinook stack up returning to Cherry Lane. We have considerable concern that the steelhead fishery and fall chinook program may conflict. Tribal efforts to capitalize collection of fall chinook, for either harvest or broodstock collection purposes, may negatively affect the sport fishery and the migration of both wild and hatchery steelhead. This aspect of the proposed fall chinook program has not been evaluated in the document and should be, given the economics of the steelhead fishery, the ratepayer expenditures, and the federal responsibility in the steelhead mitigation program. There should be a more concerted effort to strategically plan with affected fish managers to ensure fall chinook and steelhead programs do not conflict in either production or harvest actions.

12-06

■ We do not agree that summer chinook derived from Mid-Columbia tributary stocks is an appropriate stock to use for NPTH in the Clearwater Basin. Empirical evidence of existing stocks from around the Snake Basin suggest a yearling summer chinook may be just as likely an appropriate stock. There are known summer chinook mainstem spawners in the Salmon River, and spring chinook stocks in the general vicinity of the Selway and South Fork Clearwater exhibit a yearling life cycle.

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12-04

NPTH is designed to rear fish using innovative rearing techniques not commonly employed at existing Clearwater River Basin hatcheries. In Idaho, supplementation efforts to date have simply been outplants of surplus fry reared in a conventional hatchery setting. NPTH would use rearing strategies which attempt to better adapt fish to the natural environment and increase post release survival while offering the greater egg-to-fry survival benefits occurring in hatcheries. The novel rearing approaches would occur at the central incubation and rearing facilities as well as in the satellite locations, and encompass their life stages from incubation, to swim-up fry, to acclimated rearing at the satellites. Existing hatcheries would have to be modified to accommodate such rearing techniques in addition to employing practices which have proven beneficial for their typical smolt production capabilities. However, the use of existing facilities is now discussed as an alternative.

Difficulties in acquiring broodstock have always been problematic in the Snake River Basin. It is unlikely that a surplus of eggs were offered to any management agency to initiate a program. The eggs come from foregone harvest opportunities, from a decrease in production at a donor facility, or from capturing fish returning to their natal streams. NPTH is no different in this regard.

12-05

Steelhead and fall chinook would occupy the mainstem Clearwater for the same period of time in the fall. Harvest management strategies and broodstock collection would require that fishermen and hatchery managers are able to distinguish between different species of fish. Similar type regulations and activities exist elsewhere in the Columbia River Basin where multiple species and stocks return to the same river system. The NPT would coordinate harvest management with other fisheries agencies in the basin.

12-06

Summer chinook production has been dropped from consideration.

12-06 (cont.) The statement on page 3-28 of the DEIS that ocean-type (subyearling) summer chinook are best matched to the temperature regimes in the mainstem Clearwater River appears to be in direct conflict with statements on page S-18 that accelerated growth in the hatchery is necessary to improve environmental conditions and survival for subyearlings. We have considerable concerns about straying and interaction with other spring chinook stocks, both natural and hatchery, returning to the Selway and South Fork. Our concerns were not allayed by the cursory impact scoring of interactions, which was vague and made broad assumptions about straying and spawning sites. We suggest more detail regarding risk assessment and description of risk containment should be features of the DEIS.

12-07 ■ If subyearling fish adopt more of a stream-type life history (page 3-30), we question the utility of introducing an ocean type summer chinook (subyearling) rather than a stream-type summer chinook (yearling).

12-08 ■ Snake River steelhead were proposed for listing; a final determination is expected within one year. We ask that particular attention be paid to wild B-run steelhead streams (Selway and Lochsa) in terms of interactions with chinook or other species released from NPTH.

12-09 ■ We agree with the emphasis on utilizing estimated carrying capacity to direct release numbers (p. 2-5). However, at the time of the Subbasin Planning effort, there was not much information about subyearling carrying capacity in large rivers for fall or summer chinook and biologists expressed uncertainty regarding the density parameters used to estimate carrying capacity. New information may exist. It would be appropriate to review the literature to determine if the density factors utilized were appropriate.

12-10 ■ We are pleased that the proposal includes marking all fish released for evaluation and identification purposes (p. 2-5). We support this effort, which we view as necessary both for the sake of NPTH and other production programs in the basin. Consistent with other Snake River production programs, we recommend that a visual mark be placed on all released fish. We are currently investigating elastomer marking as possibly a more benign, and more flexible, visible mark than a fin clip.

12-11 ■ The Sweetwater Hatchery facility is owned by IDFG. A considerable increase in existing water rights would be necessary to operate the facility as proposed. IDFG has offered the Nez

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12-07

Summer chinook production has been dropped from consideration.

12-08

Interactions with other fish are described in Section 4.6, Fish.

12-09

Parr density factors were not used for summer and fall chinook.

12-10

Thank you for your comment.

12-11

Negotiations are currently ongoing with the Nez Perce Tribe and the State of Idaho for the ownership of Sweetwater Springs.

12-12

The use of cross breeding wild and hatchery origin fish is an attempt to counterbalance the genetic risk of: 1) losing genetic identity (adaptive fitness) through out-breeding in the natural population; 2) losing genetic diversity through inbreeding in the natural population; and 3) losing genetic diversity and identity in the hatchery population through domestication. This is described in Appendix C.

Survival of progeny in the wild may be decreased, while survival of progency offered the advantage of early rearing would be enhanced. However, it is expected that overall improvement in migratory conditions as a result of the salmon recovery efforts will increase returns. BPA believes that the difference in survival of progeny of cross bred and wild spawning adults would be offset by a larger, overall spawning population. An increase in population size would be enhanced by supplementation strategies that would not occur in the case of non-supplemented streams. Monitoring and evaluation results would determine

12-11 (cont.) Perce Tribe use of Sweetwater Springs pursuant to an operating agreement until final decisions are made about ownership, which should allow elements of NPTH to move forward. This negotiation is currently in progress.

12-12

- The logic employed in Appendix A is cryptic. For example, page 71 states: "a higher percentage of naturally produced spawners are needed among spawning in the hatchery than in the wild". The converse is that emphasis is placed on more hatchery spawners in the natural environment than natural spawners. Existing literature demonstrates that natural origin fish are generally less productive in the hatchery and hatchery origin fish less productive in the natural environment. Thus, the hatchery fish, less fit or productive in the natural environment, swamp the natural fish and any inherent natural productivity benefit may be lost. The strategy seems to emphasize putting less successful fish into the environment. If productivity and production is quickly diminished due to the "steep natural selection gradient" (p. 72) of hatchery fish, then focusing on a spawning criteria that emphasizes large numbers of hatchery fish spawning, (but less production results) is not beneficial.

12-13

- Per the enclosed letters between IDFG and the Nez Perce Tribe, it is clear that ocean type summer and fall chinook have not been jointly planned and assessed between state and tribal managers, compared to spring chinook production proposals. The DEIS represents the first step, but as pointed out in previous comments, we have concerns about interactions and conflicts with existing programs. NPTH production activities, particularly for fall and summer chinook, may complement or conflict with other salmon and steelhead programs, or other ongoing activities. NPTH is essentially introducing new chinook stocks into Lapwai Creek, the Selway River, and the South Fork Clearwater River. Such efforts must demonstrate that they do not compromise native stocks of fish. The subyearling programs have not been jointly shaped and coordinated in a long-term strategic planning context. In agreement with the Nez Perce Tribe on the issue of strategic planning for state-operated hatcheries, the IDFG Commission has directed staff to work with the tribal and federal managers to develop an annual operating plan (AOP) for Clearwater Hatchery. This initial effort will be useful for identifying production actions to complement both state and tribal proposals.

12-14

- The hatchery production goals for NPTH are clearly stated. Because NPTH is a supplementation program, the natural spawning goals for treatment and control streams, not just the number of fish left over for natural spawning (Table 2-2), should also be addressed.

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this.

12-13

IDFG has been aware since at least 1990 that NPT desired to enhance a fall chinook run in the Clearwater Basin using NPTH. The subbasin plan (NPT and IDFG, 1990) states that "IDFG does not support any enhancement (of fall chinook) until downriver harvest issues are resolved." IDFG has been party to negotiations which would make space available at existing hatcheries to produce NPTH fish (Wagner, 1990). Planned production included fall and summer chinook salmon, and IDFG decided not to use available space for NPTH production. The NPTH Master Plan was released in 1992 and also discussed summer and fall chinook propagation, and IDFG was fully apprised of that plan in formal presentations to the Fish and Game Commission. Additionally, IDFG has participated in the interagency planning meetings for development of the Draft EIS and reviewed the preliminary Draft EIS. It is apparent that IDFG has been informed, but has chosen not to be a participant in jointly planning fall chinook production by NPTH.

Summer chinook production has been dropped from consideration.

The NPT will continue to coordinate with IDFG on operation of hatchery facilities in the basin.

12-14

This has been revised, see Table 3-8.

12-15 ■ The effect of 2.5 million fall chinook and 800,000 summer chinook subyearling releases in June should be addressed in terms of mainstem corridor impacts scoring for the Selway, South Fork and Clearwater rivers. Although effect may be low, due to smaller size of these fish and their migratory behavior, it should be considered. Subsmolt to smolt losses will reduce the number of spring chinook yearling migrants from NPTH considerably, which should minimize corridor effects more than the subyearling migrants.

References:

Carlson, K.E., Chairman, Idaho Fish and Game Commission. [Letter to Mr. A. Pinkham, Nez Perce Tribe]. 1989 December 7.

Huffaker, S.M., Chief, Bureau of Fisheries, Idaho Department of Fish and Game. [Letter to Mr. S. Whitman, Nez Perce Tribe]. 1989 September 8.

Whitman, S., Fisheries Program Manager, Nez Perce Tribe. [Letter to Mr. S. Huffaker, Idaho Department of Fish and Game]. 1989 August 24.

12-15

Section 4.6.1.3, Impacts, discusses competition from fall chinook releases.

Idaho Department of Fish and Game Comments to Nez Perce Tribal Hatchery Program Draft **Summary**, Environmental Impact Statement, August, 1996

12-16

Page S-1: The Summary defines wild salmon as the progeny of naturally-reproducing salmon, regardless of parentage. This contrasts with Idaho Department of Fish and Game management definition (Idaho Department of Fish and Game 1992) which applies wild terminology to native fish without hatchery influence. There should be some distinction between fish with and without recent hatchery influence to fully define the salmon resource.

12-17

Page S-3: In section 1.1.2, little attention is paid to the reason why runs declined after stocking ceased. Idaho Department of Fish and Game (IDFG) analyses demonstrate that runs declined because the primary limiting factor(s) were not addressed with the hatchery effort. The argument has little to do with hatchery methodology, whether it was traditional or supplementation. There exists a need to increase runs of naturally-reproducing salmon by fixing the limiting factor. It is debatable, and unlikely, that hatcheries alone will provide the fix. Thus, it should be clear that this hatchery proposal will likely play a similar role to other salmon hatcheries in the Snake Basin - They may help sustain runs until the limiting factor(s) is fixed. In years when limiting factor(s) are ameliorated, they can help increase natural production, but not natural productivity. However, when significant limiting factor(s) exist, hatcheries will ultimately provide little to no benefit to natural production. This aspect has been documented in the Snake Basin for both traditional and supplementation hatchery programs.

12-18

Page S-5: It should be noted that the summer chinook currently inhabiting the Snake River ecosystem have a yearling life cycle, similar to spring chinook. Several populations are found in the Salmon River drainage; they are also believed present in the Imnaha River drainage. The tribal definition of summer chinook should clarify that this fish has a subyearling life history, not currently found in tributaries of the Snake River drainage other than for fall chinook in the lower, large mainstems of the Clearwater, Imnaha, Grande Ronde, and Salmon rivers.

12-19

Page S-15: Local broodstock options for Boulder and Warm Springs creeks on the Lochsa River should be considered as an alternative to transplanting returns from Meadow Creek on the Selway. This would provide flexibility dependent upon success of hatchery releases and natural fish survival.

12-20

Page S-15: It is not apparent how fall chinook will negotiate upstream migration unless Lapwai Creek gets a significant increase in flow during the fall. There did not appear to be any

12-16

Thank you for your comment. We have clarified our assumptions in our definition of wild salmon.

12-17

Comment noted.

12-18

Summer chinook production has been dropped from consider-ation.

12-19

True. However, BPA determined that the time, handling, travel, etc. involved in trapping and hauling fish from these streams to a central holding area would not make the operation desirable, at least at the outset.

12-20

North Lapwai Valley satellite site was selected for three principal reasons: 1) it is just upstream of an important fall chinook spawning area, Hog Islands; 2) it has the potential for an adequate water supply; and 3) the land for the site is under tribal ownership. Water flow is adequate in October through December of most years for fall chinook to navigate upstream, at least as far as the weir site (approximately 1 mile upstream from the mouth). In most years, stream flows increase during the fall with the rainy period.

12-20 (cont.) flow in early August. If Lapwai Creek is not suitable natural production habitat, Table 2 should be revised to reflect broodstock collection only. This may alter the needed release size.

12-21 Although describing all habitat attributes of treatment streams may not be appropriate for the Draft Environmental Impact Statement (DEIS), a summary table of the major environmental factors that may constrain the success of releases, such as flow and temperature during critical production/migration periods, would enhance description of treatment streams.

12-22 <u>Page S-17:</u> The section on disease management should note who would collect, process, analyze, and report disease samples since a fish health laboratory does not appear as part of the hatchery proposal. The Tribe should identify if the Pacific Northwest Fish Health Protocol will be utilized for Nez Perce Tribal Hatchery (NPTH). No mention of culling procedures, isolation facilities, or standard drug therapy for production is mentioned. We recognize that this level of detail may be beyond the DEIS, and thus, not displayed. However, we consider additional detail regarding disease management and treatment a necessity for NPTH production plans.

12-23 <u>Page S-17:</u> The section on egg take should note that state transport permits would be necessary for crossing various state boundaries and importation. Under state authority, IDFG issues transport permits for eggs and live fish.

12-24 <u>Page S-18:</u> An overall goal for NPTH is to rear and release a fish that will return to naturally produce viable offspring. However, the strategy for the subyearling life cycle is to accelerate juveniles to migrate during a spring yearling time period. The implication is that the acceleration will enhance survival but the other side of the coin is that natural fish, on a natural growth schedule, do not, or would not, survive in the environment very well. What is the logic of introducing subyearling fish for natural production enhancement? This does not seem prudent, especially if broodstock is limited or subtracted from more successful programs. Based on information in the DEIS, natural productivity of returning adults with subyearling life history will be questionable because of in-basin environmental constraints to their continued production.

12-25 <u>Page S-18:</u> The DEIS identifies many experimental rearing techniques such as artificial features in ponds and underwater feeding options that hold promise for rearing fish more fit to complete their rearing in the natural environment. NPTH represents one of the most progressive proposals in regards to rearing fish for supplementation. IDFG supports Nez Perce tribal efforts to incorporate these ideas into their hatchery design. However, these are experimental techniques that may not work in

12-21

Descriptions of all treatment and control streams which include watershed area, discharge, length by channel type, gradient, elevation, habitat types, and stocking records, etc., are on file at NPT offices.

12-22

The annual operating plan would describe the comprehensive and detailed management of fish health and disease. Fish health technical services would be provided by either a federal agency (USFWS), or be developed by the NPT in accordance with Pacific Northwest Fish Health Protection Committee, IHOT, and NPT guidelines.

12-23

All necessary permits would be obtained.

12-24

Acceleration would be done to give the best advantage that is possible while fish are in our control. Release times would be compatible with flows. See response 11-14, second paragraph.

12-25

References to benefits of “new” rearing techniques are described in Section 2.1.3.3, Rearing Techniques.

12-25 (cont.) production situations and will need considerable evaluation to determine biological effectiveness, particularly in light of the probable cost. There should be some indication from the scientific literature that supports the magnitude of survival improvement described in the DEIS from incorporating "new" techniques. Our experimental efforts to incorporate some of the aspects of "natural rearing" have not yet lead us to nearly as optimistic a conclusion of survival benefit as the Nez Perce Tribe, but we are hopeful that some benefit is achieved.

12-26 Page S-19: The proposal for fingerling spring chinook release techniques is supported by recommendations by Peery and Bjornn (1996). However, they caution against fall releases because hatchery fish may not have sufficient time to acclimate to stream conditions prior to the onset of winter, and releases may induce habitat displacement of natural fish from overwintering habitat. To date, our experimental fall presmolt releases have not been very successful. It is uncertain whether lack of success has been a function of hatchery methodology, or other factors. Additional adult data should be available soon from our experimentation to assist with decisions about the efficacy of a fall release strategy.

12-27 Page S-20: There is not enough explanation of strategies to provide pass-through of natural or other hatchery chinook stocks during adult broodstock collection. There is also little explanation of effects to other species. In many cases, stocks with substantial investment of ratepayer dollars could be negatively affected by collection strategies where there is mixed stock migration, thus a thorough evaluation and detailed strategy is needed. The impact scoring information (Chapter 4 of DEIS) is cursory. Only fish ladders and weirs were considered in Chapter 4, Environmental Consequences. Boat capture (seining, electrofishing, angling) and capture at Lower Granite were also identified as probable collection methods, but were not evaluated.

12-28 There are multiple studies and production activities in the Clearwater Basin. The intensive level of marking, coordination necessary for implementation of NPTH without negatively affecting other ongoing programs for salmon and other species should be further emphasized in the DEIS.

12-29 Page S-23: It is unclear if Table 2 refers only to hatchery produced fish, or potential returns from natural production as well. To illustrate contribution of the hatchery program to a goal of enhancing natural production, it would be useful to add a column of how many adults would be required to seed the available habitat, for example at 70 % of parr production capacity. For example, by our estimation about 39 females (78 fish) would be needed to produce 70 percent of the parr capacity in Warm Spring

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12-26

NPT would work with IDFG in evaluating adult returns based on release strategies. Displacement of juveniles is discussed in Section 4.6.1.3, Impacts.

12-27

Collection of fall chinook has been revised to include the possibility of taking an allowable portion at Lower Granite in addition to using the fish ladders at North Lapwai Valley and Cherrylane. The EIS has been revised to reflect these changes.

