Chief Joseph Hatchery Program

Final Environmental Impact Statement

DOE/EIS-0384

November 2009

US Army Corps of Engineers ®
Seattle District

BONNEVILLE POWER ADMINISTRATION

THE CONFEDERATED TRIBES OF THE COLVILLE RESERVATION 1872

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Bonneville Power Administration
Confederated Tribes of the Colville Reservation
U.S. Army Corps of Engineers

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Abstract - Chief Joseph Hatchery Program

Responsible Agencies: Lead federal agency: U.S. Department of Energy - Bonneville Power Administration (BPA); cooperating federal agency: U.S. Army Corps of Engineers; cooperating tribe: Confederated Tribes of the Colville Reservation

Title of Proposed Project: Chief Joseph Hatchery Program

State Involved: Washington

Abstract: The Final Environmental Impact Statement (DEIS) describes a Chinook salmon hatchery production program sponsored by the Confederated Tribes of the Colville Reservation (Colville Tribes). BPA proposes to fund the construction, operation and maintenance of the program to help mitigate for anadromous fish affected by the Federal Columbia River Power System dams. The proposed hatchery supports the goal of the Colville Tribes to produce adequate salmon to sustain tribal ceremonial and subsistence fisheries and enhance the potential for a recreational fishery for the general public. The final EIS discloses the environmental effects expected from facility construction and program operations and a No Action alternative. The final EIS also responds to public comments received on the draft EIS released in May 2007.

The proposed action is to build a hatchery near the base of Chief Joseph Dam on the Columbia River for incubating, rearing and releasing summer/fall and spring Chinook. Along the Okanogan River, juvenile Chinook would be reared, imprinted and released from three existing irrigation ponds, one existing salmon acclimation pond, and two new acclimation ponds (to be built). The Chief Joseph Dam Hatchery Program Master Plan (Master Plan, Northwest Power and Conservation Council, May 2004) provides voluminous information on program features. The US Army Corps of Engineers, Washington Department of Fish and Wildlife, Washington State Parks and Recreation Commission, Oroville-Tonasket Irrigation District and others cooperated on project design and siting.

BPA and the Corps of Engineers will issue Records of Decision whether to implement the project by March 1, 2010.

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The EIS and affiliated documents are also on the Internet at:
http://www.efw.bpa.gov/environmental_services/Document_Library/Chief_Joseph/.

For additional information on DOE NEPA activities, please contact Carol M. Borgstrom, Director, Office of NEPA Policy and Compliance, GC-20, U.S. Department of Energy, 1000 Independence Avenue S.W., Washington D.C. 20585-0103, phone: 1-800-472-2756 or visit the DOE NEPA Web site at www.eh.doe.gov/nepa**.**

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ABBREVIATIONS AND ACRONYMS

BPA	Bonneville Power Administration
BMP	best management practices
cfs	cubic feet per second
CJHP	Chief Joseph Hatchery Program
CTCR	Confederated Tribes of the Colville Reservation
DPS	distinct population segment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ESU	evolutionarily significant unit
FCRPS	Federal Columbia River Power System
FEMA	Federal Emergency Management Agency
HCP	Habitat Conservation Plan
HGMP	Hatchery Genetics Management Plan
NAAQS	National Ambient Air Quality Standards
NATURES	Natural Rearing and Enhancement System
NEPA	National Environmental Policy Act
NOAA	National Oceanic and Atmospheric Administration
NPCC	Northwest Power and Conservation Council (formerly NPPC)
NPDES	National Pollution Discharge Elimination System
NPPC	Northwest Power Planning Council (now NPCC)
NRHP	National Register of Historic Places
NTU	nephelometric turbidity unit
OTID	Oroville-Tonasket Irrigation District
PM_{10}, $PM_{2.5}$	particulate matter less than 10 and 2.5 microns in diameter
PUD	Public Utility District
RM	river mile
RV	recreational vehicle
UCR	Upper Columbia River
USACE	U.S. Army Corps of Engineers
USC	United States Code
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington Department of Natural Resources
WDOE	Washington Department of Ecology
WDOT	Washington Department of Transportation
WSPRC	Washington State Parks and Recreation Commission

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GLOSSARY

Ambient	surrounding or all around, as in ambient air temperature
Escapement	that portion of an anadromous fish population that escapes the commercial and recreational fisheries and reaches the freshwater spawning grounds
Eutrophic	refers to water that has an excess of nutrients which can lead to high biological oxygen demand which may result in depleted oxygen in the water and lethal conditions for fish and other aquatic organisms
Flashy	pertains to streams whose flow increases and decreases rapidly
Forebay	the portion of the reservoir immediately upstream of a dam's turbine intakes
Glacial till	sediments carried or deposited by glaciers, usually very fine particles
Hydrograph	a graph showing the stage, flow, velocity, or other water-related properties in relation to time
Lacustrine	pertaining to or originating from lakes
Metamorphic	rocks which have been changed by pressure, heat, or chemical processes to another form of rock; usually occurs in rock layers below the influence of weathering
Morainal	pertaining to the ridge of rock and soil deposited at the end and sides of glaciers
Phytoplankton	small plants (often one-celled) that float or drift in water
Piscivorous	fish-eating
Redd	the nest dug in the gravel substrates of streams for egg deposition during spawning by salmonids
Riparian	adjacent to or living on river banks
Riprap	broken rock used to stabilize river banks from flows and wave action
Smolt	juvenile anadromous salmonids that have completed their freshwater rearing phase and are preparing to migrate to saltwater

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SUMMARY

Purpose and Need

The Northwest Power and Conservation Council (NPCC, www.nwcouncil.org) recommended that the Bonneville Power Administration (BPA) study and consider funding a Chinook salmon production program and hatchery proposed by the Confederated Tribes of the Colville Reservation (Colville Tribes, CTCR). The proposal intends to increase returns of adult summer/fall Chinook by raising and releasing juvenile fish in the waters of the Okanogan River, and in the Columbia River below Chief Joseph Dam and above its confluence with the Okanogan River. The proposed program would construct, operate and maintain a hatchery below the Chief Joseph Dam on the Columbia River and several fish acclimation and release ponds on the Okanogan River and Omak Creek in Okanogan County, Washington (Figure S-1). These facilities may also be used to produce and reintroduce spring Chinook salmon to historic habitats in the Okanogan subbasin. This Environmental Impact Statement (EIS) presents the design of the project and a summation of its probable environmental effects to inform the public and guide consideration of this possible undertaking by federal agencies as required by the National Environmental Policy Act (NEPA).

The proposed project is needed to assist in the protection and mitigation of Chinook salmon (*Oncorhynchus tshawytscha*) populations in the Okanogan River and the Columbia River between the Okanogan River and Chief Joseph Dam that are affected by the Federal Columbia River Power System (FCRPS). BPA comes by this protection and mitigation responsibility under the Northwest Electric Power Planning and Conservation Act of 1980 (Northwest Power Act, 16 U.S.C. Sec. 839 et seq). After issuing the Draft Environmental Impact Statement, BPA, the U. S. Army Corps of Engineers (USACE), and the Colville Tribes signed a 2008 Columbia Basin Fish Accords Memorandum of Agreement (http://www.salmonrecovery.gov/Biological_opinions/FCRPS/2008_biop/docs/Colville-Tribes-Action-Agency-Agreement.pdf). Under the agreement, BPA agreed to make capital funds available to construct the proposed hatchery subject to NPCC review and meeting all legal compliance conditions; the USACE agreed to support the planning, design and construction of the hatchery. The proposed project would be one more element of a continuing effort by BPA, the Colville Tribes, USACE and several other partners and cooperators to protect and manage anadromous fish populations and mitigate for effects of the FCRPS in these waters.

BPA has defined the scope of the proposed action and any viable alternatives in terms of four primary purposes and decision factors to be met:

1. The proposal's objective is to increase abundance, distribution and diversity of naturally spawning summer/fall Chinook within their historical Okanogan subbasin habitat and in the Columbia River between the Okanogan River and Chief Joseph Dam. As well as helping to protect the species and mitigate for the FCRPS, the proposal is integrated with and complementary to the myriad of other

local and regional fishery improvement efforts (habitat improvements, fish passage, water rights programs, harvest controls, etc.) in these waters.

2. Operation of the FCRPS, particularly Chief Joseph Dam, must remain unaffected by the proposal (e.g., spill, timing, dissolved gases, etc.). Power system operational flexibility must not be diminished or otherwise adversely affected.

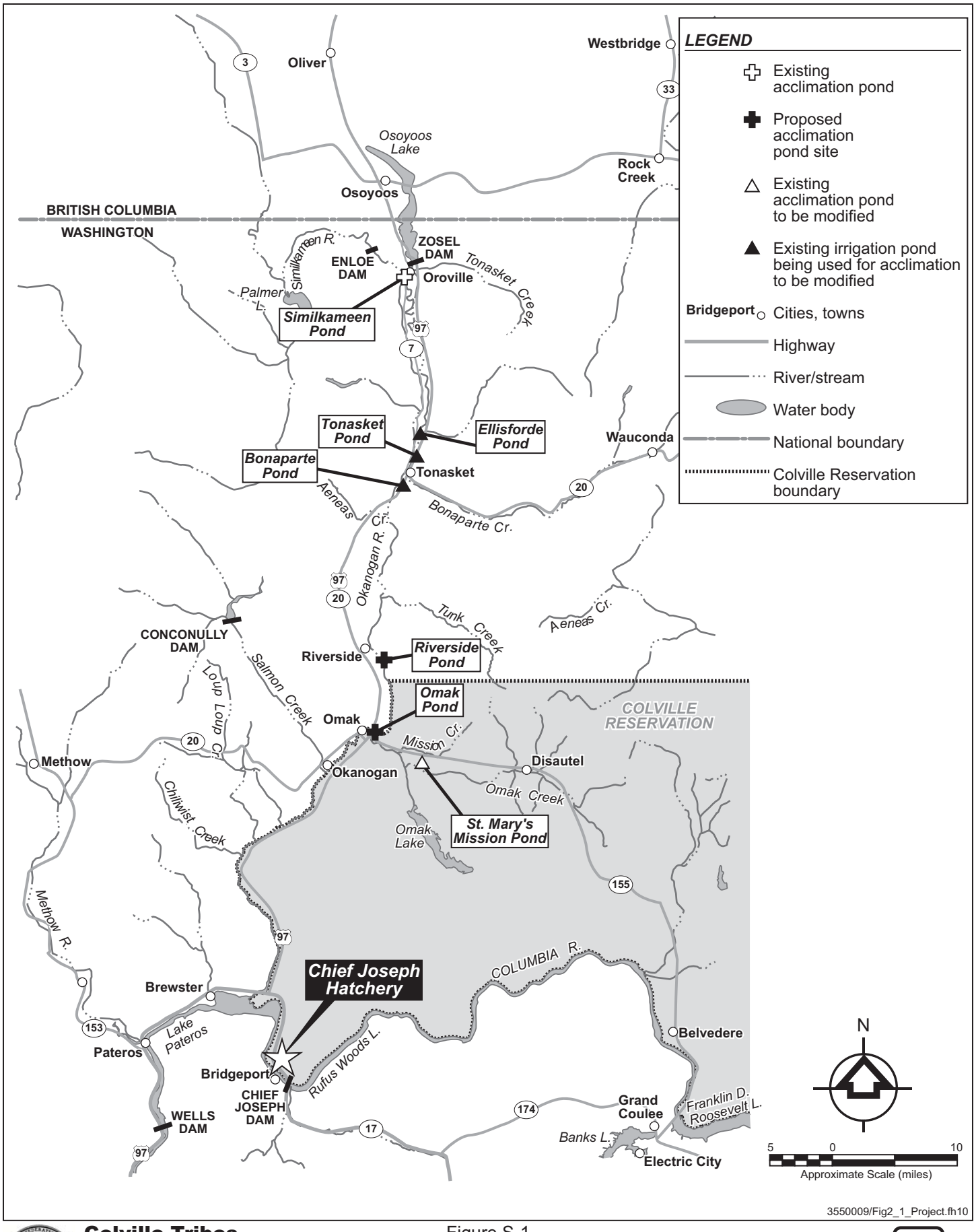
3. The action must not adversely affect populations listed under the Endangered Species Act (ESA) (e.g., through mixed stock harvest, reducing productivity, or otherwise) such that it creates a greater mitigation, protection or recovery burden on BPA. The proposal must not be contrary to FCRPS biological opinions, ESA recovery objectives, or the Hatchery Scientific Review Group findings on federal hatcheries (http://www.hatcheryreform.us/hrp/summary/welcome_show.action).

4. The Colville Tribes, as project proponents, want to produce adequate adult summer/fall and spring Chinook salmon returns to support a tribal ceremonial and subsistence fishery. BPA supports this goal to augment anadromous fish populations so as to enhance the potential for tribal ceremonial and subsistence harvests and a recreational fishery for the general public, although BPA has no authority to permit or regulate harvest.

This EIS is the second step in a 3-step project planning process outlined by the NPCC. The first step was preparation of a fish production and hatchery master plan that was released to the NPCC in May 2004 and for public review in August 2004 (Chief Joseph Dam Hatchery Program Master Plan, http://www.nwcouncil.org/library/Default.htm, incorporated by reference in its entirety in this EIS). The third step is the final design and cost estimate review leading to the construction of the hatchery and acclimation ponds. The Northwest Power and Conservation Council recommended the project to BPA for Step 3 level activities in April 2009 following a favorable review by the Independent Scientific Review Panel.

BPA will use this EIS to decide whether or not to fund the hatchery and fish production program as proposed by the Colville Tribes and recommended by the NPCC. The BPA Administrator will issue a Record of Decision based on this final EIS, which includes a response to comments received on the draft EIS (Appendix C) which was released for public, agency and tribal review and comment in May 2007. The USACE, as administrator of the site where the hatchery is proposed, and the State of Washington, as administrator of sites where some other project facilities are proposed and as co-manager of the area's fisheries, may also issue decision documents based on this EIS to serve their environmental and public review responsibilities.

In order to identify initial concerns and issues with the proposed project and any potential alternatives to the proposed action, BPA scoped the project with the public, agencies and Northwest tribes during August and September 2005 through a combination of open meetings and informative mailings.



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Colville Tribes
CHIEF JOSEPH HATCHERY PROGRAM
DRAFT ENVIRONMENTAL IMPACT STATEMENT

Figure S-1.
Location of Project Facilities

TETRA TECH/KCM

Five key issues surfaced from scoping that guided the development of this EIS.

1. The effect of the fish production program on the quality of surface waters and wells in the vicinity of the hatchery and acclimation ponds

2. The effect of the production program, hatchery and acclimation ponds on water quantity and use, especially FCRPS dam operations and irrigation and municipal withdrawals

3. The effect of the production program and facilities on aquatic organisms including additional stocking of hatchery-bred fish into the Okanogan subbasin and the Columbia River below Chief Joseph Dam

4. The effect of the production program and facilities on terrestrial organisms and resources including key wildlife species, plants and their habitats in the area

5. The effect of the production program and facility construction on local communities and BPA electric power ratepayers

The substance of the public issues did not indicate that another alternative needed to be developed to compare with or replace the proposed action (Appendix C). It was generally acknowledged that a fish production program supported by a local hatchery is needed and desired to complement other ongoing efforts and increase adult salmon returns in the Okanogan subbasin. Therefore only the proposed action and the No Action alternative required by NEPA are analyzed in the EIS (Appendix D).

As preliminary planning progressed, numerous improvements to the original proposed project were made to address cost, physical feasibility, functionality and environmental concerns. Some examples are: local public utility districts offering to cost-share the program; eliminating the ideas of locating the hatchery water supply pipe above ground or submerging it in Rufus Woods Lake in favor of a less obtrusive buried pipeline; eliminating potential hatchery and pond locations associated with high property or environmental costs; rejecting less desirable fish rearing and spawning reaches; designing hatchery components and operations to avoid impacts from and to operation of Chief Joseph Dam; and selecting between housing sites for hatchery personnel based on cost and distance from the hatchery in case of an operational emergency.

The Proposed Project

The proposed production program has three components. These components could be adopted in part or as a whole.

- Component 1 is a program designed to increase abundance, distribution, run timing and diversity of naturally spawning summer/fall Chinook salmon within their historical Okanogan subbasin habitat. This supplementation program would produce 1,100,000 hatchery smolts annually.

- Component 2 would produce an additional 500,000 early-arriving and 400,000 late-arriving summer/fall Chinook hatchery smolts primarily for harvest purposes. When combined with Component 1, this would enhance the potential to support tribal ceremonial and subsistence fisheries and provide recreational fishing opportunities for summer/fall Chinook.

- Component 3 is a spring Chinook program that would produce 900,000 smolts in an effort to return naturally spawning spring Chinook to their historical Okanogan subbasin habitat and in the Columbia River between the Okanogan River and Chief Joseph Dam. This component could also increase the potential for tribal ceremonial and subsistence fisheries and recreational fishing opportunities. Hatchery fish surplus to recovery needs in other nearby subbasins would be used to support this component. It may contribute to the recovery of the ESA-listed Upper Columbia River Spring Chinook Evolutionarily Significant Unit (ESU).

The summer/fall Chinook components (Components 1 and 2) of the proposed production program would involve:

- Developing a local Okanogan River brood stock

- Propagating the full historical run of summer/fall Chinook by extending the current brood stock collection by two months

- Propagating yearling and sub-yearling life stages to reflect natural diversity and add some necessary flexibility in the program

- Improving spawning distribution throughout their historical habitat

- Controlling the proportion of hatchery-origin fish spawning naturally

To facilitate the Chinook production program, a fish hatchery would be constructed on the Columbia River adjacent to and just downstream of Chief Joseph Dam. Hatchery design and operational parameters were developed in collaboration with the USACE to ensure that it does not interfere with dam operations. Concurrently, dam operations were factored into production program considerations and hatchery design.

Water to the hatchery would come from three sources: Rufus Woods Lake, a relief tunnel that collects seepage from the abutment of Chief Joseph Dam, and a well field. Potable water would come from the same well field supplying the hatchery and would be conveyed in the same buried pipeline. Electric power for the facilities may be provided by Nespelem Valley Electric Cooperative, whose lines span the hatchery site. Sanitary sewer treatment for the hatchery complex site would be a new on-site septic drain field disposal system. In addition to the hatchery, a housing area for critical hatchery employees would be developed upland of the Lake Woods Golf Course. All fish production program and hatchery employees would be hired and managed by the Colville Tribes.

Summer/fall Chinook salmon and spring Chinook salmon incubated and reared at the hatchery would be released from there into the Columbia River or transported to ponds along the Okanogan River and Omak Creek for final rearing, acclimation and release (Figure S-1). Two new ponds would be constructed (Riverside and Omak), three ponds currently serving a double purpose as irrigation settling ponds and fish acclimation ponds would be improved to function better (Ellisforde, Bonaparte and Tonasket), and one existing acclimation pond would receive minor upgrades (St. Mary's Pond).

A comprehensive monitoring and evaluation plan would be developed to evaluate general program success. The plan would be coordinated with existing programs and forums to share information and ensure integration with monitoring and evaluation efforts in this and other subbasins of the Columbia Cascade Province and the Columbia River Basin.

The proposed project includes two vital research and monitoring studies which are on-going, but substantially completed. The first study consists of radio-telemetry research to determine where and when summer/fall Chinook migrate, where they congregate, the extent to which they are spatially separated from other population components, and whether the timing of passage over Wells Dam is related to timing and location of subsequent spawning. This information is essential to the development of successful brood stock collection protocols and subsequent acclimation of their progeny. This study (Ashbrook et al, 2006) documents migration into tributaries between Wells Dam and Chief Joseph Dam and use of the Chief Joseph Dam tailwater by summer/fall Chinook, among other things.

The second research study tests the viability of live-capture, selective fishing gear for local brood stock collection (CTCR 2008). Methods evaluated include use of tangle nets, beach seines, floating trap-nets, fish wheels, and dip-nets. The success of the live-capture, selective fishing methods provides the ability to control the ratio of hatchery to natural fish on the spawning grounds. Also, the use of live capture techniques would reduce impacts to other native fish species incidentally collected at the facilities. Study results indicate preliminary success in the use of live-capture gear.

Comparison of Alternatives and Summary of Potential Effects

Table S-1 compares the Proposed Project and the No Action Alternative to the stated purposes of taking action.

Table S-2 summarizes potential environmental consequences of the Proposed Project and the No Action Alternative.

Table S-1. Comparison of Alternatives to Stated Purposes of Taking Action

Purposes of Action	Proposed Action	No Action
1. Increase abundance, distribution, and diversity of naturally spawning summer/fall Chinook within their historical Okanogan subbasin habitat and in the Columbia River between the Okanogan River and Chief Joseph Dam.	Would meet this purpose by acclimating fish to underutilized habitat. Implementation of the summer/fall Chinook component of the production program would provide the greatest potential to protect and enhance the summer/fall Chinook population and mitigate for FCRPS effects.	Would partially meet this purpose to the extent provided by ongoing and new fish habitat and passage improvements, water rights programs, harvest control programs. Rearing program at Similkameen Pond would continue.
2. Operation of the FCRPS, particularly Chief Joseph and Grand Coulee dams (e.g., spill, timing, dissolved gases, etc.), must remain unaffected by the fish production program.	Hatchery design and operational parameters were developed in collaboration with the USACE to ensure that the hatchery does not interfere with dam operations. Concurrently, dam operations were factored into design of the hatchery.	Would meet this purpose by not changing the current situation and having no effect or risk to dam operations.
3. The program must not adversely affect populations listed under the ESA (e.g., through mixed stock harvest, reducing productivity, or otherwise) such that it creates a greater mitigation, protection or recovery burden on BPA.	The production program is designed and would be implemented and monitored to ensure listed species are not adversely affected. Upper Columbia spring Chinook populations should increase.	Ongoing habitat, passage, water rights, and harvest control efforts would contribute to this objective. Existing facilities would continue to support the limited ongoing Chinook production program in the Okanogan River. Current risks, insufficiencies, and limitations associated with the existing situation would continue.
4. Increase Chinook salmon populations to enhance the potential for tribal ceremonial and subsistence harvests and a recreational fishery for the public.	Has the greatest potential to enhance adult fish returns of summer/fall and spring Chinook in historical habitat to sustain naturally spawning populations and tribal ceremonial and subsistence or public recreational fisheries.	Unlikely to sustain a harvestable fishery as the current situation has insufficient and downward- trending adult returns long-term. Would not change the depleted spring Chinook situation.

Table S-2. Summary of Environmental Consequences of Alternatives

Environmental Feature	Proposed Action	No Action
Fish and Aquatic Habitat (EIS Section 3.2 and Issue #3)	Implementing the three production program components should produce greater diversity, abundance and distribution of summer/fall and spring Chinook in the Okanogan subbasin. These returns should complement other on-going salmon protection and mitigation efforts. Some individual fish of all species could experience short-term stress and possible mortality from live fish trapping gear and subsequent capture and handling. Competition and predation between aquatic species at all life stages including hatchery-bred fish would not threaten viability of any species. Some increase in aquatic nutrients is likely from decaying spawned-out salmon carcasses. During construction, site and channel alterations would create minor, localized, temporary disturbances that would not measurably affect the viability of any aquatic species. Water withdrawals during operation of ponds would have an immeasurable effect on habitat in the immediate reach of each diversion for the season of the withdrawals. Fish released from hatchery and rearing facilities would have a low potential to introduce pathogens to other fish populations.	Current risks to salmon population viability would continue but would likely diminish slightly in the long-term due to the other on-going complementary protection and mitigation efforts (habitat and passage improvements, harvest controls, water rights programs). Current conditions of habitat and population viability of other aquatic species should remain unchanged.
Wildlife (EIS Section 3.3 and Issue #4)	No state or federally listed species are known to nest or breed at or near project sites, so no adverse effects are expected. Salmon carcasses may provide a long-term seasonal food source for many large and small scavenger and predator species and certain insects. Animals may be displaced or disturbed in the vicinity of construction activities and during facility operations and occupation (noise, presence of humans and machines, outside lighting). New power lines at the hatchery, housing and Omak Pond sites may provide perches or minor collision risks for certain birds.	No changes to current trends, conditions or protection status are expected for any animal species.
Vegetation, Wetlands, Geologic Hazards and Soils (EIS Sections 3.4 & 3.5, and Issue #4)	No state or federally listed plant species occur at or near any project sites, so no effects are expected. At the hatchery site, about 25 acres of non-native vegetation shrub steppe habitat would be disturbed of which about 20 acres would remain permanently developed. At the housing site, about 10 acres of native vegetation shrub steppe habitat would be disturbed of which about 5 acres would be permanently developed. Developing Riverside Pond would convert about 4 acres of hay fields and Omak Pond would convert about 2 acres of pasture to development. Work at all other pond sites would disturb little	On-going disturbance and habitat conversion would continue at current rates. Exotic plants and weeds would continue to exist and be subject to control as in the past.

Table S-2. Summary of Environmental Consequences of Alternatives

Environmental Feature	Proposed Action	No Action
	to no additional habitat. Less than 1 acre of riparian habitat near new water intakes and discharge features at the hatchery and Omak and Riverside ponds would permanently be affected. No jurisdictional wetlands were detected so none would be affected. But, if project proceeds to construction, consultation with regulatory agencies under the Clean Water Act and Shoreline Management Act may include mitigation for riparian effects. A temporary increase in exotic plants and weeds at all disturbed sites is likely. All disturbed areas would be replanted with native species and maintained to control weed species. No known landslide-prone areas exist at the project sites. There is negligible to no potential for slope instability at any sites although temporary, localized erosion could occur during construction. No active faults are known within 5 miles of the sites, so potential for earthquake damage is very low.	
Hydrology, Floodplains and Water Quality (EIS Section 3.6) Water quality (Issue #1)	Localized, temporary, construction-related runoff and sedimentation could occur at construction sites but would be controlled through application of typical Best Management Practices (BMPs). Long-term water quality would remain within limits of applicable laws and NPDES permits at all sites. A long term, minor increase in river water nutrients would be likely from decaying spawned-out salmon carcasses. No detectable effect to groundwater quality is expected near any of the sites.	Water quality would not change. Nutrients from increased numbers of spawned-out salmon would not be contributed.
Water quantity and use (Issue #2)	Typically from October to April, Okanogan River stream flow would be reduced about 4 to 6% between the intakes and discharge points of the new ponds (Riverside and Omak). No change to stream flow would occur at ponds currently being used for fish acclimation (Ellisforde, Bonaparte, Tonasket, and St. Mary's). Irrigation withdrawals and other surface water uses typically occur during other times of the year, so this program would have no effect. Groundwater conditions are unlikely to be affected at any sites. The hatchery well field is not in proximity to other wells that could be affected. For example, Lake Woods Golf Course withdraws irrigation water from Rufus Woods Lake. Potable water for Bridgeport State Park is supplied by a well that is over 500 feet upstream of the proposed project well field. Hatchery and acclimation facilities have been designed to have no effect on FCRPS dam operations or municipal or private surface or groundwater uses.	Water quantity and in-stream flow regimes would not change.

Table S-2. Summary of Environmental Consequences of Alternatives

Environmental Feature	Proposed Action	No Action
Floodplains	The two new ponds (Riverside and Omak) and their intake and discharge structures would be located in the Okanogan River's 100-year floodplain. Upland sites are infeasible. Ponds possibly could be inundated in a 100-year flood event, but the facilities would likely receive little damage and have little effect on downstream flood dynamics. The hatchery's fish ladder entrance and discharge would be in Columbia River waters directly below Chief Joseph Dam. They are designed to be compatible with dam operations and water flow regimes. No effect on dam operations is expected.	Floodplains remain unchanged. The existing ponds are within 100-year floodplains with potential for inundation with the exception of St. Mary's Pond which is not in a mapped floodplain.
Land Use, Transportation and Recreation (EIS Section 3.7 and Issue #5)	Facility construction, operation, occupancy, and use would be consistent with applicable local zoning, laws and regulations. Necessary permits would be pursued if the project proceeds to final design and implementation. During construction, temporary disruptions to the USACE Visitor Orientation Area and nearby walking trails would occur. During construction, traffic would increase locally for workers, equipment, and delivery of supplies and materials. No new public roads or changes to existing public transportation system would occur. Long-term traffic increases related to fish transport and worker commutes would be minor. If the production program is successful, there could be a long-term increase in recreation traffic and activities related to salmon viewing and fishing. Public environmental education opportunities may increase through hatchery site visitation.	No change to current land use, transportation or recreation is predicted.
Cultural Resources (EIS Section 3.9 and Issue #5)	Potential long-term sustainable tribal ceremonial and subsistence fishery and recreational fishery would most likely be restored if all components of the production program are implemented. If only Component 1 is implemented, it is unlikely that more than a modest ceremonial and subsistence fishery would result. Possible adverse effects at one of the pond sites on known cultural materials potentially eligible for listing in the National Register of Historic Places would be mitigated by investigative and curation actions taken in agreement with the Tribal Historic Preservation Officer. Known archaeological sites would be avoided at all other project sites, so no effects are expected. If evidence of cultural materials is found later, activity would cease until the finds could be properly assessed.	No change from current conditions at any site is expected. The current fishery is inadequate for even modest ceremonial and subsistence purposes, or recreational fishing. It is unlikely that a sustainable tribal ceremonial and subsistence fishery or recreational fishery would result through currently on-going fishery improvement efforts.