12-28

Further discussion of marking strategies in coordination with other studies in the basin would be conducted with other agencies in the annual planning sessions available (e.g., Outplant meetings, Interagency production meetings).

12-29

Table 2-2 shows the predicted adult returns for spawning in the habitat as well as returns used for broodstock and allocated to harvest. Table 3-8 displays the number of adults needed to seed the outplanting streams to achieve parr capacity.

12-29 Creek. After 5-20 years, Table 2 indicates that the hatchery program would contribute 18% to the natural production target.

12-30 We have technical reservations about the utility of Lapwai Creek for naturally spawning fall chinook based on its aspects of habitat for migration, spawning, and rearing. There is little information that supports a subyearling life cycle as prudent or viable in the Selway or South Fork. There is no scientific information presented to appraise the natural spawning needs for these programs.

12-31 In Table 2, there should be some documentation about the assumptions regarding post-release survival of 50-65%. Planners often use 50% for parr to smolt survival; IDFG research estimated a range of 20-30% for natural fish in Crooked and the Upper Salmon rivers. Fingerling to smolt survival would be even lower. Although the DEIS is directed at production methods to increase survival of hatchery fish in the natural environment, it is doubtful they would survive better than natural fish. Furthermore, there is no strategy offered by NPTH to support an assumption that current (whatever that is) survival rates will double.

12-32 <u>S-24:</u> We agree with the Nez Perce Tribe that Rapid River stock is the appropriate stock for supplementation and reintroduction efforts in the Clearwater Basin when local broodstock is not an option. Agreement on spring chinook broodstock for NPTH has been in place since 1989 (see attached letters). We agree with the Nez Perce Tribe, described in the DEIS, that substantial coordination will be necessary on an annual basis regarding broodstock and release strategies. IDFG will coordinate directly with the Tribe through instate forums and the Production Advisory Committee to fulfill broodstock coordination.

12-33 However, we are concerned about new production proposals because currently, not enough hatchery chinook salmon of Rapid River stock return to the Snake Basin to meet existing needs for harvest and production, much less meet new initiatives. There is no discussion in the DEIS of the current programs that hatcheries, targeted for NPTH broodstock, already support. It is unclear if the Tribe is expecting changes to current mitigation programs, some already supported by ratepayer dollars, to support NPTH. There should be some description in the DEIS about the current status of the hatchery stocks and programs targeted to provide broodstock for NPTH.

12-34 A sufficient adult return from brood year (BY)1993 (1997-98) spring chinook is anticipated to afford harvest and supplementation opportunity for state and tribal programs. However, adult returns from BY1994 and BY1995 (1999-2000) will be extremely low. Adult returns from BY1996 (2000-2001) will improve, but still be low. Our expectation is that with status quo assumptions about survival, the BY1994-96 adult returns will

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12-30

See response to 12-20.

12-31

See the revised description of adult returns in the Final EIS (Section 2.1.3.5).

12-32

Thank you for your comment.

12-33

The NPT evaluated the potential for current Clearwater Subbasin LSRCP mitigation facilities (Clearwater Anadromous and Dworshak National Fish Hatcheries) to meet their stipulated mitigation goals (Murphy and Johnson (1990). In summary, they found that the facilities were designed and constructed using an overly optimistic smolt-to-adult return rate. This results in the fact that the hatcheries would never meet their mitigation requirements, even if they functioned at full rearing capacity in every single year, unless the smolt-to-adult survival rate increases by at least four fold.

The NPT does desire a change in current mitigation programs. The Tribe was not a formal participant in the design or implementation of the LSRCP, and so its concerns were not addressed in planning the mitigation program. Even though the NPT retained rights to fisheries resources of the Northwest in its 1855 treaty with the United States, it was not until after the Boldt decision in 1979 that these rights were recognized in fisheries management decisions. Because the LSRCP (and other mitigation programs) were implemented prior to 1979, they were designed without specific recognition of tribal desires, in relation to numbers or species produced. The NPT would continue in its efforts to shape mitigation goals for anadromous fish in the avenues available to do so.

The Tribe most certainly desires that mitigation for the Lower Snake River dams occur. Planned mitigation for LSRCP

12-34 (cont.) not meet even current program needs. The next upward cycle would probably be in 2001-2003 with adult returns from BY1997-98. Likely broodstock availability should be a critical consideration in construction planning.

12-35 S-24: We have substantial concerns about the mixed stock harvest management necessary to capitalize on returning adults in migration areas such as the Clearwater River (fall chinook returning to Cherrylane) and the mainstem Selway (Cedar Flat) and South Fork (Luke's Gulch). Possible strategies should be identified in the harvest management section. As noted, harvest will have to be coordinated and negotiated between the fishery managers in the Clearwater Basin. The aspect of mixed stock will affect harvest in additional to the other factors identified in the DEIS.

12-36 S-25: The summarized broodstock strategy seems to put a greater priority on the use of wild spawners in the hatchery, rather than in the natural environment. Aspects of Table 3 seem inconsistent with other BPA-funded genetic strategies/proposals such as Regional Assessment of Supplementation Project (RASP) and Idaho Supplementation Studies (ISS).

12-37 S-26: Assuming the no action alternative means none of the NPTH supplementation proposals would be carried out is not fully correct. An alternative that focuses on acclimation facilities for spring chinook, without additional central incubation, has merit. State and federal fishery managers have worked with the Tribe on fish releases into tribal areas of interest previously. Lack of implementation has largely been a function of lack of appropriate broodstock, not a lack of central rearing facility, coordination, or desire to implement tribal programs.

References

Carlson, K.E., Chairman, Idaho Fish and Game Commission. [Letter to Mr. A. Pinkham, Nez Perce Tribe]. 1989 December 7.

Hüffaker, S.M., Chief, Bureau of Fisheries, Idaho Department of Fish and Game. [Letter to Mr. S. Whitman, Nez Perce Tribe]. 1989 September 8.

Idaho Department of Fish and Game. 1992. Anadromous Fish Management Plan, 1992-1996. Boise.

Peery, C.A. and T.C. Bjornn. 1996. Small-scale investigations into chinook salmon supplementation strategies and techniques: 1992-1994. Technical Report 96-3. Idaho Cooperative Fish and Wildlife Research Unit, University of Idaho, Moscow.

facilities would result in 21,000 spring chinook salmon returning to the Snake River Basin by fish produced at Dworshak and Clearwater Anadromous hatcheries. However, it is not realistic to argue that these mitigation goals would be severely compromised by the 645 spring chinook required for NPTH broodstock.

12-34

You describe the current status of spring chinook hatchery stocks in your comment. Returns in 1997 and 1998 would likely provide surplus broodstock for NPTH. Returns in 1999 and 2000 would be poor, although better passage and ocean conditions were encountered which could result in a larger return than in 1994 and 1995. In these years, broodstock would be scarce, and it is unlikely that spring chinook facilities would be operating at capacity. Beginning in 2001, surplus broodstock would again be available. Throughout this time, efforts would be made by the salmon recovery efforts to improve passage conditions, which should result in a better outlook for broodstock acquisition. When surplus broodstock does occur, NPTH would be making significant directed efforts to ensure that hatchery reared fish are better adapted to natural conditions and that increased returns would be to the natural stream. Without NPTH, returns (with the exception of those to Clearwater Anadromous Hatchery) would be back to the hatchery rack. It is probable that no new initiatives would be undertaken to encourage innovative type rearing strategies. Similar type troughs and surpluses are anticipated for fall chinook.

Broodstock availability would be a critical consideration in construction planning.

12-35

See response to 12-05.

12-36

See response to 12-12.

12-37

Using existing facilities is now being considered as an alternative. Please see Section 2.2, Use of Existing Facilities Alternative for additional information. The No Action Alternative assumes none of the supplementation proposals are implemented.

Whitman, S., Fisheries Program Manager, Nez Perce Tribe. [Letter to Mr. S. Huffaker, Idaho Department of Fish and Game]. 1989 August 24.

December 7, 1989

Mr. Allen Pinkham
Nez Perce Tribe
P.O. Box 365
Lapwai, ID 83540

Dear Mr. Pinkham:

The Idaho Fish and Game Commission agrees in concept with the Nez Perce Tribe hatchery development (Bonneville Power Administration Low Tech Facility) for satellite facilities as proposed.

Production of spring and summer chinook salmon at the facilities proposed offer mutual opportunities to increase the numbers of fish in their respectful runs and thereby contribute to the goal of restoring Snake River spring and summer chinook to viable levels.

The Commission provides conceptual support in good faith expecting completion of ongoing NPT and IDFG agreements in several areas related to the proposed production facilities. Specific management plans related to hatchery brood provisions, natural spawning escapement, tribal/non-tribal fisheries operations, and other fish species considerations are anticipated. Completion and agreement of these plans need to occur to prior to commencement of hatchery construction activities to equitably provide for mutual long-term fishery benefits for both sport and tribal fishermen. We suggest a technical meeting to address these concerns be convened among IDFG and NPT at everyone's earliest convenience.

We trust and are confident that the recent improvements in cooperation between the Nez Perce Tribe and Idaho Department of Fish and Game will result in a Nez Perce Tribe fish production and comprehensive salmon management program fully supported by the State of Idaho.

We look forward to continued discussion and achievements in this and other areas relative to fish and wildlife resources.

Sincerely,

s/ Keith Carlson

Keith E. Carlson, Chairman
Idaho Fish and Game Commission

KC:DP:mw

AUG 2 8 1989

Department of Fisheries Management
Nez Perce Tribe
P.O. Box 365
Lapwai, Idaho 83540
(208) 843-2253

August 24, 1989

Mr. Steven Huffaker
Idaho Department of Fish and Game
600 South Walnut, Box 25
Boise, ID 83707

Dear Steve:

We appreciated the opportunity to meet with yourself and staff on August 7 and 10 in your Boise office. We believe that the discussions were beneficial and continue to move us along in the direction of a coordinated approach to fisheries management in Idaho.

This letter is to summarize our understanding of the consensus reached at the August 7 meeting which addressed the species agreement discussion for the Nez Perce Tribal Hatchery (NPTH). The Tribe and State agreed that upriver stocks of spring chinook would be cultured at the NPTH. For example, spring chinook returning to Dworshak, Kooskia or Rapid River Hatcheries would be the targeted broodstock sources. Fall chinook production was deferred for future consideration based upon concern expressed by the State. Additional technical analysis and discussion and policy discussion needed to occur before fall chinook were artificially produced.

Satellite facilities for spring chinook would be located in the Lolo/Eldorado Creek area, Slate Creek and Newsome, Meadow and Mill Creek areas. Summer chinook production at Slate Creek was an acceptable option; broodstock would come from within the State. The Tribe would seek tributary fisheries on surplus adults returning to these sites. The State agreed with this approach but expressed the desire for a 50-50 harvest sharing between Tribal and sport fisherman and consideration of an exchange of fishing opportunity and quotas into different areas. For example, the State sought more sport opportunity in the South Fork Clearwater in exchange for Tribal tributary opportunities. The Tribe agreed in concept to the idea of harvest trade-offs and varying opportunity for harvest to occur. Policy level concurrence by the Commission and Tribal Executive Committee needs to occur.

Mr. Steven Huffaker
Idaho Department of Fish and Game
08/24/89
Page 2

Production and harvest plans would continue to be developed by the Tribe for discussion and agreement with the Idaho Department of Fish and Game. These plans will be the most in-depth for any hatchery facility or satellite constructed to date in Idaho.

We believe the consensus reached on a species agreement will allow the planning and design of the NPTH to be completed. The Tribe does desire to pursue a separate Memorandum of Agreement with the State to address the tribal hatchery production in the near future.

We believe the major points of consensus reached during our species agreement discussion are summarized herein. We would request a letter of concurrence and support of the species agreement from your Department be sent at your earliest convenience so that delays in the NPTH already experienced can be minimized and we can work together to rebuild healthy chinook runs to Idaho.

Sincerely,

Silas Whitman
Fisheries Program Manager

SW/atm

cc: C. Hayes (NPT)
File

September 8, 1989

Mr. Silas Whitman
Nez Perce Tribe
P.O. Box 365
Lapwai, ID 83540

Dear Si:

Your letter of August 24 was a positive step towards improved understanding of how the recovery of Idaho chinook can be enhanced. We hope that our discussions can continue in this positive manner.

The use of locally adapted stocks of spring and summer chinook for tribal acclimation rearing facilities is agreed. What we must now do is determine how to assure adequate adult escapement to Dworshak, Kooskia, Rapid River, Sawtooth, and Pahsimeroi hatcheries and all natural spawning grounds so we have adequate supplies of eggs. It would be helpful if our technical people could meet and develop recommendations for escapement goals for each facility and tributary. These goals should include adults for adequate natural production, as well as for egg take needs. Once escapement goals are set, harvest plans can be structured around them. Please let me know when those meetings might begin.

We feel that the decision to defer action on fall chinook was a wise one. Although it was not stated in your letter, we assume that coho falls into the same category. We will be happy to pursue additional technical analysis on both these species.

The siting of tribal satellite facilities in the Lolo, Slate, Newsome, Meadow, and Mill Creek watersheds (assuming the Meadow Creek you refer to is on the South Fork Clearwater) is agreeable to the Department, so long as locally adapted stocks of spring or summer chinook are raised there.

We anticipate that nontribal fisheries on these fish would primarily be on the South Fork Clearwater. Since nontribal fisheries are relatively inefficient, it will be the responsibility of the Nez Perce Tribe to provide escapement for egg needs of both hatchery and natural production where there are tribal satellite facilities. While we will

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Mr. Silas Whitman
September 6, 1989
Page 2

help by providing the eggs and fry necessary to bring back initial adult runs, we will not constrain sport seasons or existing mitigation and rebuilding programs to provide fish for the tribal satellites. We assume you will be able to constrain tribal harvest on existing runs as necessary to provide the eggs for production of runs at your satellite facilities.

We envision harvest sharing more in reference to an equitable share for nontribal anglers than to a 50:50 instate quota system. The courts have mandated a 50:50 sharing of harvestable surplus fish between tribal and nontribal entities. Since Idaho's nontribal entities have extremely limited opportunity to share in lower river harvest, we expect to be able to fish more heavily on fish in Idaho at sites where both needed escapement and harvestable surpluses exist. Harvest time and area trade-offs will be essential to maintain equitable harvest opportunities. It is likely that nontribal anglers will need more days of opportunity than tribal fishers to maintain an equitable harvest. The tribe must realize that mainstem mixed-stock "opportunity" for nontribal anglers is not a viable tradeoff for tribal tributary opportunity.

It does not appear to us that a tribal facility for incubation and early rearing of chinook to stock the satellite facilities is necessary. We feel that the design of the Clearwater station and the U.S. Fish and Wildlife Service operation at Dworshak and Kooskia are adequate to provide sufficient space for culture of eggs and fry. We would prefer the tribe focus on satellite rearing and brood collection facilities and enhancing survival through passage, flow, habitat, and harvest management improvements, rather than making large capital investments in additional hatchery facilities.

We are pleased that we have been able to reach agreement on the siting of the Nez Perce Tribe's spring chinook satellite facilities. We feel that working together to increase escapements to Idaho to provide fish for tribal facilities will enhance all our fisheries. We are hopeful that current cooperation on tribal facilities will lead to improved relations on other important issues.

Sincerely,

COPY / ORIGINAL SIGNED BY
STEVEN M. HUFFAKER

Steven M. Huffaker, Chief
Bureau of Fisheries

cc: CRITFC
NPPC
BPA
USFWS

bc: David Hanson
Bill Miller

SMH:blm

State of Washington
DEPARTMENT OF FISH AND WILDLIFE
Mailing Address: 600 Capitol Way N • Olympia, WA 98501-1091 • (360) 902-2200, TDD (360) 902-2207
Main Office Location: Natural Resources Building • 1111 Washington Street SE • Olympia, WA

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG#: NEZP-02-013
RECEIPT DATE:
AUG 21 1996

AUG 20 1996

August 15, 1996

Bonneville Power Administration
Public Involvement Office-CKP
Post Office Box 12999
Portland, Oregon 97212

To Whom It May Concern:

I am providing my comments on the Draft Environmental Impact Statement you sent me regarding the Nez Perce Tribal Hatchery. My comments relate only to the monitoring and evaluation (M&E) plan proposed with this project. In my opinion, an M&E plan is one of the most important parts of a large project such as this and warrants a substantial description and review. If a project cannot be monitored and evaluated, then little, if any, information will be gained on the effectiveness of the supplementation project.

13-01
1) The stated goal of the M&E plan is to determine whether the supplementation program is achieving its stated objective, i.e. to restore naturally reproducing salmon to the Clearwater River Subbasin. The method to be used in the M&E plan is *"Before-After Treatment Control"* experimental design, however there is little description of how this method is to be used. Therefore, this plan cannot be properly reviewed. For example, the description (pp.2-40 to 2-41) fails to identify which response variables will be measured, how the data will be analyzed, what the null and alternative hypotheses are, and what the sample size requirements are.

13-02
2) A similar objective exists for the Yakima River Fisheries Supplementation Project. In that project, an experimental design was created and tested for power and sample size requirements. I would recommend that the authors of this EIS read the report I have enclosed and adopt a similar strategy for their M&E plan.

13-03
3) One claim made on page 2-41 is that "The M&E plan offers techniques that would not only evaluate the performance of hatchery fish, but would determine their impacts on wild fish and other aquatic biota." Impacts on other biota are notoriously difficult to detect. How will the study design in this project accomplish that? What impacts are to be studied, what will be measured to study them, and how will other sources of variation, that could also explain the data, be controlled?

13-01

A copy of the M&E plan has been submitted to the fisheries management agencies in the Columbia Basin. Because of its extensive length (over 200 pages), it was not included in this EIS. It can be obtained by calling BPA's document line at 1-800-622-4520. A copy of the Executive Summary of the M&E Plan is included in Appendix D.

13-02

Comment noted.

13-03

See response to 13-01.