Table S-2. Summary of Environmental Consequences of Alternatives

Environmental Feature	Proposed Action	No Action
	Traditional tribal fishing at the base of Chief Joseph Dam would be temporarily disrupted while installing the hatchery fish ladder and water pipeline.	
Aesthetics (EIS Section 3.11 and Issue #5)	The scenic qualities of all sites would remain typical of the region. Aesthetic attributes are not remarkably distinctive, scenic or unique. Although the proposed hatchery site is adjacent to the Columbia River, it is in close proximity to Chief Joseph Dam and would appear congruent with the existing complex of development there. The housing site is an undeveloped upland setting but not within a popular viewshed. The acclimation ponds are all in rural settings and their low profile would not conflict with the setting.	No change to any sites.
Socioeconomics (EIS Section 3.8 and Issue #5)	Negligible increase to population overall. Some hatchery employees would reside at the hatchery housing site near Bridgeport. Employment opportunities would be created for up to 100 temporary positions during hatchery and housing construction. Long-term new employment for 8 to 15 workers would support hatchery operations. Construction would entail expenditures of about $37.5 million in the region with a long-term payroll for hatchery operations of about $2.1 million annually. Some benefit to local economy could be realized if Chinook recover and stimulate fishing and related recreation and tourism. No measurable effects to area housing, utilities, schools, law enforcement, or tax base are predicted. No impact to BPA ratepayers would occur since the project funds would be part of an established program of annual investment in protection and mitigation of fish and wildlife related to FCRPS facilities and operations.	No project-induced changes to local economies, communities or BPA ratepayers are likely. The potential for some adverse effect on local economy remains if salmon stocks continue to decline.
Air, Climate Change, Noise and Public Safety (EIS Section 3.10 and Issue #5)	Dust and vehicle exhaust would increase locally during construction with no long-term climate effects at any sites. Temporary increase in noise would occur during construction at all sites, but would not exceed. State standards. Long-term noise from new traffic, operations and residences would be negligible. An increase in demand for public services (medical, hospital, sheriff, fire, etc.) during construction is possible. New safety risks to the public would be short term and mainly associated with construction traffic encounters.	No change in air quality, climate, noise, or public safety would occur at any sites.

CHAPTER 1: PURPOSE AND NEED

The Northwest Power and Conservation Council (NPCC, www.nwcouncil.org) recommended that the Bonneville Power Administration (BPA) study and consider funding a Chinook salmon production program and hatchery proposed by the Confederated Tribes of the Colville Reservation (Colville Tribes, CTCR). The proposal intends to increase returns of adult summer/fall Chinook by raising and releasing juvenile fish in the waters of the Okanogan River, and in the Columbia River between its confluence with the Okanogan River and Chief Joseph Dam. The proposed program would construct, operate and maintain a hatchery below the Chief Joseph Dam on the Columbia River and several fish acclimation and release ponds on the Okanogan River and Omak Creek in Okanogan County, Washington (Figure 1-1). These facilities may also be used to produce and reintroduce spring Chinook salmon to historic habitats in the Okanogan subbasin using adult hatchery fish that are surplus to recovery needs in other nearby subbasins. This Environmental Impact Statement (EIS) presents the design of the project and a summation of its probable environmental effects to inform the public and guide BPA's and the U. S. Army Corps of Engineer's (USACE) consideration of this undertaking as required by the National Environmental Policy Act (NEPA).

1.1 Purpose and Need

BPA needs to decide whether to fund the proposed Chief Joseph Hatchery Program (CJHP). The underlying need for the program is the protection and mitigation of Chinook salmon (*Oncorhynchus tshawytscha*) populations in the Okanogan River and the Columbia River between the Okanogan River and Chief Joseph Dam that are affected by the Federal Columbia River Power System (FCRPS). BPA comes by this protection and mitigation responsibility under the Northwest Electric Power Planning and Conservation Act of 1980 (Northwest Power Act, 16 U.S.C. Sec. 839 et seq). After issuing the Draft Environmental Impact Statement, BPA, USACE and the Colville Tribes signed a 2008 Columbia Basin Fish Accords Memorandum of Agreement (http://www.salmonrecovery.gov/Biological_opinions/FCRPS/2008_biop/docs/Colville-Tribes-Action-Agency-Agreement.pdf). Under the agreement, BPA agreed to make capital funds available to construct the proposed hatchery subject to NPCC review and meeting all legal mandates including NEPA; the USACE agreed to support the planning, design and construction of the hatchery. The proposed project would be one more element of a continuing effort by BPA, the Colville Tribes, USACE and several other partners and cooperators to protect and manage anadromous fish populations and mitigate for effects of the FCRPS in these waters.

BPA defined the scope of the proposed action and any viable alternatives in terms of four primary purposes and decision factors to be met:

1. Increase abundance, distribution, and diversity of naturally spawning summer/fall Chinook within their historical Okanogan subbasin habitat. As well as helping to protect the species and mitigate for the FCRPS, the proposal needs to be integrated with and complementary to the myriad of other local and regional fishery improvement efforts (habitat improvements, fish passage, water rights programs, harvest controls, etc.) in these waters.

2. Operation of the FCRPS, particularly Chief Joseph Dam, must remain unaffected by the proposal (e.g., spill, timing, dissolved gases, etc.). Power system operational flexibility must not be diminished or otherwise adversely affected.

3. The proposal must not adversely affect populations listed under the Endangered Species Act (ESA) (e.g. through mixed stock harvest, reducing productivity, or otherwise) such that it creates a greater mitigation, protection or recovery burden on BPA. The program must not be contrary to FCRPS biological opinions, ESA recovery objectives, or the Hatchery Scientific Review Group findings on federal hatcheries (http://www.hatcheryreform.us/hrp/summary/welcome_show.action).

4. The Colville Tribes, as project sponsors and proponents, want to produce adequate adult summer/fall and spring Chinook salmon returns to support a tribal ceremonial and subsistence fishery. BPA supports this goal to augment anadromous fish populations so as to increase the potential for tribal ceremonial and subsistence harvests and a recreational fishery for the general public, although BPA has no authority to permit or regulate harvest.

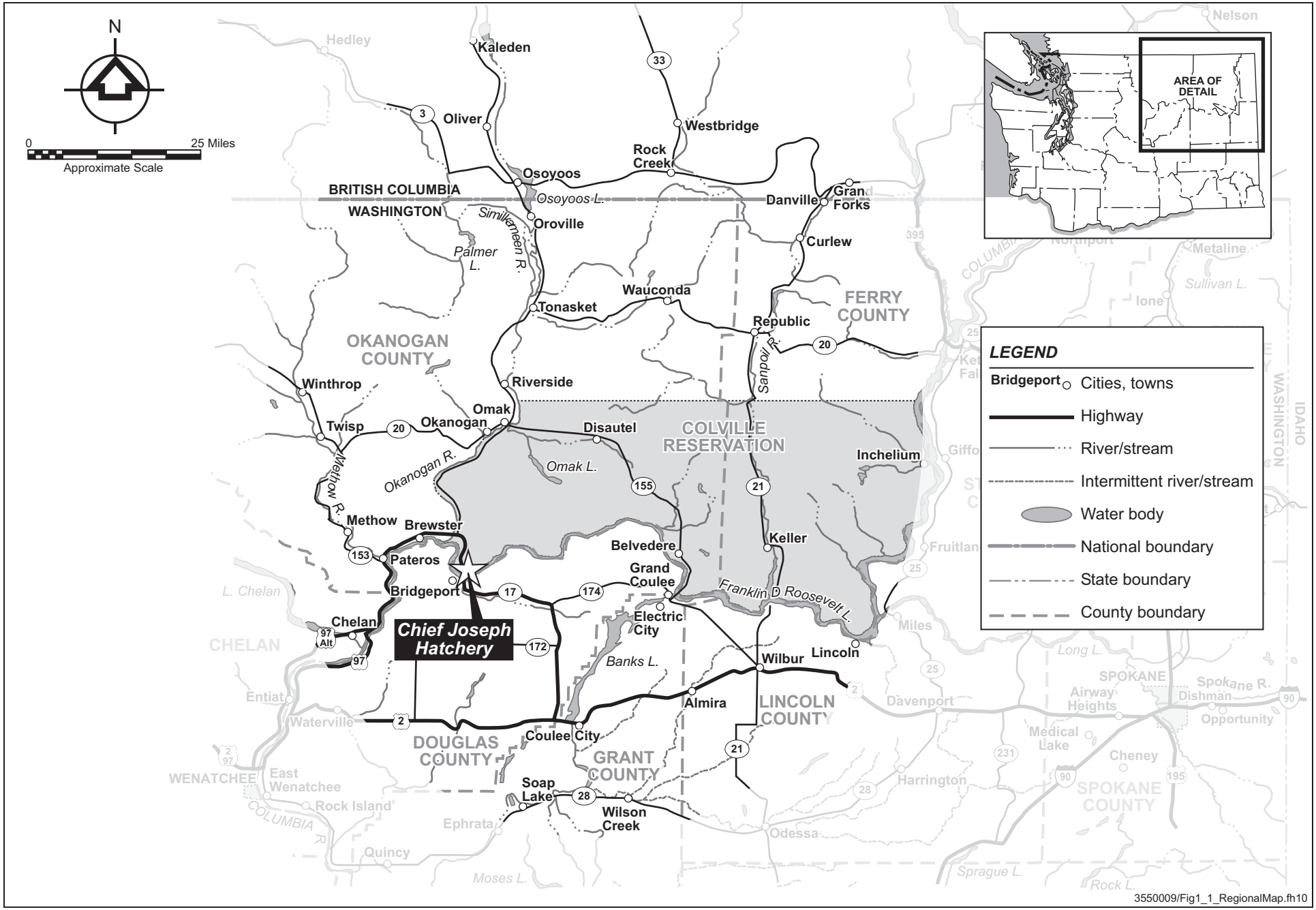
1.2 The Salmon Situation in the Okanogan

The Colville Tribes are pursuing development of the Chief Joseph Hatchery Program (CJHP) through the NPCC's Fish and Wildlife Program based on numerous historical and biological factors and regulatory decisions.

Historically, Columbia River tribes depended on salmon for subsistence and cultural purposes. Spring fishing along the Okanogan River once provided tribal members with enough salmon (their primary protein source) to last throughout the year. It has been estimated that the combined salmon and steelhead harvest by upper Columbia River tribes in the 1800s exceeded two million pounds annually (CTCR 2004).

By the late 1800s regional salmon populations were intensively commercially harvested along the Columbia River. In addition, occupation and development of the upper Columbia and Okanogan valleys altered salmonid habitat through timber harvest; agriculture (grazing and farming) and agricultural water withdrawals; and development of transportation systems, municipalities, utilities, and industry. By the early 1930s, spring Chinook in the Okanogan subbasin were extirpated, and the first of eleven dams on the Columbia River was built, which cumulatively affected summer/fall Chinook decline.

Anadromous fish are now extirpated from the Columbia River system above Chief Joseph Dam. The Okanogan River is the uppermost Columbia River tributary still accessible to anadromous fish. Limiting factors to summer/fall Chinook in the Okanogan subbasin are elevated irrigation water withdrawals, sedimentation, summer water temperatures, riparian vegetation loss, and uneven spawning distribution (NPCC 2004) (Section 3.2). Although the dams downstream of Chief Joseph Dam still affect anadromous fish productivity, substantial improvements have been made in recent years for out-migrant juveniles and returning adults. Other limiting factors on anadromous fish include degraded habitat in the lower Columbia River and ocean harvest levels.



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Colville Tribes
CHIEF JOSEPH HATCHERY PROGRAM
DRAFT ENVIRONMENTAL IMPACT STATEMENT

Figure 1-1.
Regional Map

TETRA TECH/KCM

Spring Chinook are listed as endangered under the Endangered Species Act (ESA) of 1973 (as amended) (Federal Register, Vol. 64, No. 56, March 24, 1999, p. 14308) throughout much of the Columbia River system. Spring Chinook have been extirpated from the Okanogan River, so any spring Chinook coming from that river would not be part of the upper Columbia River spring Chinook Evolutionarily Significant Unit (ESU). Upper Columbia River summer/fall Chinook have been deemed not in danger of extinction (Meyers et al. 1998). However, upper Columbia River steelhead are ESA-listed as endangered and the upper Columbia River Distinct Population Segment (DPS) for steelhead includes the Okanogan River, so evaluation of this project is required under Section 7 of the ESA. Federal agencies must ensure that actions they authorize, fund, or conduct are not likely to jeopardize the continued existence of any ESA proposed or listed species or designated critical habitat.

The summer/fall Chinook run in the Okanogan River currently is supported by the Eastbank Hatchery near Rocky Reach Dam. The Washington Department of Fish and Wildlife (WDFW) selects broodstock from adult fish collected at a trap at Wells Dam (see Figure 2-1) and transports them to the hatchery for spawning and incubation. Juvenile fish are transported to Similkameen Pond on a tributary to the Okanogan River for final rearing and release. Most of the salmon now returning to the Okanogan are the progeny of this mixed run program. However, since 1987 later-arriving natural-origin summer/fall Chinook have declined to such low levels that early-arriving summer/fall Chinook have been primarily relied upon for hatchery brood stock. So the current population may not be representative of the indigenous population which was probably more suited to the historic range of Okanogan habitat and environmental conditions. Also, hatchery bred fish that return from the ocean as adults to spawn in the Okanogan are concentrating near Similkameen Pond rather than distributing throughout the available habitat in the basin.

Since 2001, the Colville Tribes have released hatchery juvenile spring Chinook in the Okanogan subbasin. As a result, a few adult spring Chinook returned to the subbasin in 2005, and the Colville Tribes observed the First Salmon ceremony for the first time in many years.

Today, harvest and recreational fishing opportunities in the Okanogan are limited by inconsistent adult fish returns. The Colville Tribes manage a limited ceremonial and subsistence fishery, targeting summer/fall Chinook that are in excess of escapement objectives.

1.3 Decisions to be Made and Responsible Officials

BPA will use this EIS to decide whether to fund the fish production program and hatchery as proposed by the Colville Tribes and recommended by the NPCC. The BPA Administrator will issue a Record of Decision based on this final EIS, which includes responses to comments received from the public, agency and tribal review of the draft EIS which was released in May 2007.

This EIS is the second step in a 3-step project planning process outlined by the NPCC. The first step was preparation of a fish production and hatchery master plan that was released to the NPCC in May 2004 and for public review in August 2004 (Chief Joseph

Dam Hatchery Program Master Plan, http://www.nwcouncil.org/library/Default.htm). The third step is the final design and cost estimate review leading to the construction of the hatchery and acclimation ponds should BPA decide to fund it. The Northwest Power and Conservation Council recommended the project to BPA for Step 3 level activities in April 2009 following a favorable review by the Independent Scientific Review Panel.

The USACE, as administrator of the main site where the hatchery facility is proposed, and the State of Washington, as administrator of sites where some other project facilities are proposed and as co-manager of the area's fisheries, may also issue decision documents based on this EIS to serve their environmental and public review responsibilities. Information presented in this EIS may also be used by other federal, tribal, state and local agencies to base decisions on permits, authorizations, management plans and other approvals associated with this project.

1.4 The Chief Joseph Hatchery Master Plan

For many years, BPA, the Colville Tribes, WDFW, and other partners and cooperators have directed substantial resources toward protecting, mitigating for and managing anadromous fish in the Okanogan subbasin. Efforts have included habitat protection and restoration measures, fish passage improvements, limited fish supplementation and harvest, public education, water rights programs, watershed planning, and monitoring and evaluation programs. While these efforts have helped improve conditions for anadromous fish, they are not adequate to sustain naturally-spawning populations in the basin. It is generally agreed that a hatchery supplementation program would make the fishery management efforts more comprehensive, cohesive, effective and timely.

Based on the NPCC's recommendations, BPA funded the Colville Tribes to develop the Chief Joseph Dam Hatchery Master Plan (Master Plan, May 2004) (http://www.nwcouncil.org/library/Default.htm). The Master Plan defines the hatchery program as part of a comprehensive plan for managing summer/fall and spring Chinook salmon in the Okanogan River and the reach of the Columbia River between Wells Dam and Chief Joseph Dam. The Master Plan (Volume 1) complete with appendices (Volume 2) is incorporated by reference in this EIS in its entirety as the primary source of detailed information on the proposed Chinook production program. It includes the developmental history of the program, biological data, ecological rationale, conceptual design, component descriptions, and cost estimates. It also contains summer/fall Chinook and spring Chinook Hatchery Genetic Management Plans (HGMPs) and environmental and engineering research information that are used as a basis of support for much of the information in this EIS.

1.5 Public Scoping and Key Issues

In order to identify initial concerns and issues with the proposed project and any potential alternatives to the proposed action, BPA scoped the project with the public, agencies and Northwest tribes through a combination of open meetings and informative mailings. A Notice of Intent to prepare an EIS, published in the Federal Register on August 2, 2005, introduced the proposed project and provided scoping meeting and contact information. In August, 2005 notices of upcoming scoping meetings were published in the *Wenatchee World*, *Omak Chronicle*, and the *Colville Statesman* and mailed to parties thought to be

interested or potentially affected by the proposal. Public scoping meetings were held at Chief Joseph Dam in Bridgeport, Washington on August 23, 2005; in Okanogan, Washington on August 24, 2005; and in Wenatchee, Washington on August 25, 2005. The scoping comment period extended from August 2 to September 19, 2005.

Five key issues revealed by scoping guided the development of this EIS.

1. The effect of the fish production program on the quality of surface waters and wells in the vicinity of the hatchery and acclimation ponds (EIS Section 3.6)

2. The effect of the production program, hatchery and acclimation ponds on water quantity and use, especially FCRPS dam operations and irrigation and municipal withdrawals (EIS Section 3.6)

3. The effect of the production program and facilities on aquatic organisms including additional stocking of hatchery-bred fish into the Okanogan subbasin and the Columbia River below Chief Joseph Dam (EIS Section 3.2)

4. The effect of the production program and facilities on terrestrial organisms and resources including key wildlife species, plants and their habitats in the area (EIS Sections 3.3, 3.4 and 3.5)

5. The effect of the production program and facility construction on local communities and BPA ratepayers (EIS Sections 3.7, 3.8, 3.9, 3.10 and 3.11)

The substance of the public issues did not indicate that another alternative needed to be developed to compare with or replace the proposed action. Rather, it was generally acknowledged that a fish production program supported by a local hatchery is needed and desired to complement other ongoing efforts and increase adult salmon returns in the Okanogan subbasin. So, only the proposed action and the No Action alternative required by NEPA are analyzed in this EIS. Other options considered and eliminated from detailed analysis in this EIS are briefly discussed in Section 2.3 and Appendix D.

1.6 Issues Beyond the Scope of this EIS

This EIS compares the environmental consequences of not taking any action (the No Action alternative, continuing with things as they are) and of implementing the proposed project as a means for meeting the stated purposes and need for action (Section 1.2). This EIS addresses the merits of the proposal and cumulative effects when it is combined with other on-going fish protection and mitigation programs and projects (as required by NEPA). Issues associated with fish restoration, harvest levels, hatchery programs in general, or the relative importance/priorities of other on-going fish protection programs or projects are more appropriately addressed in other forums. Examples of such forums include the NPCC's project proposal solicitation process or the processes by which WDFW and NOAA Fisheries set harvest limits, or when a government agency proposes to adopt a policy relating to these broader, general programs. For BPA, the Fish and Wildlife Implementation Plan EIS (BPA 2003) covers the broad issue of funding hatcheries and fish production programs. A decision to implement the Chief Joseph Hatchery Program would tier to BPA's Fish and Wildlife Implementation Plan EIS.

Also outside the scope of this EIS are suggestions made during scoping for project elements that are outside BPA's and CTCR's responsibilities, are not necessary to implement the proposed project, do not contribute directly to meeting the purpose and need for action, or do not address any environmental consequences of the proposal.

Examples are:

- Studying the effects of long-term drought on water releases from Zosel Dam in the Okanogan subbasin near Oroville, WA
- Proposals to manage salmon in places other than the Okanogan River subbasin and the Columbia River between the Okanogan River and Chief Joseph Dam
- Constructing a welcome center near the hatchery site for the Okanogan Trails Scenic Byway to aid tourism
- Adding public access, boat launch sites and other recreational developments on the Okanogan River
- Sponsoring riverside clean up initiatives in response to additional recreational use

1.7 Relationship to Fish Management Plans, Programs and Projects in the Vicinity

Numerous programs have been enacted in recent years to address salmon and steelhead conservation and restoration in the Okanogan subbasin. These programs and specific projects being implemented under each are fully described in the Master Plan (CTCR 2004). The major initiatives and their relationship to the CJHP are listed below.

Okanogan Subbasin Plan

The Okanogan Subbasin Management Plan (NPCC 2004) outlines objectives for summer/fall and spring Chinook management that are used to select and prioritize projects to improve stream habitat and salmonid productivity within the Okanogan River subbasins. These objectives relate to the health of natural Chinook populations, artificial propagation, and harvest. The CJHP, if implemented, would improve productivity, abundance, diversity, and sustainability of Chinook salmon in the Okanogan subbasin in concert with the Subbasin Plan's objectives.

Salmon and Steelhead Habitat Limiting Factors Assessment, Watershed Resource Inventory 49: Okanogan Watershed (Entrix, Inc., Golder Assoc., and Washington Conservation Commission, 2004)

This limiting factors assessment summarized habitat conditions in the Okanogan River and its tributaries based on current professional knowledge of a Technical Advisory Group. This group included both agency and consulting scientists from the United States and Canada. Action items were suggested for each Okanogan sub-watershed to address limiting factors. State, tribal, and federal agencies use the plan to develop salmon enhancement actions and programs. The proposed CJHP, including the use of acclimation

facilities along the Okanogan River in the U.S., are consistent with the objectives to more fully utilize available habitat.

Mid-Columbia Habitat Conservation Plans

Habitat Conservation Plans (HCPs) were developed by Chelan and Douglas County PUDs to mitigate for the effects of Rocky Reach, Rock Island and Wells Dam hydroelectric projects on fish and wildlife. These HCPs were coordinated with various state and federal fisheries agencies including National Oceanic and Atmospheric Administration (NOAA) Fisheries, U.S. Fish and Wildlife Service (USFWS), Washington Department of Fish and Wildlife (WDFW), three tribes, and American Rivers. The HCPs commit the PUDs to a 50-year program to ensure that their hydroelectric projects have no net impact on mid-Columbia salmon and steelhead runs. This would be accomplished through fish bypass systems, spill at the dams, off-site hatchery programs, and habitat restoration work. In addition to meeting the ESA, the HCPs are also intended to satisfy obligations under the Federal Power Act, the Fish and Wildlife Coordination Act, the Essential Fish Habitat provisions of the Magnuson-Stevens Fishery Conservation and Management Act, the Pacific Northwest Electric Power Planning and Conservation Act, and Title 77 Revised Code of Washington; and to obligate the parties to work together to address water quality issues. Some of the Chinook mitigation required by the HCPs could be produced at the Chief Joseph Hatchery via cost sharing arrangements. BPA, the CTCR, and two local PUDs have an agreement in principle to share CJHP operations and maintenance costs and fish production, and a third PUD is considering participating, also.

Biological Assessment and Management Plan: Mid-Columbia River Hatchery Program (Bugert 1998)

The Mid-Columbia HCPs included the development of a Biological Assessment and Management Plan for the mid-Columbia River hatchery program upstream of the Yakima River. The Biological Assessment and Management Plan describes an approach to increase artificial production of summer/fall Chinook in the mid-Columbia region and establish ESU-wide coordination in order to move toward the "no net impact" goal for the PUDs' hydroelectric operations.

The Biological Assessment and Management Plan identifies fish production increases intended to be consistent with conservation of low-risk, natural populations and recovery of ESA-listed species. It includes broadly supported genetic and ecologic assessments of summer/fall and spring Chinook, sockeye, and steelhead, and sets a stage for ESU-wide coordination efforts. Although the Biological Assessment and Management Plan and HCPs have not been formally approved, the CJHP appears to be consistent with their tenets. Discussions with PUDs for cost-sharing are occurring.

Hatchery Reform: Principles and Recommendations of the Hatchery Scientific Review Group (HSRG 2004)

The HSRG was established by Congress to review and make recommendations for improving salmon hatcheries in the Pacific Northwest. Many of the HSRG recommendations have been incorporated into the hatchery practices proposed for the

CJHP. For example, the program would control the proportion of hatchery fish spawning in the wild and wild fish spawned in the hatchery in order to improve the overall fitness of the composite wild and hatchery population. The CJHP thus recognizes that to restore fish production using hatcheries will require an approach where the natural, rather than hatchery environment drives local adaptation. This approach should increase the overall survival of the population, leading to higher rates of adult returns to the basin, and therefore the success of the CJHP.

Upper Columbia Salmon Recovery Plan

The Upper Columbia Salmon Recovery Board (Board), a standing committee of the North Central Washington Resource Conservation and Development Council, completed the draft Upper Columbia Salmon Recovery plan in January 2004. The Board includes elected officials or designates from Chelan, Douglas, and Okanogan counties, the Colville Tribes, and the Yakama Nation. The Board coordinates and oversees regional recovery planning for Washington's statewide salmon recovery planning efforts. The Board's efforts are being integrated with subbasin planning activities in the Okanogan subbasin. This draft plan identifies the need for the programs described in the CJHP to address the unique circumstances of the Okanogan subbasin.

Upper Columbia Biological Strategy

The Upper Columbia Biological Strategy was developed by the Regional Technical Team to support salmon recovery efforts in the region and specifically to help guide the Washington State Salmon Recovery Funding Board process. The Upper Columbia Biological Strategy has also been adopted as a tool to help guide subbasin planning in the region. Technical guidance developed by the Regional Technical Team was taken into consideration in the development of the Okanogan Summer/fall Chinook Hatchery and Genetic Management Plan (HGMP) that is the foundation of the CJHP. The Regional Technical Team has also provided substantial input in the development of the Okanogan Subbasin Plan.

Since 1999, the Colville Tribes and Okanogan County have been co-leads of the Okanogan County Lead Entity Strategy to provide guidance for habitat protection and restoration projects under the 1998 Salmon Recovery Act (Revised Code of Washington 75.85). Lead entity strategies and project lists developed for funding provide a critical foundation for habitat restoration and actions like those proposed in CJHP.

Colville Tribes' Anadromous Fish Management Plan

The Colville Tribes are developing a tribal anadromous fish management plan. The draft plan includes objectives covering enhancement of existing populations, restoration of extirpated populations, increasing harvest opportunities, and cooperation and collaboration with regional fisheries managers. Key to the Colville Tribes' anadromous fish management plan is the restoration of natural spawning populations of summer/fall and spring Chinook, sockeye salmon, and steelhead to their historical habitat throughout the traditional lands of the Colville Tribes. The CJHP is a central component of this plan.

Okanogan River Summer/Fall Chinook Salmon Hatchery Genetic Management Plan and the Okanogan River Spring Chinook Salmon Hatchery Genetic Management Plans (HGMPs)

In collaboration with WDFW and the USFWS, the Colville Tribes initiated the preparation of draft HGMPs to guide the management of summer/fall and spring Chinook in the Okanogan subbasin. Both of the plans indicate a need for additional artificial propagation facilities to meet Chinook salmon conservation and harvest objectives in the Okanogan River and in the upper Columbia River above Wells Dam. The draft Chinook HGMPs, and the collaborative process through which they were reviewed and developed, provide the foundation for the CJHP Master Plan, and subsequently the CJHP.

Habitat Protection and Restoration

Recent habitat protection and restoration activities in the Okanogan subbasin include: protection and restoration of land along key tributaries and mainstem reaches, stream channel and riparian habitat restoration and fencing programs, fish screening projects, and fish passage barrier removals. Habitat restoration has focused primarily on Omak and Salmon creeks, and limited areas along the Okanogan River. These measures will contribute to the success of the CJHP.

Salmon Enhancement Programs

WDFW operates a summer/fall Chinook artificial production program at Similkameen Pond that is responsible for much of the current production in the Okanogan River system. In addition, the Colville Tribes have initiated a number of programs to restore naturally-spawning populations of salmon and steelhead in the subbasin. The proposed CJHP is designed to complement the existing programs.

The Mitchell Act (Public Law 75-502) was passed by Congress in 1938 in recognition that the salmon fishery of the Columbia River was in serious and progressive decline. The Mitchell Act program provides authority for funding, operation, and maintenance of 18 hatcheries in the Columbia River Basin. All of the Mitchell Act fish production occurs below the Okanogan River (NPCC 2003). Thus, the main beneficiaries of Mitchell Act hatcheries are the lower Columbia River and ocean fisheries. The CJHP would help ameliorate this situation.

Public Education

Many entities share in salmon protection and recovery outreach and education efforts in local schools, public meetings, festivals, and such in the Okanogan subbasin. The CJHP would provide a visitor center and occasional hatchery tours to complement these efforts.

CHAPTER 2: ALTERNATIVES

2.1 Proposed Project

A fish hatchery is proposed for construction on the Columbia River adjacent to Chief Joseph Dam to produce juvenile summer/fall Chinook and spring Chinook (Section 2.1.4). Some of the fish would be released into the Columbia River at the hatchery while others would be transported to acclimation ponds located along the Okanogan River and Omak Creek for final rearing and release (Figure 2-1). A fish ladder at the hatchery and portable live-capture gear (Section 2.1.2) deployed down river and in the Okanogan River would be used to collect adult brood stock, which would reside at the hatchery's adult holding facility. Water, septic sewer and power utility systems would be installed to serve the hatchery and the four proposed employee houses (Section 2.1.5) nearby.

Two new acclimation ponds (Riverside and Omak) would be built. Three existing irrigation water settling ponds (Bonaparte, Ellisforde and Tonasket ponds) that have already been modified to also function as fish acclimation ponds outside the irrigation season would receive minor improvements. One existing acclimation pond (St. Mary's pond) would also receive minor modifications to enhance its function. (Section 2.1.6.)

The fish production program and proposed hatchery have been designed with the cooperation and oversight of the USACE to avoid adverse effects on Chief Joseph Dam and its operations. If any unforeseen or unintended adverse consequences on the operation Chief Joseph Dam or other FCRPS dams become apparent, then the hatchery and/or the fish production program would be altered to alleviate the situation.

2.1.1 Program Biological Components

The proposed Chief Joseph Hatchery Program (CJHP) has three biological components. Decision-makers may choose to adopt them in part or as a whole.

Component 1 is a program designed to increase abundance, distribution, and diversity of naturally spawning summer/fall Chinook salmon within their historical Okanogan subbasin habitat and in the Columbia River between its confluence with the Okanogan River and Chief Joseph Dam. This supplementation program would produce 1,100,000 hatchery smolts annually.

Component 2 would produce an additional 500,000 early-arriving and 400,000 late-arriving hatchery smolts annually in an attempt to broaden the spectrum of the run of returning summer/fall Chinook adults in the future. This component combined with Component 1 would enhance the potential to support tribal ceremonial and subsistence fisheries and provide recreational fishing opportunities for summer/fall Chinook.

Component 3 is a spring Chinook program that would produce 900,000 smolts annually in an effort to return naturally spawning spring Chinook to their historical Okanogan subbasin habitat and in the Columbia River between the Okanogan River and Chief Joseph Dam. Hatchery fish surplus to recovery needs in other nearby subbasins would be

used to support this component. This component could also enhance the potential for tribal ceremonial and subsistence fisheries and recreational fishing opportunities. It may also contribute to the recovery of the ESA-listed Upper Columbia River Spring Chinook Evolutionarily Significant Unit (ESU).

Summer/Fall Chinook

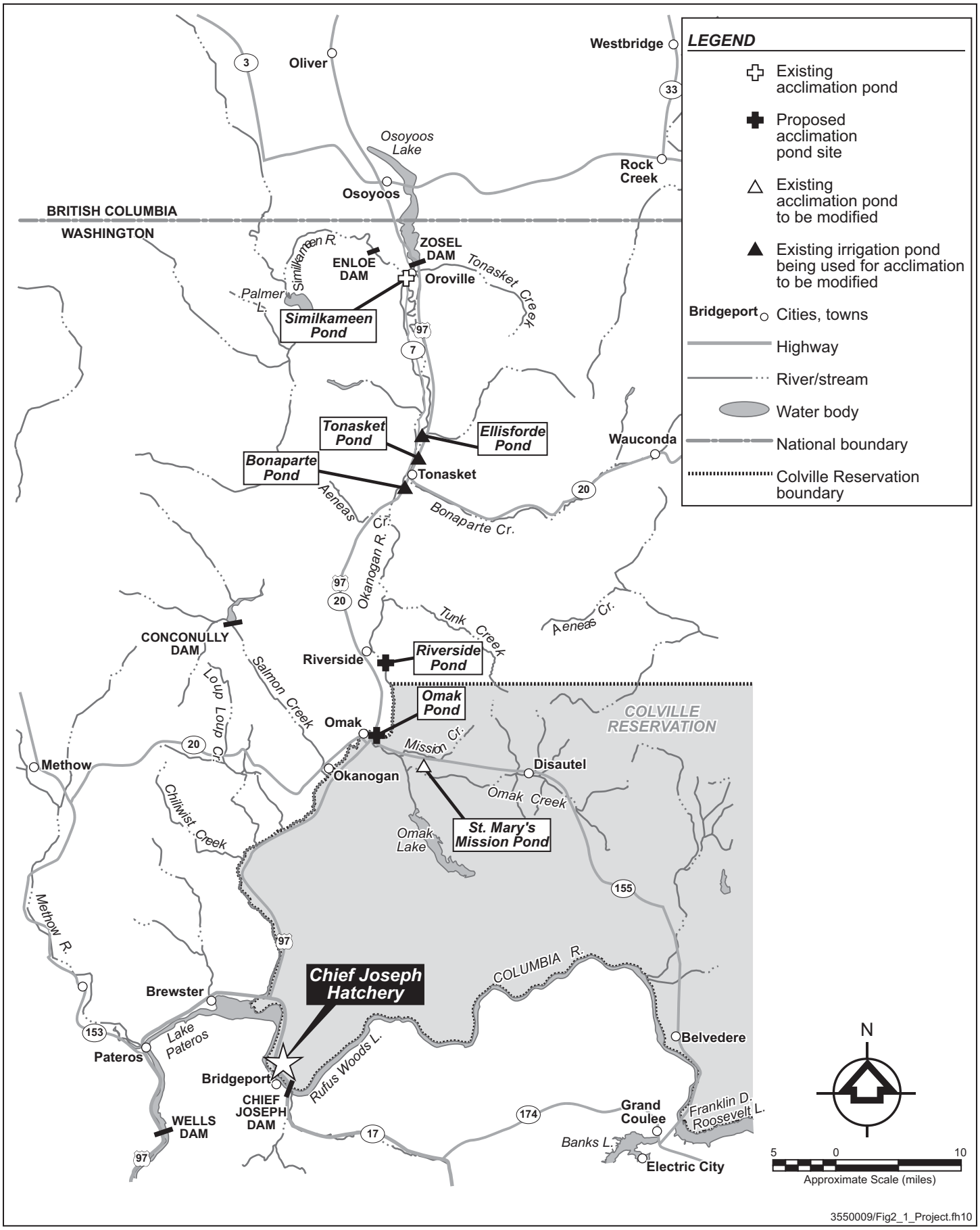
Components 1 and 2 would supplement the existing run of summer/fall Chinook, a population that is supported by some natural reproduction and the Eastbank Hatchery/Similkameen Pond program (Section 1.3) which produces up to 576,000 smolts annually. Supplementation within the CJHP would involve five elements (CTCR 2004, Volume 2 Appendix C, Summer/Fall Chinook Hatchery Genetic Management Plan):

- Develop a local Okanogan River brood stock through live capture of adults migrating past Wells Dam
- Propagate the full historical run of summer/fall Chinook by extending the current brood stock collection season by two months later (to early November)
- Propagate yearling and sub-yearling life stages from the brood stock to reflect natural diversity and add some necessary flexibility in the program
- Improve spawning distribution throughout the historical habitat
- Control the proportion of hatchery-origin fish spawning naturally

It is conceivable, although not currently proposed, that the on-going Eastbank Hatchery/Similkameen Pond production program and the CJHP would be integrated once the CJHP is well established. This would allow use of the local brood stock and smolts that are more representative genetically, phenotypically and behaviorally of the entire run of Okanogan fish than the current stock, and improve the abundance and distribution of smolts and returning adults eventually throughout the available habitat.

Spring Chinook

Component 3, spring Chinook reintroduction, involves using Carson stock spring Chinook (not ESA-listed) collected at the Leavenworth National Fish Hatchery or other adult fish surplus to program needs in other nearby subbasins as brood stock for producing up to 900,000 smolts annually. During project start-up, spring Chinook smolts would be reared at Little White Salmon and Willard hatcheries for a portion of their life cycle, and then moved to Chief Joseph Hatchery (CJH) for 5 to 6 months of low density final rearing. Eventually, smolts would be reared and released at CJH and its affiliated acclimation ponds. At the same time, adult escapement of spring Chinook destined for the Okanogan subbasin and CJH would be allowed to increase to stimulate natural spawning. Eventually, brood stock for the CJHP would be collected from adults returning to the CJH fish ladder and the existing Omak Creek weir, supplemented as needed with fish collected at Zosel Dam or via live-capture gear in the Okanogan and Columbia rivers (CTCR 2004, Volume 2 Appendix D, Spring Chinook HGMP).



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Colville Tribes
CHIEF JOSEPH HATCHERY PROGRAM
DRAFT ENVIRONMENTAL IMPACT STATEMENT

Figure 2-1.
Location of Project Facilities

TETRA TECH/KCM

Component 3 includes monitoring and evaluation (Section 2.1.3) to identify and correct any potentially adverse interactions between the proposed spring Chinook production program and summer/fall Chinook, steelhead, and Methow River spring Chinook populations, and to document the extent of any tribal or recreational harvest.

It is possible that Methow composite stock (currently ESA-listed as endangered) may eventually be developed for use in place of the Carson stock. Any such decision would be based on consultation with NOAA Fisheries. The Methow composite stock evolved in the subbasin nearest to the Okanogan and may harbor some genetic material of historical Okanogan spring Chinook. Using Methow composite stock could stimulate the Okanogan reintroduction effort by building a more adapted run providing that Methow composite stock numbers get large enough to contribute to this program.

2.1.2 Critical Research

The proposed project includes two vital research studies that are on-going but substantially completed. The first consists of radio-telemetry research to determine where and when summer/fall Chinook migrate, where they congregate, the extent to which they are spatially separated from other population components, and whether the timing of passage at Wells Dam is related to timing and location of subsequent spawning. This information is essential to the development of successful brood stock collection protocols and subsequent acclimation of their progeny. This study (Ashbrook et al, 2006) documents migration into tributaries between Wells Dam and Chief Joseph Dam and use of Chief Joseph Dam tailwater by summer/fall Chinook, among other things.

The second research study tests the viability of live-capture, selective fishing gear for local brood stock collection (CTCR 2008). The live-capture, selective fishing methods would provide the ability to control the ratio of hatchery fish to natural fish on the spawning grounds. Methods evaluated include the use of beach seines, floating trap-nets, fish wheels, tangle nets and dip-nets. The use of portable/removable live capture gear would also reduce impacts to other native fish species incidentally collected. Study results indicate preliminary success in the use of live-capture gear.

2.1.3 Monitoring and Evaluation

A draft monitoring and evaluation plan has been developed that outlines a strategy for how and which information would be gathered to evaluate the success of all components of the proposed production program (CTCR 2004, Master Plan Appendix H). Crucial information would be collected on fish interactions, productivity rates of hatchery origin and natural origin populations and harvest effects, which would all be used to refine brood stock collection and adjust fish production numbers and release locations.

This plan would be coordinated through existing forums to ensure strategic integration with other programs and projects in this and other subbasins of the Columbia Cascade Province. Finally, the monitoring and evaluation plan would be coordinated with broader, Columbia River Basin monitoring and evaluation efforts in order to seek cost efficiencies and opportunities to address prevailing uncertainties at a larger scale.

2.1.4 Chief Joseph Hatchery Complex

The hatchery would be built on a plateau over the right bank of the Columbia River between Chief Joseph Dam and State Highway 17 at River Mile (RM) 543 near Bridgeport, WA (Figure 2-1). The site is flanked on the east by Chief Joseph Dam and a tribal fishing access site near the base of the dam, and on the west by the USACE's visitor orientation area, overlook and picnic area (Figure 2-2 and Figure 2-2a). Access to the site is from Half-Sun Way, which joins SR-17 about 1,000 feet to the west.

Heavily impacted during the construction of Chief Joseph Dam, this 24.5-acre site was subsequently graded and seeded to grass, and remains undeveloped. Minor grading would be required prior to initiating structural improvements. About 300 feet of the USACE's paved trail along the southern edge of the hatchery site plateau would need to be realigned to accommodate the new hatchery complex.

Main hatchery features would include fish rearing raceways, waste treatment ponds, a main hatchery building, a small administration/visitor facility, a fish ladder and brood stock collection/holding area, and a complex water supply/routing system (Figure 2-3).

Sixty concrete raceways, each about 10 feet wide by 110 feet long, would be built below ground level (below grade) occupying about 2 acres nearest to the USACE's visitor orientation area. The raceways would be arranged in three sets terraced at different elevations to allow use of low-head oxygenators (aerators) between sets to enable serial re-use (re-cycling) of raceway water during emergency or low water conditions.

Raceway waste would be pumped to concrete waste treatment aeration and settling ponds excavated below grade on the western end of the hatchery complex, well above the high-water level of the river (Figure 2-3). After any solids have settled, waste pond flow would be mixed with regular raceway discharge and piped down to the adult holding ponds where it would enter the river via the fish ladder. Waste pond configuration would be dual cell so that one waste pond may be dewatered and cleaned while the other cell remains in use. The waste ponds would function year-round. Concentrated wastes would be removed from the ponds and deposited at an approved dry land location annually. The concentrated wastes may be used as fertilizer in upland applications if permissible.

East of the raceways, the main hatchery building would contain a laboratory, workshop, incubation area, hatchery water treatment equipment, fish food storage, staff offices, and rest rooms within its 20,000 square foot area. Near the main hatchery building would be a 3,000 square foot head box structure for water collection and routing throughout the complex. An administration/visitor facility would be provided at the east end of the hatchery complex, complete with paved access road and parking space for cars, buses and RVs. The gravel access road from the existing fishing access down to the bank of the Columbia River would be upgraded for safer year-round use and would be paved where the fish ladder and adult collection/holding facility would be installed. The USACE (the road managers) would be consulted to determine if additional improvements may be necessary to accommodate hatchery operations and continued recreational use.

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Figure 2-2
PROPOSED CHIEF JOSEPH HATCHERY SITE PLAN

TETRA TECH/KCM

Figure 2-2a. Proposed Chief Joseph Fish Hatchery

SCD 6/25/07

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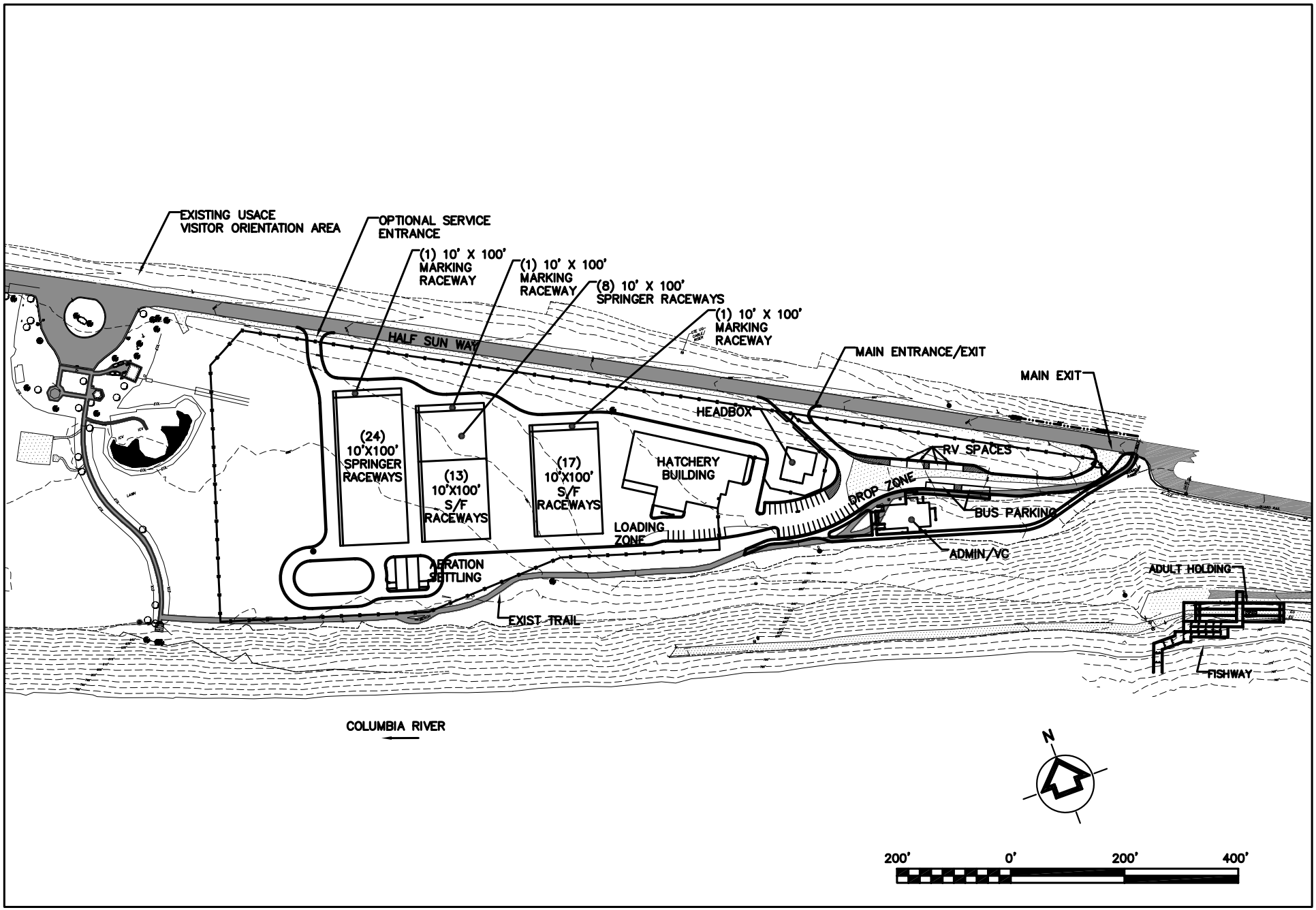
0 125 250 500 750 1,000

Feet

1:1,200

EXISTING USACE VISITOR ORIENTATION AREA
OPTIONAL SERVICE ENTRANCE
(1) 10' X 100' MARKING RACEWAY
(1) 10' X 100' MARKING RACEWAY
(8) 10' X 100' SPRINGER RACEWAYS
(1) 10' X 100' MARKING RACEWAY
HALF SUN WAY
(24) 10'X100' SPRINGER RACEWAYS
(13) 10'X100' S/F RACEWAYS
(17) 10'X100' S/F RACEWAYS
HEADBOX
HATCHERY BUILDING
MAIN ENTRANCE/EXIT
MAIN EXIT
LOADING ZONE
EXIST. TRAIL
DROP ZONE
RV SPACES
BUS PARKING
ADMIN/VIS
ADULT HOLDING



Colville Tribes
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Figure 2-3
SITE PLAN

TETRA TECH/ KCM

Common building materials and standard construction practices would be used for all structures. All necessary leases, easements, and permits (construction/building, water rights, water discharge, instream work) would be secured before construction begins. Buildings would be above grade standard industrial-type structures on concrete slabs with spread footings for foundations. The head box, raceways, fish ladder and waste treatment ponds would have cast-in-place concrete walls, extending a few feet above grade. Architecturally, structures would be sensitive to the surrounding landscape, other nearby structures, and the cultural heritage of the Colville Tribes, if possible. Heavy equipment would be used for all excavation. Piping for the water supply network would require extensive use of trenching equipment through the well field along Half-Sun Way Road and from Chief Joseph Dam's relief tunnel (Figure 2-4). In total, about 20 acres would be permanently developed. Native plants would be used to revegetate undeveloped, disturbed areas (about 5 acres).

Construction would probably take 2 years, beginning as early as 2010. Silt fences, hay bales, erosion control matting and other typical construction Best Management Practices (BMPs) would be used to prevent erosion and contain pollution on portions of the site and riverbank affected during construction. The size of the work force at the site would depend on the season, the type of work being performed, and the contractors' approach. It is expected that fewer than 100 workers would be employed at any one time.

About two months would be needed to construct the in-stream portion of the fish ladder. Temporary cofferdams consisting of sandbags and/or sheet pile would be placed in the river to isolate this work area. The contractor would be required to use dewatering pumps with sediment filtration to remove and return cofferdam seepage into the river.

All of the salmon culture activities would begin with adult salmon brood stock held in four concrete raceways (about 10 by 100 feet each) located at the head end of the fish ladder. The fish ladder would be submerged about 3-5 feet in the Columbia River, and climb about 20 feet through several 90 degree turns to where the adult holding ponds would be. Some brood stock would swim up the ladder directly to the holding ponds, being attracted by the scent and velocity (40-50 cubic feet per second [cfs]) of the hatchery discharge flow there. The rest of the brood stock would be collected at downstream sites or in the Okanogan River using live-capture gear and transferred by truck to the holding pools. Although the fish ladder would typically be operated only from May through November, hatchery discharge water would be routed down the fish ladder year-round. If unwanted (non-target) fish enter the ladder, they would be sorted from potential brood stock and promptly returned to the river. Screening to block the ladder in the off-season would be installed if monitoring reveals the need.

Selected brood stock would be sorted and monitored in the adult holding ponds until they are ready to spawn. The eggs and milt would be collected in a nearby spawning shed where the eggs would be fertilized and water-hardened before being trucked up to the incubation area in the main hatchery building. There, the young fry would emerge and mature into smolts, be marked (fin-clipped) and moved into the raceways to be reared at proper densities to stimulate growth and heartiness. During rearing, the smolts would be fed a pelletized diet. The raceways would be periodically cleaned to remove feces, un-eaten food and other waste. Finally, some fish would be released directly from the

hatchery into the Columbia River while others would be trucked to various acclimation ponds for release into the Okanogan River.

The administrative/visitor facility would be used year-round for hatchery operations and would be open to visitors and occasional guided tours on normal business days. The gated entrance would be locked when the facility is closed. The USACE's existing trail would be incorporated into an entry plaza at the administrative/visitor center. The tribal fishing site and USACE's visitor orientation area would be unaltered, and existing access to the river would be maintained although restrictions may be imposed near the fish ladder entrance during brood stock collection.

2.1.5 Utilities and Water Supply

The utilities and water supply systems would be installed as part of the hatchery complex construction over about two years. Electric power for the hatchery complex and water supply pumps would be provided by Nespelem Valley Electric Cooperative, whose lines currently span the sites. A new transformer and several hundred feet of overhead power line within the hatchery site would be installed. The existing telephone service along Half-Sun Way would be extended about 1,000 feet to the hatchery.

Sanitary sewer will be treated via an on-site septic drain field system. Domestic wastewater from the hatchery would be relatively minor and could easily be handled by an on-site system. However, if soil conditions or other factors are found to prohibit this option, then a lift station and force main to the City of Bridgeport could be considered. Although not expected to be needed, the lift station/force main option would consist of a 2,000-gallon buried concrete tank, 2 submersible pumps, and a 2- to 4-inch-diameter plastic pipe extending about 3,000 feet to Bridgeport's nearest sewer main.

Hatchery water would come from three sources: 1) a groundwater well field along Half-Sun Way (also the hatchery's potable water source), 2) an existing relief tunnel that collects seepage from the abutment of Chief Joseph Dam, and 3) an existing irrigation tap in the dam that would divert water from Rufus Woods Lake (Figure 2-4).

Up to twenty groundwater wells may be drilled on an undeveloped 25-acre site along Half-Sun Way adjacent to the Lake Woods Golf Course. Wells would be about 12 inches in diameter and would be spaced to minimize hydraulic interference. Exact well locations, spacing and size would depend upon the results of a groundwater analysis and well tests which would be conducted if the project proceeds to implementation. Attempts would be made to locate wells along existing roads to minimize construction and maintenance costs. Individual well pipelines would be linked to join a 2.5-mile long, 30-inch diameter pipeline which would be buried along the Half-Sun Way right-of-way. The final 1,500 feet of pipeline would run down slope from the road to the hatchery head box structure (Figure 2-3).

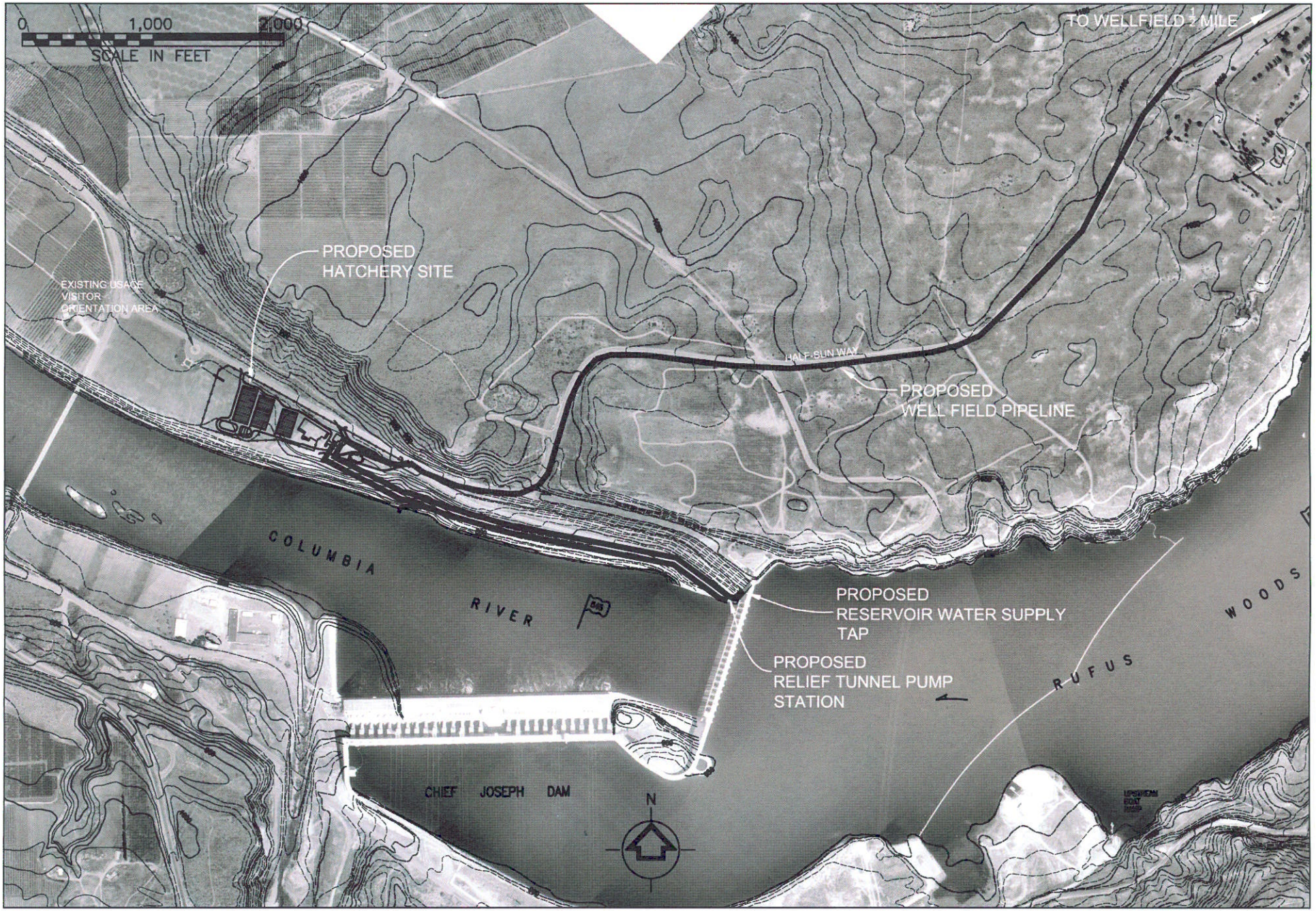

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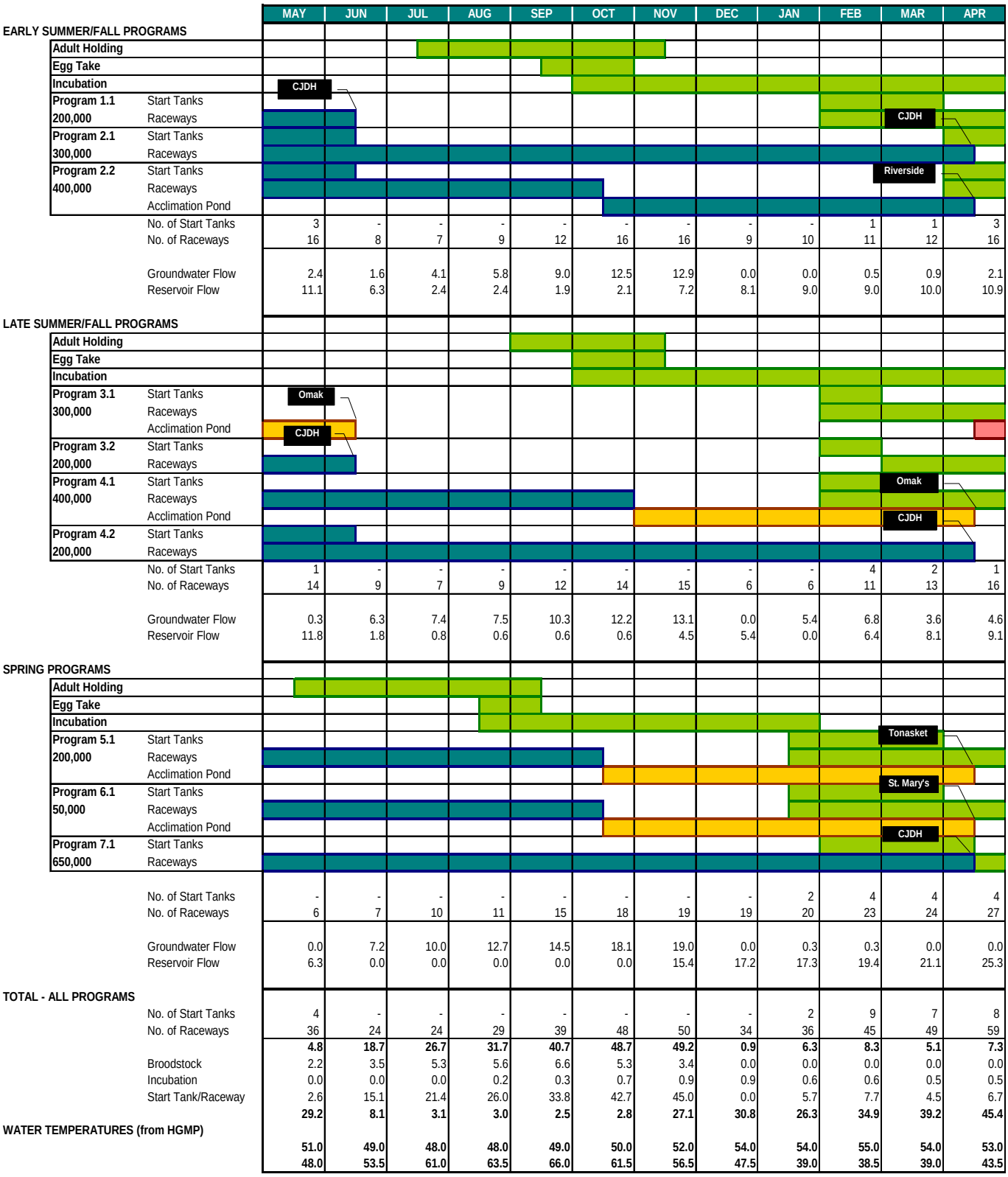
Figure 2-4
HATCHERY WATER SUPPLY FEATURES