Bonneville Power Administration
Public Involvement Office
August 15, 1996
Page 2

13-04 I recommend the authors describe in much more detail their M&E plan and for this more detailed plan to be reviewed before it is accepted.

Sincerely,

Annette Hoffmann

Annette Hoffmann
Fisheries Biometrician
Resource Assessment

AH:dht

Enclosures

13-04
See response to 13-01.

Public Involvement Manager-CKP
Bonneville Power Administration
P.O. Box 12999
Portland, Oregon 97212

Thomas L. Welsh, Ph.D
419 E. Highland View Drive
Boise, Idaho 83702
August 14, 1996

AUG 2 0 1996

RE: Comments on draft EIS-Nez Perce Tribal Hatchery Program

14-01 I have made an extensive review of the above listed document and find it fraught with inaccuracies that, if not refuted, will forever misconstrue the truth. The more important misconceptions regarding historic anadromous fish populations and restoration efforts in the Clearwater River drainage are addressed below. While I wholehearted agree that our anadromous fish stocks should be preserved, I disagree with most past efforts as well as this program to restore the runs. I am most appalled by the blatant attempts to ignore accurate historical records regarding fish populations in the Clearwater and Salmon rivers. These omissions are for the purpose of "creating" fish runs that never existed in the lower portions of these two rivers.

Since 1959, I have been a fishery biologist involved in salmon and steelhead research and management in the Columbia River drainage. From 1960 until 1966, I was the project leader on the Idaho Department of Fish and Game (IDFG) effort to rebuild salmon and steelhead runs in the Clearwater River drainage. From 1966 until 1978, I was the Regional Fishery Manager for Central Idaho, including the lower 200 miles of the Salmon River drainage. Since my resignation from the IDFG in 1978, I have been self-employed as a fishery consultant on projects in the Salmon, Snake and Columbia rivers.

Following are my specific comments on the draft environmental impact statement listed above:

14-02 Page 1-1. End of 1st paragraph under "Need For Action". "Though there have been attempts to reestablish salmon runs using traditional hatchery practices, low adult returns indicate new methods are needed to help restore these runs."

COMMENT: Since 1960, we have expended massive amounts of effort and money to restore salmon and steelhead runs in the Clearwater River watershed. Methods have included open-stream plants of eyed eggs, eyed-egg-plantings in controlled-flow hatching channels, transfer of fry from hatching channels to other streams, and hatchery-rearing of smolts. Species and stocks have included chinook salmon (several stocks of spring/summers and fall chinook), coho salmon, and summer steelhead trout. Over 60 million chinook salmon eggs were planted in the Selway River alone and over 10 million coho salmon eggs were planted in the South Fork of the Clearwater River. Seven million fall chinook (two different stocks) were planted in the lower Selway and a tributary of the Locksa River. IDFG records show an actual count of 3,467 adult salmon passing over Lewiston Dam prior to its removal in the early 1970's and an estimated adult salmon return of over 5,000 fish the year the dam was removed. These figures do not include the millions of salmon eggs moved to fish hatcheries in the Clearwater River drainage nor the massive steelhead trout restoration efforts..

14-03 Page 1-3. Last paragraph. "For thousands of years, while salmon runs were plentiful, the Clearwater River was supplied with nutrients brought in by returning adults from July through December, year after year."

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14-01

Section 3.6.3.2, Mainstem Rivers (Fall Chinook Habitat), describes the evidence for fall chinook in the Clearwater River. Section 3.6.2.1, Chinook Salmon, describes the evidence for believing that a summer type chinook existed at one time in the Clearwater River.

14-02

Comment noted. A history of fish stocking is described in Sections 1.1.1.2, Hatchery Fish Production in the Clearwater River Subbasin, 3.6.3.1, Tributary Streams (Spring Chinook Habitat), and 3.6.3.2 Mainstem River (Fall Chinook Habitat).

14-03

See response to 14-01.

14-03 (cont.)

COMMENT: I agree that decomposing salmon carcasses add to the nutrient level in the spawning areas and rearing areas immediately downstream. However, those nutrients are quickly tied-up by algae and aquatic macrophytes and are not carried vast distances downstream. My main objection to this statement is the period that adult salmon were present in the Clearwater River drainage. Historically, there was not a fall chinook salmon run present in the Clearwater River drainage. In the Journals of Lewis and Clark, they made no mention of chinook salmon spawning in the lower Clearwater River as they floated downstream over those riffles in October 1805 when fall chinook would have been spawning or at least staging in pools prior to moving onto the riffles to spawn. No fishery was present in October on the lower Clearwater and the Journals state that the Nez Perce were observed fishing on "Lewis's River" (Snake River) as they passed downstream. The only other fisheries referenced in the Journals were an important spring chinook fishery on "Colter's Creek" (Potlatch River), and an occasional "red salmon trout" in the Clearwater. Lewis and Clark observed attempts to take salmon from the main Clearwater in May and June, 1806, but these attempts were unsuccessful. On June 3, 1806, while camped on the Clearwater River, Lewis wrote, "I begin to lose all hope of and dependance on the Salmon as this river will not fall sufficiently to take them before we shall leave it, as yet I see no appearance of their running near the shore as the indians informed us they would in the course of a few days. I find that all the salmon which they procure themselves they obtain on Lewis's River...." Obviously, the Clearwater River did not support a fall chinook salmon run or the Nez Perce would have fished it rather than traveling to the Snake River for their fish.

14-04

Pages 1-4-5.
COMMENT: This section does a good job of listing the failure of anadromous hatchery programs already in place in the Clearwater River drainage. However, if a "technological" breakthrough exists for correcting hatchery survival, why are they not being incorporated into existing hatchery operations?

14-05

Page 1-15. Last paragraph. In reference to fall chinook, "Temporary acclimation facilities are being considered in the Snake, Clearwater, Grande Ronde, Imnaha and lower Salmon rivers."
COMMENT: This is another attempt to distort the historical record of where fall chinook salmon runs were present. I am absolutely certain that historically, fall chinook were unable to colonize the lower Salmon and lower Clearwater rivers. Others would be a better source for information on the lower Grande Ronde and Imnaha but I suspect that fall chinook were not historically present on the lower reaches of these rivers as well. I have compiled extensive temperature records on the lower Clearwater and Salmon rivers and without going into a long dissertation, the primary environmental variable lacking on the lower reaches of these two rivers is a suitable water temperature regime for salmon spawning, incubation, emergence, and rearing. Release of warmer water from Dworshak Reservoir has unnaturally altered the water temperature regime of the Clearwater River below the North Fork and in recent years, a few fall chinook have attempted to colonize this reach.

14-06

Page 1-18. First paragraph. "NMFS determined that proposed hatchery operations described by USFWS, NMFS, BPA, the Cops, and BIA at federal hatcheries are likely to jeopardize the continued existence of listed Snake River sockeye salmon, Snake River spring/summer chinook salmon, and Snake River fall chinook salmon."

14-04

Comment noted. Management of existing hatcheries is not controlled by BPA, BIA or NPT, but using existing facilities is now being considered as an alternative (see Section 2.2).

14-05

See response to 14-01.

14-06

Comment noted.

14-06 (cont.)

COMMENT: I concur with this statement. A case in point is the dismal failure of the Sawtooth National Fish Hatchery on the upper Salmon River. The bulk of the brood stock for this hatchery was "mined" from the wild stock in the upper Salmon River drainage. Both the hatchery and wild stocks continued to dwindle and last year, only two hatchery chinook females and four wild chinook females were counted at the weir below the hatchery. This stock is on the brink of extinction.

14-07

Page 1-19. Last paragraph. "This Tribal Recovery plan focuses more on restoring salmon runs to their historic abundance, not on preserving the genetic purity of the remaining populations."
COMMENT: As stated earlier, this plan, if implemented, will attempt to introduce non-indigenous, ill-suited salmon stocks in the Snake River drainage from the Grande Ronde to the Salmon River. Preserving those stocks that have adapted to the particular set of environmental variables in their habitat should be our number 1 priority, not a high-risk venture such as this hatchery program with all of the potential disease and genetic dilution problems.

14-08

Page 3-27. Second paragraph. "Depending on water temperatures, spring chinook fry in the Clearwater River usually hatch in December and emerge from the gravel in late February and March, but they may emerge as late as June."
COMMENT: This is a totally false statement. First of all, spring chinook do not spawn in the Clearwater River do to an inhospitable water temperature regime. Secondly, the fry emergence work I have done on the Bear Creek (Selway River) shows clearly that the peak of fry emergence most years is the first week of May. That timing comports with other fry emergence studies I have conducted in tributaries of the Salmon River as well as fall chinook fry in the Hanford Reach of the Columbia River.

14-09

Page 3-28. Speculation on summer chinook salmon (ocean-type) existing in the Clearwater River Subbasin.
COMMENT: The authors state that their is "compelling evidence" that another form of summer chinook may have spawned in the Clearwater River. To the contrary, the compelling evidence, as already stated above, shows that salmon did not spawn in either the lower Salmon or the lower Clearwater rivers.

14-10

Page 3-29. Last section on fall chinook salmon.
COMMENT: Again, the authors would have you believe that fall chinook salmon spawned in the lower reaches of the Clearwater, Grande Ronde, Imnaha and Salmon rivers. This is false.

14-11

Page 3-35. Last paragraph. "Between 1961 and 1987, nearly 50 million spring chinook eggs were outplanted into Selway and South Fork incubation channels (Horner and Bjornn 1981; Chapman eta al., 1991)."
COMMENT: This may be a true quote but it is not a true statement. As stated earlier, I was the project leader on the reintroduction of salmon in the Clearwater River from 1960 to 1966. The first hatching channel in the Selway River drainage was a small channel in an irrigation ditch at Running Creek, hand constructed in about 1964. Prior to this time, all the eggs (approximately two million/year) were planted in open streams channels in the Selway River and Bear Creek.

14-07

The stock used would be Snake River stock from Lyons Ferry which is considered to be part of the Snake River fall chinook ESU. Fall chinook spawning as determined by redd counts is shown in Table 3-3. It includes the lower mainstem of the Imnaha, Grande Ronde and Clearwater, as well as the Snake River. NPTH would strive to preserve that stock.

14-08

The spring chinook emergence statement refers to tributaries of the Clearwater River Subbasin, not to the mainstem river itself. The source of the information was U.S. Department of Commerce, NMFS (1995). The text has been changed to make this clear.

14-09

See response to 14-01.

14-10

See response to 14-01.

14-11

Comment noted.

14-12 Page 3-43. Second paragraph. "Anecdotal evidence suggests that a late spawning race of chinook salmon, most likely fall chinook, were indigenous to the Clearwater River Subbasin."
COMMENT: The constant repeating of a falsehood does not render it truth.

14-13 Page 3-43. End of next to bottom paragraph. "The one year that Snake River stock were used did produce some adult returns, 122 fish (Richards, 1967).
COMMENT: I planted a relatively small number of Snake River fall chinook eyed eggs in open stream channels in Warm Springs Creek in the upper Lochsa River in either 1960 or 1961 (can be verified by reviewing Welsh 1961-62 progress reports). The planting site was in heavy rubble and in completely uncharacteristic fall chinook spawning habitat. The 122 fall chinook counted at Lewiston Dam was in 1966. It stretches the imagination to believe that these fish were five or six-year-old survivors from the open-stream plantings. I rather believe they were strays from the Snake River.

14-14 Page 3-45. Potential production of fall chinook in the lower Clearwater River. "Arnsberg et al. (1992) reported modeling that indicates the lower mainstem Clearwater River can provide habitat for as many as 90,000 chinook salmon redds, which they also believe is an overestimate."
COMMENT: This kind of computer modeling is of no value. I do agree it is an overestimate, by 90,000.

CONCLUSIONS:

14-15 This plan makes no sense what-so-ever. At a time when we should be closing fish hatcheries, we are considering building new ones. All this does is detract from the real problem facing the continued survival of anadromous fish in the Snake River drainage, excessive mortality of both adults and smolts at the eight hydroelectric dams on the lower Snake and Columbia rivers. If we are truly committed to saving these fish, we must not pursue failed programs that have been in place for the past three or four decades. One only needs to review the demise of anadromous fish beginning in northeastern United States and Canada, then to the Sacramento River drainage and finally to the Columbia River drainage to find the primary culprit--**DAMS!** If the pattern continues, anadromous fish runs in the Frazer River of Canada and in the large Alaska rivers will be the next to be lost. All of the clamor about over-fishing, mining, logging, agriculture, pollution, mackerel and marine mammal predation, El Nino etc. does nothing but confuse the issue and draw attention away from the real problem. All one needs to do to graphically portray the real problem is to plot the number of salmon redds in Idaho vs. the number of mainstem dams on the lower Snake and Columbia rivers. Then by computing a simple regression analysis, you will see that dams explains about 85% of the variation in redd counts.

14-16 Rather than saddle our electric rate payers with additional costs that will result in no net benefits, let us dedicate our effort and money to meaningful programs in order to rescue our salmon and steelhead stocks from the brink of extinction.

Thomas L. Welsh, Ph.D.

14-12

See response to 14-01.

14-13

Cramer (1995a) reported that 400,000 eggs from Oxbow Hatchery in the Snake River were planted at Fenn (Selway River) in 1962. The source for his information was Richards (1967) and the report was *Appraisal of Project Results for Salmon and Steelhead Reintroduction and Introductions into the Clearwater River Drainage, Idaho.*

14-14

Comment noted.

14-15

A large body of research suggests that federal dams alone are not responsible for the decline of the wild salmon runs. The other factors you mentioned are also very real limiting factors. This project was developed as the result of many years of study. The principles of supplementation and adaptive management would be used to rebuild natural runs of salmon. The Nez Perce Tribal Hatchery Program would be a long-term effort designed to aid natural production until such time as conditions improve to a point where runs would be self-sustaining.

14-16

Comment noted.

State of Washington
DEPARTMENT OF FISH AND WILDLIFE

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LOG#: NEZP-02-015
RECEIPT DATE:
SEP 03 1996

August 22, 1996

AUG 30 1996

Public Involvement Manager - CKP
Bonneville Power Administration
P.O. Box 12999
Portland, Oregon 97212

Dear Sir:

The following is a compilation of comments from the Washington Department of Fish and Wildlife(WFDW) relative to the *Nez Perce Tribal Hatchery Program Draft Environmental Impact Statement*. These comments are from several sources and in many cases are unedited. I have also included one comment in total from Anne Marshall of WDFW Genetics Unit with added reference material.

COMMENTS REGARDING THE DRAFT EIS FOR THE NEZ PERCE TRIBAL HATCHERY

General Comments:

15-01

1. WDFW, NMFS and others have been involved in an eggbank program for Snake River fall chinook salmon since 1976. We currently make every effort to eliminate any stray, or unknown origin, salmon from contributing to the broodstock at Lyons Ferry Hatchery in an effort to maintain the genetic integrity of Snake River fall chinook salmon. As you are aware, we will be releasing Lyons Ferry fall chinook salmon into the Clearwater River in the spring of 1997. I am concerned about the proposed use of Columbia River summer chinook stocks (ocean-type chinook) in the Clearwater River. These fish have a similar life history to Snake River fall chinook, but their genetic composition is different. The summer chinook proposed for use in the Clearwater are not part of the Snake River fall chinook ESU, and they are not part of the same genetic diversity unit (GDU). They are however, part of the same major ancestral lineage (WDFW 1996). I am concerned about genetic introgression in the fall chinook population. This would not be consistent with ESA efforts in the Snake River and may negate our egg bank efforts to date. This action would jeopardize the listed stock that is protected under Endangered Species Act (ESA).

15-01

Summer chinook production has been dropped from consideration.

page 2

15-02 2. We have been unable to consistently meet our yearling and subyearling fall chinook production goals for Lyons Ferry Hatchery. The NPTH plan calls for 2 million subyearling fall chinook from Lyons Ferry Hatchery for several years to initiate their release program until they have adults return as broodstock. I am doubtful that enough broodstock will be available for quite some time at Lyons Ferry to provide our production needs and the needs of the NPTH. I am concerned current outplant efforts above Lower Granite Dam will be terminated to provide fish for the NPTH program, although Snake River releases have been given priority by PAC and others. The NPTH plan may severely compromise the Lyons Ferry Hatchery fall chinook program and its outplants upstream of Lower Granite Dam.

15-03 The releases of smolts at Lyons Ferry Hatchery have been at a low level in recent years and are limited by the 1996-1998 Management Agreement for Upper Columbia River Fall Chinook to 450,000. Additionally, the management plan calls for all adults that stray to Lower Granite from Lyons Ferry be released above Lower Granite Dam, this action will reduce available fish fro the production program. The production needs for the NPTH may not be met for some years in the future.

15-04 3. The NPTH program relies on massive releases of chinook salmon and an unlikely assumption that the NPTH can double the smolt to adult survival rates to obtain program goals for adult returns. Massive releases have not overcome the mortality factors in the migration corridor, etc. The proposed experimental approaches to improve rearing and smolt to adult survivals should not be assumed to double, or even increase, post release or smolt to adult survival rates presently documented. The stated assumptions are likely too optimistic and appear unrealistic. The stated program goals are not likely to be attained based on these assumptions. For example, fall chinook would be released as subyearlings. I don't believe that manipulating their rearing will double their smolt to adult survival rates. I obtain an estimate of 726 adults returning from the Cherrylane releases instead of the 1,020 adults projected in this draft EIS if I apply our documented smolt to adult survival rates from Lyons Ferry, with estimated losses at dams above Lower Monumental Dam, to the projected release numbers.

15-05 4. Three large hatchery programs are currently active in the Clearwater River. Why do we need more hatchery production there? Why can't the existing programs be modified to address the needs identified for the NPTH program?? How would the NPTH program releases fit under the ESA production cap, or be in compliance with ESA? Adjustments may need to be made with current facilities to improve distribution and increase survivals and adult returns of salmon, while protecting or enhancing listed species. However, I believe that spending another $18-20 million for more hatchery facilities, plus the associated operation costs, is the wrong approach to improving adult returns.
15-06 The proposed program is inconsistent with NMFS' proposed recovery plan because it uses nonindigenous stocks (Columbia River summer chinook), will exceed

15-02

As stated in Section 2.1.3.7, Broodstock Source and Management, acquisition of broodstock would be determined by NPT within the Columbia River production forums. It is expected that production at NPTH would be gradually phased in as broodstock becomes available. Since NPT is a participant in efforts to bring fall chinook production upstream of Lyons Ferry, it would concentrate on those activities which do so in the most effective manner. These include releasing yearling smolts at the portable acclimation facilities (discussed in Section 1.6.4, Lower Snake River Fish and Wildlife Compensation Plan) in addition to releasing subyearling smolts as planned by NPTH.

Trade-offs would occur in negotiation for broodstock during years of poor returns and all restoration efforts would be considered by the PAC. However, in years of good returns, there has been a lack of space at existing hatcheries to attempt a true supplementation strategy which focuses on improving rearing conditions. Consequently, by default, hatchery production always emphasizes conventional rearing methods, and a harvest augmentation approach. Supplementation of natural spawning populations becomes a secondary endeavor. NPTH, and the yearling releases upstream of Lower Granite, reverse this focus. The NPT would continue to support these supplementation strategies in addition to maintaining the critical egg bank and mitigation program at Lyons Ferry.

15-03

See response to 15-02.

15-04

Doubling the smolt-to-adult return rates was not based on hatchery practices. Rather, it is based on the assumption that 20 years from now, salmon recovery efforts will work. In order for the recovery plans to at least yield a stable, non-declining run, there must be an improvement made in the relationship between the number of smoltsthat leave the system to the number of adults that return. This smolt-to-adult survival rate must be increased by at least two fold.

page 3

15-06 the hatchery production cap, and may increase competition with naturally produced, listed, chinook salmon.

15-07 5. Complete marking of hatchery releases in order to identify returning adults usually insures that additional handling of target and nontarget fish will/must occur. Trap facilities are rarely 100% effective, usually require excessive staffing and trucking costs, and can change the migration behavior and passage of target and nontarget fish if temporary weirs are involved. Potential impacts from fish traps, live boxes, ladders and weirs is listed as "moderate" for chinook and other salmonids. Configuration of traps and weirs can have moderate to high impacts in some situations for reasons that are not readily apparent.

15-08 6. Who, where, how are the extra Mid-Columbia chinook broodstock to be collected? For an 800,000 summer chinook program, about 435 adults would need to be collected at current survival standards for Rock Island/Wells programs. The environmental impacts of removing these fish and their future production from the Mid-Columbia was overlooked in the document.

Specific Comments:

15-09 1. A stated program goal of the NPTH is to "sustain long term fitness and genetic integrity of targeted fish populations". I believe that is impossible if you mix Columbia River summer chinook and Snake River spring/summer and fall chinook. These fish will interbreed and they will become genetically mixed. The NPTH "targeted chinook populations" are not in compliance with ESA recovery efforts.

15-10 2. On page S-5, it states that the NPTH would rear and release chinook "biologically similar to wild fish to reproduce in the Clearwater River Basin." Columbia River summer chinook salmon are not similar genetically to fall, summer or spring chinook salmon in the Snake River, although they do have a similar life history to Snake River fall chinook.

15-11 3. The spring chinook stock should be determined (with public review) before this program begins.

15-12 4. Page S-11 states that all fish would be marked to evaluate the program. The draft EIS should discuss how these fish would be marked. All with CWTs, and unique external marks to pass or collect summer and fall chinook at Lower Granite Dam?? If they are not externally marked they may be collected at Lower Granite Dam and sent to Lyons Ferry for spawning as strays.

15-13 5. The document states that 500,000 subyearling fall chinook would be released into Lapwai Creek, and the intent of the program is to return fish for natural spawning.

15-05

Section 1.1.1.2, Hatchery Fish Production in the Clearwater River Subbasin, discusses the need to increase runs of naturally-reproducing salmon with the aid of hatcheries.

The use of existing facilities is now being considered as an alternative. See Section 2.2, Use of Existing Facilities Alternative, for updated information.

Sections 1.6.2, and 4.6.1.2, describe how NPTH production fits within the production cap. Summer chinook would exceed the production cap and has been dropped from consideration.

Adjustments that may need to be made with current facilities to improve distribution and increase survivals and adult returns of salmon, while protecting or enhancing listed species, are outside the scope of the EIS.

15-06

Section 1.6.2, The Proposed Recovery Plan for Snake River Salmon, describes how NPTH fits in with the proposed recovery plan. Summer chinook production has been dropped from consideration. Competition with naturally produced listed chinook salmon is described in Section 4.6.1.2, Impacts. In addition, NMFS will address the Biological Assessment for effects in relation to the proposed recovery plan.

15-07

Section 4.6.1.2, Impacts, discusses effects of fish traps, ladders and weirs. The methods for assessing impacts are described in Section 4.6.1.1, Method for Evaluating Impacts. The analysis was conducted using these methods.

15-08

Summer chinook production has been dropped from consideration.

15-09

Section 4.6.1.2, Impacts, describes genetic impacts. Summer chinook production has been dropped from consideration. The term "targeted chinook populations" was defined as part of the methods for evaluating impacts. The term is not intended to be used in reference to ESA definitions.

page 4

15-13 (cont.) Lapwai Creek is a very small stream that is not a suitable spawning site for a mainstem spawner like fall chinook.

15-14 6. Use of ambient water temperatures to incubate spring chinook eggs and for hatchery rearing may produce hatchery fish that far exceed the size of wild salmon.

15-15 7. I applaud the proposals in the NPTH plan to attempt to produce juveniles that are as similar to naturally produced fish as possible. However, mortality is usually quite high from these attempts (higher than the assumed post release mortalities). On page S-19 it states that spring chinook would be released in October at 100 fish per pound. We have attempted an October release in the Tucannon River and we documented less than 10% survival to smolt stage. Even wild fish in the Tucannon River may not have the 50% over winter survival assumed for hatchery releases under the NPTH plan. Releases of fish prior to smolting may conflict with the NMFS recovery plan and the Biological Opinion for the LSRCP program because of the potential for increased predation or competition with naturally produced salmon. These hatchery fish will be sharing habitat with naturally produced salmon for much longer periods of time than with smolt releases, so potential interaction would be increased as well.

15-16 8. The draft EIS is incomplete. Page S-11 states that the exact locations of water sources, discharge lines, ponds, housing, temporary weirs and access roads are not available. It also states additional new facilities may be added later. There should be a process identified that ensures public review and comment for these details.

15-17 9. Page S-23, at the bottom of Table 2, states a 65% or 50% post release survival and double the current smolt to adult survival rates. These rates are not well documented and appear to be overly optimistic.

15-18 10. Page S-24&25, has inadequate discussion of how to determine the number of salmon available to spawn or harvest, and how to obtain appropriate spawning ratios to apply Table 3 broodstock and spawning protocols.

15-19 11. The definition and use of "targeted" chinook is confusing. The summary of potential impacts is listed in Table 5, page S-31. The impacts are not presented for impacts to listed, or naturally produced stocks of chinook (e.g. Snake River summer and fall chinook). The use of Columbia River summer chinook as a target chinook is inappropriate. Table 5 also lists low impact to non-targeted chinook for broodstock selection and maintenance, mating protocols, release methods and numbers, competition, predation, genetic exchange, etc. Throughout the pages that follow Table 5 there are comments that non-targeted chinook are not present or would not be effected. On page S-36 it states that straying into NPTH facilities is not expected to be significant. We have documented a substantial interchange of adult fall chinook between the Clearwater, Snake and Grande Ronde rivers. We suspect that Clearwater

15-10

Summer chinook production has been dropped from consideration.

15-11

As stated in the EIS, the spring chinook broodstock which is proposed to be used would be Rapid River stock. See Section 2.1.3.7, Broodstock Source and Management.

15-12

Further discussion of marking strategies in coordination with other studies in the basin would be conducted with other agencies in the annual planning sessions available (e.g., Outplant meetings, Interagency production meetings).

15-13

See response to 12-20.

15-14

Spring chinook eggs would be incubated in water that approximates the temperature regime of the streams where fish would eventually be released. See Section 2.1.3.3, Rearing Techniques.

15-15

A more thorough discussion on the survival rates is presented in Section 2.1.3.5, Adult Returns. In that discussion, BPA assumes that survival from October release to smolt would be 19.5%. The model takes into consideration loss of fish due to effects of hatchery rearing, as well as loss occurring through overwinter survival in the natural environment.

A biological assessment is part of this EIS, (see Appendix B) and has been submitted to NMFS.

15-16

Final designs would be completed after the Record of Decision and would consider the concerns raised during the NEPA process.

page 5

15-19 (cont.) River releases of fall and summer chinook will interact with, and probably spawn with fall chinook in the Snake and Clearwater rivers. If fall chinook are captured in the Clearwater River by weir, or boat, etc. I suspect Snake River fall chinook will be taken as broodstock. Also, introduced summer chinook may spawn with spring chinook in the Clearwater Basin. The impacts of this program need to be reevaluated, especially with regards to listed, or naturally produced chinook salmon.

15-20 Another potential impact should be reevaluated. The potential impacts listed for fishing is "low" for other salmonids. We are concerned that steelhead fishing in the Snake and Clearwater rivers will be restricted because of future efforts to protect hatchery chinook for broodstock or natural spawning. We do not believe that the potential impacts would be low, as stated, for fishing and recreation. We believe these impacts could be moderate or high.

15-21 12. Pages S37-39. I believe the potential impacts for fish interactions of Columbia River summer chinook to Snake River fall chinook is high. This is not limited to competition of spring chinook populations, as stated. I am concerned that the release numbers are above the current carrying capacity of the system and about the accuracy of the estimate of the natural production capacity.

15-22 13. Under Section 2.1.6.5 Potential impacts to listed species it does not discuss the impacts of this program on listed chinook populations in the Snake River Basin. Columbia River summer chinook will affect listed spring/summer and fall chinook in the Snake River Basin. The EIS should now include potential impacts to steelhead (proposed for listing) and bull trout.

15-23 14. The releases at Cedar Flats seem destined to confound any information gathered from the Meadows Creek direct release program.

15-24 15. The temperature regime as indicated for the Luke's Gulch satellite facility is listed as 62°F, this is much in excess of the desired temperature for chinook rearing. It is indicated that river water would be mixed at a later time, river water may be needed initially to temper the water.

15-25 16. On p s-6 the number of hatchery chinook released would be limited so that when added to the number of wild chinook the total would not exceed habitat capacity. How do you do that? This statement implies they know what carrying capacity is, know how many wild fish are currently rearing, and during broodstock collection how many fish will be the right amount next spring or summer.

15-26 17. On P S-39 In the category of "Reproduction and Genetic Exchange". How can there be a "moderate level of impact" but "Cumulative impacts are not expected"?

15-27 18. On p S-39 Section 2.1.6.5. If you have unlisted species interbreeding and

15-17

Summer chinook production has been dropped from consideration. Section 1.6.1, Endangered Species Act, discusses that NMFS finds that the Snake River fall chinook ESU is made up of a single population which spawns in the mainstem Snake River and in the lower reaches of the major tributaries downstream of Hells Canyon Dam. Therefore, there may be interactions between NPTH fall chinook and Snake River, Clearwater River and Grande Ronde river fish, but they are all considered to be the same ESU. This premise underlies discussion of impacts to fish presented in the EIS.

15-20

Comment noted. If steelhead fishing in the Snake and Clearwater rivers would be restricted because of future efforts to protect hatchery chinook for broodstock or natural spawning, the impacts would be considered to be moderate to high for fishing and recreation in the area. Because BPA has no way of knowing whether steelhead fishing would be curtailed or restricted altogether to protect chinook salmon, the agency cannot assess the impacts on that event. According to Section 1502.22 of the Council on Environmental Quality Regulations, 1992, the agency can only assess environmental impacts of reasonably foreseeable events.

15-21

Summer chinook production has been dropped from consideration.

15-22

Effects on steelhead, spring/summer and fall chinook, and bull trout are described in Section 4.6, Fish, and in the Biological Assessments.

15-23

Summer chinook production has been removed from the proposed program. Fall chinook are expected to spawn in the mainstem during September - November. Spring chinook returns in Meadow Creek are expected to pass the mouth of that drainage by July.

page 6

15-27 (cont.) rearing in the same areas as listed species how can you have "no to low" impacts? ESA recovery does not allow the loss of listed species to be "offset" by the propagation of unlisted ones from outside the ESU.

15-28 19. There are no contingencies listed for phase 2 if and when broodstock collection at the weirs fall short of goals.

Hope the collective comments are useful in preparation of the final EIS. I look forward to receiving a copy.

Sincerely,

Robert W. Foster
Columbia River Coordinator

15-24

True. Thank you for your comment.

15-25

Carrying capacities are displayed in Table 3-8. The number of wild fish would be determined through monitoring adult returns past the weir sites, conducting redd counts and extrapolating for number of young. Production from the hatchery would be adjusted accordingly.

15-26

Summer chinook production has been dropped from consideration.

15-27

Effects on spring and fall chinook are described in Section 4.6, Fish. The fact that there are no listed spring chinook in the Clearwater River is established in Section 3.6, Fish. Listed species of fall chinook would be spawning with listed species of fall chinook. Summer chinook production has been dropped from consideration.

15-28

At that time, NPT would negotiate for egg acquisition from hatcheries. After 5 years of outplanting, Phase II would offer the first real opportunity to use fish returning to the outplant streams as broodstock.

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STATE OF WASHINGTON
DEPARTMENT OF FISH AND WILDLIFE
FISH MANAGEMENT - RESOURCE ASSESSMENT

19 August 1996

TO: Bob Foster, Hatcheries Program

FROM: Anne Marshall, Genetics

SUBJECT: Nez Perce Hatchery E.I.S.

I have reviewed most of the Nez Perce Tribal Hatchery draft Environmental Impact Statement and have several comments on it. Overall however, their proposal to import mid-Columbia "summer" (sub-yearling outmigrant type) chinook for rearing and release in the Clearwater basin raises the most serious genetic concerns. I will first address this subject, and then other genetic or biological issues in the EIS.

15-29

The only description given for the broodstock source of summer chinook is "mid-Columbia stock". Although this is inadequate information for evaluating the basic proposal for a summer chinook component, I am not aware of any Columbia River summer chinook populations upstream of Bonneville Dam that I would find appropriate for transferring onto the Snake River basin. Extensive genetic data have been gathered by the WDFW Genetics Unit for summer-run (subyearling types) chinook from the Klickitat, Wenatchee, Methow, and Similkameen rivers, as well as the hatchery population maintained at the Wells Dam facility. A comparative genetic analysis of these populations with Columbia fall- and spring-run chinook populations is available in a publication enclosed. There has also been considerable genetic work done on the Lyons Ferry Hatchery fall chinook population (e.g. "Status Review for Snake R. Fall Chinook Salmon" by Waples et al. 1991, NMFS Technical Memorandum), and also on wild-spawned Snake River fall chinook outmigrants (see progress reports for a BPA funded project "Upstream Passage, Spawning and Stock identification of Fall Chinook in the Snake River"; and unpublished data, A. Marshall (WDFW) and B. Connor (USFWS)).

Results from this research are relevant to the summer chinook proposal for the Nez Perce project. Generally, summer chinook from populations in the mid- and upper Columbia show insignificant levels of genetic differentiation (40 allozyme loci) from fall chinook populations in the same areas. Although these summer chinook spawn approximately a month earlier than most fall chinook and usually in different ares, indicating some reproductive isolation, the genetic data imply that isolating mechanisms have not been in place long enough for stock-specific genetic characteristics to develop. For most of the populations, if isolation and

15-29

Summer chinook production has been dropped from consideration.

page 8

15-29 (cont.)

differentiation had existed in the past, stock transfers and hatchery activities since the 1940's could have easily disrupted them. One population that did show a low level of divergence was the Wenatchee summer chinook. In recent times they have been geographically isolated from fall chinook and not subject to fall chinook transfers, and thus could be in the process of genetic divergence. In a recent WDFW Technical Report, Chapter D, "Genetic Diversity Units and Major Ancestral Lineages of Chinook Salmon in Washington", we chose to identify the upper Columbia summer chinook as a separate Genetic Diversity Unit even though genetic differentiation from fall chinook was minimal. We believed that the differences in geographic distribution, adult return-timing and spawn-timing were valuable characteristics, and that they had the potential to allow for divergence should future natural selection for them occur.

Transferring summer chinook into the Snake River basin, Clearwater drainage, would likely create a high risk of genetic "contamination" for the wild fall chinook and the Lyons Ferry Hatchery fall chinook populations. Although return- and spawn-timing of the summer chinook source stocks are, on average, earlier than fall stocks from the same rivers, heritability levels of these traits is unknown. More importantly, the expression of these traits under different environmental conditions in the Snake basin could be altered. I believe that the opportunity for transplanted summer chinook to reproduce with native fall chinook, or to be crossed in a hatchery with fall chinook would be unacceptably high. Also, cumulative impacts should be expected (see p. 4-41).

15-30

The Lyons Ferry Hatchery fall chinook population is genetically differentiated from upper Columbia wild and hatchery fall populations, and from summer-run populations. Recent, unpublished genetic data from three years' samples of 0-age, fall chinook outmigrants, progeny of wild spawners upstream of Lower Granite Dam, indicate that they are also genetically distinct from upper Columbia fall and summer populations. These fall chinook have already been identified as important genetic resources through the ESA listing process, and it would be unacceptable to put them at risk of 'hybridization' with a non-local, genetically divergent, summer-run stock.

Perhaps the best, but more long range, opportunity for the Nez Perce Tribe to promote the development of summer-run chinook in the Clearwater River, would come from their work to build a large, self-sustaining fall chinook population. The premise being that summer and fall run, subyearling outmigrant-type, chinook are closely related genetically, and that natural variation in life-history parameters occurring in a fall-run group can be advantageous in certain environments, and could lead to the natural development of a summer-run component. The draft EIS claims (p. 3-28) that Clearwater River temperature regimes are well-suited to earlier spawn-timing and juvenile outmigration-timing, so perhaps selection pressures on fall chinook planted in the basin with variation in these traits would be high.