TETRA TECH/ KCM

Table 2-1. Approximate Hatchery Operation Schedule: Average Monthly Flows in CFS



		MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR
EARLY SUMMER/FALL PROGRAMS													
Adult Holding													
Egg Take													
Incubation													
Program 1.1	Start Tanks												
200,000	Raceways												
Program 2.1	Start Tanks												
300,000	Raceways												
Program 2.2	Start Tanks												
400,000	Raceways												
	Acclimation Pond												
	No. of Start Tanks	3	-	-	-	-	-	-	-	-	1	1	3
	No. of Raceways	16	8	7	9	12	16	16	9	10	11	12	16
	Groundwater Flow	2.4	1.6	4.1	5.8	9.0	12.5	12.9	0.0	0.0	0.5	0.9	2.1
	Reservoir Flow	11.1	6.3	2.4	2.4	1.9	2.1	7.2	8.1	9.0	9.0	10.0	10.9
LATE SUMMER/FALL PROGRAMS													
Adult Holding													
Egg Take													
Incubation													
Program 3.1	Start Tanks												
300,000	Raceways												
	Acclimation Pond												
Program 3.2	Start Tanks												
200,000	Raceways												
Program 4.1	Start Tanks												
400,000	Raceways												
	Acclimation Pond												
Program 4.2	Start Tanks												
200,000	Raceways												
	No. of Start Tanks	1	-	-	-	-	-	-	-	-	4	2	1
	No. of Raceways	14	9	7	9	12	14	15	6	6	11	13	16
	Groundwater Flow	0.3	6.3	7.4	7.5	10.3	12.2	13.1	0.0	5.4	6.8	3.6	4.6
	Reservoir Flow	11.8	1.8	0.8	0.6	0.6	0.6	4.5	5.4	0.0	6.4	8.1	9.1
SPRING PROGRAMS													
Adult Holding													
Egg Take													
Incubation													
Program 5.1	Start Tanks												
200,000	Raceways												
	Acclimation Pond												
Program 6.1	Start Tanks												
50,000	Raceways												
	Acclimation Pond												
Program 7.1	Start Tanks												
650,000	Raceways												
	No. of Start Tanks	-	-	-	-	-	-	-	-	2	4	4	4
	No. of Raceways	6	7	10	11	15	18	19	19	20	23	24	27
	Groundwater Flow	0.0	7.2	10.0	12.7	14.5	18.1	19.0	0.0	0.3	0.3	0.0	0.0
	Reservoir Flow	6.3	0.0	0.0	0.0	0.0	0.0	15.4	17.2	17.3	19.4	21.1	25.3
TOTAL - ALL PROGRAMS													
	No. of Start Tanks	4	-	-	-	-	-	-	-	2	9	7	8
	No. of Raceways	36	24	24	29	39	48	50	34	36	45	49	59
		4.8	**18.7**	**26.7**	**31.7**	**40.7**	**48.7**	**49.2**	**0.9**	**6.3**	**8.3**	**5.1**	**7.3**
	Broodstock	2.2	3.5	5.3	5.6	6.6	5.3	3.4	0.0	0.0	0.0	0.0	0.0
	Incubation	0.0	0.0	0.0	0.2	0.3	0.7	0.9	0.9	0.6	0.6	0.5	0.5
	Start Tank/Raceway	2.6	15.1	21.4	26.0	33.8	42.7	45.0	0.0	5.7	7.7	4.5	6.7
		29.2	**8.1**	**3.1**	**3.0**	**2.5**	**2.8**	**27.1**	**30.8**	**26.3**	**34.9**	**39.2**	**45.4**
WATER TEMPERATURES (from HGMP)													
		51.0	**49.0**	**48.0**	**48.0**	**49.0**	**50.0**	**52.0**	**54.0**	**54.0**	**55.0**	**54.0**	**53.0**
		48.0	**53.5**	**61.0**	**63.5**	**66.0**	**61.5**	**56.5**	**47.5**	**39.0**	**38.5**	**39.0**	**43.5**

Path: S:\CADD\3450002CJHS3\Images\CJH EIS Housing Fig 2-5 7-22-09.dwg Plot date: Jul 22, 2009-03:14:59pm CAD User: mike.schumacher.
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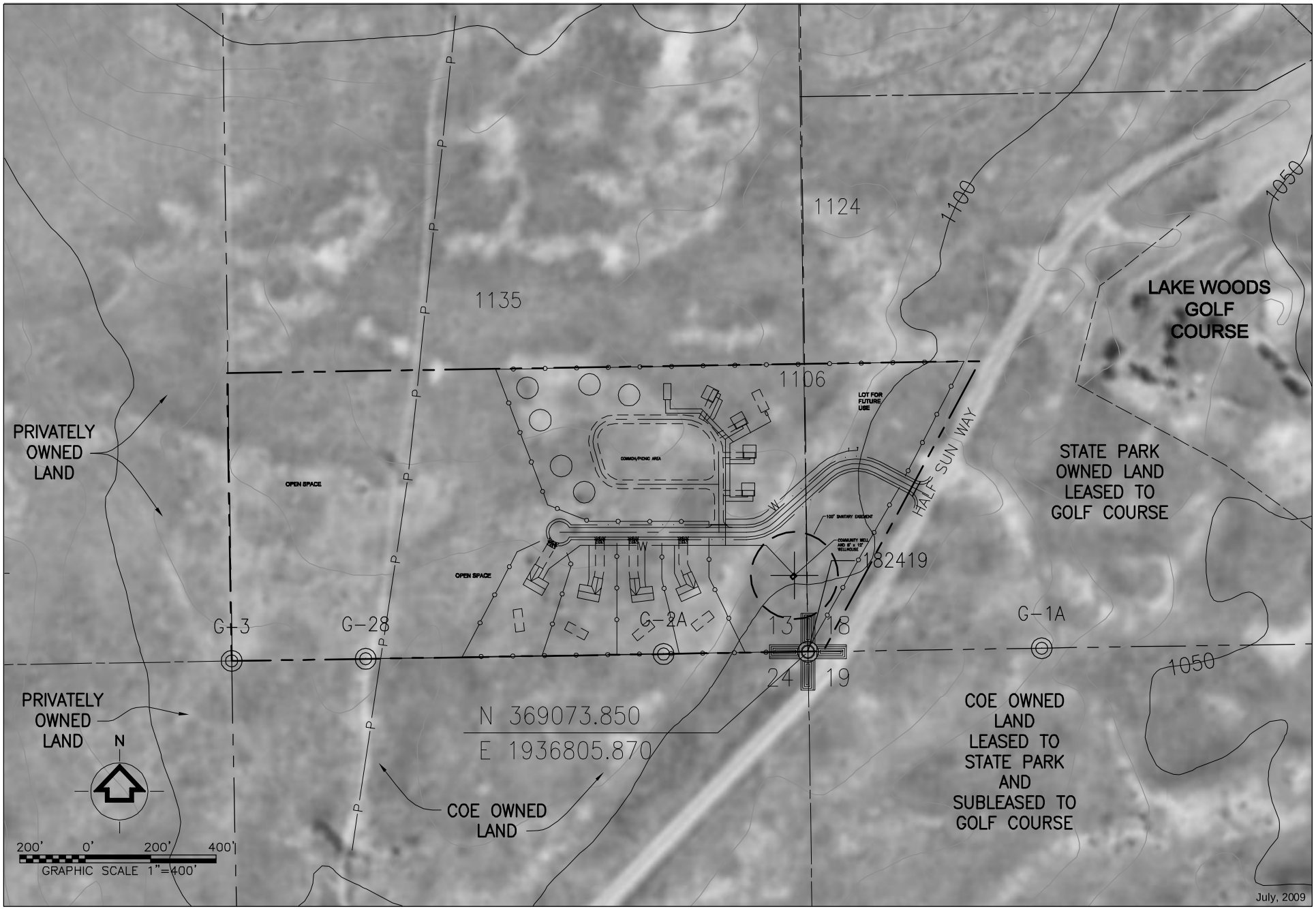

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Figure 2-5
HATCHERY STAFF HOUSING PLAN

TETRA TECH

Existing flow from the dam's relief tunnel would be collected at a new wet well located on the river's right bank just downstream of the dam and then pumped through a buried 24-inch-diameter pipeline to the hatchery head box (Figure 2-3). The wet well would be part of a new 24-foot-diameter by 80-foot-deep buried relief tunnel pump station (Figure 2-4). It would be positioned near the relief tunnel to facilitate interconnection in the fill near the intersection of the right training wall and the toe of the dam in Monolith No. 4. A four-foot diameter horizontal conduit would then be constructed at the base of the shaft through about 15 feet of monolith concrete to intercept the drain line from the relief tunnel sump. Four pumps would be installed within this structure. A small building containing the pump controls and operator access to the wet well would be built on top. Pump station construction would use a secant wall and pumps and to dewater below-grade portions of the operation.

The reservoir water supply would use the existing irrigation intake in Monolith No. 2. At the irrigation tap in the dam (an unused port in the dam), panels would be placed in existing slots on the upstream face of the dam to dewater the opening and allow construction to occur in the dry. New stoplogs or a custom gate well panel would be installed in the stoplog slot. This feature would be designed so that it could be quickly lowered into position in an emergency. Portions of both walls would be removed and a 30-inch diameter water supply line installed. There would be a custom steel plate mounting flange attached to the upstream wall of the existing room located at the interior of the monolith at the inlet elevation. A gallery is incorporated into the interconnecting passageway to accommodate piping, valves, and controls. The gallery opens to an access corridor, which would be fitted with a stainless steel watertight door to contain flow in the unlikely event of a pipe rupture. A galvanized steel platform, stairs, and handrail would be installed in the gallery to enable access for routine operation and maintenance activities. A 30-inch pipe would be run through the wall of the dam. The pipe would then be attached down the face of the dam and routed a short distance to join the relief tunnel pipeline trench where the pipeline would continue underground to the hatchery head box. The pipeline trench from the face of the dam to the hatchery head box would be about 12 feet wide and 3,500 feet long. At the reservoir inlet, trash rack and fish screen would be installed in existing slots. Inlet work would be performed from the deck of the dam and piping work from the downstream river embankment. A pipe shutoff valve would be installed at the inlet in the irrigation room. An additional emergency shutoff valve would be placed outside of the dam in case of a pipe break. Pipelines would be monitored for leakage that might imperil bank stability.

The hatchery water demand needed to incubate and raise fish would vary throughout the year due to the variety of rearing programs planned. Table 2-1 shows a proposed operating schedule for the 10 hatchery programs, including the timing of water use by month for a 2-year fish rearing cycle.

Water from the groundwater wells and relief tunnel is considered to be pathogen-free, but would need to be gas-stabilized to remove excess nitrogen and add oxygen prior to use in the hatchery. Water from Rufus Woods Lake may require filtration to eliminate common water-borne contaminants and particulates. Occasionally, some Rufus Woods Lake water may be needed to supplement the groundwater, in which case it would need to be treated with finer filtration and UV disinfection. Relief tunnel water may need to be chilled to

provide suitable temperatures to incubate eggs. The apparatuses associated with these water treatments would be installed either near the head box facility or in the main hatchery building.

2.1.6 Employee Housing

Employee housing would be constructed so that personnel are near during hatchery operations. The proposed site is about 23.3 acres of Washington State Parks and Recreation Commission land located two miles northeast of the hatchery on Half-Sun Way (Figure 2-5) across from the Lake Woods Golf Course. Four 2,000 square-foot single-family homes on one-acre lots would be constructed complete with potable water (through a shared well), individual septic tanks/drain fields, power (from Nespelem Valley Electric Cooperative) and communications connections. These utilities would also be provided to a one-acre parcel nearby to support up to four RVs or camp trailers for temporary residents (e.g. construction personnel and seasonal personnel employed during peak hatchery operations). Another small space (about an acre) at the housing site may be used for temporary storage of hatchery equipment (boats, tagging trailers, live-capture fish gear, etc.), while most of the site would remain in native vegetation.

During construction, up to 10 acres of land may be temporarily disturbed while 5 acres would be permanently developed. Development would consist of access road construction, utility trenches, and housing site clearing, foundations and landscaping. Final surfacing would include paved roads, concrete driveways, and grass lawns. Construction is expected to take about 7 months (October through April) and would employ an average of 10 workers. Building permits and other approvals would be acquired, as appropriate.

2.1.7 Acclimation Ponds

The ponds are discussed below in order from north to south (Figure 2-1). When in use for fish acclimation, the ponds would be visited daily by hatchery staff to feed fish, check intake screens and pumps, and periodically clean the ponds. Waste would be vacuumed from the ponds and stored in containment areas until it could be properly disposed of per State of Washington environmental regulations. The ponds would also all be linked to the main hatchery and the Omak Office of the Colville Tribes' Fish and Wildlife Department via radio telemetry instruments so that water and rearing conditions can be monitored remotely. Sensors would detect pond water level and other physical parameters and transmit this data via either a telephone line or a radio-based system.

Similkameen Pond

This pond is at RM 3 of the Similkameen River (a tributary to the Okanogan River) near the town of Oroville. It is owned by Chelan PUD and operated by WDFW as part of the on-going Eastbank Hatchery/Similkameen Pond production program. No change to the current operations or facilities is proposed although they may eventually be integrated with the CJHP (Section 2.1.1). For the purposes of this analysis, Similkameen Pond is not considered to be part of the CJHP.

Ellisforde Pond

Ellisforde Pond is an Oroville-Tonasket Irrigation District (OTID) irrigation pond located at RM 62.0 of the Okanogan River, adjacent to Highway 97 (Figure 2-6). It would be used to acclimate summer/fall Chinook from October to April (when not being used for irrigation) if one of the other proposed facilities proves infeasible or becomes unavailable. Although it is already adapted for fish acclimation, its outlet would need to be modified for easier volitional fish release and maintenance. The pond would be fed by 25 cfs of water pumped from the Okanogan River.

To install the new concrete outlet structure, a 10 square-foot area would be excavated adjacent to the pond in the unvegetated quarry rock about 20 feet from the Okanogan River shoreline. A silt fence placed between the excavation and the river would control erosion. This work would likely occur between October and December.

Tonasket Pond

This OTID irrigation pond, at RM 59.0 of the Okanogan River, is on State Highway 7 upstream of the town of Tonasket (Figure 2-7). Already adapted for fish acclimation, it only needs radio telemetry instruments to remotely track water and fish rearing conditions at the pond. The pond would withdraw 25 cfs from the Okanogan River between October and April (outside the irrigation use season) for spring Chinook acclimation.

Bonaparte Pond

This OTID irrigation pond is located at RM 56.0 of the Okanogan River, adjacent to Highway 97 downstream of the town of Tonasket (Figure 2-8). It would be used to acclimate summer/fall Chinook from October to April when not being used for irrigation. Although Bonaparte Pond is already adapted for fish acclimation, it needs modifications to improve its drainage and cleaning mechanisms and its radio telemetry instruments. The pond is fed by 25 cfs of water pumped from the Okanogan River.

Construction work would occur within the existing fenced perimeter and may involve minor earth disturbance confined within the existing lined pond and gravel parking area. Modifications would occur when the pond is not in use for irrigation, and would take about two months to complete.

Riverside Pond

This acclimation pond would be built on a hay field at Okanogan RM 41.0 adjacent to the Omak-Riverside Eastside Road and the Cascade Columbia River Railroad line, near the Town of Riverside (Figure 2-9). Riverside Pond would hold 55,000 cubic feet of water to be supplied by seasonally pumping 15 cfs from the Okanogan River and approximately 200 gallons per minute of well water to acclimate summer/fall Chinook from October through April. When not in use, the pond would be drained and cleaned. Waste would be vacuumed from the pond and stored in a containment area until it could be properly disposed of per State of Washington environmental regulations.

Development of the pond would require building an access road, a power line connection, a water intake and pump station, three sections of pipeline, the pond, an outlet into the river, predator protection (bird netting or a roof over the pond, depending on funding), controls, and radio telemetry instruments. Construction would take about seven months. Up to 15 acres of hay field may be temporarily disturbed by construction, four of which would be permanently altered. Silt fences, hay bales, erosion control matting and other typical construction BMPs would prevent erosion and control construction contaminants. Native plants would be used wherever possible to revegetate disturbed areas.

The gravel access road would be about 1,800 feet long by 12 feet wide and would use an existing permitted railroad crossing.

The pond would occupy about an acre, most of it below ground surface grade. Much of the excavated soil would be stockpiled and used as fill around the edge of the pond while excess material would be hauled by dump truck to an undetermined location.

A small pump station would be built just south of the pond on the bank of the Okanogan River to transfer river water to the pond through about 300 feet of buried pipeline. Since the water intake part of the pump station would be about three to five feet deep in the river, a temporary sandbag cofferdam and dewatering pumps would be needed to allow in-stream construction. The cofferdams and dewatering pumps would clear about 1,000 square feet of river area. Dewatering pump discharge would be filtered for sediment before being returned to the Okanogan River. The intake design includes installation of a screen to keep fish and certain other debris out of the pump station. All in-stream work would be completed within two months; the rest of the pump station construction and pipeline occurring above the river bank would take about 6 months. About 1,200 feet of power line would need to be extended from existing lines on the Omak Eastside River Road to serve the pump station and pond.

An existing on-site irrigation well would supply cool, clean ground water to the pump station where it would be mixed with river water and piped into the pond. The 1,500-foot-long pipeline from the well to the pump station would be replaced with higher quality pipe buried at a frost-free depth. Appropriate permits would be obtained so that the pipeline may cross under the railroad.

Water leaving the pond would flow through about 400 feet of buried pipeline that would discharge directly into the Okanogan River at a point about 350 feet downstream of the pump station/intake. Smolts would volitionally release from the pond and pass through this pipeline to the river at the end of their rearing period. When the pond is in use for fish rearing, water would continuously flow through the system, discharging at a low velocity onto a flat concrete pad designed to prevent erosion of the river bed. The pipe outfall would be unscreened because it would be releasing, not diverting flow.

St. Mary's Mission Pond

This existing acclimation pond owned and operated by the Colville Tribes is located in a fallow field at RM 5.0 of Omak Creek, a tributary to the Okanogan River at about RM 32 (Figure 2-10). Up to 2 cfs of Omak Creek water would supply this pond from October to April to acclimate spring Chinook. Proposed modifications would include perimeter

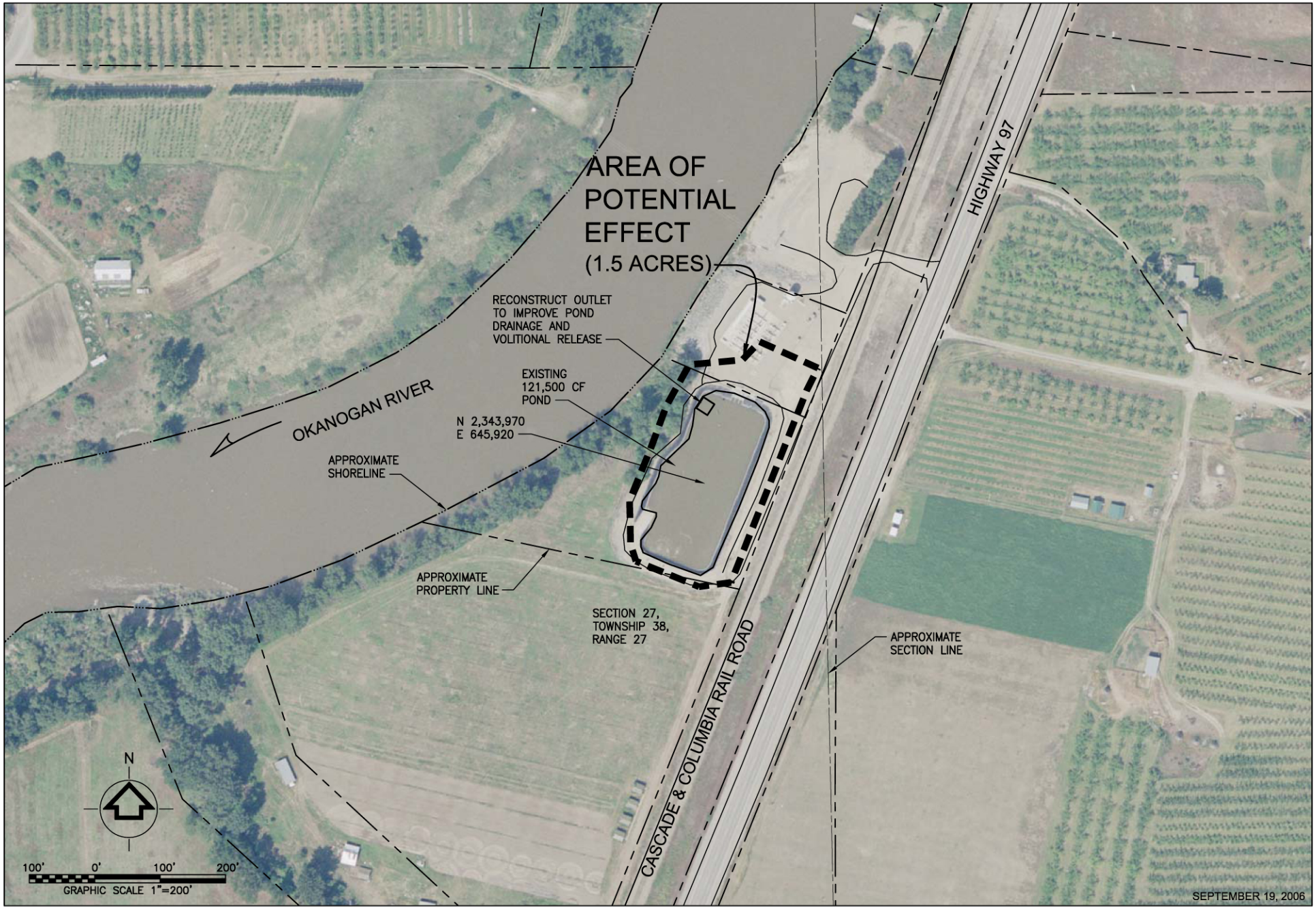

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Figure 2-6
ELLISFORDE ACCLIMATION POND

TETRA TECH/ KCM

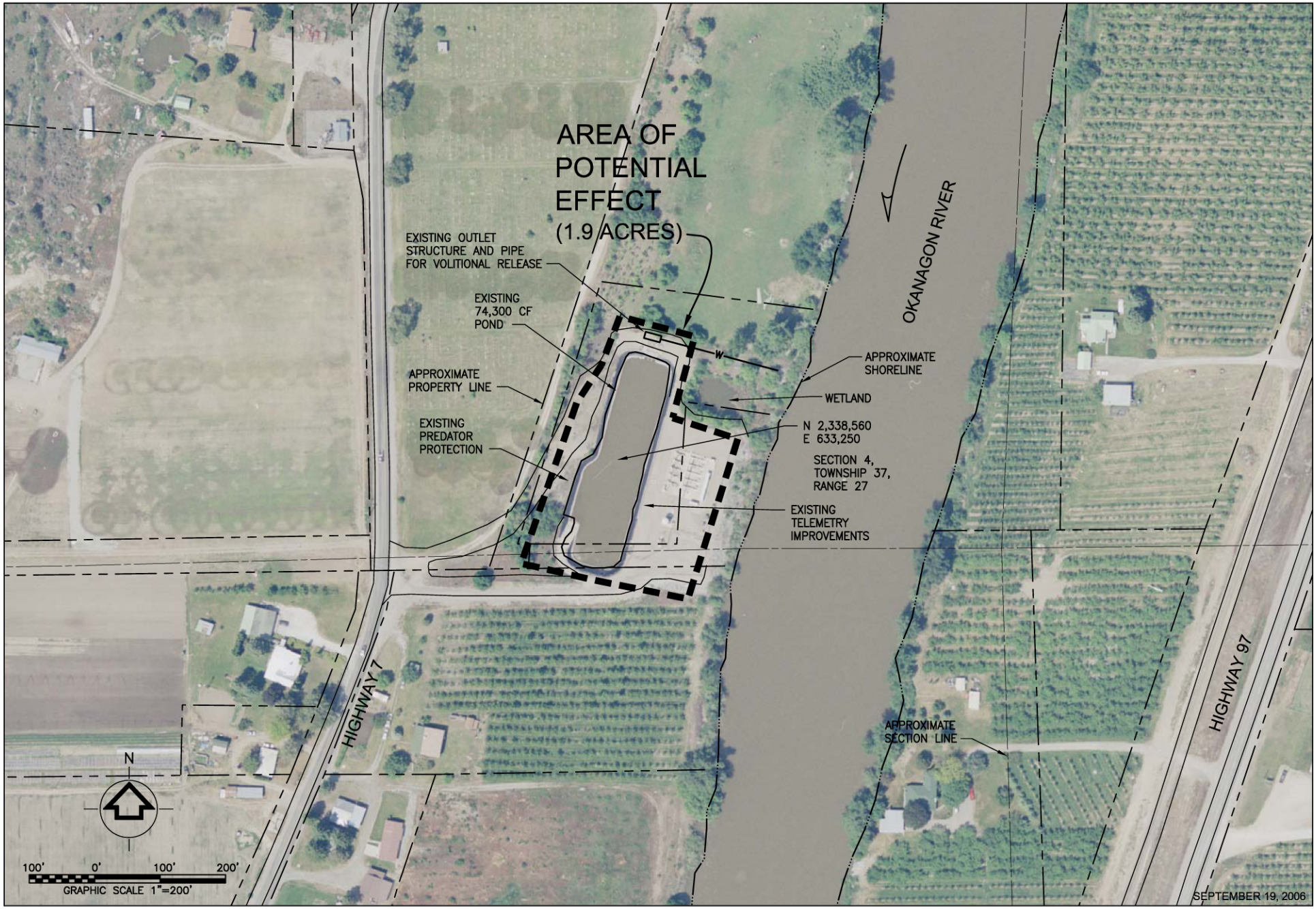

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Figure 2-7
TONASKET ACCLIMATION POND

TETRA TECH/ KCM

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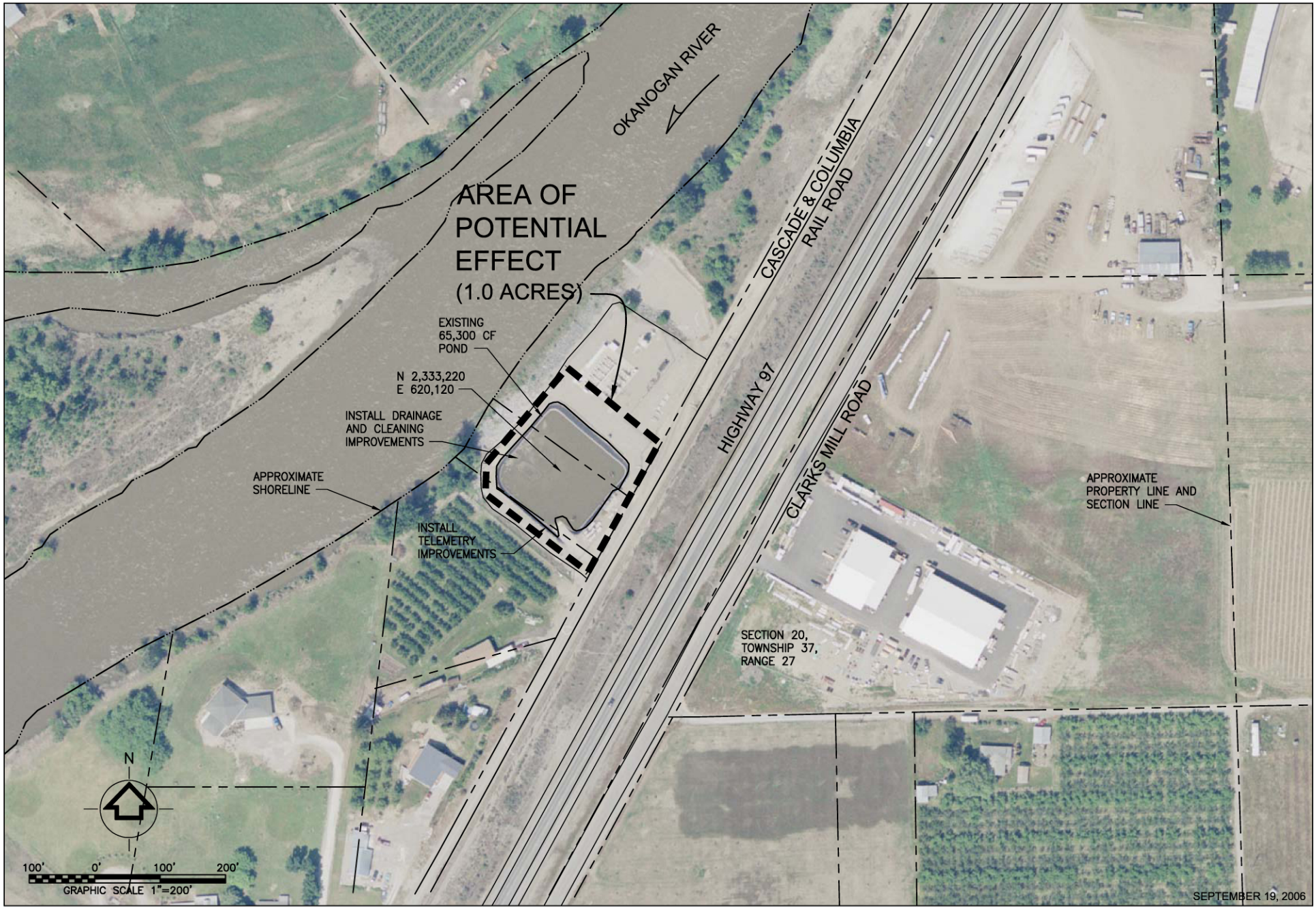