15-31

The mating protocol proposed for the overall hatchery program calls for mixing hatchery-origin fish with wild-spawned fish in particular ratios outlined in Table 2-3. It is claimed that this strategy is required to maintain long-term genetic fitness. I am not aware of any data from

15-30

Summer chinook production has been dropped from consideration. The NPTH Program would attempt to encourage the run suggested.

15-31

See response to 12-12. The fact that the total number of adults returning to the Tucannon is low is not surprising given that the total number of adults, of hatchery and wild origin, anywhere in the Snake River has been low. They are all subject to similar migratory conditions.

page 9

15-31 (cont.) other salmon hatchery programs that provide any support for this hypothesis. On the contrary, there is more evidence that swamping the gene pool of a wild population with even local-origin hatchery fish does not aid in increasing survival of progeny, especially where environmental sources of stress and mortality are high. The efforts of the Tucannon Hatchery spring chinook program may be an example of this, where wild-origin fish have always been incorporated into the hatchery broodstock, yet the total number of returning adults has not increased.

These concerns about the removal of wild fish from wild spawning populations and the disruption of valuable wild gene pools may not be so relevant since their projects for spring and fall chinook are proposed for areas that have few if any established wild fish populations, and it will likely be many years before they have any substantial numbers of naturally produced progeny that return to spawn. However, I believe their broodstock practices should be labeled as experimental, with a goal of evaluating effects on establishing and enhancing natural production.

15-32 The following is a miscellaneous group of questions or comments. The proposal states that the number of hatchery chinook released would be limited so that they plus any wild chinook would not exceed habitat carrying capacity. I could not find information on what they proposed to do with the excess hatchery fish that they could not release. This needs to be clearly outlined.

15-33 The proposal states that fall and summer chinook would need an accelerated (=unnatural) schedule of incubation and growth so that released smolts can avoid poor passage conditions in the lower Snake River. Given this scenario, how do they expect fish that are eventually allowed to spawn naturally to survive well in the Clearwater, and become self-sustaining? Is there any indication that these passage conditions are going to be changed to the benefit of chinook life-history?

15-34 In their table of expected adult returns, they have assumed a smolt to adult survival rate that is double the current rate. They base this on an untested hypothesis that the fish raised in their program will acquire "a fitness advantage due to extended rearing in the wild". It seems like the largest sources of juvenile and smolt mortality in the Snake and Columbia are physical passage problems at dams, and environmental and predation problems in reservoirs. It seems unlikely that longer in-stream rearing will combat these problems, especially since wild Salmon River spring chinook and wild Snake River fall chinook are currently experiencing poor survival. I think they are unwise and unfounded in assuming a doubling of the rate, and should use revise their calculations.

15-35 Regarding harvest management, they propose that "surplus hatchery fish would be targeted, allowing weaker wild stocks to rebuild to self-sustaining levels". This seems somewhat contradictory to the way wild-produced fish are treated in hatchery production, in that weaker wild stocks are not exactly "allowed" to rebuild, but are removed (up to 100%) from wild production and taken into the hatchery. Perhaps their objectives or intentions need to be stated

15-32

The Supplement to the Nez Perce Tribal Hatchery Master Plan (Johnson, et al., 1995) describes the disposition of hatchery fish in years with surplus production. The Decision Tree from the Supplement is included in Appendix F.

15-33

Fish do survive now. The NPTH was designed with the assumption that the salmon recovery efforts would be successful.

15-34

See revised discussion in Section 2.1.3.5, Adult Returns.

15-35

Section 2.1.3.7, Broodstock Source and Management, and Appendix C describe the rationale for broodstock management to avoid genetic risks and for bringing fish into the hatchery

page 10

differently.

15-36 There is an error in the third sentence, second paragraph, p.3-29, about water temperatures and spawn-timing. The meaning of the sentence is a bit unclear and 14° C does not equal 37° F.

Attachment included

when they drop below a certain level.

15-36

Thank you for your comment. The text has been corrected.

American Fisheries Society Symposium 17:149–165, 1995

Genetic Population Structure and History of Chinook Salmon of the Upper Columbia River

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Abstract.—Chinook salmon *Oncorhynchus tshawytscha* that return to the upper Columbia River (upstream from the confluence of the Yakima River) are considered from the perspectives of allelic variation at 32 polymorphic loci, historical activities within this region, and ancestral affinities to downstream populations. Collections of summer–fall-run fish are distinguished from spring-run fish by an eightfold greater genetic distance between groups than exists within either group. Each group was related to but remained distinct from adjacent downstream groups within different major ancestral units, previously identified throughout the Columbia River. Summer–fall-run fish are most closely related to fall-run fish of the mid-Columbia and Snake rivers, and spring-run fish to the spring–summer-run fish of the Snake River. In both groups, the present geographic distributions and genetic population structures within the upper Columbia River reflect translocations, confinements, and cultural activities between 1939 and 1943 under the Grand Coulee Fish Maintenance Project, and subsequent introductions and fish culture. The considerable genetic homogeneity within the summer–fall-run group appears to have been maintained through past and present interbreedings and strayings over a single continuous run. Some degree of genetic distinction persists between cultured and wild spring-run fish; the cultured fish are genetically indistinguishable from their ancestral source of the downstream Carson Hatchery, derived during the 1950s from fish returning to the upper Columbia and Snake rivers. The entire summer–fall-run group and the wild component of the spring-run group qualify for consideration as different evolutionarily significant units. Suggestions to conserve the genetic variation within these groups focus on measures that restrict excessive gene flow and permit maintenance and development of local adaptations.

The Columbia River is the largest river entering the Pacific Ocean from North America, draining 670,810 km^2 of the northwestern United States and southwestern Canada (Figure 1). Historically, this drainage supported the world's greatest runs of chinook salmon *Oncorhynchus tshawytscha*. The present distribution of returning fish in spring, summer, and fall modes contrasts with a continuum of returns and a summer mode recorded in the nineteenth century (Thompson 1951). This altered distribution and an overall numerical decline has been attributed to the combined effects of overharvest and habitat degradation (Mullan 1987; Nehlsen et al. 1991). The currently depleted number of summer-run fish has stimulated petitions for their protection under the U.S. Endangered Species Act (ESA; 16 U.S.C. §§ 1531 to 1544; Rohlf 1993). An adequate understanding of the ancestral relationships among geographically and temporally isolated chinook salmon populations, particularly within the drainages of the upper Columbia River, is a necessary component of response to these petitions (Waples 1991).

We examine relationships among chinook salmon populations of the upper Columbia River. Biochemical genetic data from 16 summer-run, fall-run, and spring-run collections identify two distinct groupings consistent with those indicated from previous studies in Figure 2. We relate these observations to historical fishery management in the region and discuss the relationships of these groups to other populations, their relevance as evolutionarily significant units (ESUs), and appropriate management strategies.

Background

Biochemical Genetic Studies

Biochemical genetic studies involving chinook salmon populations of the Columbia River have

SEP 5 1996

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
ENVIRONMENTAL & TECHNICAL SERVICES DIVISION
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RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG#: NEZP 02-016
RECEIPT DATE: SEP 12 1996

F/NWO3

Leslie Kelleher
Bonneville Power Administration
PO Box 3621
Portland, Oregon 97208-3621

RE: Review of Nez Perce Tribal Hatchery Final Draft EIS

Dear Ms. Kelleher:

16-01 As requested, we have reviewed the Final Draft Environmental Impact Statement (EIS) on the Nez Perce Tribal Hatchery (NPTH), published by the Bonneville Power Administration (BPA 1996). We previously submitted comments (Smith 1996) on an earlier draft (BPA 1995). We have noted that most of our earlier comments were used in preparation of the current final draft, and we appreciate that our input was considered. Overall, the Final Draft EIS is well-organized, well-written and provides a thorough, up-to-date description of the proposed projects.

There are several items in the Final Draft EIS that we would like to address:

- **Section 1.6.2, page 1-14, Proposed Recovery Plan and production ceiling:**

This section provides a good overview of how the NPTH Master Plan relates to the Proposed Recovery Plan for Snake River Salmon (Schmitten et al. 1995). However, we would like to clarify the discussion of the production ceiling as described in the Proposed Recovery Plan.

16-02 Item 1.6.2 of the Final Draft EIS states that "Production of fall chinook from Lyons Ferry Hatchery is designed to support natural production of endangered Snake River salmon, and appears to qualify for exemption from the limit. Spring chinook production is included within the hatchery cap. Summer chinook production would exceed the hatchery cap."

It is unknown, however, whether any of the proposed NPTH production programs would exceed the production ceiling since this depends on total production within both the Snake and Columbia River Basins. The NMFS is in the process of completing a Final Recovery Plan and specific recommendations regarding the production ceiling may be different from those in the Proposed Recovery Plan.

16-01

Thank you for your comment.

16-02

NMFS will make a determination in the biological opinion about how proposed production will meet the production cap. Summer chinook production has been dropped from consideration.

16-02 (cont.)

The Proposed Recovery Plan (Schmitten et al. 1995) and 1995-1998 Hatchery Biological Opinion (NMFS 1995) specify an anadromous salmonid production ceiling of 20.2 million in the Snake basin, which is part of an overall 197.4 million ceiling in the Columbia basin. These numbers are based on actual production in 1994; they do not include "production to support recovery" (i.e., propagation of listed stocks), or releases of resident fish such as rainbow trout. Although they are not considered listed under the ESA, Lyons Ferry Hatchery fall chinook are considered part of the Snake River fall chinook Evolutionarily Significant Unit (ESU). It is our understanding that their propagation is intended to promote recovery of natural Snake River fall chinook salmon. Therefore, this could be considered "production to support recovery" and should be exempt from the production ceiling. The spring and summer chinook salmon stocks proposed for propagation in the NPTH are not listed and would not be considered "production to support recovery" of listed species. Summer chinook, therefore, would not be exempt from the production ceiling.

Total production of non-listed anadromous salmonids within the Snake River Basin in 1995 was 19.6 million, which includes 18.6 million described in the existing BiOp, plus 700,000 coho fingerlings and 290,000 steelhead fry covered in subsequent informal consultations. The 1995 total was only 600,000 below the production ceiling of 20.2 million. Total 1996 releases in the entire Columbia River Basin are approximately 173.5 million, of which 14.2 million are in the Snake River Basin (NMFS 1996), well below the production ceiling. The expected total releases in future years are unknown as hatchery programs change throughout the Columbia River Basin. Consequently, it is unknown whether any of the proposed NPTH production programs would exceed the production ceiling since this depends on total production within both the Snake and Columbia River Basins.

It is possible that the production ceiling policy will be amended when the Final Recovery Plan is completed in 1997, but for now it remains in effect, and will be an item for consideration when Endangered Species Act (ESA) consultation on the NPTH proceeds. However, it should be noted that the purpose of the production ceiling is to address the question of overall carrying capacity and is not intended as a means to inhibit specific programs.

- **Item 2.1.3.6, Broodstock source and management:**

Fall chinook:

16-03

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, page V-4-22). Therefore, NMFS has indicated support for the Nez Perce Tribe's proposed fall chinook

16-03
Comment noted.

3

16-03 (cont.) supplementation programs. Although it is not part of the NPTH program proposed by BPA, NMFS also supports development of the fall chinook acclimation and release facilities at Pittsburg Landing on the Snake River, Big Canyon on the Clearwater River, and other sites (Stelle 1995). The allocation of Lyons Ferry Hatchery production among on-station releases and acclimation sites has been addressed in a recent fall chinook management agreement (CRITFC 1996).

Summer chinook:

16-04 As stated in our earlier letter (Smith 1996), NMFS has serious concerns with the proposal to transplant mid-Columbia stock summer chinook into the Clearwater Basin. The proposed release locations (Lukes Gulch and Cedar Flats) appear to be 30 to 50 miles upstream of current Snake River fall chinook critical habitat. However, mid-Columbia summer chinook and Snake River fall chinook have similar "ocean-type" life histories and appear to overlap somewhat in spawn timing. It is possible, therefore, that the introduced summer chinook would stray and spawn with the Snake River fall chinook in the lower Clearwater or elsewhere. Therefore, NMFS would not support the transfer of mid-Columbia summer chinook into the Clearwater Basin and strongly recommends that it be dropped from the proposed NPTH program because of potential genetic introgression with listed fall chinook. The transfer of Mid-Columbia summer chinook into the Snake River Basin would be a major consideration when ESA Section 7 consultation proceeds for the Nez Perce Tribal Hatchery.

Spring chinook:

16-05 NMFS generally supports the proposed spring chinook supplementation, assuming that the programs can fit within the Snake River Basin production ceiling and that the question of appropriate stock to use in each subbasin is agreed to by co-managers. Given the above, NMFS would support development of the Yoosa/Camp Creek, Newsome Creek, and Mill Creek sites as spring chinook acclimation/release and/or adult collection satellite facilities.

- **Item 1.6.8, ESA Section 7 consultation:**

16-06 As noted in Item 1.6.8 of the draft EIS, the NPTH was not included in the current comprehensive 1995-1998 Hatcheries Biological Opinion (NMFS 1995), because ESA Section 7 consultation had not been initiated at the time the BiOp was prepared. ESA Section 7 consultation is appropriate for this project because BPA, a federal entity, is directly funding the proposed action. Before the project proceeds BPA should prepare a Biological Assessment (BA) which describes the potential impact of the project on listed Snake River salmon. Based on the information presented in the draft EIS the BA could conclude that

16-04

Summer chinook production has been dropped from consideration.

16-05

Thank you for your comment.

16-06

The Biological Assessment has been completed and is included in the EIS (see Appendix B). BPA has requested formal consultation from NMFS.

4

16-06 (cont.) the project "may affect" listed Snake River salmon. BPA would, therefore, request formal Section 7 consultation with NMFS. The NMFS would then prepare a Biological Opinion in response to the BA and the ESA Section 7 consultation process would be completed. It should be noted that a similar Section 7 consultation with BPA was recently completed for the Cle Elum Hatchery on the upper Yakima River in Washington (BPA 1995, Stelle 1996).

- **Proposed listing of Snake River steelhead:**

16-07 It must be noted that several ESU's of steelhead were recently proposed for listing under the ESA, including Snake River steelhead proposed as threatened (NOAA 1996). When BPA requests ESA Section 7 consultation with regard to the listed Snake River salmon species (fall chinook, spring/summer chinook, and sockeye), BPA should also consider ESA Section 7 "conferencing" with regard to the steelhead proposed for listing. ESA Section 7 conferencing provides a means for federal entitites to discuss the possible effects of actions on species before a final listing determination is made. We would be happy to discuss further the ESA Section 7 consultation and conferencing procedures with BPA and NPT staff as needed.

Thanks again for the opportunity to review the NPTH Final Draft EIS. If you have any questions or comments, please contact Moe Nelson at (503) 231-2178.

Sincerely,

Stephen H. Smith, Chief
Hatcheries and Harvest Branch

cc:
NOAA F/NWO3 - File copy, D.M. Nelson, S. Smith, M. Delarm
NOAA CS - D. Wieting
BPA - B. Austin, J. Bauer, R. Westerhof
NPT - D. Johnson

16-07

Comment noted. BPA and the Nez Perce Tribe are in the process of consulting with NMFS.

References

BPA. 1995. Nez Perce Tribal Hatchery Program, Draft Environmental Impact Statement. December, 1995. DOE/EIS-0213.

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

Smith. S. 1996. Letter from S. Smith, NMFS, to L. Kelleher, BPA, dated January 29, 1996, with comments on NPTH draft EIS.

Stelle, W.. 1995. ESA Section 7 informal consultation letter from W. Stelle, NMFS, to W.F. Shake, USFWS, dated November 6, 1995, regarding operation of the Pittsburg Landing acclimation site.

Stelle, W. 1996. ESA Section 7 informal consultation letter from W. Stelle, NMFS, to M. Armbrust, BPA, dated April 1, 1996, regarding construction and operation of the Cle Elum Hatchery.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
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Portland, Oregon 97232-4181

IN REPLY REFER TO:

SEP 2 3 1996

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG#: NEZP-02-017
RECEIPT DATE: SEP 2 5 1996

Bonneville Power Administration
Public Involvement Office - CKP
P.O. Box 12999
Portland, Oregon 97212

September 13, 1996

Subject: Nez Perce Tribal Hatchery Program (NPTH)
Draft Environmental Impact Statement (DEIS)

Thank you for incorporating many of our comments on the preliminary DEIS into this draft. We have reviewed your DEIS and offer the following comments for consideration.

17-01 The DEIS considers five alternatives but eliminates three from further consideration and analyzes only the proposed action and the "No Action" alternatives. The Service believes that there are other actions besides the proposed action that potentially could meet the purposes identified in Section 1. The "Use of Existing Hatcheries" and "Natural Habitat Enhancement and Restoration" alternatives should not have been eliminated from further consideration. The explanation for eliminating the "Use of Existing Hatcheries" alternative does not consider the potential for modifying Clearwater basin hatcheries or making programmatic changes to accomplish the purposes of the DEIS. Consideration should also be given and analysis completed for the use of existing facilities outside the basin. Facilities located outside the basin may be appropriate for incubation or rearing activities, eliminating the need to construct new hatchery facilities within the basin.

17-02 It appears that the DEIS analysis of the proposed alternative takes into consideration improvements in migration conditions in the Lower Snake River and the Columbia River downstream of the Snake River confluence. Elimination of the "Natural Habitat Enhancement and Restoration" alternative appears to have been without considering improvement of migration conditions. Such improvements would make this alternative a feasible action that could accomplish the purposes set forth in Section 1. Therefore, the "Natural Habitat Enhancement and Restoration" alternative should not be eliminated from further consideration and analysis.