Colville Tribes
CHIEF JOSEPH HATCHERY PROGRAM
DRAFT ENVIRONMENTAL IMPACT STATEMENT

Figure 2-8
BONAPARTE ACCLIMATION POND

TETRA TECH/ KCM

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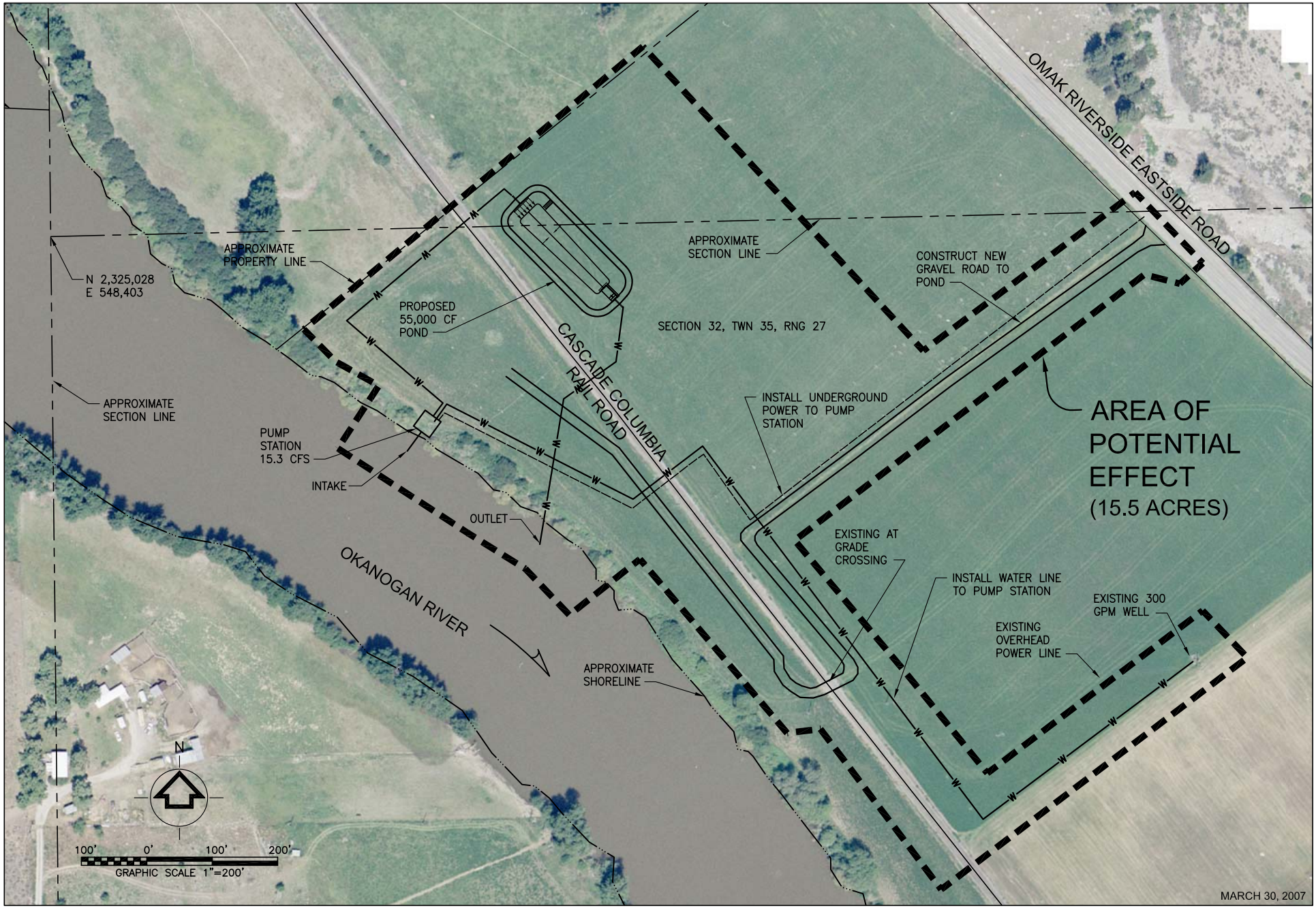

Colville Tribes
CHIEF JOSEPH HATCHERY PROGRAM
DRAFT ENVIRONMENTAL IMPACT STATEMENT

Figure 2-9
RIVERSIDE ACCLIMATION POND

TETRA TECH/ KCM

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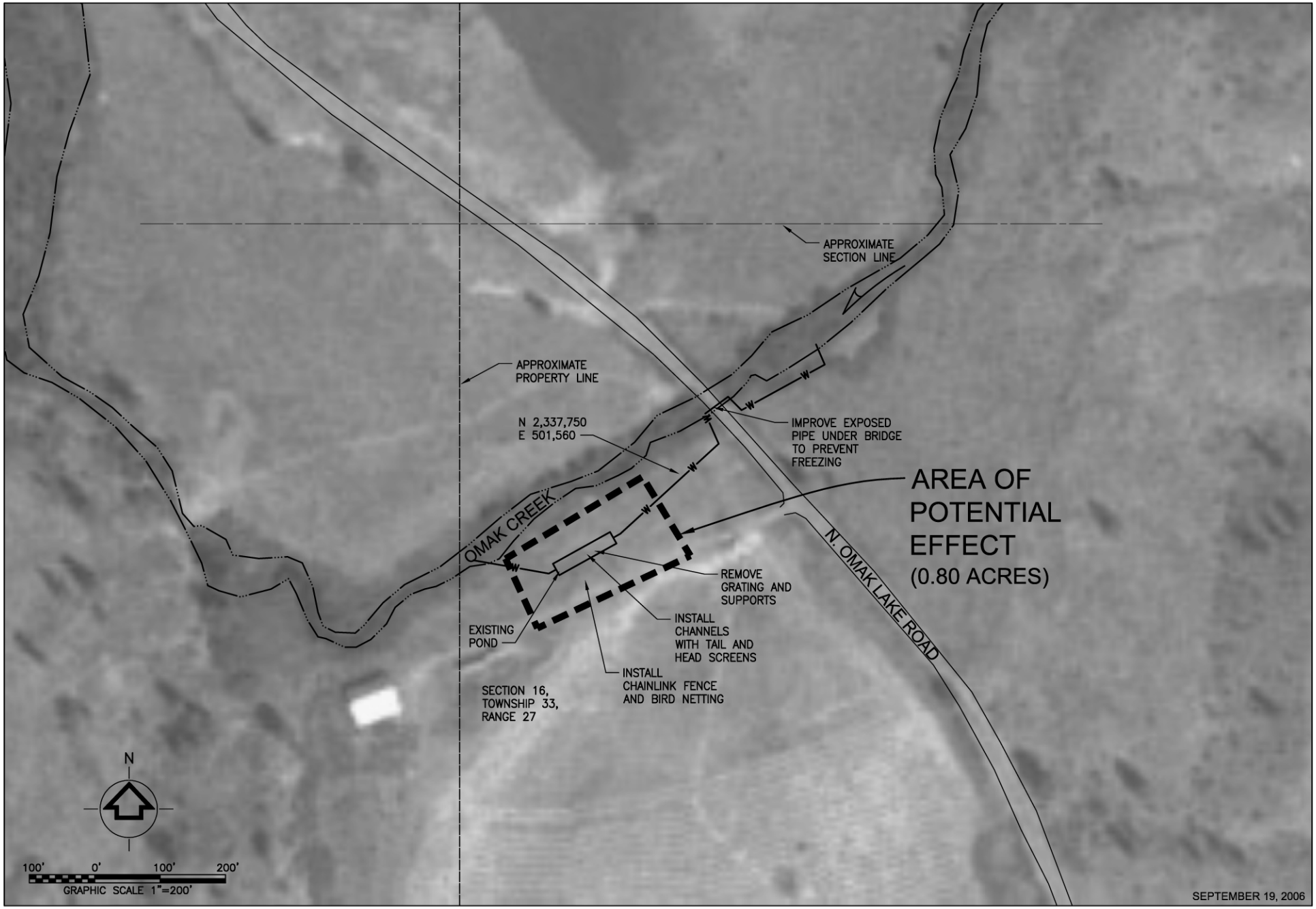

Colville Tribes
CHIEF JOSEPH HATCHERY PROGRAM
DRAFT ENVIRONMENTAL IMPACT STATEMENT

Figure 2-10
ST MARY'S MISSION ACCLIMATION POND

TETRA TECH/ KCM

Path: G:\CADD\CADProj\3450002CJDH\STEP2\Figures\EIS\CJH EIS Omak Fig 2-11 3-30-07.dwg Plot date: Mar 29, 2007-05:08:48pm CAD User: Darrel.Nice.
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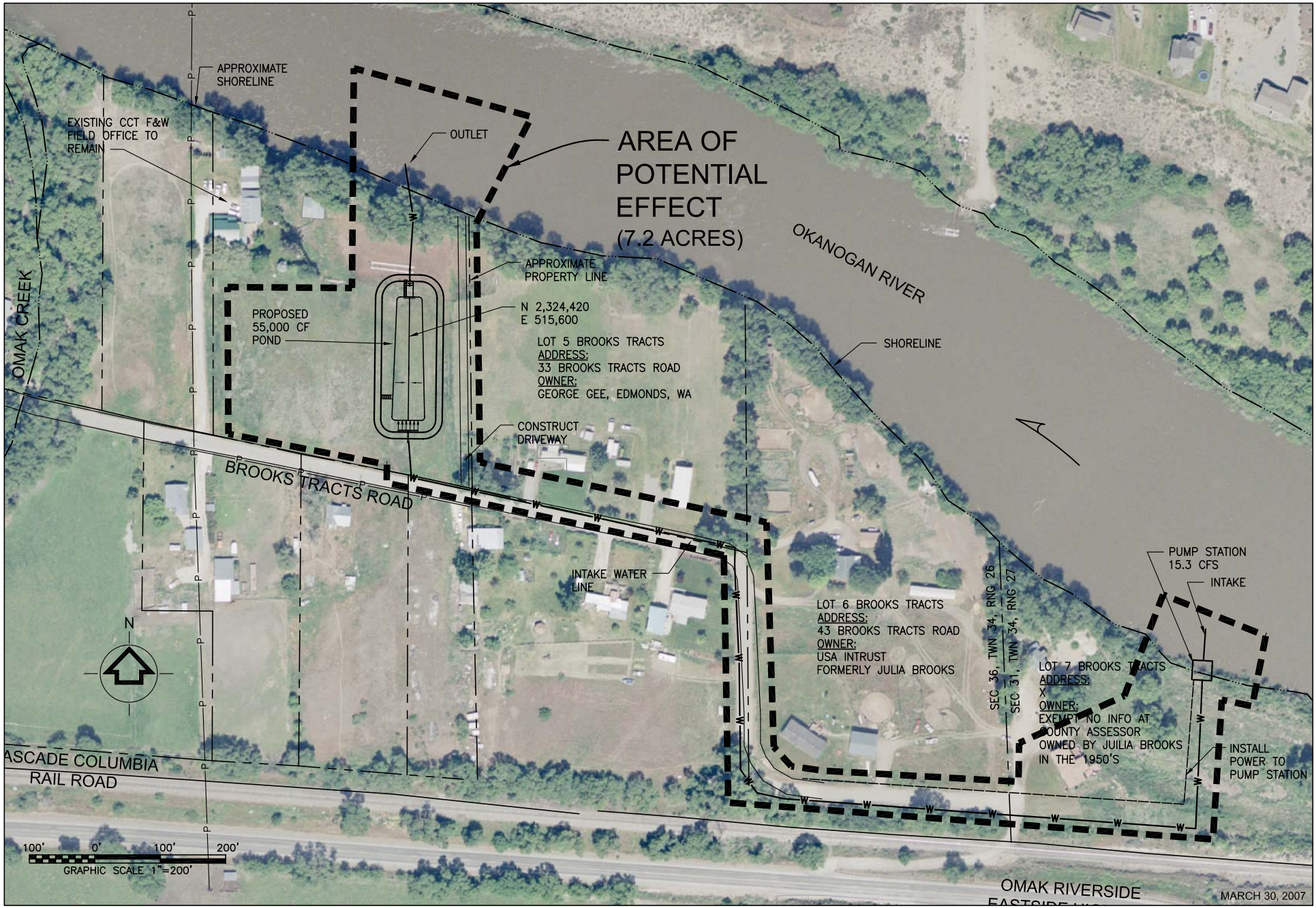


Colville Tribes
CHIEF JOSEPH HATCHERY PROGRAM
DRAFT ENVIRONMENTAL IMPACT STATEMENT

Figure 2-11
OMAK ACCLIMATION POND

TETRA TECH/ KCM

security fencing, bird netting over the pond to prevent predation, channels inside the pond with tail and head screens to segregate fish, and radio telemetry instruments to remotely monitor water and fish rearing conditions.

Omak Pond

This acclimation pond would be built in a pasture in the town of Omak at RM 32.0 of the Okanogan River near its confluence with Omak Creek (Figure 2-11). Its 55,000 cubic feet volume would be supplied by pumping 15 cfs of Okanogan River water from October to April to acclimate summer/fall Chinook smolts, and from April to June to rear and release a sub-yearling group of late arriving summer/fall Chinook. When not in use, the pond would be drained and cleaned. Waste would be vacuumed from the pond and stored in a containment area until it could be properly disposed of per State of Washington environmental regulations.

Development of the pond would require building an access road, a power line connection, a water intake and pump station, two sections of pipeline, the pond, an outlet into the river, predator protection (bird netting or a roof over the pond, depending of funding), controls, and radio telemetry instruments. Construction would take about seven months. Up to three acres of pasture may be temporarily disturbed by construction; two of which would be permanently altered. Silt fences, hay bales, erosion control matting and other typical construction Best Management Practices (BMPs) would prevent erosion and control construction contaminants. Native plants would be used wherever possible to revegetate disturbed areas.

The gravel access road to Omak Pond would be about 350 feet long by 12 feet wide and would run from the Brooks Tracts Road to the pond and outlet. The relatively flat terrain enables the road to be built with minimal grading.

The pond would occupy about an acre, and due to the high flood elevations in this area, would be built mostly above ground. Soil would be imported in dump trucks to form the pond berm.

A small pump station would be built east of the pond on the bank of the Okanogan River to transfer river water to the pond through about 2,000 feet of buried pipeline. Since the water intake part of the pump station would be about three to five feet deep in the river, a temporary sandbag cofferdam and dewatering pumps would be needed during in-stream construction. The cofferdams and dewatering pumps would clear about 1,000 square feet of river area. Dewatering pump discharge would be filtered for sediment before being returned to the Okanogan River. The intake design includes installation of a screen to keep fish and certain other debris out of the pump station. All in-stream work would be completed within two months; the rest of the pump station and pipeline construction occurring above the river bank would take about four months. About 1,500 feet of power line would be installed from the pond to the pump station, potentially necessitating reconstruction of a segment of existing line that provides service to the site. This would be determined by the local power company.

A portion of the pipeline would be buried within the Brooks Tracts Road right-of-way, requiring approvals from Okanogan County. Segments of the pipeline near the pump station would require easements with the property owners.

Water leaving the pond would flow through about 200 feet of buried pipeline that would discharge directly into the Okanogan River at a point about 1,500 feet downstream of the pump station/intake. Smolts would volitionally release from the pond and pass through this pipeline to the river at the end of their rearing period. When the pond is in use for fish rearing, water would continuously flow through the system, discharging at a low velocity onto a flat concrete pad designed to prevent erosion of the river bed. The pipe outfall would be unscreened because it would be releasing, not diverting flow.

2.2 No Action Alternative

NEPA requires consideration of a No Action alternative to provide an environmental baseline against which the effects of the proposed action and any other alternatives can be compared (EIS Chapter 3). In this EIS, No Action means that the current uses of the proposed project sites and current fish management programs and projects (habitat and passage improvements, water rights programs, harvest controls, etc.) would continue. The Chief Joseph Hatchery and two new fish rearing ponds (Riverside and Omak ponds) would not be constructed, and improvements would not occur at Ellisforde, Bonaparte, Tonasket, and St. Mary's Mission ponds. No other changes in the function, type, or number of available fish production facilities would be expected. The programs for summer/fall and spring Chinook production in the Okanogan River system would likely continue at present levels. Currently, the summer/fall Chinook and spring Chinook programs rear and release 576,000 and 300,000 spring Chinook smolts, respectively[1].

2.3 Alternatives Eliminated from Consideration

Public scoping of the proposed action (Section 1.5) and comments on the draft EIS (Appendix C) did not indicate that another alternative should be developed to compare to or replace the proposed action. It was generally acknowledged that a fish production program supported by a local hatchery is needed and desired to complement other efforts and increase adult salmon returns in the Okanogan subbasin. Therefore only the proposed action and the No Action alternative required by NEPA are analyzed in the EIS.

The following alternatives were considered earlier in the project planning process and during development of the Master Plan (CTCR 2004), but have been eliminated from detailed study in this EIS. They are either physically or economically infeasible or did not appear to satisfy the stated purpose and need or objectives (Section 1.1). Master Plan Chapters 8, 11 and 13 and Appendix D provide more detailed information on the context and process of selecting viable fish production enhancement alternatives and suitable sites for facilities.[2]

[1] Spring Chinook program has historically released from 100,000 to 300,000 fish annually.

[2] The Colville Tribes, as project proponent and Master Plan authors, considered that potential alternatives had to satisfy two key criteria: 1) Okanogan River Chinook would be protected; 2) fish returns should be sufficient to supply ceremonial and subsistence harvest needs for tribal members. If an alternative did not meet these criteria, the Colville Tribes' would not support further consideration.

2.3.1 Improving Tributary Habitat

Although spawning habitat is fully utilized in the immediate vicinity of the Similkameen Pond, most other historical habitat throughout the Okanogan subbasin is only sparsely used and is thought to be not limiting production (CTCR 2004 and Bugert 1998). On-going summer/fall Chinook habitat programs have focused on reducing sedimentation and lowering summer water temperatures to improve productivity. If at all feasible, this focus would likely require many generations of fish returning over many decades to achieve substantial increases in productivity and habitat use distribution. So, it is not feasible that a focus on habitat improvements would meet protection, mitigation and supplementation objectives in a timely and effective manner.

2.3.2 Improving Passage Conditions at Columbia River Dams

Significant improvements have been made recently to the hydroelectric system below Chief Joseph Dam to increase juvenile and adult salmon survival. Standards for juvenile and adult fish passage at the dams (which were established in biological opinions for federal dams and habitat conservation plans for non-federal dams adopted pursuant to the ESA) are largely being met by dam operations. While improvements at dams will continue, it appears that further increases in passage survival are limited.

2.3.3 Reducing Ocean and Lower Columbia River Harvest

Past ocean and lower river high harvest rates caused significant decline of Okanogan summer/fall Chinook and spring Chinook. When ocean and lower river harvests were substantially reduced under the Pacific Salmon Treaty of March 18, 1985 and by annual decisions of the Columbia River Compact, Okanogan summer/fall Chinook runs did not immediately respond and continued in their depressed state. Mixed-stock Chinook management under the Pacific Salmon Treaty and the Columbia River Compact has not been effective for specifically returning upper Columbia River Basin Chinook in sufficient numbers to provide for both population sustainability and harvest. Neither BPA nor the Colville Tribes have the authority to control ocean and lower river harvests.

2.3.4 Use, Expand, or Reprogram Existing Facilities

Expanding or reprogramming the on-going Eastbank Hatchery/Similkameen Pond production program was eliminated as an option for the CJHP for a number of reasons. The Eastbank/Similkameen program collects broodstock from a limited segment of the summer/fall Chinook run and uses Eastbank Hatchery and Methow River brood stock (an aggregate brood stock) which are probably not native to the Okanogan subbasin. In addition, the current program releases only yearling fish, excluding a range of sub-yearlings from the release population, and rears fish only in Similkameen Pond (where most surviving hatchery-origin adults eventually return to spawn) leaving other available habitat underutilized.

The CJHP, as proposed, would complement this on-going program. Key tenets of the CJHP are to increase natural production by seeding historical habitat in the mid and lower Okanogan River, to increase natural production using local brood stock representing the life history diversity historically found in the basin, and to control hatchery origin fish in

the escapement. It is conceivable that, although not currently proposed, the on-going Eastbank/Similkameen production program and the CJHP would be integrated once the CJHP is well established (Section 2.1.1).

A limited pilot program managed by the Colville Tribes in Omak Creek produces some spring Chinook. This small watershed is not representative of the historic range of spring Chinook in the Okanogan subbasin and production is limited by the rearing capacity of St. Mary's Mission Pond. The proposed CJHP would incorporate and expand this operation.

2.4 Comparison of the Alternatives Considered in Detail

Table 2-2 compares the Proposed Project and the No Action Alternative to the stated purposes of taking action (Section 1.1). Table 2-3 summarizes potential environmental consequences (Chapter 3) of the Proposed Project and the No Action Alternative. Scoping issues referenced in this table are listed in Section 1.5.

Table 2-2. Comparison of Alternatives to Stated Purposes of Taking Action

Purposes of Action	Proposed Action	No Action
1. Increase abundance, distribution, and diversity of naturally spawning summer/fall Chinook within their historical Okanogan subbasin habitat and in the Columbia River between the Okanogan River and Chief Joseph Dam.	Would meet this purpose by acclimating fish to underutilized habitat. Implementation of the summer/fall Chinook components of the production program would provide the greatest potential to protect and enhance the summer/fall Chinook population and mitigate for FCRPS effects.	Would meet this purpose to the extent provided by ongoing and new fish habitat and passage improvements, water rights programs, harvest control programs. Rearing program at Similkameen Pond would continue.
2. Operation of the FCRPS, particularly Chief Joseph and Grand Coulee dams (e.g., spill, timing, dissolved gases, etc.), must remain unaffected by the fish production program.	Hatchery design and operational parameters were developed in collaboration with the USACE to ensure that the hatchery does not interfere with dam operations. Concurrently, dam operations were factored into design of the hatchery.	Would meet this purpose by not changing the current situation and having no effect or risk to dam operations.
3. The program must not adversely affect populations listed under the ESA (e.g., through mixed stock harvest, reducing productivity, or otherwise) such that it creates a greater mitigation, protection or recovery burden on BPA.	The production program is designed and would be implemented and monitored to ensure listed species are not adversely affected. Upper Columbia spring Chinook populations should increase.	Ongoing habitat, passage, water rights, and harvest control efforts would contribute to this objective. Existing facilities would continue to support the limited ongoing Chinook production program in the Okanogan River. Current risks, insufficiencies, and limitations associated with the existing situation would continue.
4. Increase Chinook salmon populations to enhance the potential for tribal ceremonial and subsistence harvests and a recreational fishery for the public.	Has the greatest potential to enhance adult fish returns of summer/fall and spring Chinook in historical habitat to sustain naturally spawning populations and tribal ceremonial and subsistence or public recreational fisheries.	Unlikely to sustain a harvestable fishery as the current situation has insufficient and downward- trending adult returns long-term. Would not change the depleted spring Chinook situation.

Table 2-3. Summary of Environmental Consequences of Alternatives

Environmental Feature	Proposed Action	No Action
Fish and Aquatic Habitat (EIS Section 3.2 and Issue #3)	Implementing the three production program components should produce greater diversity, abundance and distribution of summer/fall and spring Chinook in the Okanogan subbasin. These returns should complement other on-going salmon protection and mitigation efforts. Some individual fish of all species could experience short-term stress and possible mortality from live fish trapping gear and subsequent capture and handling. Competition and predation between aquatic species at all life stages including hatchery-bred fish would not threaten viability of any species. Some increase in aquatic nutrients is likely from decaying spawned-out salmon carcasses. During construction, site and channel alterations would create minor, localized, temporary disturbances that would not measurably affect the viability of any aquatic species. Water withdrawals during operation of ponds would have an immeasurable effect on habitat in the immediate reach of each diversion for the season of the withdrawals. Fish released from hatchery and rearing facilities would have a low potential to introduce pathogens to other fish populations.	Current risks to salmon population viability would continue but would likely diminish slightly in the long-term due to the other on-going complementary protection and mitigation efforts (habitat and passage improvements, harvest controls, water rights programs). Current conditions of habitat and population viability of other aquatic species should remain unchanged.
Wildlife (EIS Section 3.3 and Issue #4)	No state or federally listed animal species are known to nest or breed at or near project sites, so no adverse effects are expected. Salmon carcasses may provide a long-term seasonal food source for many large and small scavenger and predator species and certain insects. Animals may be displaced or disturbed in the vicinity of construction activities and during facility operations and occupation (noise, presence of humans and machines, outside lighting). New power lines at the hatchery, housing and Omak Pond sites may provide perches or minor collision risks for certain birds.	No changes to current trends, conditions or protection status are expected for any animal species.
Vegetation, Wetlands, Geologic Hazards and Soils (EIS Sections 3.4 & 3.5, and Issue #4)	No state or federally listed plant species occur at or near any project sites, so no effects are expected. At the hatchery site, about 25 acres of non-native vegetation shrub steppe habitat would be disturbed of which about 20 acres would remain permanently developed. At the housing site, about 10 acres of native vegetation shrub steppe habitat would be disturbed of which about 5 acres would be permanently developed.	On-going disturbance and habitat conversion would continue at current rates. Exotic plants and weeds would continue to exist and be subject to control as in the past.

Environmental Feature	Proposed Action	No Action
	Developing Riverside Pond would convert about 4 acres of hay fields and Omak Pond would convert about 2 acres of pasture to development. Work at all other pond sites would disturb little to no additional habitat. Less than 1 acre of riparian habitat near new water intakes and discharge features at the hatchery and Omak and Riverside ponds would permanently be affected. No jurisdictional wetlands were detected so none would be affected. But, if project proceeds to construction, consultation with regulatory agencies under the Clean Water Act and Shoreline Management Act may include mitigation for riparian effects. A temporary increase in exotic plants and weeds at all disturbed sites is likely. All disturbed areas would be replanted with native species and maintained to control weed species. No known landslide-prone areas exist at the project sites. There is negligible to no potential for slope instability at any sites although temporary, localized erosion could occur during construction. No active faults are known within 5 miles of the sites, so potential for earthquake damage is very low.	
Hydrology, Floodplains and Water Quality (EIS Section 3.6) Water quality (Issue #1)	Localized, temporary, construction-related runoff and sedimentation could occur at construction sites but would be controlled through application of typical Best Management Practices (BMPs). Long-term water quality would remain within limits of applicable laws and NPDES permits at all sites. A long term, minor increase in river water nutrients would be likely from decaying spawned-out salmon carcasses. No detectable effect to groundwater quality is expected near any of the sites.	Water quality would not change. Nutrients from increased numbers of spawned-out salmon would not be contributed.
Water quantity and use (Issue #2)	Typically from October to April, Okanogan River stream flow would be reduced about 4 to 6% between the intakes and discharge points of the new ponds (Riverside and Omak). No change to stream flow would occur at ponds currently being used for fish acclimation (Ellisforde, Bonaparte, Tonasket, and St. Mary's). Irrigation withdrawals and other surface water uses typically occur during other times of the year, so this program would have no effect. Groundwater conditions are unlikely to be affected at any sites. The hatchery well field is not in proximity to other wells that could be affected. For example, Lake Woods Golf Course withdraws irrigation water from Rufus Woods Lake. Potable water for Bridgeport State Park is supplied by a well that is over 500 feet upstream of the proposed project well field. Hatchery and acclimation facilities have been designed to have	Water quantity and in-stream flow regimes would not change.

Environmental Feature	Proposed Action	No Action
Floodplains	no effect on FCRPS dam operations or municipal or private surface or groundwater uses. The two new ponds (Riverside and Omak) and their intake and discharge structures would be located in the Okanogan River's 100-year floodplain. Upland sites are infeasible. Ponds possibly could be inundated in a 100-year flood event, but the facilities would likely receive little damage and have little effect on downstream flood dynamics. The hatchery's fish ladder entrance and discharge would be in Columbia River waters directly below Chief Joseph Dam. They are designed to be compatible with dam operations and water flow regimes. No effect on dam operations is expected.	Floodplains remain unchanged. The existing ponds are within 100-year floodplains with potential for inundation with the exception of St. Mary's Pond which is not in a mapped floodplain.
Land Use, Transportation and Recreation (EIS Section 3.7 and Issue #5)	Facility construction, operation, occupancy, and use would be consistent with applicable local zoning, laws and regulations. Necessary permits would be pursued if the project proceeds to final design and implementation. During construction, temporary disruptions to the USACE Visitor Orientation Area and nearby walking trails would occur. During construction, traffic would increase locally for workers, equipment, and delivery of supplies and materials. No new public roads or changes to existing public transportation system would occur. Long-term traffic increases related to fish transport and worker commutes would be minor. If the production program is successful, there could be a long-term increase in recreation traffic and activities related to salmon viewing and fishing. Public environmental education opportunities may increase through hatchery site visitation.	No change to current land use, transportation or recreation is predicted.
Cultural Resources (EIS Section 3.9 and Issue #5)	Potential long-term sustainable tribal ceremonial and subsistence fishery and recreational fishery would most likely be restored if all components of the production program are implemented. If only Component 1 is implemented, it is unlikely that more than a modest ceremonial and subsistence fishery would result. Possible adverse effects at one of the pond sites on known cultural materials potentially eligible for listing in the National Register of Historic Places would be mitigated by investigative and curation actions taken in agreement with the Tribal Historic Preservation Officer. Known archaeological sites would be avoided at all other project sites, so no effects are expected. If evidence of cultural materials is found later, activity would cease until the finds could be properly assessed. Traditional tribal fishing at the base of Chief Joseph Dam would	No change from current conditions at any site is expected. The current fishery is inadequate for even modest ceremonial and subsistence purposes, or recreational fishing. It is unlikely that a sustainable tribal ceremonial and subsistence fishery or recreational fishery would result through currently on-going fishery improvement efforts.

Environmental Feature	Proposed Action	No Action
	be temporarily disrupted while installing the hatchery fish ladder and water pipeline.	
Aesthetics (EIS Section 3.11 and Issue #5)	The scenic qualities of all sites would remain typical of the region. Aesthetic attributes are not remarkably distinctive, scenic or unique. Although the proposed hatchery site is adjacent to the Columbia River, it is in close proximity to Chief Joseph Dam and would appear congruent with the existing complex of development there. The housing site is an undeveloped upland setting but not within a popular viewshed. The acclimation ponds are all in rural settings and their low profile would not conflict with the setting.	No change to any sites.
Socioeconomics (EIS Section 3.8 and Issue #5)	Negligible increase to population overall. Some hatchery employees would reside at the hatchery housing site near Bridgeport. Employment opportunities would be created for up to 100 temporary positions during hatchery and housing construction. Long-term new employment for 8 to 15 workers would support hatchery operations. Construction would entail expenditures of about $37.5 million in the region with a long-term payroll for hatchery operations of about $2.1 million annually. Some benefit to local economy could be realized if Chinook recover and stimulate fishing and related recreation and tourism. No measurable effects to area housing, utilities, schools, law enforcement, or tax base are predicted. No impact to BPA ratepayers would occur since the project funds would be part of an established program of annual investment in protection and mitigation of fish and wildlife related to FCRPS facilities and operations.	No project-induced changes to local economies, communities or BPA ratepayers are likely. The potential for some adverse effect on local economy remains if salmon stocks continue to decline.
Air, Climate Change, Noise and Public Safety (EIS Section 3.10 and Issue #5)	Dust and vehicle exhaust would increase locally during construction with no long-term climate effects at any sites. Temporary increase in noise would occur during construction at all sites, but would not exceed State standards. Long-term noise from new traffic, operations and residences would be negligible. An increase in demand for public services (medical, hospital, sheriff, fire, etc.) during construction is possible. New safety risks to the public would be short term and mainly associated with construction traffic encounters.	No change in air quality, climate, noise, or public safety would occur at any sites.