17-03 I would like to reiterate our comment that until improvements in the migration corridor are made, we do not believe that the NPTH will return adult fish any better than hatcheries already existing in the Clearwater basin. When improvements in the migration corridor are made, return rates for existing hatcheries will improve, thereby providing additional fish for sport and tribal harvest. Natural production in the remaining habitat will also improve thereby providing enough adults to meet the carrying capacity of the streams, so some discussion of the fate of the NPTH at that time should be discussed. Will it be converted to a harvest augmentation hatchery, used for resident fish production, etc.? Will the changed hatchery practices comply with the Integrated Hatchery Operations Team (IHOT) Policies?

17-01

See response to 19-01. All comments below are addressed in responses to comment letter 19 which represents the Department of Interior's formal comments.

17-02

See response to 19-02.

17-03

See response to 19-03 - 19-07.

Bonneville Power Administration Page 2

17-04 The discussion of hatchery practices in Section 1.1.1.2 is misleading. The term "traditional hatcheries" should not be used. Each hatchery is a tool to replace one or more critical factors in the life cycle of the fish and therefore operated to meet that goal.

17-05 The descriptions of Dworshak and Kooskia National Fish Hatcheries in Section 1.1.1.2 should identify these facilities as mitigation hatcheries. Their purpose is to mitigate for the fish that spawned and spent the freshwater part of their life cycle in habitat of the North Fork that is no longer available.

17-06 The hatchery practices described in Section 1.1.1.2 are especially misleading, they are against basin wide policy, and many have not been used in twenty years. Some of Section 2.2 (2.3.2) should be moved to this section.

17-07 It should be made clear that the National Marine Fisheries Service (NMFS) "suggestion" to revise rearing techniques in the Columbia Basin is based on their priority to speed the restoration of listed populations that have declined due to poor migration conditions over their responsibility to mitigate for permanently lost habitat. Such revisions would be for recovery purposes and would not satisfy mitigation needs. Hatcheries designed for mitigation purposes were not designed to produce fish for restoration. Although they are already in existence and can be used, it may be more cost effective to construct a new hatchery than convert an old one for recovery purposes.

The discussion of NMFS "suggested" rearing techniques should indicate that they are based on a theory that if the hatchery conditions mimic the wild, the fish will be better suited for restoration purposes. While this premise has merit, and it may be possible to construct and operate a hatchery that mimics wild habitat, under existing technology it would be more expensive than restoring degraded existing habitat. Some of the practices listed are affordable and should be used in the NPTH to produce fish that will be used to repopulate empty habitat. These practices will not compensate for the poor survival in the migration corridor. Hatchery protection cannot replace poor migration conditions and if fish are returning to good spawning and rearing habitat a hatchery becomes unnecessary.

17-08 Section 1.6 (Relationship to other Plans) should include a section on the relationship of the Nez Perce hatchery practices to the IHOT hatchery practice policies adhered to in the existing production plans.

17-9 In Section 1.6.6 it should be made clear that the NPTH monitoring and evaluation plan uses the same streams as control streams as the Idaho Salmon Supplementation Studies. The paragraph now reads as if fish could be released in a control stream.

17-10 The DEIS assertion that the NPTH program would be undertaken as a measure under the Northwest Power Act (NPA) and is independent of the United States Columbia River Fish Management Plan (CRFMP) duties is incorrect. Clearly the CRFMP is pertinent to every fish production program designed to rebuild upriver anadromous runs and explicity sets forth

17-04
See response to 19-14.

17-05
See response to 19-13.

17-06
See response to 19-14 and 19-15.

17-07
See response 19-08 - 19-10.

17-08
See response to 19-16.

17-09
See response to 19-8.

17-10
See response to 19-19.

17-10 (cont.)

coordinated procedures between the Parties for the planning and implementation of existing and future production programs. In and of itself, the CRFMP is not a mitigation or restoration effort; it intends to coordinate those various state, tribal, and federal efforts towards rebuilding and harvest allocation goals set forth in the CRFMP. The CRFMP is indeed a "framework within which the Parties may exercise their sovereign powers in a **coordinated and systematic manner** to protect, rebuild, and enhance upper Columbia River fish runs while providing harvests for both treaty Indian and non-Indian fisheries".

Clearly the CRFMP recognizes existing, and anticipated new, state, tribal, and federal programs affecting fish restoration. The CRFMP was created in part to provide the coordinated inter-party forums the Technical Advisory Committee (TAC); the Production Advisory Committee (PAC); and the Policy Committee to ensure thoughtful, mutually agreed-upon, and biologically sound fishery restoration and run rebuilding programs from these various programs. In Section I.B.4. under the Scope and Nature of the Agreement, the CRFMP recognizes that several federal and state laws require fisheries protective, mitigative or enhancement measures or affirmatively promote development of comprehensive and joint inter-party fisheries management and propagation plans and programs. It states the Parties "pledge to confer with each other and to use their best efforts to see that mutually acceptable provisions that will promote the earliest feasible achievement of the rebuilding and harvest sharing objectives specified in this Agreement are included in the plans and programs required or adopted under those laws". The DEIS claims that since this facility is constructed under the NPA it is independent of the CRFMP. It is also clear within the NPA that the Council and Bonneville Power Administration must ensure program consistency and approval with affected states and sovereigns. Therefore, the NPA is yet another federal law that would require close coordination and implementation of fishery enhancement programs that are mutually acceptable to the responsible fishery comanagers and sovereigns.

Further support for including the NPTH within the scope of the CRFMP are found in other sections. Section III. Artificial and Natural Production of the CRFMP clearly sets forth procedures and actions required for the planning and implementation of **present (at the time of the agreement) and future artificial production programs**. Some of these include:

1. In Section A. "Purpose", Present **and future** artificial production programs shall be integrated with natural production as described herein".

2. The PAC is to develop an Annual Brood stock Planning Report that coordinates state, federal, and tribal artificial and natural/wild fish production actions for each designated subbasin and artificial production facility.

3. In Section C. "Subbasin Plans" it states harvest and production management plans for each subbasin will be developed cooperatively by the affected state, tribal, and federal entities in consultation with other relevant entities.

4. In Section D. paragraph 3 of "Artificial Production Modifications" it states that the parties agree to identify long-term program adjustments in addition to those identified in Appendix B, including expansion of or additions to existing hatchery programs necessary to meet identified fish supplementation needs of the Parties. These long-term needs shall be designed to compliment harvest, production, and rebuilding needs of this Agreement.

17-10
0 (cont.)

In Section IV.B. Procedures for the PAC it states that "Coordination of production and harvest management is essential to the successful implementation of this Agreement". It also states that PAC is hereby established to coordinate information, review and analyze existing and future artificial and natural production programs **pertinent** to this Agreement and to submit recommendations to the management entities. As stated in the Purpose under Section III. Artificial and Natural Production, it is the intent "....of the Parties to develop and implement those agreed-to production orientated actions to achieve the goal of rebuilding upriver anadromous runs ...." As the Nez Perce hatchery is being designed for just such a purpose its production **is pertinent** to this Agreement and subject to the requirements of the Agreement.

Finally, not only is the language of the CRFMP clear on how new and future production shall be coordinated and therefore subject to the terms of the agreement but the Nez Perce Tribe has and is using the existing CRFMP policy and biological review processes of the Policy Committee and the PAC to obtain consensus for moving forward with the planning for the facility. It follows no logic path at this time to claim it will not be subject to the terms of the CRFMP when it becomes operational.

17-11

Section 2.1.3 that discusses hatchery operations should address the relationship between the NPTH hatchery operations and those of the IHOT basin wide policies. Section 2.1.3.1 is unclear when it states that the disease control and monitoring would conform with IHOT policies. Does this mean they will comply with all IHOT fish health requirements (i.e., transport permits etc.)?

17-12

Some discussion of the process for determining the trade offs in use of the carrying capacity of the habitat between populations that exist now and the effects of the proposed hatchery programs should be presented in the section on release techniques.

17-13

There are still contradictory statements regarding fall chinook salmon. On page 3-30 (end of the second paragraph) states that fall chinook from the Clearwater River may be adopting more of a "stream-type" life history by migrating the following spring (The draft should reference literature or include in the appendices the data this is based on). Whereas, page 3-45 in the Potential Production paragraph you are trying to justify the minimal amount of fry habitat available in the Clearwater River by stating that fall chinook migrate during their first year anyway. Which is it, do they migrate during their first year or the following spring? The amount of available fry habitat in the Lower Clearwater River (below Cherrylane) should be fully evaluated given the plan to release 1,500,000 subyearlings. Even if the subyearlings do migrate during their first year, they rear 1-3 months before beginning their migration.

17-11

See response to 19-16 and 19-21.

17-12

See response to 19-22.

17-13

See response to 19-24 and 19-25.

Bonneville Power Administration Page 5

17-14 We still disagree with the redd estimate of 95,000 (pg 3-45) and believe it is more likely 3,600 redds. The DEIS also does not mention the emigration problem for juveniles from the Clearwater River specifically. The best minimum survival (Pit-tag detections at dams) we have seen from Clearwater River sampling is 19.1%. As you noted, fall chinook emerge and emigrate later from the Clearwater River, than from the Snake River. Therefore they are subjected to lower velocities, higher water temperatures, greater predator and disease susceptibility, and may revert to parr before reaching the Columbia River estuary.

17-15 The appendix A, Monitoring and Evaluation section appears to be incomplete.

We appreciate the opportunity to comment on this DEIS and look forward to the final. If you have any questions or need additional information, please contact Dan Diggs at (503) 872-2766.

Sincerely

William F. Shake
Assistant Regional Director - Fisheries
Columbia Basin Ecoregion

17-14
See response to 19-26.

17-15
See response to 19-27.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

JAN [illegible] 1997

Reply To
Attn Of: ECO-088

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG#: NEZP-02-018
RECEIPT DATE: FEB 03 1997

Public Involvement Manager
Bonneville Power Administration
P.O. Box 12999
Portland, Oregon 97212

Re: **Bonneville Power Administration's Draft Environmental Impact Statement (EIS) for the Nez Perce Tribal Hatchery Program**

Dear Sir or Madam:

The Environmental Protection Agency has conducted a limited review of the draft EIS for the Nez Perce Tribal Hatchery. Our review was conducted in accordance with the National Environmental Policy Act and our responsibilities under Section 309 of the Clean Air Act.

The Proposed Action is to build and operate the Nez Perce Tribal Hatchery. The purpose of the Proposed Action is to restore naturally-reproducing salmon to the Clearwater River. The draft EIS evaluated the construction and operation of the proposed Nez Perce Tribal Hatchery Program. This is a supplementation program that would rear and release spring, summer and fall chinook, biologically similar to wild fish, to reproduce in the Clearwater River Subbasin. The draft EIS also evaluates the No-Action Alternative.

Based on our review, we are rating this draft EIS EC-2 (Environmental Concerns-Insufficient Information). Our environmental concerns are based on the potential for adverse impacts to existing fisheries resources. We have requested additional information on fisheries impacts, mitigation and monitoring. An explanation of the EPA rating system for draft EISs is enclosed for your reference. This rating and a summary of these comments will be published in the Federal Register.

2

We appreciate the opportunity to review and provide comments on this draft EIS. If you have any questions about our review comments, please contact Cara Berman at (206) 553-6246 or Larry Brockman at (206) 553-1750.

Sincerely,

Richard B. Parkin, Manager
Geographic Implementation Unit

Enclosures (2)

18a

U.S. Environmental Protection Agency (EPA), Region 10
Detailed Review Comments
Nez Perce Tribal Hatchery
Draft Environmental Impact Statement (EIS)

18-01 (1) The Proposed Action alternative should be analyzed and assessed according to its ability to reduce the range of documented risks to salmonids posed by traditional hatchery programs as well as supplementation programs.

18-02 Nehlsen et al. (1991) state that management efforts should focus on conservation of ecosystems through perpetuation of natural reproduction of wild stocks (e.g., flow re-allocation, improved fish passage). A comprehensive strategy targeting basic habitat integrity and ecosystem processes needs to be stressed in management plans rather than single species augmentation. Recent studies (Emlen 1990) have indicated that artificial production alone cannot sustain anadromous stocks, and may actually contribute to the decline of native salmon populations. Increased salmonid production will not necessarily lead to increased adult returns if habitat degradation, reduced flow regimes, altered genetic and demographic structure and dam passage concerns are not addressed.

18-03 Hatchery programs generally do not provide anticipated production benefits (Hilborn 1992). Chilcote et al. (1986) documented diminished reproductive success of hatchery reared steelhead trout. Based on these results they concluded that hatchery fish may negatively affect the genetic integrity of wild fish when hatchery and wild fish compete on the spawning ground. In addition, there is consistent evidence that hatchery produced salmonids vary genetically from their indigenous source populations. This has been attributed to genetic drift arising from small broodstock numbers or as well as broodstock selection processes occurring in the hatchery (Gharrett and Smoker 1991, Chilcote et al. 1986). As salmon are highly adapted to local spawning and rearing conditions, genetic drift may lead to decreased reproductive success and fitness (Utter et al. 1989). It is important to note that supplementation strategies may also lead to decreased population fitness (Kapuscinski,A.R., 1997). Because supplementation encourages ecological interaction and interbreeding between hatchery-propagated and naturally spawning fish, supplementation programs make it difficult to avoid the range of genetic, demographic, behavioral, ecological and other biological problems posed by traditional hatchery programs.

18-04 (2) Prior to the development of a hatchery operation plan, specific project related impacts are difficult to assess. The hatchery operation plan should be submitted for peer review. Hatchery operations may alter population size and long-term population stability through a number of mechanisms including the collection of broodstock during low return years as well as increased commercial and recreational catch during high return years (i.e., the Tribal Hatchery Program would increase harvest

18-05 potential). Operational impacts may lead to decreased genetic

18-01

The Proposed Action was evaluated according to its effects on the fisheries resource of the affected environment. Fisheries effects derived from the Proposed Action were discussed in relation to four major sources: 1) the design, siting, and construction of hatchery facilities, 2) hatchery operations and management, 3) fish interactions, and 4) human-fish interactions. These four sources of effects are further broken down into several principal categories and they are described in detail in Section 4.6, Fish. The discussion focuses specifically on risks to salmonids posed by this supplementation program. Where effects are determined to be significant, mitigation requirements are recommended to reduce the risk on the fisheries resource.

18-02

BPA agrees that ecosystem function and health need to be restored in all parts of the salmon's life cycle, from gravel-to-gravel. However, BPA believes, as do others in the Columbia River Basin (see NMFS, 1995 and Nez Perce Tribe, et al., 1995), that supplementation hatcheries can aid in restoring populations, especially in underseeded or vacant habitat. The existing condition of the Clearwater Subbasin is discussed in Section 3.6, Fish. The success of NPTH, as well as other hatcheries and wild runs of anadromous salmonids in the Clearwater River Subbasin and the Snake River Basin in general, is ultimately dependent on salmon recovery efforts.

18-03

NPTH developed a set of guidelines for Hatchery:Natural spawning ratios to address these problems, yet still allow the program to allow an increase in natural production. These are discussed in Appendix C. In addition, the M&E Plan addresses risks posed to the naturally spawning population by NPTH activities. Although it may indeed be difficult to avoid risks, the M&E activities allow for detection of impacts and an evaluation of changes needed to eliminate or minimize such risks.

18-04

A hatchery operation plan has not been completed and is dependent upon the outcome of the Record of Decision. Should the proposed

18-05 (cont.) variability, increased intra- and inter-specific competition, and altered community dynamics. The operations plan should include: hatchery stock selection criteria, identification of subpopulations collection methodology, minimum escapement levels, maximum catch limits, effective population sizes, juvenile release schedule, estimated stocking densities.. To detect

18-06 individual and population level effects, a monitoring plan including Quality Assurance/Quality Control plan, baseline genetic data, genetic monitoring procedures, monitoring duration, contingency plans, management feedback loops as well as a monitoring strategy for non-genetic impacts should be developed. Additionally, a supplementation target including time frame should be identified that when reached would halt further

18-07 artificial propagation activities. The final EIS should include a peer reviewed monitoring plan.

18-08 (3) As mentioned previously (#2) the final EIS should include contingency measures. If project associated risks (e.g., genetic demographic, behavioral) are not reduced or alleviated will management measures be modified the scope of project be reduced, or will the project be curtailed? Several potential adverse impacts may require several generations to be detected. Therefore, rapid alteration of supplementation plans to reduce impacts may not occur. As hatchery related impacts may be significant, the final EIS should address contingency planning and monitoring sensitivity.

18-09 (4) The final EIS should discuss possible ramifications of transporting juvenile salmonids to various satellite rearing facilities and hence various water regimes. The precise timing of olfactory imprinting is unknown. However, it is believed that imprinting occurs at several early life history stages, i.e., that it is sequential. Proposed hatchery operations may not provide juvenile salmonids with the appropriate cues to successfully home to "natal" streams (i.e., increased risk of straying). The final EIS should provide a justification of early life history operation strategies, potential risks, and an operations schedule.

18-10 (5) The draft EIS states that, "disease transmission from hatchery to non-hatchery fish is believed to be low since the pathogens responsible are already present in both groups of fish,..." This statement regarding current disease/pathogen presence and fish susceptibility should be supported by actual data and data limitations should be specified. It has been shown that salmonid populations that co-evolve with infectious organisms may develop an immunity not present in other populations. Therefore, introduced diseased organisms may have a profound effect on indigenous fish populations.

action be selected, a hatchery operation plan would be developed which would be similar to those discussed in IHOT hatchery audits.

18-05

Impacts on genetic variability, intra-and inter-specific competition and community dynamics are discussed in Section 4.6, Fish. Hatchery stock selection and the rationale for making such a selection is discussed in Section 2.1.3.7, Broodstock Source and Management, as well as in the Genetic Risk Assessments developed by Cramer and Neeley (1992), and Cramer (1995a), which are discussed in Section 1.2, Finding Solutions. Collections methodology are discussed in Section 2.1.3.6, Adult Collection, which includes a revised discussion on fall chinook. Minimum escapement levels are discussed in Section 2.1.3.7, Broodstock Source and Management. Maximum catch limits would be determined on an annual basis through coordination between the NPT and other fisheries agencies in the basin. The measurement of effective population sizes in relation to NPTH is discussed in the M&E Plan (Steward 1996) in the section on Genetic Variability (pgs. 81 - 85). The juvenile release schedule is discussed in Section 2.1.3.4, Release Techniques. Estimated stocking densities are discussed in Section 2.1, Proposed Action, and Section 2.1.5, Monitoring and Evaluation Plan.