CHAPTER 3: AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter summarizes the potential effects of the proposed project and the No Action alternative on the physical, biological and human environments. The analysis considers the hatchery site itself, the water supply sources and pipelines, the employee housing area and the acclimation pond sites as well as the effects of the fish production program operations. Direct, indirect and cumulative effects are disclosed for each aspect of the environment studied. Project design features and reasonable mitigation measures that help avoid, reduce or compensate for certain adverse effects are identified. This chapter includes sections that identify adverse effects that cannot be avoided, irreversible and irretrievable commitments of resources, short-term uses of the environment, and effects on long-term productivity.

The Chief Joseph Dam Hatchery Master Plan (Master Plan) (CTCR 2004, http://www.nwcouncil.org/library/Default.htm) is incorporated by reference in this EIS in its entirety. It includes much biological data, ecological rationale, and environmental and engineering research information that are used as a basis to support much of the information in this EIS. It also contains summer/fall Chinook and spring Chinook Hatchery Genetic Management Plans (HGMPs) and a monitoring and evaluation design.

3.1 Overview

The proposed Chief Joseph Hatchery and fish acclimation ponds would be located in Okanogan County in the north central region of Washington State (Figure 1-1), an area sparsely populated and largely dependent economically on agriculture. River valleys are important for irrigated orchards and other crops, transportation corridors and human occupation while uplands are used primarily as pasture and open range for livestock. Shrub-steppe plant communities reflective of the semi-arid Columbia Plateau climate dominate the landscape outside the river bottoms, with wildlife and vegetative composition being typical of that habitat. The average annual precipitation ranges from 11 to 16 inches with much of it coming as summer thunderstorms and hail storms. Snow may accumulate to 10 to 20 inches in the winter.

The Okanogan River valley communities include Okanogan, Omak, Tonasket, Oroville, and Riverside. With Bridgeport on the Columbia River, these communities support primarily service-oriented businesses for the surrounding rural agricultural areas and the west side of the Colville Indian Reservation. Primary industrial activities in the area are fruit-packing and processing facilities and a lumber mill near Omak. Hydropower facilities operated by the USACE (Chief Joseph Dam) and Douglas County PUD (Wells Dam) are important employers. Two main transportation corridors, US Highway 97 and State Route 17, serve the area.

3.2 Fish and Aquatic Habitat

3.2.1 Affected Environment

The main fish-bearing waters in the project area are the Columbia River between Wells Dam and Chief Joseph Dam, and the Okanogan River and its tributaries (Figure 1-2). These historically contained both anadromous and resident salmonid populations (Wydoski and Whitney 2003). Appendix B lists the fish species in the area and their protected status.

Fish Populations

Anadromous Fish

The Columbia and Okanogan rivers support Chinook salmon, summer steelhead trout and sockeye (CTCR 2005c). While coho salmon are present in the Columbia River, they have been extirpated from the Okanogan River subbasin and there are no current plans for reintroduction (NPCC 2004). Table 3 shows counts of summer/fall Chinook, steelhead and sockeye past Wells Dam between 1993 and 2008.

Table 3-1. Anadromous fish counts at Wells Dam, 1993-2008 (University of Washington 2009)

Year	Summer/Fall Chinook		Summer Steelhead		Sockeye
	Adult	Jack	Total	Unmarked	
1993	4465	330	2400	0	27849
1994	7075	926	2183	0	1666
1995	3774	464	945	0	4892
1996	2932	375	4127	0	17701
1997	2998	300	4101	0	24621
1998	4424	892	2744	355	4666
1999	9274	1062	3551	581	12388
2000	8547	4896	6251	1780	59944
2001	39927	7387	17508	7889	74486
2002	68706	605	9307	5738	10659
2003	50976	2656	9095	5382	29374
2004	36719	1905	9350	5627	78053
2005	34075	1149	7203	2760	55559
2006	29011	3228	6674	2573	22075
2007	14877	4610	7500	3410	22273
2008	25023	3835	9808	3803	165334

Upper Columbia River Spring Chinook

The Upper Columbia River (UCR) spring Chinook salmon were listed as endangered in 1999 (Federal Register, Vol. 64, No. 56, March 24, 1999, p. 14308). The ESU includes

all naturally-spawned populations of spring Chinook in accessible reaches of Columbia River tributaries between Rock Island and Chief Joseph dams, however Upper Columbia spring Chinook are considered extinct from the Okanogan subbasin (Smith et al. 2006). UCR spring Chinook are also a Washington State Candidate species and are culturally significant to the Colville Tribes for ceremonial and subsistence purposes (Section 3.9).

Adult spring Chinook migrate past Wells Dam from May through June to spawn in water between 42º and 58ºF. As summer progresses, water temperatures rise in the Okanogan, creating thermal barriers to migrating adult spring Chinook (NPCC 2004). As a result, late-returning spring Chinook adults experience high mortality prior to spawning.

UCR spring Chinook juveniles primarily reside in fresh water for at least one year prior to rapidly migrating to the ocean during their second spring (West Coast Salmon Biological Review Team 2003). Optimal water temperature for juvenile rearing is 54º to 55ºF; temperatures in excess of 73ºF are lethal.

Recently, the average escapement for the entire UCR spring Chinook ESU has been less than 5,000 hatchery-origin plus wild Chinook (Myers et al. 2004). The short- and long-term trends in abundance are declining. The average smolt-to-adult survival of spring Chinook produced at Entiat, Methow, Leavenworth, and Winthrop hatcheries for 1989 to 1998 was 0.002% (Mobrand Biometrics unpublished). There are no estimates of historical production of spring-run Chinook salmon from the Okanogan River subbasin.

Spring Chinook runs were extirpated from the Okanogan River by the 1930s due to over harvest, irrigation water withdrawals, and construction of impassable dams. Historically, Salmon Creek and its tributaries (Figure 2-1) were the primary spring Chinook spawning areas in the U.S. portion of the Okanogan River subbasin. This area became inaccessible over 80 years ago due to construction of Conconully Dam and the Okanogan Irrigation District diversion dam at RM 4.3 (Section 3.2.2) (NPCC 2004). There is insufficient flow below the diversion dam to provide fish habitat.

Spring Chinook recently have been reintroduced into the Okanogan subbasin by the Colville Tribes. About 50,000 to 150,000 “Carson stock” smolts have been acclimated at St. Mary’s Mission Pond and released in Omak Creek annually since 2003. In spring 2005, eleven spring Chinook adults returned to Omak Creek (C. Fisher, CTCR, personal communication, January 6, 2006).

Upper Columbia River Summer/Fall Chinook

Adult summer/fall Chinook salmon migrate past Wells Dam between mid-July and November to spawn in the Columbia River, Methow River and Okanogan subbasin. In the Okanogan subbasin, most summer/fall Chinook adults return to the Similkameen River and spawn within a 1.2-mile area in the vicinity of Similkameen Pond (C. Fisher, CTCR, personal communication, November 2005) where a summer/fall Chinook rearing and release program has been managed by WDFW for many years. The spawning density in this reach exceeds 644 redds per mile which may reduce the overall spawning success of the population. Juveniles use the Okanogan River and the Columbia River between Wells and Chief Joseph dams for rearing before emigrating toward the ocean in

the spring and early summer (CTCR 2004). The proportion of hatchery-origin fish spawning in the wild increased with increasing adult escapement (NPCC 2004).

The Similkameen Pond program (Section 3.2.2) relies on brood stock collected at Wells Dam from July through August (brood stock collection in 2005 was extended into September). These adults, a combination of Methow and Okanogan subbasin fish, produce about 576,000 smolts for rearing and release at Similkameen Pond annually.

Summer/fall Chinook also spawn in areas of the Okanogan River below Zosel Dam (RM 78.9). About 76% of hatchery-origin fish spawn in areas of scoured gravel and in the tributary confluences above Riverside (about RM 40) (CTCR 2004). Late-arriving fall Chinook spawn primarily in the lower Okanogan River and possibly in the Columbia River up to the base of Chief Joseph Dam (NPCC 2004).

Recent summer/fall Chinook run sizes have been highly variable. The number of adults passing Wells Dam has ranged from 2,932 in 1996 to 68,706 in 2002 (Table 3-1). While this stock does not warrant protection status under the ESA, it is considered depressed. The Okanogan population has a declining short-term trend of 8.8% and a declining long-term trend of 5.2% (CTCR 2004). The smolt-to-adult survival of yearling summer/fall Chinook salmon released from Similkameen Pond has increased from 0.4% for brood year 1995 to nearly 2% in recent years (CTCR 2004). This is likely due to improvements in the freshwater environments as well as the Columbia River estuary and Pacific Ocean.

Upper Columbia River Steelhead

The Upper Columbia River Summer Steelhead (*Oncorhynchus mykiss*) Distinct Population Segment (DPS), formerly listed as endangered under the ESA, was upgraded to threatened effective February 6, 2006 (Federal Register, Vol. 71, No. 3, January 5, 2006). The DPS includes all naturally spawning steelhead in the Columbia River Basin and its tributaries upstream from the Yakima River to the Canadian border, including the Okanogan River and Wells Hatchery stock (CTCR 2005c). Summer steelhead are also classified as a Washington State Candidate species (WDFW 2005b). The Interior Columbia Basin Technical Review Team recently listed the Okanogan River subbasin summer steelhead as an independent population (NPCC 2004); however, the State of Washington manages steelhead in the Okanogan and Methow rivers as a composite stock, i.e. the same population (CTCR 2005a).

Adult summer steelhead migrate past Wells Dam from July through November with peak passage occurring from late August through September (Columbia River Data Access in Real Time 2009). Spawning begins in late March, peaks in April, ends in mid-May, and progresses upstream along the mainstem Okanogan before entering the tributary habitats. Juveniles generally migrate from early spring through June.

Natural steelhead production is severely reduced in the Okanogan River subbasin due to tributary habitat degradation, construction of dams, and irrigation water withdrawals. Out-of-basin factors contributing to steelhead declines include passage mortalities at Columbia River dams and harvest in lower Columbia River fisheries. Currently, steelhead are primarily hatchery-origin fish from Wells Dam Hatchery. The numbers of adult summer steelhead migrating past Wells Dam from 1993 through 2008 are presented

in Table 3-1. Between 1991 and 2000, only 6.5% of the adults passing Wells Dam were natural-origin (unmarked) fish (CTCR 2004).

Summer steelhead use the Columbia River and the Okanogan River and as a migration corridor and for rearing. Steelhead redds have been documented in the Okanogan and Similkameen rivers, as well as Salmon, Omak, Tunk, Bonaparte, Ninemile, Tonasket, and Vaseux creeks (CTCR 2005c) (Figure 2-1). Aeneas, Chiliwist, and Johnson creeks may provide habitat for other life stages, but are not accessible to adult steelhead or do not have suitable spawning habitat.

Omak Creek was reconnected to the Okanogan in the 1990s and is currently an important summer steelhead production area. In 2004, the steelhead escapement was 104 fish. A few redds have also been sighted in Mission Creek above Mission Falls (CTCR 2005c).

Steelhead redds have also been documented annually in Tunk Creek (RM 0 to 0.1), Bonaparte Creek from the mouth to Bonaparte Falls (RM 1.0), and Ninemile Creek (RM 0 to 1.2). Summer steelhead smolts and one adult have been observed in Tonasket Creek between the mouth and Tonasket Falls in one out of ten years (RM 2.2) (CTCR 2005c).

Available data is insufficient to determine trends in abundance, timing, and distribution of summer steelhead in the Okanogan subbasin (CTCR 2005c). During surveys conducted in 2005 by the Colville Tribes, 470 steelhead redds were documented in the Similkameen and Okanogan rivers, with an average density of 7 redds per mile. The highest redd density—30 redds per mile—was documented in the reach between the Similkameen River and Zosel Dam (RM 78.9), with the greatest concentration found below the US Highway 97 bridge at Oroville.

Sockeye

The Okanogan subbasin supports a population of sockeye salmon, one of only two viable populations remaining in the Columbia River Basin. All sockeye spawning and rearing occurs within the Canadian portion of the Okanogan subbasin where suitable spawning habitat is abundant (NPCC 2004).

Since 1977, annual sockeye salmon counts at Wells Dam have been highly variable, ranging from 1,666 to 165,334 adults. Counts from 1993 through 2008 are presented in Table 3-1. While recent sockeye salmon returns have been relatively large, there has been a continual decline in escapement.

Resident Fish

There are 20 native resident fish species and five introduced species in the Okanogan River subbasin (Appendix B). Species with federal or state protected status are discussed individually below.

Bull trout were listed as Threatened under the ESA on June 10, 1998 (NPCC 2004). All *Salvelinus confluentus* in the Columbia River are currently considered bull trout as no anadromous Dolly Varden were ever documented in the Columbia River Basin (Smith et al. 2006). The historic extent of bull trout distribution in the upper Columbia River and

its tributaries is unknown, although they were reported in upper Salmon Creek and its tributaries over 50 years ago (NPCC 2004). Currently, migratory bull trout (bull trout which spawn in other basins) are present in the Columbia River during winter and spring, but have most likely been extirpated from the lower Okanogan subbasin. Spawning bull trout require very cold clear water with clean gravel substrates--conditions which are not present in the Okanogan River subbasin.

The redband trout, a race of rainbow trout, is a federal species of concern and may possibly occur in the upper reaches of Omak, Salmon, Bonaparte, Loup Loup, and Tunk creeks. Rainbow trout are known to occur in these areas, and they have been stocked in several lakes including Bonaparte Lake, Conconully Reservoir, and Leader Lake within these watersheds. But, tests have not determined if they are redband trout, rainbow trout, or hybrids (C. Fisher, CTCR, personal communication, December 5, 2005). The introduced rainbow trout may have hybridized with the native redband trout.

Westslope cutthroat trout, also a federal species of concern, occurs in higher elevation coldwater streams. They have been documented in the North Fork Salmon Creek and Aeneas Creek (C. Fisher, CTCR, personal communication, December 5, 2005). The pygmy whitefish, a federal species of concern and a State of Washington "Sensitive" species, is present in Lake Osoyoos (WDFW 2005b; Wydoski and Whitney 2003).

Two state "Candidate" species, leopard dace and Umatilla dace, are also present in the area (Wydoski and Whitney 2003). Both were listed by the State of Washington in 1998 due to their discontinuous distribution and their unknown status. Leopard dace, found in the Similkameen River and the Columbia River below Chief Joseph Dam, prefers stream habitats with currents less than 1.5 feet per second. Umatilla dace, found in the Similkameen, Okanogan, and Columbia rivers, prefer faster water with boulder and cobble substrates free of silt.

Five introduced species are present in the Okanogan subbasin: Lahonton cutthroat trout, grass carp, brook trout, smallmouth bass, and largemouth bass (Wydoski and Whitney 2003). Lahonton cutthroat trout (stocked by the Colville Tribes) and grass carp are present in Omak Lake where they tolerate the lake's high total dissolved solids. Smallmouth and largemouth bass occur throughout the Okanogan subbasin and the Columbia Basin. Other warm water species occurring in the Columbia River include pumpkinseed, black crappie, yellow perch, walleye, and common carp. These species may also occur in the Okanogan River below Chiliwist Creek. Brown trout have been observed in the Wells Dam fishway. Bass, walleye, and, to a lesser extent, brown trout prey on salmonids and other native fish.

Habitat

The following discussion focuses on habitat suitable for anadromous salmonids within three distinct areas: the Columbia River reach, the Okanogan River mainstem, and major tributaries to the Okanogan River.

Columbia River Reach

The Columbia River reach between Wells and Chief Joseph dams extends about 29.5 miles and is dominated by pool-type habitat of Lake Pateros, the impoundment formed by Wells Dam. It serves as a migration corridor and rearing habitat for adult and juvenile spring Chinook, summer/fall Chinook, summer steelhead, bull trout, and sockeye. Summer/fall Chinook spawn in or near the tailrace of Chief Joseph Dam.

Okanogan Mainstem

The Okanogan is the northern-most river accessible to anadromous fish in the Columbia River Basin (CTCR 2005a). It is a low-gradient, low-velocity system originating from lakes in Canada. Production of salmonids is limited in the mainstem by high water temperatures, high sediment, lack of habitat diversity, and in some places, lack of connectivity with the floodplain. The Okanogan River has few stable sources of cold water (NPCC 2004) and a thermal barrier forms each summer at the mouth which affects the upstream passage of fish.

Lake Pateros extends upstream into the Okanogan River to just below Chiliwist Creek (RM 15.1). This reach is wide and shallow and contains poor quality habitat for anadromous fish. Suitable spawning substrate is lacking. The channel is moderately confined by US Highway 97 and railroad beds.

Between RM 15.1 and the Similkameen River (RM 74.2), the Okanogan channel is confined by US Highway 97, railroad beds, and dikes. This artificial confinement has lead to lateral erosion resulting in large areas of silt and sand substrate within the stream channel (NPCC 2004). Areas of scoured gravel and tributary confluences within this section provide important summer/fall Chinook spawning habitat.

The Similkameen River contributes 75% of the water flowing through the Okanogan River. It is a flashy snowmelt system with high turbidity and cooler water temperatures than the Okanogan (CTCR 2005a). The majority of the sediment in the lower Okanogan River is delivered by the Similkameen River.

From the Similkameen River confluence upstream to the outlet of Lake Osoyoos at Zosel Dam (RM 78.9), the Okanogan River is stable and clear (CTCR 2005a). The substrate is dominated by gravel and cobble. Summer/fall Chinook spawn in this portion of the river while other salmonids use the area as a migratory corridor. Primary limiting factors to salmonid production above the Similkameen River confluence include high water temperatures, sediment, loss of habitat diversity, and loss of floodplain connectivity.

The United States border with Canada bisects the southern portion of Lake Osoyoos. In mid- to late-summer, low oxygen levels and high water temperatures in the lake reach levels lethal to salmonids. Water flowing from Lake Osoyoos has characteristically high temperature and low sediment load and transport (NPCC 2004). Above Lake Osoyoos, the mainstem Okanogan River supports sockeye and Chinook salmon and steelhead trout up to McIntyre Dam which is a complete passage barrier to fish. Other than Omak Creek and possibly Salmon Creek, the area with the greatest potential to support a spring

Chinook salmon run occurs within the Canadian portion of the Okanogan River subbasin (NPCC 2004).

Major Okanogan Tributaries

Perennial tributaries to the Okanogan River that historically provided or currently provide suitable salmonid habitat include Chiliwist Creek, Similkameen River, Loup Loup Creek, Salmon Creek, Omak Creek, Aeneas Creek, Tunk Creek, Bonaparte Creek, and Tonasket Creek (Figure 2-1). Vaseux and Inkaneep creeks in Canada also provide salmonid habitat. Habitat in the tributaries is primarily limited by low flows caused by irrigation water demands and the subsequent reduction in gravel recruitment and availability of coldwater refuge areas (NPCC 2004).

The Chiliwist watershed (Okanogan RM 15.1) minimally contributes to the fish production of the Okanogan basin, both historically and currently. Historically, summer steelhead trout most likely inhabited Loup Loup Creek (Okanogan RM 16.9). Currently, the creek is dry below the falls during the irrigation season (NPCC 2004).

Salmon Creek, which enters the Okanogan River at RM 25.7, is currently inaccessible to most anadromous fish. In addition to Conconully Dam, there is a diversion dam on Salmon Creek at RM 4.3 which has been in operation for more than eighty years. The diversion dewaters lower Salmon Creek except during periods of snowmelt when spill occurs at the dam (NPCC 2004). Excellent spawning and rearing habitat occurs between the diversion and Conconully Dam. A project has been proposed to re-allocate irrigation water back to the stream allowing salmonids access to 11 miles of habitat. Historically, Upper Salmon Creek and its tributaries were the major production areas for spring Chinook salmon within the U.S. portion of the Okanogan subbasin.

Omak Creek enters the Okanogan River at RM 31. Omak Creek is an important summer steelhead production area from its mouth upstream to Mission Falls. Restoration efforts of the Colville Tribes in the 1990s reconnected the creek to the Okanogan River. Though Omak Creek provides some suitable spawning and rearing habitat, its capacity to produce salmonids is primarily limited by low habitat diversity and quantity. Other limiting factors include sedimentation, barriers, and channel instability (NPCC 2004).

Aeneas Creek, which enters the Okanogan River at RM 50, is a spring-fed stable source of cold water. The lower 1/3 mile is a cold-water refuge for migrating sockeye and summer/fall Chinook in the Okanogan. There is no spawning habitat in this area due to unsuitable substrate.

Little is known about the habitat in Tunk Creek which enters the Okanogan River about five miles north of Riverside, Washington. Summer steelhead are known to spawn in Tunk Creek from the mouth to an impassable natural falls at RM 0.1 (NPCC 2004).

Bonaparte Creek, which enters the Okanogan River at RM 56.7, provides a mile of suitable summer steelhead habitat from its mouth to Bonaparte Falls. Summer steelhead return to Bonaparte Creek annually (NPCC 2004).

Ninemile Creek originates in Canada and enters the Okanogan River at RM 80.2. Adult summer steelhead have been observed near its mouth, but there is no data regarding abundance or production. The lower two miles of the creek are used only as a migration corridor. No spawning habitat occurs in this reach because the channel bottom is cement interspersed with areas of sparse, unconsolidated gravels (NPCC 2004). Agricultural practices at the adjacent orchards may introduce chemicals into the stream which could limit fish production. Macro-invertebrate abundance and diversity are low.

Tonasket Creek which enters the Okanogan River at RM 77.8 near Oroville, Washington has highly variable flows. Summer steelhead spawn in the lower mile in years with sufficient water (NPCC 2004).

The Similkameen River (Okanogan RM 74.2) is the Okanogan River's major tributary. According to the Colville Tribes, Enloe Dam (RM 8.8) is most likely a fish barrier. The dam has affected downstream fish habitat by retaining gravels while allowing the transport of fine sediment (NPCC 2004). Below Enloe Dam, the Similkameen River flows through a relatively high-gradient, confined canyon, transitioning to an unconfined, low gradient channel. This gravel deposition area supports the highest densities of spawning summer/fall Chinook salmon in the Okanogan watershed.

Above Lake Osoyoos in Canada, Vaseux and Inkaneep creeks contain excellent spawning habitat for salmonids. Inkaneep Creek provides about three miles of habitat (NPCC 2004), and could support Chinook and limited steelhead spawning. Rearing within Inkaneep Creek would be limited due to high summer water temperatures. Limiting factors also include sedimentation, lack of large woody debris, reduced habitat complexity, and the presence of unscreened water diversions.

Hatchery Production

Hatchery programs in the Okanogan subbasin produce summer/fall Chinook, spring Chinook, summer steelhead, and rainbow trout. The programs are summarized below and more information can be found in the Okanogan Subbasin Plan (NPCC 2004).

About 576,000 yearling summer/fall Chinook smolts are currently produced and released by WDFW at Similkameen Pond (Similkameen RM 3.1) using brood stock collected at Wells Dam. This program was developed to mitigate for the summer Chinook adults that may have been produced in this area prior to the Wells, Rocky Reach, and Rock Island hydroelectric developments (CTCR 2004).

The Similkameen summer/fall Chinook program has not consistently produced sufficient fish to meet its limited program objectives. In some years, the Similkameen program has lost substantial numbers of fish to disease. Water quality problems, including high water temperature, pollution, and heavy loads of fine sediments, have also posed challenges for the program. In other years, insufficient eggs have been collected at Wells Dam.

In recent years, returns of adult hatchery summer/fall Chinook to the Similkameen River and upper Okanogan have increased substantially. High smolt-to-adult survival of the Similkameen Pond fish has produced an extremely high spawning density in the Similkameen River of more than 644 redds per mile. Unfortunately, this has not meant

an increase in natural-origin fish. The capacity of the Similkameen spawning habitat is being exceeded as Chinook are building redds on previously established redds. Most of the adult hatchery fish returning between 1995 and 2000 spawned in the Similkameen River while some spawned above the Town of Riverside, leaving a large portion of the Okanogan River underutilized.

Since 2001, spring Chinook have been artificially propagated and released in the Okanogan subbasin (mainstem and Omak Creek) through a cooperative agreement between the National Oceanic and Atmospheric Administration (NOAA) Fisheries, U.S. Fish and Wildlife Service (USFWS), CTCR, and WDFW (Table 3-2). These fish are part of an interim program to support tribal ceremonial and subsistence harvest and provide information for a proposed, long-term integrated recovery program (NPCC 2004).

Table 3-2. Year, Quantity and Location of Spring Chinook Salmon Released in Okanogan River Basin

Year	No. Fish Released	Release Location
2001	40,000	Omak Creek
2002	48,000	Omak Creek
2002	250,000	Ellisforde Pond
2003	35,000	Omak Creek
2003	95,000	Bonaparte Pond
2004	95,000	Ellisforde Pond
2005	99,000	Bonaparte Pond
2005	50,000	Omak Creek
2006	0	n/a
2007	6,000	Bonaparte Pond
2008	215,000	Okanogan River
2008	40,000	Omak Creek
2009	100,000	Bonaparte Pond

Source: CTCR 2009; UW DART 2009

Summer steelhead from Wells Hatchery stock are released each year into the Okanogan subbasin. In the past, releases have varied considerably, ranging from 37,500 to 82,415 juvenile fish in the lower Similkameen River and between 30,000 to 160,756 juveniles in the rest of the Okanogan subbasin (primarily Omak and Salmon creeks). Current releases of Wells Hatchery stock steelhead are planned at 50,000 into the lower Similkameen River with another 50,000 being distributed to various locations in the Okanogan subbasin (NPCC 2004).

The Colville Trout Hatchery is located on the Columbia River downstream of Chief Joseph Dam at RM 542. Kokanee and rainbow trout are reared at this facility for the Lake Roosevelt net pen programs. At WDFW's Omak Hatchery on Jasmine Creek near the Town of Omak, resident rainbow trout are reared to be planted in various locations including Bonaparte Lake, Leader Lake, and Conconully Reservoir. Rainbow, Lahonton,

cutthroat, eastern brook, and tiger (eastern brook x brown) trout as well as kokanee salmon are stocked in closed-system lakes throughout the Okanogan subbasin.

Harvest

The Colville Tribes currently manage a limited summer/fall Chinook salmon fishery immediately below Chief Joseph Dam. A sockeye fishery is occasionally held and, more recently, a limited spring Chinook fishery occurred in the Okanogan River. Harvests are for ceremonial and subsistence uses rather than commercial or sport purposes. Over the last several decades, the Colville Tribes' combined salmon and steelhead harvest has averaged 930 fish annually (CTCR 2004). These fish are harvested in a snag fishery at the base of Chief Joseph Dam and a net fishery in the lower Okanogan River.

Management of summer/fall Chinook in the Okanogan River is based on achieving adult spawner escapement objectives regardless of fish origin. Tribal and recreational harvest management does not distinguish between hatchery and natural origin Chinook (NPCC 2004). Runs of summer/fall Chinook to the Okanogan River have been highly variable. Tribal and recreational harvest of summer/fall Chinook in the Okanogan River and the Columbia River from its confluence with the Okanogan to Chief Joseph Dam generally depends on adult abundance determined through preseason predictions by fishery management agencies and actual counts taken at Rocky Reach and Wells dams. Recreational fishing in the Okanogan has been infrequent, opening only when at least 11,000 summer/fall Chinook pass Priest Rapids Dam.

The Colville Tribes fish for summer Chinook below Chief Joseph Dam, with harvest generally proportional to run size. This rod-and-reel snag fishery annually takes less than 1,000 fish average for their more than 8,000 person membership (NPCC 2004). Even with the record run in 2001 of 47,700 summer/fall Chinook passing Wells Dam only 3,400 fish were taken (CTCR 2004).

Recreational steelhead fishing is limited to hatchery-origin fish in the Okanogan River. Season openings, managed by WDFW and NOAA Fisheries, are unpredictable and depend on the highly variable smolt-to-adult survival rates of Wells Hatchery smolts (NPCC 2004). With the recent large runs of hatchery steelhead, the recreational fishery re-opened primarily to remove excess hatchery-origin fish from the naturally spawning population. This unique fishery is allowed only as a conservation measure to improve the viability of the naturally spawning population. Future harvest will depend on the recovery of the Upper Columbia River Steelhead DPS in general and the Okanogan population specifically.

3.2.2 Environmental Consequences

Proposed Project

The proposed hatchery program (Chapter 2) would increase the number of summer/fall Chinook adults (Program Components 1 and 2) and UCR spring Chinook (Program Component 3) adults returning to the Okanogan subbasin, aiding in the protection of these species. The brood stock selection, collection locations, and timing would likely lead to greater diversity and distribution of both summer/fall and spring Chinook salmon

populations if all three program components are implemented. Summer/fall Chinook spawning would expand into currently underutilized areas of the lower and middle Okanogan River. Nutrient enrichment from decaying carcasses would increase throughout the basin, benefiting all fish species and their prey. Tribal ceremonial and subsistence harvest of target fish of each species could be enhanced and recreational fishing opportunities may become available.

Construction Effects

Most of the proposed facilities would be built in upland areas. In-stream construction would occur at the hatchery, Riverside Pond and Omak Pond (Table 3-3). During construction, no temporary or permanent barriers would completely block any water body. In-stream structures would be adjacent to the river bank and would occupy very little in-stream area. These areas would be permanently unavailable to fish but are not designated as critical habitat. The small size of the structures would have little or no effect on fish populations.

Table 3-3. In-stream Facilities Associated with Chief Joseph Hatchery Program

Construction Site	In-stream Facilities	Water body	Project Component
Chief Joseph Hatchery	▪ Water Intake & outlet/effluent pipes ▪ Screens ▪ Fish ladder	Rufus Woods Lake and Columbia River	1, 2, and 3
Riverside Pond	▪ Water intake and pump station ▪ Outlet/release structure	Okanogan River	1, 2, and 3
Omak Pond	▪ Water intake and pump station ▪ Outlet/release structure	Okanogan River	1, 2, and 3

To control impacts to water quality, construction of Riverside and Omak pond intakes and outlets would be conducted during low water periods. Timing would be adjusted to avoid detrimental effects on migrating fish. The sites do not provide critical habitat for steelhead or resident fish, but suitable summer/fall Chinook spawning habitat is present nearby. July, August, and September are months in which in-stream work has been permitted in the past (C. Fisher, CTCR, personal communication, January 9, 2006; W. Meyer, WDFW, personal communication, January 9, 2006). Any in-stream construction would be scheduled to comply with requirements of regulatory or permitting agencies (e.g., NOAA Fisheries, USFWS, USACE, Washington Department of Ecology, etc.)

Temporary cofferdams and water diversion structures would route water around all in-stream work areas to lessen impacts to water quality and fish. Portable pumps, used to remove water from the work areas, would be screened to exclude fish. During installation of the cofferdams, a fisheries biologist would be on site to capture any fish stranded during dewatering and return them to flowing waters. Best Management Practices (BMPs) (e.g., silt fences, hay bales, erosion control matting, sediment retention

ponds, etc.) would be applied to all in-stream structures and construction to reduce erosion on portions of the riverbank affected by construction.

Water quality effects are expected to be temporary, i.e. limited only to the construction period, and should return to a pre-construction condition. Construction is not expected to affect in-stream temperatures. Leakage of petroleum products and other pollutants from heavy equipment operating within the stream course would be minimized by proper equipment maintenance, use of absorbents, and conducting refueling operations away from the water body. Riparian vegetation affected by construction would be replaced if it would not compromise operation of or access to the in-stream structures.

Operations Effects

Operation of the hatchery facilities and fish production program could affect fish through water quality impacts, intake structures and water use, introduction of fish diseases, genetic effects on population productivity, operation of the fish ladder, and collection of brood stock.

Water Quality Effects

Water quality effects can include sediment, changes in nutrient levels, introduction of chemical pollutants into the water body, and altered water temperatures.

Sediment and Nutrients

Sediment, fish food, and fish waste would be introduced into the Columbia River at the hatchery site year-round. These introductions would be minimized by directing the intake filter backwash and raceway effluents to the proposed waste water treatment aeration/settling ponds (Chapter 2).

The acclimation sites would also be sources of nutrients and sediment when in use between October and April annually. During this time, river water temperatures are cold, and the fish eat less food and produce less waste than at the hatchery (C. Fisher, CTCR, personal communication; November 3, 2005). Currently operating acclimation sites appear to remain relatively clean. But, as an added measure, effluent from seasonal pond cleaning may be routed through a detention pond prior to returning to the river. Waste would be disposed of in an appropriate upland location per Washington State environmental regulations.

At existing acclimation sites, flow, pH, total suspended sediments, total phosphorus, dissolved oxygen, and water temperature are monitored and have remained within the acceptable ranges established in the National Pollution Discharge Elimination System (NPDES) permits. It is expected that the amount of sediment and nutrients introduced from the hatchery and acclimation ponds would not affect the overall water quality in the Columbia River, Okanogan River, and Omak Creek, and would not adversely affect fish and other aquatic organisms. Introduction of nutrients may, in fact, produce beneficial effects as significant settling of natural nutrient load occurs in upstream reservoirs.

The nutrient content of the Okanogan subbasin waters would also be increased through introduction of salmon carcasses from returning adult spawners. This enrichment would be variable throughout the subbasin and would be greatest around spawning sites. The number of returning fish and potential for nutrient enrichment would also be dependent upon downstream harvests. Further discussion of water quality effects is in Section 3.6.

Chemical Pollutants

The types and amounts of chemicals used at a hatchery or rearing facility depend upon site-specific conditions, fish culture practices, species of fish, and types of parasites or disease organisms being treated. Information about the types and amounts of chemicals which would be used at the proposed hatchery facility and acclimations ponds is not currently available. However, all chemical handling, application, and disposal would adhere to U.S. Department of Agriculture (USDA), state, and other federal regulations to protect human and environmental health.

Temperature

Water discharged from the hatchery into the Columbia River may, at times, be of a different temperature than the receiving waters. The temperature difference would vary by season and would depend on hatchery operational needs and the current ambient river temperature. The amount of water discharged would be small in relation to the flow of the river and discharge water is expected to rapidly mix with river water. The effect on the river as a whole would be negligible.

Water temperatures in the Okanogan River and Omak Creek are not expected to be affected by operation of the acclimation ponds. Water in the ponds would be subject to warming through solar radiation, but because they would be in use in winter, this effect is not expected to measurably increase the temperature of the receiving streams.

The CJHP proposes to shift the collection of spring Chinook brood stock to as early in the run as possible to try to establish a future run that returns prior to late June. This strategy should decrease the probability of migrating spring Chinook encountering the thermal barrier that forms each summer at the mouth of the Okanogan River and their possible migration downstream into the Methow River.

Fish Health

Hatchery effluents may slightly increase the abundance and virulence of endemic pathogens present in the Columbia River near Chief Joseph Hatchery. Hatchery intake water would pass through a filtration system and most likely an ultraviolet light system to reduce pathogens prior to hatchery use, and hatchery effluent would be greatly diluted before reaching waters inhabited by major fish populations. No water treatment would occur at the acclimation ponds. However, rearing densities would be much lower than typical propagation standards, reducing the potential for disease outbreaks (CTCR 2004).

Little information is available on the relationship between hatcheries and disease outbreaks in natural populations of fish (Smith et al. 2006). The impact to natural fish populations from endemic pathogens may be small since native fish have co-evolved with

the endemic pathogens and because native fish are present in the wild in lower densities than found in hatchery settings. Natural fish are also already exposed to pathogens from five other existing hatcheries in the general area.

CJHP operations would follow state and federal protocols for reducing the transfer of disease to wild fish. Juvenile fish would be sampled for presence and virulence of pathogens prior to release at any sites. Fish with pathogens not present in the wild population would not be released. Fish carcasses from the hatchery would be distributed to selected waters in accordance with the Pacific Northwest Fish Health Protection Committee Salmon and Steelhead Carcass Distribution Protocols (CTCR 2004).

Brood Stock Collection

Currently, a mixed brood stock of Methow and Okanogan summer/fall Chinook is collected at Wells Dam between July and September. Under CJHP, collection at Wells Dam would continue until sufficient brood stock is collected at the CJH fish ladder and from live-capture at various locations in the Columbia, Okanogan and the Similkameen rivers. The collection season for the CJHP would be extended to capture fish representative of the entire returning run. All collections would comply with collection and ESA Section 10 incidental take permit requirements. Injuries to fish listed under ESA Section 10 would be documented and reported.

The proposed hatchery fish ladder along the north bank of the Columbia River (Section 2.1.4) would not impede fish movement due to the ladder's close proximity to Chief Joseph Dam (the dam is a complete barrier to anadromous fish passage), the ladder's relatively small size, and its orientation and design.

Methods, timing, and locations of live captures would be chosen on a site-specific basis and would be aimed at collection effectiveness and minimization of adverse effects on non-target species.

Brood stock would be randomly collected in proportions approximating the timing and age distribution of the population. Natural-origin fish would be incorporated into the brood stock to prevent genetic divergence between hatchery and wild fish. Monitoring would assure that life-history characteristics of the natural population are maintained. It is anticipated that the brood stock collection locations and timing would lead to greater diversity and distribution of both summer/fall and spring Chinook salmon populations. No adverse effects on existing salmon populations are anticipated as the program is designed to increase the abundance of the target species.

Non-target fish entering the hatchery ladder during operation (May through November) or collected in the live-capture gear could be stressed by handling and holding prior to their return to the river. It is not known how many non-target fish may enter the ladder or live-capture gear annually. It is not likely that UCR steelhead or spring Chinook would be adversely affected since the ladder and gear would not be operated when steelhead are typically migrating into the Okanogan subbasin (March to April) and since non-target spring Chinook in the area would most likely be strays from the Methow River (Okanogan spring Chinook are deemed extinct). As described below, some hatchery bred spring Chinook potentially could be in the area. Fish managers would set handling

protocols for releasing or returning the captured spring Chinook strays to the Methow. A bull trout may rarely stray into collection areas, but it is unlikely that the population would be affected by brood stock collection. Individuals of other resident species may also be incidentally captured and handled, but it is not likely that these species would be affected at a population level.

Spring Chinook brood stock would also be collected from the semi-permanent Omak Creek weir that was installed several years ago to collect summer steelhead brood stock. Steelhead have returned to the weir between March 15 and late April, and hatchery-bred spring Chinook began returning in 2005 around May 15 (C. Fisher, CTCR, personal communication, December 13, 2005). Therefore, the return timing of the two species would probably not overlap. Also, there has been no mortality observed among steelhead or native resident fish since weir operation began. Non-target fish species freely pass through the weir without being handled. UCR spring Chinook would not be affected by this collection because they have been extirpated from the Okanogan subbasin. Bull trout are not known to inhabit Omak Creek and have never been observed in the area during weir operation (C. Fisher, CTCR, personal communication; November 3, 2005).

Rearing

The interactions between hatchery and wild fish are affected by hatchery rearing conditions, which influence the physiological, morphological, and behavioral characteristics of the hatchery fish. Rearing techniques that mimic the natural environment, such those based on NATURES criteria, have improved the post-release survival of hatchery-reared Chinook (BPA 2003b) and reduce the potential for divergence between hatchery-origin and natural-origin fish. NATURES rearing techniques that would be implemented in the CJHP include:

- Minimizing human contact
- Low-density incubation and rearing at CJH and each acclimation pond
- Using automatic feeders at CJH
- Using dark-colored early-rearing troughs
- Placing natural cover such as tree branches in the raceways or acclimation ponds
- Using baffles in raceways to create varying flow patterns
- Varying the degrees of shading and sunlight penetration to raceways
- Providing raceways with colored bottoms to mimic a natural stream bed
- Volitionally releasing fish from CJH and each acclimation pond

Interbreeding

Wild summer/fall Chinook would be, by design, affected by interbreeding with hatchery-origin fish released through the proposed program. However, the potential for adverse effects would be reduced by monitoring the proportions of natural-origin fish and hatchery-origin fish spawning in the river. All hatchery fish would be fin-clipped to distinguish them from natural-origin fish. In the proposed program, at least 80% of the naturally spawning population would be natural-origin fish in the better return years. If the percentage of hatchery-origin fish rises above 20%, the co-managers would increase harvest and/or decrease production (CTCR 2004). In low return years, the proportion of

hatchery-origin fish in the naturally spawning population would be allowed to increase to meet the escapement objective.

No impacts are anticipated to spring Chinook since spring Chinook are considered extirpated from the Okanogan subbasin. Any natural production currently occurring in the subbasin is the result of recent hatchery supplementation with Carson stock fish.

The potential for straying and interbreeding with other Columbia River stocks is expected to be minimal. The Okanogan River is the uppermost Columbia River tributary accessible to anadromous fish. CJHP fish would be acclimated to local conditions prior to being released, allowing sufficient time for imprinting on natal water. The rearing/acclimation ponds would be supplied with river water, exposing fish to the chemical composition of the river and maximizing homing ability.

The potential for interbreeding between out-of-basin strays and naturally spawning fish in the Okanogan subbasin is expected to be low. The potential for ESA-listed spring Chinook from the Methow River to stray into the Okanogan River also is low. Annual monitoring would confirm these assumptions. The coded wire tags that identify the fish's origin would be retrieved during adult carcass surveys. Modifications would be made to the program if straying rates are too high.

Natural Escapement Distribution

Currently, the majority of summer/fall Chinook returning to the Okanogan subbasin spawn near Similkameen Pond, leaving a large portion of the subbasin underutilized by salmon. The proposed project would release Chinook smolts from several locations and should result in returning summer/fall Chinook adults being more evenly distributed throughout the subbasin.

Implementation of the summer/fall Chinook program (Program Components 1 and 2) is anticipated to increase runs past Wells Dam by 3,000–15,000 early-arriving adults and 3,000-14,000 later-arriving adults (CTCR 2004). During years of low escapement, the run would be managed to support natural escapement, broodstock needs, and perhaps a minimal tribal ceremonial and subsistence fishery. The total brood stock requirements for the program are 842 early-arriving and 618 later-arriving summer/fall Chinook adults. During high escapement years, tribal and recreational selective fisheries may be expanded to capture surplus hatchery-origin fish at the discretion of agencies responsible for setting harvest goals.

Currently the expected spring Chinook adult returns are 1,800 to Chief Joseph Dam and 900 to the Okanogan subbasin (CTCR 2004). The goal for the proposed spring Chinook program is to produce, on average, about 2,700 adults for the Okanogan subbasin. The program is sized to eventually provide for tribal ceremonial and subsistence and recreational fisheries. Initially, total brood stock requirements for the program would be about 324 fish. If all aspects of the initial program were successful, brood stock needs may increase to about 644 fish.

Spring Chinook carcasses would be retained after spawning in the Okanogan River and Omak and Salmon creeks to provide needed nutrients to the ecosystem. Resident and

anadromous fish as well as terrestrial animals and plants would benefit in the short- and long-term from the rich source of nutrients. Increasing the number of fish and their distribution would be a benefit to the entire Okanogan subbasin.

Competition and Predation

Introducing large numbers of fish into a water body at one time and location can cause competition between the hatchery fish and natural fish for food and habitat. It can also stimulate predation by natural fish on hatchery fish and vice versa. The proposed hatchery program is designed to reduce the potential for competition and predation by placing hatchery fish at several acclimation locations and allowing for volitional release of fish from each site. The volitional releases would occur when fish are physiologically ready to migrate. It is expected that larger yearling fish would move rapidly downstream to the Columbia River estuary, minimizing the potential for competition with natural fish. The program also allows fish to volitionally leave the hatchery rearing facility over time, avoiding large densities of fish and minimizing competition and predation risks.

Summer/fall Chinook salmon would be released as yearling smolts at 10 fish per pound. Spring Chinook would be released at 15 fish per pound. Some predation on small resident fish may occur during out-migration, but this would probably be negligible. Out-migrating Chinook smolts are not expected to prey on ESA-listed steelhead because the steelhead juveniles would generally be larger than the Chinook. Because sub-yearling steelhead are usually found in tributaries whereas Chinook prefer mainstem rivers, the juveniles of both species are most likely to be spatially separated.

Some summer/fall Chinook would be released as sub-yearlings at 50 fish per pound in an effort to enhance life history diversity. These fish are expected to move rapidly down the Okanogan River due to rising water temperatures and rear in Columbia River reservoirs where they may compete with ESA-listed salmonids. Interactions should be minimal, however, as the upper Columbia River species that are listed all rapidly migrate into and then down the Columbia River as yearling fish.

In accordance with the operating plan outlined in the current HGMP (CTCR 2004), release numbers and escapement would be monitored to remain within the estimated local and basin-wide carrying capacity for spawning, freshwater rearing, migration, and estuarine and near-shore rearing. In years with large runs, harvest would be increased to capture surplus hatchery-origin fish and thus ensure that hatchery fish make up less than 20% of total adult escapement in the basin.

Harvest

One of the purposes of the proposed project is to support a potential tribal and recreational fishery of hatchery-origin Chinook in the Columbia River and the Okanogan subbasin (Chapter 1). Few non-target or ESA-listed fish would be exposed to the terminal fishery below Chief Joseph Dam. Some late-returning adult spring Chinook may be exposed to harvest activities targeting the early portion of the summer/fall Chinook run if Program Component 3 is implemented. The harvest, however, would be selective for hatchery fish; all non-fin-clipped fish would be released.

ESA-listed UCR steelhead could be incidentally affected in the long-term by any increase in Chinook fishing pressure within the Okanogan subbasin. The impacts would be addressed by harvest and fishery managers through ESA compliance consultations with NOAA Fisheries. ESA-listed steelhead must be released, but some individuals would probably die from injury or stress.

Any harvests would be conducted within the incidental mortality limitations established in the ESA Section 10 permit and would follow the performance standards specified in the HGMPs (CTCR 2004). Harvest opportunities could be adjusted annually to manage hatchery-origin fish escapement and thereby minimize potential adverse impacts to natural populations. Selective fishing gear and timing and location of fisheries could be restricted if excessive harvest mortality occurs in non-target species.

The CTCR and WDFW have adopted a draft harvest agreement that protects the CTCR's opportunity to harvest summer/fall Chinook in the Okanogan River system associated with increased production under the CJHP (pers. comm. Steve Smith, September 19, 2006). If other Columbia River Basin fishery managers were to consider increasing allowable harvest rates on the entire summer/fall Chinook ESU, the harvest agreement would protect CJHP stocks, and only the Methow and Wenatchee populations could be targeted which may be indicate a potential to over-harvest those stocks, an outcome unacceptable to these managers. So, potential downstream harvest of CJHP Chinook would be ameliorated because of the potential to affect these other populations. In addition, the effect of the CJHP and the harvest agreement on ocean-based fisheries would be negligible.

No Action Alternative

With the No Action alternative, no new facilities would be constructed and none of the expected impacts or benefits associated with the CJHP would occur. The current summer/fall and spring Chinook supplementation programs would be expected to operate as in the recent past. Summer/fall Chinook would continue to be managed under the Eastbank Hatchery/Similkameen Pond program. Brood stock selection would not represent the timing of the entire summer/fall Chinook run, potentially decreasing genetic diversity of the population. Some progeny would be reared in water from sources other than the Okanogan River. Juveniles would be transported for long distances from the natal hatchery to the acclimation facilities. Smolts would be released from only a few locations within the Okanogan subbasin. Summer/fall Chinook redd densities in the vicinity of Similkameen Pond would be expected to continue to be high as fish would not be distributed well throughout the subbasin.

Declining population trends would likely continue long-term. The summer/fall Chinook salmon population would likely remain depressed, exhibiting a long-term declining trend. Natural re-colonization into underutilized areas is unlikely to occur (CTCR 2004). Spring Chinook population size in the Okanogan is also not likely to improve.

Chinook production would continue to be far below the carrying capacity of the Okanogan subbasin. No spawning would be expected to occur in the lower Okanogan River which historically supported heavy spawning concentrations of summer/fall Chinook salmon. Historically important summer/fall Chinook spawning areas near

Riverside and Omak would continue to be underutilized. Nutrient enrichment from salmon carcasses would be limited in availability and distribution which also would keep natural production levels low. Escapement to the Okanogan River would continue to be far below the carrying capacity of the subbasin. Harvest opportunities would likely be limited further, occurring less frequently and for shorter periods of time. The opportunity to develop local broodstock would be foregone and out-of-basin stock (Carson and others) would continue to be imported.

3.2.3 Cumulative Effects

Aquatic habitat in the region has been substantially affected by hydroelectric dams, agriculture, and rural development. Agricultural and rural developments continue. Construction and operation of the proposed project should have a nearly undetectable effect on the accumulation of development in and near aquatic habitat. The proposed CJHP project is compatible with and additive to other aquatic habitat and fish management programs in the region. CJHP is expected to increase aquatic habitat use and the populations of target species while not appreciably affecting others.

The State of Washington and the Colville Tribes have initiated a comprehensive habitat rehabilitation program for the mainstem Okanogan River and several tributaries with the goal of improving fish populations (CTCR 2004). Ongoing and proposed future projects include increasing stream flows, improving fish passage, screening diversions, reducing sediment loads, and restoring stream channel and riparian habitats. The Chief Joseph Hatchery program would provide acclimation facilities for the supplementation of juvenile salmonids to increase spring and summer/fall Chinook stocks in the Okanogan River subbasin. The Colville Tribes and the Okanagan Nation Alliance are collaborating on the recovery of at-risk fish and wildlife species in the Canadian portion of the Okanogan River watershed with a goal of improving salmonid populations (CTCR 2004). These programs, in combination with the CJHP, would have a beneficial cumulative effect on the summer/fall and listed spring Chinook stocks, as well as listed UCR steelhead, in the Okanogan River subbasin.

The State of Washington has also initiated habitat rehabilitation in subbasins other than the Okanogan within the UCR spring Chinook and UCR steelhead ESUs, such as the Methow, with the goal of improving fish populations. The CJHP may use the Methow composite spring Chinook stock in the future, and the CJHP monitoring and evaluation of the spring Chinook supplementation program would assess spring Chinook and steelhead interactions. Habitat restoration and hatchery supplementation in other subbasins in combination with the CJHP could have a net beneficial effect on the recovery of ESA-listed UCR spring Chinook and UCR steelhead ESUs.

Public and private agencies and operators of hydroelectric projects on the mainstem Columbia River are conducting studies and implementing changes in operations to improve downstream survival of juvenile salmonids, with the intent of increasing adult returns (CTCR 2004). These changes include increased spring flows, spill programs, and improvements to the bypass, collection and transport systems. The changes in the operation of mainstem Columbia River dams and the supplementation of salmonids from the CJHP could produce a net increase in the population of ESA-listed salmonid species

and other fish. Alternatively, in drought years where the magnitude, duration, and timing of spill events and flows through Columbia River dams are reduced, possibly causing a corresponding reduction in juvenile salmonid survival rates, supplementation from the CJHP could offset losses, thus reducing adverse effects on the total population.

Performance standards for adult and juvenile passage at the nine Columbia River mainstem dams have been established and are monitored through the NPCC's Fish and Wildlife Program, Federal Energy Regulatory Commission (FERC) licensing requirements, and NOAA's ESA regulations (CTCR 2004). As part of the Okanogan subbasin natural production monitoring and evaluation program, the Colville Tribes and WDFW conduct steelhead and summer/fall Chinook redd surveys annually. Monitoring returns for the CJHP would provide additional data for improving the management of salmonid stocks in the subbasin. Monitoring fish survival through the Columbia River dams and production within the Okanogan subbasin in combination with the CJHP monitoring and evaluation activities could facilitate improvements in the management of runs and estimates of carrying capacity in the Okanogan subbasin, and would be expected to result in a net benefit to listed and unlisted anadromous fish and their habitats.

As the proposed CJHP increases the number of Chinook adults returning to the Columbia River below Chief Joseph Dam and in the Okanogan subbasin, allowable tribal and recreational harvest levels in the Columbia and Okanogan rivers may increase. Potential adverse impacts from increased Chinook harvest levels to non-target species, such as ESA-listed UCR steelhead, sockeye, and resident fish would not be offset by the proposed program. With increased fish production from the CJHP as well as habitat restoration and enhancement and improved spill at mainstem dams, commercial harvests may increase. Close monitoring would be required to ensure that the benefits of increased fish runs are not negated by increased harvest.

3.3 Wildlife

3.3.1 Affected Environment

The general area is characterized by semi-arid habitat types typical of northeastern Washington State. The most common habitats are shrub-steppe, agricultural, and mixed-use development. Open water and riparian habitats are represented by the Columbia River, the Okanogan River, Similkameen River, Omak Creek, and various ponds. Riparian areas typically support the highest diversity of wildlife, especially birds and mammals. Wetland habitats are uncommon although in this part of Washington they are an important habitat type and often support a wide variety of wildlife. The vegetative communities that form the various habitats are described more fully in Section 3.4. Appendix B lists wildlife and associated habitats found in the general area.

The shrub-steppe habitat type is common in the region and supports a variety of wildlife, including mule deer, burrowing owl, and sagebrush lizard. Over 100 bird species forage and nest in shrub-steppe including three species found only in sagebrush habitats: sage thrasher, sage sparrow, and Brewer's sparrow (Ashley and Stovall 2004).

Orchards and pasture lands comprise the agricultural habitats. Mixed-use development habitats are areas containing human development such as rural residential areas, parks,

the golf course, roads, businesses, etc. Areas with more human development are generally not as important to wildlife although some species, such as gulls, starlings, sparrows, and ground squirrels have higher tolerances and may be found in these areas.

Culturally important wildlife species that may occur in the general area include mule deer, white-tailed deer, black bear, gray wolf, beaver, rabbits, rodents, eagles, hawks, owls, upland game birds, waterfowl, great blue heron, scavenger birds, snakes, lizards, and river mussels.

The golden eagle is a year-round resident of Okanogan County. It and the bald eagle are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668a-d). Golden eagle nesting occurs near each of the proposed acclimation ponds (WDFW 2005b).

ESA-listed Species

Of the species on the Priority Habitats and Species List (WDFW 2005b) for Okanogan County having special status under ESA, only bald eagles, yellow-billed cuckoos, and gray wolf may occur anywhere near the project sites (M. Miller, USFWS, personal communication, July 15, 2005). Other listed species are not expected to occur near project sites because the habitat is unsuitable or the sites are not in reasonable proximity to their current distribution or historic range. For example, CJHP sites do not contain suitable habitat for grizzly bear or Canada lynx because these species are strongly associated with forested habitats at higher elevations. Nor is it likely that sage grouse or pygmy rabbit use CJHP sites. Of the two known Washington populations of sage grouse, one is in Douglas and Grant counties and the other is in Kittitas and Yakima counties (Stinson, Hays, and Schroeder 2004). The nearest historically known pygmy rabbit site was located in 1950 near Mansfield, about 12 miles south of Chief Joseph Dam.

Bald Eagles

The bald eagle was de-listed under the ESA in August 2007, but remains listed by the State of Washington as a threatened species (WDFW 1991a). The historical distribution of the bald eagle is unknown in the upper Columbia River (Smith et al. 2006), although they are known to winter along the Okanogan and Columbia rivers and nest in the vicinity of Rufus Woods Lake (USACE 2002). Lake Pateros supports a winter population of more than 40 birds (WDFW 2005b). In November 2005, two mature bald eagles were observed in the riparian area adjacent to the Okanogan River near Bonaparte Pond. A possible nest has been documented along the Okanogan River in the vicinity of Ellisforde Pond.

The most important food sources for bald eagles at Columbia River reservoirs are coots, mallards, and chukars. Opportunistic feeders, bald eagles will also seek carrion and anadromous and resident fish. Bald eagles commonly forage along wide rivers with gravel bars that retain salmon carcasses. Eagles use prominent snags, dead-topped trees or exposed lateral limbs with an unobstructed view of water for perching. Along the Okanogan River, eagles prefer ponderosa pine and black cottonwood trees due to their availability and height. In open areas, eagles may use cottonwoods or willows for night roosting.

Yellow-billed Cuckoo

The yellow-billed cuckoo is an ESA candidate for listing and a Washington State threatened species. The cuckoo disappeared from most of its breeding range in the 1930s (WDFW 1991b) and has not been documented in the general area (WDFW 2005b). Yellow-billed cuckoos breed mid-June to mid-August, nesting in deciduous forested riparian and wetland habitats with dense foliage within 30 feet of the ground (WDFW 1991b). Few cuckoos have been documented in riparian areas less than 300 feet wide and 4 acres in area. They eat insects exclusively and require very large territories. The birds have been observed foraging in riparian areas and orchards in California. They may nest in early to mid-successional habitat and forage in mature forests. The factors limiting yellow-billed cuckoo populations in Washington are unknown, but studies in California suggest that riparian habitat availability and food may be limiting.

Gray Wolf

Wolves, ESA-listed as threatened, were historically common and well-distributed throughout Washington (Palmquist 2002). They were nearly extirpated from Washington by the 1930s due to intensive human settlement, overexploitation of prey species by settlers, extreme predator control measures to protect livestock beginning in the 1800s, and loss of habitat (USFWS 1987). In the last couple of decades, wolf populations in western North America have increased and they have reoccupied the north Cascades and eastern Washington, emigrating from British Columbia, Idaho, and Montana. Gray wolves are present in the Canadian portion of the Okanogan subbasin (Palmquist 2002), although no breeding pairs or packs are known to reside in Washington State. Expansion of their range into the Okanogan subbasin is impeded by intensive human development and occupation. So, wolves are not expected to be present in the vicinity of project sites.

Species of Concern

The following species of concern possibly occur in the general area (M. Miller, USFWS, personal communication, July 2005): black swift, burrowing owl, Columbian sharp-tailed grouse, loggerhead shrike, northern goshawk, olive-sided flycatcher, peregrine falcon, western gray squirrel, long-eared myotis, pallid Townsend's big-eared bat, sagebrush lizard, California floater, and giant Columbia spire snail. Of these, only the burrowing owl, loggerhead shrike, peregrine falcon, sagebrush lizard, and the giant Columbia spire snail have any likelihood of being found in or near the project sites. The sites are not suitable habitat for the other species.

Burrowing owls use burrows excavated by other species such as badger, yellow-bellied marmot, striped skunk, or ground squirrels. In 1988, over 100 active nests were found in the Columbia River Basin (Wahl, Tweit, and Mlodinow 2005). In the 1980s, several pairs were reintroduced at sites near Vaseux and Osoyoos lakes (Cannings, Cannings, and Cannings 1987). The burrowing owl is a rare summer resident of the Okanogan subbasin. If suitable burrows are present, the owls may occur in the grassland and shrub-steppe habitats at the proposed hatchery and housing sites and in the fallow field near St. Mary's Mission Pond.

Loggerhead shrikes inhabit relatively undisturbed shrub-steppe habitats with greasewood, sagebrush, and patchy grass. Its summer distribution is mainly east of the Cascades at low elevations along the Columbia River and in Okanogan and Klickitat counties (Wahl, Tweit, and Mlodinow 2005). Shrikes often nest in ravines, scattered trees or hedgerows. They are very rare in the Columbia River Basin during the winter, but have been documented in Okanogan County.