18-06

The BPA published M&E Plan has been sent to interested fisheries management agencies in the Columbia Basin. In addition, the discussion on the M&E plan has been revised.

18-07

Prior to writing the M&E report, the author, Cleve Steward, had participated in the RASP process, had assisted in the design of the genetics monitoring element of the Idaho Supplementation Studies, and had represented NMFS and Mobrand Biometrics at meetings of the Yakima-Klickitat Fisheries Program (another supplementation hatchery). He had authored two papers and a lengthy literature review of hatchery impacts, and so was familiar with scientific literature on the subject.

References

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 Fisheries Society 115:726-735.

Gharrett, A.J. and W.W. Smoker. 1991. Two generations of hybrids between even- and odd-year pink salmon (*Oncorhynchus gorbuscha*): a test for outbreeding depression? Canadian Journal of Fisheries and Aquatic Sciences 48:1744-1749.

Hilborn, R. 1992. Hatcheries and the future of salmon in the northwest. Fisheries 17(1): 5-8.

Kapuscinski, A.R., 1997. Rehabilitation of Pacific Salmon in thier ecosytems: What can articifical propagation contribute? Pg. 3

Nehlsen, W., J. E. Williams, and J.A. Lichatowich. 1991. Pacific Salmon at the Crossroads: Stocks at Risk from California, Oregon, Idaho, and Washington. Fisheries 16 (2):4-20.

While engaged in writing the report, Mr. Steward consulted frequently with geneticists and experts in the field of aquatic and fisheries sciences. He also presented papers describing various aspects of the M&E Plan at meetings of the American Fisheries Society, the Integrated Hatchery Operations Team, and the Northwest Power Planning Council. A draft of the report was reviewed by the team of biologists, engineers, and technical writers that completed the Environmental Impact Statement for the project. The report was carefully reviewed by Tribal fisheries managers and biologists before being released.

Although not subjected to a rigorous peer review process, the M&E Plan exceeded requirements set by the Northwest Power Planning Council. Moreover, the M&E Plan was based on the best known available science, benefited from technical reviews by project biologists, and was widely disseminated at scientific and technical meetings.

18-08

The M&E Plan (Steward 1996) discusses monitoring strategies for determination of effects resulting from operation of NPTH. Implementation of the NPTH M&E plan is essential to assessing and revising operations of the supplementation program. The NPTH Program is designed to use adaptive management, which allows managers to adapt the program to future events.

18-09

Spring chinook reared by NPTH would be spending a longer portion of their life in streams in which they are intended to return than are spring chinook reared by most other hatchery programs. This is a directed effort by NPTH to ensure imprinting. Those fish that are released directly in the streams are expected to reside through the summer and fall. A portion would migrate downstream in the fall while others would reside in the natal stream through the winter and migrate out in the spring of the following year. Those fish that are reared in satellite ponds would be introduced into the ponds in the summer and reared in stream water from the stream in which they are expected to return. They would be released in the fall, and some may overwinter in the natal stream, while others may join other migrants moving downstream in the fall.

A portion of the fall chinook would also be moved to satellite facilities to encourage imprinting. They would be moved from Cherrylane or Sweetwater Springs to the acclimation facilities to complete an additional one to two months of rearing. Fish released from Cherrylane would be reared in acclimation ponds fed by the Clearwater River. These acclimation efforts are designed to specifically enhance the homing fidelity for the returning adults. Actual transportation of fish from the central incubation and rearing facilities to the satellite facilities is expected to take no more than one day for any given group of fish.

18-10

The effects of diseases introduced to wild fish are discussed in Section 4.6.1.3, Impacts, under Fish Health Management. It was the opinion of the Impact Assessment Team that the effect of disease transmission from hatchery to non-hatchery fish would be low. The Impact Assessment Team consisted of three professional fish biologists, an aquatic biologist, an engineer, and a hatchery production manager. Specific actions taken to prevent introduction of disease are discussed further in the discussion on Fish Health Management.

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
500 NE Multnomah Street, Suite 600
Portland, Oregon 97232-2036

IN REPLY REFER TO:

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG#: NEZP-02-019
RECEIPT DATE:
FEB 04 1997

January 30, 1997

ER 96/0790

Leslie Kelleher, Environmental Project Leader
Bonneville Power Administration
Public Involvement Office - CKP
P.O. Box 3621 - ECN
Portland, Oregon 97208-3621

Dear Ms. Kelleher:

The Department of the Interior (Department) has reviewed the Draft Environmental Impact Statement (DEIS) for the Nez Perce Tribal Hatchery (NPTH) Program, Latah, Nez Perce, Clearwater, and Idaho Counties, Idaho. The following comments are provided for your information and use when preparing the Final Environmental Impact Statement (FEIS).

GENERAL COMMENTS

Fish Resources

On September 13, 1996 the U.S. Fish and Wildlife Service (Service) provided technical comments to the Bonneville Power Administration (BPA) on the preliminary DEIS. Many of these comments have been incorporated into the DEIS. This information was not intended to represent the position of the Department. The Department's position is represented in the following comments which largely reiterate the earlier technical comments from the Service.

19-01 The DEIS lists five alternatives. They consist of the proposed action, no action alternative, and three additional action alternatives. The DEIS states after study, three alternatives are eliminated from further consideration. Thus, only the proposed action and the "No Action" alternatives are further analyzed. However, the Department believes other action alternatives in addition to the proposed action could potentially meet the project purposes identified in Chapter 1. They include two of the three eliminated alternatives: "Use of Existing Production Hatcheries" and "Natural Habitat Enhancement and Restoration." The FEIS should further consider both alternatives. The explanation given in the DEIS for eliminating the "Use of Existing Production Hatcheries" alternative does not consider modifying Clearwater River basin hatcheries or making programmatic changes to accomplish project purposes. In addition

19-01

This has been done. However, you bring up the problem in your letter that: *"Hatcheries designed for mitigation purposes are not designed to produce fish for restoration. Although mitigation hatcheries are already in existence and they can be used for restoration production, construction of a new hatchery may be more cost effective than converting an old one for recovery purposes."*

Leslie Kelleher, Environmental Project Leader 2

19-01 (cont.) to modifying Clearwater basin hatcheries or making programmatic changes, the FEIS should consider use of existing facilities outside the Clearwater River basin. These facilities may be appropriate for incubation or rearing activities and would eliminate the need to construct new hatchery facilities within the Clearwater River basin. The FEIS should provide a complete analysis of this alternative.

19-02 The DEIS analysis of the proposed action appears to consider improvements in migration conditions in the Lower Snake River and the Columbia River downstream of the Snake River confluence. However, the "Natural Habitat Enhancement and Restoration" alternative appears to have been eliminated without considering improvement of migration conditions. Inclusions of such conditions in the analysis of this alternative could make it feasible for accomplishing the purposes in Chapter 1. Therefore, the "Natural Habitat Enhancement and Restoration" alternative should be further considered and analyzed in the FEIS.

19-03 Until improvements in the migration corridor are made, the NPTH program would not return adult fish any better than hatcheries already existing in the Clearwater River basin.
19-04 We believe when improvements in the migration corridors are made, fish return rates for existing hatcheries would improve. These improvements would allow additional fish for sport and tribal harvest.
19-05 In addition, improvements in natural production in the remaining habitat would provide enough adults to meet the carrying capacity of the streams.
19-06 The FEIS should provide a discussion of the potential roles of the NPTH program at that time, e.g., the role of the NPTH program being converted to a harvest augmentation hatchery or being used for resident fish production.
19-07 Also, the FEIS should confirm the changed hatchery practices would comply with the Integrated Hatchery Operations Team (IHOT) policies.

19-08 The FEIS should clarify the National Marine Fisheries Service (NMFS) "suggestion" to revise rearing techniques in the Columbia Basin is based on resource priorities (Hatchery Practices on page 1-5). The NMFS has prioritized the need to speed the restoration of fish populations, listed under the Endangered Species Act of 1973 (ESA) as endangered or threatened, over the need to mitigate for permanently lost habitat. The listed populations have declined due to poor migration conditions. Although such revisions would serve recovery purposes, they would not satisfy mitigation needs. Hatcheries designed for mitigation purposes are not designed to produce fish for restoration. Although mitigation hatcheries are already in existence and they can be used for restoration production, construction of a new hatchery may be more cost effective than converting an old one for recovery purposes.

19-09 The FEIS should indicate the discussion on NMFS' "suggested" rearing techniques are based on the following premise: If the hatchery conditions mimic the wild, the fish will be better suited for restoration purposes. While this premise has merit and it may be possible to construct and operate a hatchery that mimics wild habitat, under existing technology it would be more expensive than restoring degraded existing habitat.
19-10 Some of the practices listed in the DEIS are affordable and should be used in the NPTH program to produce fish for repopulating empty habitat. These practices would not compensate for the poor survival in the migration corridors and hatchery protection cannot replace poor migration conditions. If fish return to good spawning and rearing habitat, hatchery production becomes unnecessary.

19-02

This alternative was reconsidered, but BPA does not believe that, without supplementation intervention, the Purpose and Need for the program can be accomplished, even with an improvement in migration conditions coincident with implementation of salmon recovery efforts. The Purpose and Need emphasize the timely restoration of salmon runs, and therefore the need to take an active role in seeding underutilized salmon streams in the Clearwater River. Supplementation activities proposed by NPTH do take such an active role.

19-03

The fact that NPTH, other Clearwater hatcheries, and wild runs of chinook depend on the successful implementation of salmon recovery efforts is discussed in Section 1.6.2, The Proposed Recovery Plan for Snake River Salmon and Section 2.1.3.5, Adult Returns.

19-04

BPA agrees.

19-05

BPA agrees that the natural habitat could eventually produce returns of salmon. However, the rate of population increase would be much slower than with supplementation intervention. See discussion for 19-02.

19-06

The primary focus of the EIS is the first 10 years of the program, the reasonable foreseeable future. Any change in facility production after this time would be discussed in further environmental documents as necessary. Until such time, those possible changes are remote and speculative.

19-07

See Section 1.6.12 for a discussion of IHOT policies.

19-08

Assigning or prioritizing NMFS strategies for salmon restoration and/or settling disputes on their strategies is outside the scope of this

19-11

The FEIS should correct the DEIS' assertion that the NPTH program would be undertaken as a measure under the Northwest Power Act (NPA) and is independent of the Columbia River Fish Management Plan (CRFMP) duties (Page 1-17, Section 1.6.7. Columbia River Fish Management Plan). The CRFMP is pertinent to every fish production program for rebuilding upriver anadromous runs. It explicitly sets forth coordinated procedures between the involved parties for the planning and implementation of existing and future production programs. In and of itself, the CRFMP is not a mitigation or restoration effort. It would coordinate those various state, tribal, and Federal efforts towards rebuilding fish stocks and meeting harvest allocation goals set forth in the CRFMP. The CRFMP is indeed a "framework within which the Parties may exercise their sovereign powers in a coordinated and systematic manner to protect, rebuild, and enhance upper Columbia River fish runs while providing harvests for both treaty Indian and non-Indian fisheries".

The CRFMP recognizes existing, and anticipated new, state, tribal, and Federal programs affecting fish restoration. The CRFMP was created in part to provide the coordinated inter-party forums for ensuring thoughtful, mutually agreed-upon, and biologically sound fishery restoration and run rebuilding programs. These forums consist of the Technical Advisory Committee (TAC); the Production Advisory Committee (PAC); and the Policy Committee. In Section I.B.4. under the Scope and Nature of the Agreement, the CRFMP recognizes that several Federal and state laws require fisheries protective, mitigative, or enhancement measures or affirmatively promote development of comprehensive and joint inter-party fisheries management and propagation plans and programs. It states the Parties "pledge to confer with each other and to use their best efforts to see that mutually acceptable provisions that will promote the earliest feasible achievement of the rebuilding and harvest sharing objectives specified in this Agreement are included in the plans and programs required or adopted under those laws". The DEIS claims that since this facility is constructed under the NPA it is independent of the CRFMP. It is also clear within the NPA that the Council and Bonneville Power Administration must ensure program consistency and approval with affected states and sovereigns. Therefore, the NPA is yet another Federal law that would require close coordination and implementation of fishery enhancement programs that are mutually acceptable to the responsible fishery co-managers and sovereigns.

Further support for including the NPTH within the scope of the CRFMP is found in other CRFMP sections. Section III. Artificial and Natural Production of the CRFMP clearly sets forth procedures and actions required for the planning and implementation of present (at the time of the agreement) and future artificial production programs. Some of these include:

1. In Section A. "Purpose", Present and future artificial production programs shall be integrated with natural production as described herein";

2. The PAC is to develop an Annual Brood stock Planning Report that coordinates state, Federal, and tribal artificial and natural/wild fish production actions for each designated sub-basin and artificial production facility;

3. In Section C. "Sub-basin Plans" it states harvest and production management plans for each sub-basin will be developed cooperatively by the affected state, tribal, and Federal entities in consultation with other relevant entities; and

document. Conventional hatcheries may not be the means to restore naturally-spawning salmon populations and constructing a new supplementation hatchery may be more cost effective than converting an old one for recovery purposes.

19-09

BPA has no estimates on the cost of restoring degraded existing rearing habitat, but because of the many landowners and land uses involved it is unlikely that this cost would be less than those of using innovative rearing techniques. Even with improvement in migration conditions attributed to salmon recovery efforts, an increase and restoration of salmon runs would occur at a slow rate that is dependent on straying and colonization. The purpose and need emphasize the timely restoration of salmon runs, and therefore the need to take an active role in seeding underutilized salmon streams in the Clearwater River. Supplementation activities proposed by NPTH do take such an active role.

19-10

The NPTH program depends in part on the success of salmon recovery efforts. However, as a new draft report from NMFS indicates, smolt barging is now viewed as fully mitigating for the federal hydrosystem and impacts on spring/summer chinook. The report's analysis "suggest that transportation, given that outside factors do not control adult returns, does not result in delayed mortality to fish, can alleviate the majority of losses from passage through the hydrosystem, and can provide historic adult return rates" (J. Williams, et al., June 1997). The report concludes with a short question and answer. "[D]oes the Columbia River hydropower system limit recovery of spring/summer chinook salmon? Most likely not" (J. Williams, et al., June 1997). Given that the hydropower system is not the limiting factor in spring/summer chinook recovery, BPA believes it is prudent to rely on methods of mitigation other than improvements in the migration corridor. At such time when naturally-spawning runs are restored that support a harvestable surplus, supplementation activities would become unnecessary.

19-11 (cont.)

4. In Section D. paragraph 3 of "Artificial Production Modifications", it states that the parties agree to identify long-term program adjustments in addition to those identified in Appendix B, including expansion of or additions to existing hatchery programs necessary to meet identified fish supplementation needs of the Parties. These long-term needs shall be designed to complement harvest, production, and rebuilding needs of this Agreement.

Section IV.B. 'Procedures for the PAC' of the CRFMP, states that "Coordination of production and harvest management is essential to the successful implementation of this Agreement". It also states that the PAC is hereby established to coordinate information, review, and analyze existing and future artificial and natural production programs pertinent to this Agreement and to submit recommendations to the management entities. As stated in the Purpose under Section III. Artificial and Natural Production, it is the intent "....of the Parties to develop and implement those agreed-to production orientated actions to achieve the goal of rebuilding upriver anadromous runs ...." As the NPTH program is being designed for just such a purpose, its production is pertinent to and subject to the requirements of the Agreement.

The language of the CRFMP is clear on how new and future production shall be coordinated and, therefore, is subject to the terms of the Agreement. Further, the Nez Perce Tribe has and is using the existing CRFMP policy and biological review processes of the Policy Committee and the PAC to obtain consensus for moving forward with the planning for the facility. However, the FEIS does not follow a logical path in claiming the proposed NPTH program would not be subject to the terms of the CRFMP when the proposed NPTH facilities would become operational.

Water Resources

19-12

The proposed Sweetwater Springs Central Incubation and Rearing Facility lies upstream of Sweetwater Diversion Dam which diverts water into Reservoir A (Mann Lake). Both of these facilities are part of Bureau of Reclamation's (Reclamation) Lewiston Orchards Project which provides irrigation, municipal, and industrial water to the Lewiston Orchards Irrigation District.

The analysis presented in the draft EIS indicates that no consumptive water use would occur at the Sweetwater Springs facility, and discharges from this facility would meet Federal and state water quality standards. Based on the analysis in the draft EIS and with an adequate water quality monitoring program, it appears that the Sweetwater Springs facility would have no effect on Reclamation's Lewiston Orchard Project.

SPECIFIC COMMENTS

19-13

Page 1-4. 1.1.1.2. Hatchery Fish Production in the Clearwater Basin The descriptions of Dworshak and Kooskia National Fish Hatcheries should identify these facilities as mitigation hatcheries. They provide mitigation for the fish that would have been spawned and spent the freshwater part of their life cycle in the North Fork.

19-11

See Section 1.6.7, Columbia River Fish Management Plan (CRFMP) language.

19-12

Thank you for your comment.

19-13

The fact that Dworshak National Fish Hatchery is a mitigation hatchery is identified on page 1-4 of the Draft EIS. The discussion on Kooskia National Fish Hatchery has been revised.

Leslie Kelleher, Environmental Project Leader 5

19-14 Page 1-5. Hatchery Practices The term "traditional hatcheries" is misleading and should not be used. Each hatchery is a tool to replace one or more critical factors in the life cycle of the fish, and, therefore, operates to meet its particular goal or goals.

19-15 The hatchery practices described in this section are especially misleading because they are against basin wide policy and many have not been used in twenty years. Some information in section 2.3.2 Use of Existing Production Hatcheries on page 2-43 would be appropriate for this section, and should be moved to this section.

19-16 Page 1-12. Section 1.6 Relationship to Other Fish Plans, Programs, Projects, Affecting the Clearwater River Sub-basin This section should compare the relationship of the Nez Perce hatchery practices to the IHOT hatchery practice policies adhered to in the existing production plans.

19-17 Page 1-13. Section 1.6.2 The Proposed Recovery Plan for the Snake River Salmon According to the DEIS, success of the NPTH program is dependent on a two-fold increase in smolt-to-adult survival rates. Because the rearing and release strategies and the rearing facilities are less than optimum, the FEIS should clarify whether or not the NPTH program would improve survival. If the NPTH program fails to double the smolt-to-adult survival rate, the need for the NPTH program would be even less.

19-18 Page 1-17. Section 1.6.6 Idaho Salmon Supplementation Studies The second paragraph gives the impression that: fish could be released in a control stream. The FEIS should clarify the same control streams are used in the monitoring and evaluation plan of the NPTH program and the Idaho Salmon Supplementation Studies.

19-19 Section 1.6.7. Columbia River Fish Management Plan (CRFMP) Please refer to the General Comments.

19-20 Page 2.5. NPTH Facility Descriptions and Operation Summary to Page 2-31. Satellite Facilities Facilities proposed for the NPTH program are scattered throughout the drainage in an attempt to develop natural production in several places and take advantage of limited fish rearing sites. At most facility sites, water for fish rearing would come from the adjacent streams which can be debris laden and carry a large suspended sediment load for periods during the rearing cycle. The FEIS should include data documenting that fish may be reared at each of the sites and reach the desired size at release time, given the temperature and turbidity problems that exist.

19-21 Page 2-31. Section 2.1.3 Hatchery Operations, 2.1.3.1 Disease Management The FEIS should address the relationship between the NPTH hatchery operations and those of the IHOT basin wide policies. Whether or not the statement that the disease control and monitoring would conform with IHOT policies, includes compliance with all IHOT fish health requirements (i.e., transport permits etc.) should be clarified.

19-14

The term "traditional hatcheries" was used to present a distinction between traditional (or conventional) harvest augmentation hatcheries and supplementation hatcheries. The word has been changed to reflect your concern. The discussion on hatchery practices is a valid representation of negative consequences that have occurred over the years.

19-15

The information presented in Section 2.3.2, Use of Existing Production Hatcheries, does not apply to the discussion presented in Section 1.1.1.2, Hatchery Fish Production in the Clearwater Subbasin. The discussion in Section 2.3.2 presents the reasons given at the February 13, 1990, meeting between the Northwest Power Planning Council, the USFWS, IDFG, and the NPT stating why it was the preference of the agencies to not use space at the existing hatchery facilities to accommodate new (i.e., NPTH) production. The discussion in Section 1.1.1.2 presents information on the use and production at the existing hatcheries.

19-16

Section 1.6 has been amended to reflect the role of IHOT to NPTH. The NPT would follow IHOT guidelines. However, as is discussed in IHOT meetings, every federal, state and tribal agency maintains its own sovereignty when applying its fish health policy, and IHOT guidelines do not supersede this management authority.

19-17

NPTH can focus on improving survival prior to smoltification. Further discussion on the rationale for improvement as a result of rearing strategies has been added to the Final EIS. NPTH would rely on improvements made as a result of implementing the recovery plans for salmon to increase smolt-to-adult survival.

19-18

The text has been changed to clarify this point.

Leslie Kelleher, Environmental Project Leader 6

19-22 Page 2-33. 2.1.3.4 Release Techniques The FEIS should discuss the process for determining the trade offs in use of the carrying capacity of the habitat between populations that exist now and the effects of the proposed hatchery programs.

19-23 Page 2-43. 2.3.2. Use of Existing Production Hatcheries As previously stated, some information in this section would be appropriate for inclusion in the Hatchery Practices discussion. Please refer to comments given under Page 1-5 Hatchery Practices.

19-24 Page 3-30. Second Paragraph, Last Sentence This sentence states the Clearwater fall chinook salmon may be adopting more of a "stream-type" life history by migrating the following spring. However, on page 3-45 in the Potential Production paragraph, the DEIS attempts to justify the minimal amount of fry habitat available in the Clearwater River by stating fall chinook salmon migrate during their first year anyway. The FEIS needs to clarify this apparent contradiction whether fall chinook salmon migrate during their first year or the following spring.

19-25 The amount of available fry habitat in the Lower Clearwater River (below Cherrylane) should be fully evaluated given the plan to release 1,500,000 sub-yearlings. Even if the sub-yearlings do migrate during their first year, they rear 1-3 months before beginning their migration making the availability of fry habitat important.

19-26 Page 3-45. Potential Production We agree the redd estimate of 95,000 is an overestimate. The FEIS should provide a discussion on potential production based on a reliable redd estimate; the Service believes 3,600 redds is a more reliable estimate.

19-27 The FEIS also should address the emigration problem for juveniles from the Clearwater River specifically. The best minimum survival (Pit-tag detections at dams) the Service has observed from Clearwater River sampling is 19.1%. As the DEIS notes, fall chinook salmon emerge and emigrate later from the Clearwater River than they do from the Snake River. Therefore, they are subjected to lower water velocities, higher water temperatures, greater predator and disease susceptibility, and reversion to "parr" before reaching the Columbia River estuary.

19-28 Appendix A. Monitoring and Evaluation This section should be completed in the FEIS.

Thank you for the opportunity to comment on this DEIS.

Sincerely,

Preston Sleeger
Acting Regional Environmental Officer

19-19

See Section 1.6.7, Columbia River Fish Management Plan (CRFMP), for clarifying language.

19-20

The Nez Perce Tribal Hatchery Predesign Study (Montgomery Watson, 1994) evaluated the proposed sites for their capability to grow fish. Spring runoff is the most typical time period in which the streams would carry a large debris load and suspended sediment. Spring chinook would be moved to the satellite facilities in the early summer, avoiding complications posed by spring runoff. Water intake for the satellite sites for fall chinook would use a combination of infiltration galleries and well water to avoid problems with high suspended sediment load and debris.

19-21

See response to 19-16.

19-22

Effects on other fish species present are discussed in Section 4.6, Fish. Existing carrying capacities are discussed in Section 3.6, Fish.

19-23

See response to 19-15.

19-24

It is likely that they do both. Arnsberg and Statler (1995) discuss PIT tag detection data from fish collected in the Clearwater River. They found that a greater percentage of fish tagged in 1993 and 1994 were detected as yearling migrants (rather than subyearling migrants). However, preliminary results of their 1995 tagging show a higher proportion of fish were detected as subyearling migrants. In addition to PIT tag data, analysis of scale patterns have indicated the presence of yearling fall chinook migrating through the Snake River in the early spring (Sneva, 1996). These fish have also adopted a variance of the typical fall chinook subyearling smolt life cycle. Arnsberg and Statler (1995) discuss that a possible reason for the variability in migrant ages is the flow fluctuations from Dworshak Dam. They find that unseasonably high and cold Dworshak Dam releases coinciding with early juvenile fall chinook salmon rearing in the lower Clearwater River may be influencing selective life history traits including growth, smolt development and outmigration timing.

19-25

Section 4.6.1.3, Impacts, discusses the competitive interactions between fall chinook released from NPTH and their wild living counter-parts. The fish would be released with a demonstrated propensity to smolt. Such hatchery release practices, i.e., releasing smolts, are typically employed in the Clearwater River Basin by Dworshak and Kooskia National Fish Hatcheries. There are approximately 1,050,000 spring chinook smolts and 2,300,000 steelhead smolts released from Dworshak National Fish Hatchery into the Clearwater River, and another 800,000 spring chinook smolts released from Kooskia National Fish Hatchery into the Clearwater as well. The fish are not believed to rear and compete with the existing natural production in the river. The Biological Assessment for the spring chinook releases (Idaho Fishery Resource Office, 1993) states that, "Competition between hatchery released smolts and natural chinook salmon should be minimal due to the rapid emigration time in free flowing river sections. In addition to rapid emigration timing, chinook salmon habitat preference criteria studies have shown spatial habitat segregation. Larger juveniles select deeper water and faster velocities which should minimize competition between emigrating hatchery chinook and natural fry in free-flowing sections (Hampton 1988)." Fall chinook sub-yearling smolts released from NPTH are expected to be larger than naturally rearing fish and would be actively migrating as well.

19-26

Potential production for fall chinook spawners in the Clearwater River is based on the best information available.

19-27

This is true. In spite of the problems in migratory conditions, Table 3-3 shows that approximately 23% of the fall chinook spawning in the Snake River Basin above Lower Granite Reservoir occurs in the Clearwater River.

19-28

The Executive Summary is included as Appendix D. The Executive Summary of the Monitoring and Evaluation Plan can be obtained by calling the BPA document request line at 1-800-622-4520.

COMMENTS FROM BOISE PUBLIC MEETING 7/10/96

BPM-01
Will techniques such as those at the Leavenworth hatchery be used for this project?

BPM-02
What effect will this project have on Lewiston Orchard Irrigation District water and flows for irrigation?

BPM-03
Where is the Bureau of Reclamation involved with this project?

BPM-04
Sounds like a good project.

BPM-05
Do we have support from USFS?

BPM-06
Will habitat re-seed?

BPM-07
Are there push-up dams for irrigation?

BPM-08
We have the habitat—now we need the salmon!

BPM-09
Idaho will not be supportive in drought conditions—water flows from Snake River.

BPM-10
Hope you get support for your project.

BPM-11
Movement “afoot” in Idaho to remove 4 Snake River dams.

BPM-12
Sounds like a good project.

BPM-01
Leavenworth Hatchery is a conventional harvest augmentation hatchery, similar to those described in Section 1.1.1.2, Hatchery Fish Production in the Clearwater Subbasin. NPTH would differ from this facility by being a supplementation hatchery as described Section 1.1.1.2.

BPM-02
There would be no impact to the Lewiston Orchard Irrigation District.

BPM-03
The Bureau of Reclamation is not involved in this project, but received copies of the Draft and Final EIS.

BPM-04
Comment noted.

BPM-05
USFS is a cooperating agency on the EIS.

BPM-06
Yes, habitat will reseed. Please refer to Section 2.5.2, Natural Habitat Enhancement and Restoration.

BPM-07
Push-up dams are not in this project.

BPM-08
Comment noted.

BPM-09
Comment noted.

BPM-10
Comment noted.

BPM-13
What species are you producing?

BPM-14
What is the purpose of the project?

BPM-15
I like it!

BPM-16
Looks like a good facility design.

BPM-17
If Snake River steelhead are listed or proposed for listing, how will this affect the project?

BPM-18
What impacts will outside forces (i.e. Regional Forum, election, etc.) have on this project and others?

BPM-19
FISH PASSAGE, INC. - J. R. WOODWORTH

The hazards to smolts during downstream migration through the slack water of reservoirs, powerplant turbines, supersaturated water below dams, and predator-infested waters are the major causes of their reduced populations. Some species are near extinction from these impacts, along with overfishing.

Efforts to reduce smolt damage at power plants [are] centered on new or improved screening and bypass systems . . .

A pipeline transport alternative is described in this report. This alternative will require a series of tests and exploration to validate its feasibility from a biological, engineering and cost standpoint . . . . There is also a potential for the combined application of the canal and the pipeline methods of transportation. [See report commentor submitted, “Report and Proposal to Study the Boylan Smolt Transport System.”]

BPM-11
Comment noted.

BPM-12
Comment noted.

BPM-13
Spring and fall chinook salmon.

BPM-14
Chapter 1 describes the Purpose and Need for the project.

BPM-15
Comment noted.

BPM-16
Comment noted.

BPM-17
Projects effects would have to be addressed through “conferencing” with NMFS.

BPM-18
Anything is possible. State, tribal, and federal elections may change focus of fishing policies and strategies as in other areas of concern.

BPM-19
Although mainstem passage is important to the long-term success of the NPTH program, it is a difficult issue to analyze in the context of this EIS and is therefore outside our scope. Section 1.7 lists several on-going efforts intended to address mainstem passage.

COMMENTS FROM LAPWAI PUBLIC MEETING 7/11/96

LPM-01
Problem not in river system. Fish populations are declining. Not dams.

LPM-02
Problem is people (drawdowns, etc.)

LPM-03
Not in favor of hatchery on reservation. Hatchery at this location is a "double dip."

LPM-04
How does this project mesh with CRITFC?

LPM-05
Good project.

LPM-06
Problem is basically ocean harvest.

LPM-07
Need more hatcheries.

LPM-08
What is BPA's solution to the fish problem?

LPM-09
How is this project different?

LPM-10
Clearwater should be managed to mimic natural flows and temperatures.

LPM-11
Will a certain percentage of adults be allowed to spawn naturally?

LPM-01
Comment noted.

LPM-02
Comment noted.

LPM-03
Comment noted.

LPM-04
Founded to coordinate and to provide technical services, the Columbia River Inter-Tribal Fish Commission is made up of the Warm Springs, Umatilla, Nez Perce and Yakama tribes. This project is proposed by the Nez Perce Tribe, one of its members.

LPM-05
Comment noted.

LPM-06
Comment noted.

LPM-07
Comment noted.

LPM-08
This program is one of many proposed and implemented by BPA.

LPM-09
The proposed program uses innovative rearing techniques.

LPM-10
Comment noted.

LPM-11
Yes.

LPM-12
Will habitat management remain status quo?

LPM-13
Address recreational impacts to returning adults.

LPM-14
Does or will BPA do/assist the USFS in an EA for Eldorado Falls?

LPM-15
Cherrylane Inc. concerned about outfall, by-pass, and returning adults/releasing smolts. Will restrict fishing. Also concerned with fish ladders.

LPM-16
I think hatchery program is necessary but that's only part of the answer. There are mainstem issues to be dealt with.

LPM-17
Concern about impacts to other wildlife, e.g., elk, from construction of hatcheries (Lolo Creek).

LPM-18
Look at Tom Curets thesis.

LPM-19
What will Dworshak drawdowns do to fall chinook releases in July and August.

LPM-20
Where do I get copies of recovery plan? And what does it say about commercial ocean harvest?

LPM-21
What is design and construction schedule and how long will it take to complete entire NPTH program?

LPM-12
There are efforts planned to improve habitat in the Clearwater River Subbasin.

LPM-13
Recreational fishing impacts to returning adults would not occur until the runs of chinook salmon have reestablished themselves in the Clearwater River Subbasin. Runs are expected in 15-20 years following program implementation. Prior to the onset of any recreational fishing for these returning salmon, the State of Idaho and the Nez Perce Tribe would set seasons and bag limits for each of the two runs of chinook salmon. The fish are expected to return to the Clearwater River Subbasin from June to November each year. Because it is not known what the sport fishery season and bag limits would be for these returning adult fish, if any, it would be premature at this time to attempt to identify what the impacts would be to the resource.

LPM-14
BPA does not currently have plans to be involved with the USFS in an Environmental Assessment for Eldorado Falls.

LPM-15
Comment noted.

LPM-16
Comment noted.

LPM-17
Comment noted.

LPM-18
Comment noted.

LPM-22

Needs the fish count between each dam.

LPM-23

How does ocean harvest effect the project?

LPM-24

How do I find out what the increase in cannery production is?

LPM-25

I'm definitely opposed to supplying the Indian commercial fishery down below with fish from a hatchery up here that rate payers will pay for.

LPM-26

I do believe there should be hatcheries built, but people who benefit from it should pay for it.

LPM-27

I think this book [EIS] is easy to read, not a lot of words that you can't understand.

LPM-28

Who will ultimately own these facilities?

LPM-29

Will they be turned over to the Indians?

LPM-30

What future tightening of controls on commercial fishing (in river and ocean) are necessary to insure success of a project like this?

LPM-19

NPTH fish would be released in June and should be through the system by July and August. The progeny of NPTH fish spawning in the wild would be negatively affected. Arnsberg and Statler (1995) determined that unseasonably high and cold Dworshak Dam releases (drawdowns) coinciding with early juvenile fall chinook salmon rearing in the lower Clearwater River may be influencing selective life history traits including growth, smolt development, outmigration timing, behavior, and could be directly affecting survival. During July 1994, discharges from Dworshak Dam increased from a baseline released of 1,300 cfs to a maximum release of 25,530 cfs with an overall temperature depression in the lower Clearwater River exceeding 10 degrees C (Arnsberg and Statler, 1995).

LPM-20

National Marine Fisheries Service (NMFS), Environmental and Technical Services Division, 911 NE 11 Avenue, Portland, Oregon, 97232; (503) 230-5400 can provide copies of the recovery plan.

LPM-21

Completion of ROD, August 1997
Predesign and Design of all Facilities, 1997-98
Construction of Acclimation Sites, begins late 1997
Cherrylane and Sweetwater Springs, summer 1998

LPM-22

The Corps of Engineers has information on the fish counts at each of the dams. That information is also available on many on-line home pages.

LPM-23

According to NMFS (1995), impacts on Snake River spring/summer chinook resulting from ocean fisheries cannot be determined precisely, but they are apparently quite small. Snake River fall chinook on the other hand, contribute to a variety of ocean fisheries. Approximately 66% of the Lyons Ferry fall chinook that were harvested were captured in the ocean fisheries. These include fisheries off the Washington, Oregon, California, Alaska, and Canadian coasts.

LPM-24

To our knowledge, no salmon canneries exist in the United States outside of the state of Alaska. According to the Idaho Department of Commerce, no fish canneries of any kind exist in Idaho (Twight, 1996). As to the question of whether any of the salmon that would emanate from the Clearwater River Subbasin i.e., as a result of the proposed supplementation program, would end up in the commercial catch in the North Pacific, it is not known at this time. Change in commercial cannery production is dependent on the harvest regulations determined by the U.S.-Canada Pacific Salmon Treaty, and is outside the scope of this document.

LPM-25

Comment noted.

LPM-26

Comment noted.

LPM-27

Thank you for your comment.

LPM-28

The Nez Perce Tribe would operate the proposed facilities with BPA providing the funding for operation and maintenance. No decision has been made as to the ownership of the facilities.

LPM-29

See response to LPM-28.

LPM-30

Commercial fishing regulations are decided in other forums.

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