Peregrine falcons are a species with "monitor" status under ESA. Peregrines are a rare-to-uncommon summer resident of Okanogan County and the Columbia River Basin (Wahl, Tweit, and Mlodinow 2005). They nest on cliffs, bridges, and tall buildings and forage over large river deltas and agricultural fields, preying on waterfowl, shorebirds, and starlings. Peregrines may potentially forage at Lake Pateros and over agricultural fields. They have been documented occasionally at Chelan Ridge, Okanogan County, during the fall migration. Suitable nesting habitat does not occur at any of the project sites but may occur in the vicinity.

Sagebrush lizard populations are widely scattered throughout eastern Washington, occurring in sagebrush plains and open juniper or pine woodlands with brushy cover (Storm and Leonard 1995). Rock outcrops are used for basking and cover. Sagebrush lizards feed on insects and invertebrates and are prey for snakes and birds. Suitable sagebrush lizard habitat occurs at the hatchery and housing sites and possibly in the fallow field near St. Mary's Mission Pond.

Giant Columbia spire snails, also known as the Columbia pebblesnail, inhabit streams with relatively high dissolved oxygen concentration and low turbidity levels (Pacific Biodiversity Institute 2005b). Historically, the snail was widespread throughout the lower Snake and Columbia rivers. They currently occur in six locations, three of which are in the Okanogan River. The snail has a life span of about one year, with 90% of the population turning over annually. For this reason, a disruption during the spring-to-autumn breeding season (Natureserve 2009) can devastate a population.

Hatchery Site

Habitat types at the proposed hatchery site include open water, riparian, and mixed-use development (mowed, irrigated grasslands). Several seeps or irrigation outflows are developing wetland characteristics. The site is subject to human activity and disturbance from the USACE visitor orientation area, irrigated grass cover, and the nearby roads and highway. Some species like gulls, terns, and Canada geese may use the irrigated grasslands for foraging and resting. The Columbia River at the site is too deep to allow foraging by wading birds and the steep, rip-rapped bank precludes waterfowl nesting.

Small mammals and reptiles are probably present at the hatchery site and larger mammals such as coyotes may be present sporadically. The adjacent steep river banks most likely preclude the site as a river access point for large mammals. Large mammals may be discouraged from using the site due to the sparse cover and human disturbance from the highway and the visitor orientation area.

Swallows and bats most likely forage for insects over the open water and grasslands at the site. Belted kingfishers, red-winged blackbirds, warblers, and other songbirds are

found in willow habitats similar to those at the river's edge. Human presence may preclude some species from using the site, but more tolerant species may be found there. These species may include ring-billed gull, California gull, killdeer, Brewer's blackbird, European starling, black-billed magpie, American crow, and common raven.

Housing Site

The housing site, situated in bitterbrush shrub-steppe habitat, is likely inhabited by a variety of birds typical of shrub-steppe habitats (Appendix B). The deep, loamy soils there are home to mice, voles and larger burrowing mammals. Coyotes hunt and travel in the area. Nearby, the Rufus Woods Lake area and its tributaries provide important mule deer winter range and fawning habitat (WDFW 2005c) and forage for Canada geese.

Ellisforde Pond

Ellisforde Pond, located on a high, rip-rapped bank above the Okanogan River, is an existing concrete irrigation pond with pumps surrounded by gravel fill, paving and fencing (Figure 2-7). Vegetation within the fenced gravel compound is sparse. The riparian area, with more varied and dense vegetation, lies outside the fenced area.

The most common wildlife species at the Ellisforde Pond site are likely those that use a variety of habitats and tolerate high levels of human activity and disturbance. Killdeer may nest on the gravel fill. Belted kingfishers periodically forage at the Ellisforde Pond while salmonids are being reared. Rats, mice, voles, and snakes may also occur.

The narrow, riprapped riparian area at the Ellisforde Pond site may serve as a travel corridor for deer, coyotes, furbearers, and black bears. Garter snakes and furbearers may inhabit the river shorelines and adjacent shallow water habitats. The few mature trees nearby provide suitable perching for bald eagles which are likely present during the winter. Cavity-nesting ducks and osprey rest along the Okanogan River in the vicinity of the pond (WDFW 2005b).

Tonasket Pond

Tonasket Pond, another fenced irrigation pond complex recently modified for fish acclimation, lacks vegetation. The pond site could support wildlife species that are very tolerant of humans, as described for Ellisforde Pond. The site is not likely an established use area for fish-eating birds. Riparian habitat and a constructed emergent wetland lined with riprap exist between the pond's fence and the Okanogan River, and an orchard lies to the east. The constructed wetland provides escape cover for small animals including mink, voles and snakes. The shoreline may be used by birds such as gulls, terns, great blue heron, mallards, common loon, and mourning dove. Cavity-nesting ducks, including wood ducks, hooded mergansers and Barrow's goldeneye nest nearby (WDFW 2005b).

The 15- to 30-foot wide riparian area may be a travel corridor for mule deer, coyotes, furbearers, and black bears. The riparian area and adjacent open water provide cover and resting, nesting and foraging habitat for many species of birds. Bald eagles have been documented along the Okanogan River near Tonasket Pond (WDFW 2005b), and past beaver activity is apparent.

Bonaparte Pond

Bonaparte Pond is surrounded by gravel fill and paving and is contained within a chain link fence topped with barbed wire. The 5-foot-wide riparian area between the fence and the Okanogan River has a riprap bank and holds a few sapling willow shrubs and roses. Very little wildlife habitat exists, but the area may be used as a travel corridor by wildlife, although its suitability may be compromised by the presence of a non-motorized boat ramp located upstream of the site. Bald eagles are known to use nearby snags and cottonwoods as fall/winter perches.

Riverside Pond

The proposed Riverside Pond site is irrigated hay and alfalfa field crossed by the Cascade Columbia River Railroad line and bordered by a 15- to 25-foot wide densely vegetated riparian area. The surrounding landscape is agriculture and rural residences. The riparian area is a rich source of insects, fruits, and berries for upland game birds, songbirds, and bats; and a few mammal trails traverse it. Large mammals such as deer, coyote and black bear use the area as a travel corridor. Recent beaver activity is apparent, and other furbearers likely use the shorelines and adjacent shallow water habitats. Water shrews and water voles may be present, providing a prey base for predators. Butterflies also probably use this habitat. It is likely that small mammals and reptiles typical of agricultural lands use the Riverside Pond site hayfield, and bats may forage over the area.

St. Mary's Mission Pond

St. Mary's Mission Pond sits in a large fallow field adjacent to Omak Creek that supports a 10- to 15-foot-wide riparian area. The field and riparian habitat support wildlife similar to Riverside Pond, although St. Mary's field also contains sagebrush which adds some structural complexity. California quail, Merriam's turkey and ruffed grouse inhabit the area, and black bear sign is common.

Omak Pond

The proposed Omak Pond site is a fallow field containing a barn and sheds skirted by a 15- to 20-foot-wide riparian area. It is likely used by the same species associated with these habitats at Riverside and St. Mary's Mission ponds. The barn and sheds may provide roosting habitat for bats.

3.3.2 Environmental Consequences

Proposed Project

Hatchery Site

Construction Effects

Construction of the hatchery complex would temporarily alter about 24.5 acres and permanently occupy 20 acres. Habitats affected include irrigated grasslands, shrub-steppe fringe, mixed-use developed areas, and a slight amount of riparian area. The fish ladder

and effluent pipes would be placed within the narrow riparian area dominated by small willows, reducing available songbird nesting habitat to some small degree. The effect of the reduction would be negligible in the area. None of the habitat is limited or considered critical in the general area.

Possible effects on any wildlife populations from hatchery construction are considered negligible. Wildlife species inhabiting the site and its vicinity are probably tolerant of the noise associated with Chief Joseph Dam, State Highway 17, and the USACE visitor orientation area. Animals most likely to be temporarily displaced are small mammals, birds, insects, and reptiles. Bald and golden eagles, often present along the Columbia River during the winter, may avoid the site during hatchery construction.

Operations Effects

Because of daily traffic to and from the hatchery and noise from machinery, raceways, and pumps, wildlife species sensitive to human activity and noise may not return to the area. This effect is expected to be negligible because the site is currently lightly used by wildlife and, with the exception of bald eagles which are present during the winter along the river at Lake Pateros and Rufus Woods Lake, none of the species are threatened, endangered, or a species of concern.

The permanent loss of about 20 acres of irrigated grassland and fringe shrub-steppe habitat would not affect the viability of any wildlife population since this habitat is not limited in the general area. Furthermore, the habitat at the site is currently isolated from other upland habitats by State Highway 17 which most likely discourages wildlife from moving into it.

Several hundred feet of overhead power and telephone lines and a new transformer would be installed at the site, requiring placement of an unknown number of poles. The remainder of the power supply would be installed underground. Birds commonly use overhead lines for perching, so new lines may attract more bird use of the area. Raptors such as kestrels may benefit from the increased foraging opportunities provided by the lines in the long term. It is possible some birds may die from colliding with the lines, but the lines would be designed to avoid the likelihood of electrocution. Although mortality potential has not been quantified, it is expected to be negligible because this area is not and probably would not be in the future be heavily used by birds.

The fish food storage area would be enclosed to minimize foraging by wildlife such as mice, rats, bears, and birds. Used salmon carcasses would be stored in covered totes and transferred off-site to minimize attracting scavengers.

As the program continues, several thousand adult Chinook are expected to return to the fish ladder. Fish that die in Lake Pateros before entering the fish ladder will likely feed animals such as eagles, bears, furbearers, other fish, and macro-invertebrates. These species and their predators would benefit in the long term from the increased foraging opportunities. The distribution of such wildlife may shift during the spawning season to areas where salmon carcasses are found.

Housing Site

Construction Effects

Construction of the hatchery employee housing would disrupt about 10 acres of shrub-steppe wildlife habitat for about 7 months. Most resident wildlife is expected to be displaced during this time. Bald and golden eagles wintering at Rufus Woods Lake may be displaced when outdoor construction is particularly loud.

Operations Effects

About 5 acres of bitterbrush shrub-steppe habitat would be permanently lost to housing development. The surrounding habitat would be permanently affected by human use and occupancy, which may include pets, noises, children, bicycles, vehicle traffic, stray trash, and the unintentional spread of non-native weeds. Native plant diversity may diminish as soil disturbance and competition with non-native species increases, and typical sagebrush-inhabiting wildlife would be displaced to other areas. Mule deer would likely be displaced from the area. Wildlife species at the site would likely shift to species more tolerant of humans. The overhead utility lines may benefit some birds (rock dove, mourning dove, blackbirds, kestrel, and European starlings) tolerant of humans by providing perching structures. Bears could be attracted to the housing site in search of garbage and pet food. These effects are expected to be limited to the immediate vicinity of the housing site.

The housing areas would likely be landscaped with lawn grasses and ornamental shrubs and trees which would be watered. The wetter landscape and septic drain field areas may attract small mammals, amphibians and reptiles including rattlesnakes. Individual snakes, especially rattlesnakes, may be adversely affected by human interactions. Insects attracted to outdoor lighting may increase foraging opportunities for bats. Long-term impacts to wildlife populations are not anticipated.

Acclimation Ponds

Ellisforde Pond

If Ellisforde Pond is modified to support the proposed CJH program (this is a contingency facility) construction would be limited to the pond outlet within the confines of the existing pond. All work would probably occur between May and September. Because this pond already exists, wildlife in the vicinity are probably fairly tolerant of noise and activity, but some wildlife, including nesting songbirds and waterfowl, may be displaced. If the eagle nest nearby is occupied, construction activities would avoid the nesting period (January 1 – July 31) and would be restricted within 660 to 800 feet (Watson and Rodrick 2001). All effects would be transitory and minor. During operation of the pond for fish acclimation, the wildlife disturbance level would be similar to that already being experienced.

Tonasket Pond

Since construction is limited to installation of telemetry equipment, no discernable effects to wildlife at Tonasket Pond are expected. The wildlife disturbance level during operations would be similar to that already being experienced.

Bonaparte Pond

Proposed construction at Bonaparte Pond would be confined within the existing structure and occur between May and September. Wildlife in the vicinity may be temporarily displaced during this time. The wildlife disturbance level during operations would be similar to that already being experienced.

Riverside Pond

The new construction proposed at the Riverside Pond site would temporarily alter about 15 acres of pasture and about 2,000 square feet of shrub-scrub and riparian habitat. Construction would probably occur between March and September, the nesting period for songbirds and cavity-nesting ducks, so activity and noise could disrupt nesting for a few individuals. Bald eagles would not be affected since they do not use the habitat in this area. Giant Columbia spire snails may occur in the Okanogan River and could be affected by in-stream construction-generated turbidity. Sediment-reducing BMPs required during construction would reduce potential impacts to this species.

About 4 acres of pasture would be permanently replaced with the pond, piping, associated structures, and access roads. Individuals of some wildlife species such as mule deer, small mammals, upland game birds, and snakes would be displaced by this loss of habitat. Less than 1,000 square feet of riparian habitat would be permanently replaced by the proposed water intake, pump station and outlet structure, and certain wildlife would be displaced. But, the local habitats affected by construction at this site are not limited in the general area, so the potential effects to wildlife populations are expected to be negligible.

Netting would be installed over the pond to minimize avian predation and fencing would be erected to prevent entry of land-based predators. Therefore, operation of this facility is not expected to benefit fish-eating species. Some individual birds may become trapped in the netting. New overhead power lines at the site would prove both beneficial (perching, foraging and nesting) and adverse to birds (possible collisions). Human activity may permanently disturb certain wildlife.

Omak Pond

Omak Pond construction would temporarily displace wildlife from about 3 acres of fallow field and about 2,000 square feet of riparian habitat. The riparian habitat includes large trees suitable as eagle perches, and bald eagles are usually present in the area during the winter. But, construction would occur outside the wintering period between April and September. Still, eagles, if present, may avoid the trees during the construction period. Nesting by songbirds and cavity-nesting ducks could be disrupted by noise and activity. If present in this reach of the Okanogan River, giant Columbia spire snails could

be affected by in-stream construction-generated turbidity. Sediment-reducing BMPs required during construction would reduce potential impacts to this species.

Omak Pond would permanently occupy 2 acres of fallow field. Individuals of some species, such as deer, small mammals, upland game birds, and some songbirds would be displaced by this loss of habitat. Less than 1,000 square feet of riparian habitat would be permanently replaced by the proposed intake, pump station and outlet structure, and would displace certain wildlife. The loss of large trees would reduce the amount of suitable perch sites for bald eagles, which migrate through the area and spend winter along the Okanogan River. But, the local habitats affected by construction at this site are not limited in the general area, so the potential effects to wildlife populations are expected to be negligible.

Netting would be installed over the pond to minimize avian predation and fencing would be erected to prevent entry of land-based predators. Therefore, operation of this facility is not expected to benefit fish-eating species. Some individual birds may become trapped in the netting. New overhead power lines at the site would prove both beneficial (perching, foraging and nesting) and adverse to birds (possible collisions). Human activity may permanently disturb certain wildlife.

St. Mary's Mission Pond

Modifications proposed for St. Mary's Mission Pond include removal of the pond grating, installation of channels with tail and head screens, a water level alarm system, predator netting, and installation of a chain-link fence. These minor activities may temporarily disturb some wildlife for about 2 months. A very small amount of fallow field habitat surrounding the pond may be temporarily affected by construction, but it is expected to restore itself naturally. The wildlife disturbance level during operations would be similar to that already being experienced.

Effects Attributable to the Fish Production Program

If the proposed program is successful in increasing returns of Chinook salmon to the Okanogan subbasin, and if increased salmon escapement and distribution are achieved, wildlife which forage on salmon (e.g. eagles, ospreys, mergansers, great blue herons, gulls, mink, otters, and bears) could significantly benefit in the long term. The depleted freshwater mussel population (historically an important food source for the Colville Tribes) may improve since they depend upon salmon as hosts for parts of their life cycle.

No Action Alternative

With the No Action Alternative, no change to the current situation would occur. The summer/fall and spring Chinook supplementation programs would continue as in the past. No new construction, site disturbance, wildlife displacement, or fish production would be expected. Long-term declining population trends of summer/fall Chinook salmon would continue, and natural re-colonization of underutilized habitat would not likely occur (CTCR 2004). Salmon carcasses, which provide an important forage base and source of nutrients for eagles, bears, and scavengers, would continue to be limited in availability and distribution. Natural production of juveniles, an important prey base for piscivorous

species such as mergansers, osprey, great blue heron, mink, and otter, would continue to be low and limited in distribution.

3.3.3 Cumulative Effects

The proposed project would result in a very minor, incremental addition to the accumulated decline of available wildlife habitat and to the frequency of human/animal interactions in region. Wildlife habitat has been and will continue to be affected by development of agriculture, housing developments, roads, industry, and hydroelectric installations. None of the habitats affected by this project are critical or limited and the cumulative effect of their removal is considered inconsequential in the region. Development represents a gradual "nibbling" away and fragmentation of wildlife habitat in the region and may ultimately contribute to more serious cumulative effects if large-scale future development occurs.

The proposed project, in conjunction with habitat restoration/enhancement and spill projects, is expected to increase salmonid populations in the area. These projects in aggregate would result in an increase in salmonid carcasses which are fed upon by various wildlife species such as bald eagles, osprey, and black bears which could serve to buffer some of the other cumulative pressures on these species.

3.4 Vegetation and Wetlands

3.4.1 Affected Environment

The project area is within the Okanogan Highlands and Columbia Basin physiographic provinces (Franklin and Dyrness 1973). The Okanogan Highlands Province is characterized by moderate slopes above about 4,000 feet elevation separated by five broad, low-lying river valleys. The Okanogan River subbasin is the western-most watershed in the province.

The project area is primarily composed of shrub-steppe, agriculture, and rural residences. Deciduous riparian, riverine and reservoir vegetative communities are also present. Agricultural lands are used to produce hay, cereal grains, and fruit (apples, pears, and cherries). Much of the remaining shrub-steppe habitat has been altered by livestock grazing, fire suppression and invasion by exotic plant species (Ashley and Stovall 2004). Native bunchgrass cover has declined and sagebrush has increased. The surviving native habitat of eastern Washington is highly fragmented and more likely to occur on shallow soils because areas of deep soils are more desirable for agriculture.

Many plant species are important to the Colville Tribes for traditional subsistence practices, medicines, and ceremonies. Species that may occur in the project vicinity are listed in Appendix B.

Black cottonwood, alders, willows, hawthorn, rose, spirea, and snowberry occur in the riparian areas at the proposed acclimation sites. Desert-parsley, sagebrush, rabbitbrush, and bunch grasses are present at the proposed hatchery and housing sites. Prickly pear cactus also grows at the proposed housing site.

Hatchery Site

Most of hatchery site was planted to weedy grasses and forbs and now supports weedy species such as orchard grass, oat grass, horseweed, and mullein. The site is mowed and irrigated by the USACE. Riprap with very little vegetation extends up the Columbia River bank to reduce erosion from high discharges and/or water velocities from the dam. Closer to the dam there are several seeps or outflows from irrigation that are developing wetland conditions. These small areas (less than 0.5 acres total size) contain narrow-leaved willows.

Housing Site

The proposed housing site is in typical bitterbrush shrub-steppe habitat. Dalmatian toadflax, a noxious weed, may be present at the site in low numbers. Cheatgrass, a highly invasive non-native species, is the most common herbaceous plant at the site.

Ellisforde Pond

Ellisforde Pond, located on a high bank above the Okanogan River, is surrounded by gravel fill and paving. Vegetation within the fenced compound is sparse. The riparian area consists of a few older black cottonwood trees, willows, chokecherry, and Rocky Mountain maple. Purple loosestrife, a noxious weed, is also present (Whitson et al. 1999). Riprap is extensive along the bank.

Tonasket Pond

Tonasket Pond is a concrete irrigation pond with associated pumps surrounded by a dirt access road. Vegetation is lacking inside the fenced area. A pipe discharges a small amount of water from the pond into a created wetland to the north. Cattails, smartweed, pondweed, weedy sweet clover, and a few scattered willows and cottonwood grow in the wetland. The banks of the wetland consist of riprap. A berm over the main discharge pipe from the pond to the Okanogan River is covered with elm trees, aspen saplings, and grasses. The riparian area is about 10 to 15 feet wide and is dominated by red-osier dogwood, willows, and black cottonwood.

Bonaparte Pond

Bonaparte Pond, an existing concrete irrigation pond, is surrounded by gravel fill and paving and contained within a chain link fence. Vegetation within the fenced area is sparse. The five-foot-wide riparian area between the fence and the Okanogan River holds a few sapling willow shrubs and roses. The bank consists of riprap. A railroad right-of-way occurs along the inland side of the complex.

Riverside Pond

Riverside Pond site would be within 200 feet of the Okanogan River. The surrounding landscape consists of agricultural lands and rural residences. The site is an irrigated field used to raise hay and alfalfa within a landscape of agricultural lands and rural residences.

It includes a water pump, the Cascade Columbia River Railroad line and a 15- to 25-foot-wide riparian area along the river containing willow and black hawthorn about 6 to 10 inches in diameter and 25 feet in height. The riparian understory is dense rose, common snowberry, goldenrod, thistles, and milkweed. A portion of the hay/alfalfa field lies between the riparian area and the railroad tracks.

St. Mary's Mission Pond

St. Mary's Mission Pond is in a large fallow field adjacent to Omak Creek. The 10-15 foot-wide riparian area is dominated by red-osier dogwood, willows, alder, birch, clematis, reed canarygrass, twinberry, and bulrush. The fallow field includes annual rye, crested wheatgrass, Russian thistle, and ripgut brome, as well as native sagebrush.

Omak Pond

The Omak Pond site is a fallow field lined by a 15-20-foot-wide riparian area along the Okanogan River. Near the proposed pond outlet is a group of 8 to18-inch-diameter elm trees about 50 feet tall, with red-osier dogwood, rose, and snowberry in the understory. At the proposed water supply intake, the riparian area is narrower and void of mature trees. A few black hawthorn and black locust saplings are scattered near the fallow field. Weeds in the field include annual rye, orchard grass, horseweed, mullein, oat grass, and diffuse knapweed. The Colville Tribal office complex nearby has been landscaped with ornamental trees and shrubs including sweet gum, sumac, black locust, and pine.

Rare, Threatened and Endangered Plant Species

Federally listed plant species and species of concern likely to be found in Okanogan County are listed in Table 3-4. The state status of each species is also shown.

Table 3-4. Federal Endangered, Threatened, and Species of Concern Plants occurring in Okanogan County, Washington

Common Name	Scientific Name	Federal Status	State Status
Ute ladies'-tresses	*Spiranthes diluvialis*	T	E
Triangular-lobed moonwort	*Botrychium ascendens*	SoC	S
Crenulate moonwort	*Botrychium crenulatum*	SoC	S
Two-spiked moonwort	*Botrychium paradoxum*	SoC	T

Source: WDNR 2005. T = Threatened; E = Endangered; SoC = Species of Concern; S=Sensitive

Ute Ladies'-tresses

Ute ladies'-tresses is listed as threatened under the ESA and as endangered by the State of Washington (Smith et al. 2006). Four populations of this orchid are documented in Washington; all occur from 720 to 1,500 feet in elevation. One population occurs in a periodically flooded alkaline flat in northern Okanogan County. The other three populations occur close to one another on gravel bars adjacent to the Columbia River in Douglas County (WDNR 2005). This rare orchid grows in moist, calcareous soils in wetland meadows or wetland complexes with channels or swales having low vegetation cover. The Columbia River populations grow on stabilized gravel bars that are inundated

early in the growing season and remain moist for the duration of the season. Although Ute ladies'-tresses may potentially occur in the general area, it is unlikely to occur within the project's area of potential effect due to lack of suitable habitat.

Triangular-lobed Moonwort

The triangular-lobed moonwort, a perennial fern, can be found growing in coniferous forests, wet and dry meadows, roadsides, ravines, and adjacent to perennial streams in rocky soil, surface gravel, or moist decayed litter (WDNR 2005). Of the 20 recently documented occurrences in Washington, four are in Okanogan County, and all are 2,100 to 6,400 feet in elevation. Although suitable habitat occurs within the general area, the project sites lie below 1,500 feet elevation.

Crenulate Moonwort

The crenulate moonwort occurs in moist areas of the Okanogan Highlands province between 2,000 to 5,200 feet in elevation (WDNR 2005) within dense western redcedar, western hemlock, and Engelmann spruce forests. Because the general project area lies below 1,500 feet elevation and is not forested, this fern is not expected to occur.

Two-spiked Moonwort

Of the 14 recently documented occurrences of two-spiked moonwort in Washington, three are in north central Okanogan County. The fern is unlikely to occur within the project area because it is found in mature redcedar forests at 2,400 to 6,400 feet elevation.

Noxious Weeds and Invasive Non-Native Plants

Noxious weeds are introduced plants that compete with native plants, may reduce native biodiversity and habitat suitability for native wildlife, and are likely toxic to humans and/or livestock (Whitson et al. 1999). The State of Washington classifies noxious weeds according to the risk they pose to environmental and economic resources. Appendix B lists the 26 noxious weeds potentially present or known to occur in the Okanogan subbasin and the state and county status of each weed. Noxious weed species observed during the site visit in November, 2005 are also noted in Appendix B.

Not all invasive non-native plants are legally designated as noxious weeds. Cheatgrass, for example, was first collected in Washington in 1896 (Washington Biodiversity Project 2007), and since that time has become widespread in the state and throughout the intermountain west (Vander Haegen et al. 2001). Native bunchgrasses in shrub-steppe communities are being replaced with cheatgrass and several knapweed species as a result of ground disturbance, grazing, and fire suppression. Russian knapweed is widespread throughout the Columbia River Basin, especially near major watercourses (Ashley and Stovall 2004). Cheatgrass is very common at the hatchery and housing sites. Dalmatian toadflax also may be present at the housing site in low numbers.

Purple loosestrife, a wetland weed that forms dense monocultures, is present near Ellisforde Pond. At St. Mary's Mission Pond, reed canarygrass is in the riparian area of Omak Creek and Russian thistle occurs in the fallow field. Reed canarygrass grows in

disturbed sites and seasonally inundated areas. It can out-compete native plants, forming dense monocultures and altering the soil hydrology. Russian thistle, an invasive weed common to roadsides, railways and dry open areas, establishes in areas without competition from other plants (Royer and Dickinson 2004).

3.4.2 Environmental Consequences

Proposed Project

Short-term adverse impacts would include removal or disturbance of vegetation during construction activities at all proposed sites. Long-term adverse impacts would occur where there is permanent loss of vegetation, reduction in native plant diversity, or increase in invasive or noxious weeds.

No ESA or Washington State listed plants or federal species of concern would be affected at the project sites since no suitable habitat exists. Construction would affect several culturally important plant species, including bunchgrasses, sagebrush, rabbitbrush, balsamroot, and prickly pear cactus, which grow in shrub-steppe habitats, and dogwood, willow, hawthorn, rose, and snowberry, which occur in riparian habitats (Appendix B).

BMPs would be implemented at all construction sites to limit effects on native plants and species of cultural significance. Examples include retaining riparian and wetland vegetation wherever practicable; salvaging and replanting riparian and wetland vegetation wherever site conditions allow; and using native species to revegetate disturbed soils. Other BMPs include placing silt fences, hay bales, and erosion control matting to prevent riverbank erosion; washing construction vehicles and equipment to avoid introducing and spreading noxious weed seeds; and monitoring equipment to ensure early detection and correction of fuel or oil leaks.

Construction of the proposed project would require gravel and rock for building pads, access roads, and other uses. If previously existing rock material sites are used, impacts to vegetation would not be as great as developing an entirely new site. Use of off-site material sources could introduce additional noxious weeds to the proposed project sites. It is assumed that any material sites proposed for this project would be properly managed and permitted by the appropriate agencies.

Fugitive dust would be generated at most, if not all, construction sites. Dust could coat nearby vegetation, though the effect of the dust would decrease with distance from the source. Vegetation that is heavily coated could be adversely affected. It is expected, however, that dust abatement practices would limit impacts to the immediate activity areas and the construction periods. No persistent adverse effects are anticipated.

Hatchery Site

All 24.5 acres of the hatchery site would likely be disturbed during construction due to material stockpiling, equipment staging and related activities. Permanent facilities would occupy about 20 acres of which 2.5 acres would be impervious. Less than 1 acre of shrub-steppe vegetation would be permanently affected. Implementing weed control measures and revegetating disturbed soils with native shrubs and grasses should

minimize adverse impacts to vegetation. Landscaping with native species would occur around some hatchery buildings.

Construction of the proposed fish ladder and adult fish holding ponds would permanently occupy a 20,000 square foot area on the steep, riprapped river bank of the Columbia River. Attempts would be made to salvage the small patch of narrow-leaf willow there and replant them following construction. If salvage is not possible, other nearby willow stands could provide cuttings for revegetation. No wetlands were detected and none would be affected at the hatchery site. Long-term operation of the hatchery is not expected to affect native plant communities or wetlands.

Housing Site

Construction at the housing site would temporarily disturb up to 10 acres and permanently disturb 5 acres of bitterbrush shrub-steppe habitat. No wetlands or riparian species were detected, so none would be affected. About 0.2 acres would be converted to impervious surface as residences and pads for RVs or camp trailers. Construction would affect species of cultural importance to the Colville Tribes (e.g. bunchgrasses, sagebrush, rabbitbrush, desert-parsleys, willow, balsamroot, asters, yarrow, plantain, and prickly pear cactus). Some species desirable for gardens or container plants, such as prickly pear, may be collected from the area. The house lots would likely be landscaped with lawn grasses, ornamental shrubs and trees, and native species.

Long-term occupancy and use of the housing site would likely affect remaining plant communities on the site and on adjacent lands. Cheatgrass and Dalmatian toadflax, two weed species already present at the site, may be promoted by activities such as foot traffic, pets, horses, bicycles, and motorized vehicles use. In addition to BMPs during construction, long-term monitoring and weed management would be accomplished to prevent weeds from spreading. Without these measures, weeds would likely out-compete native species at the site and spread to adjacent lands, diminishing native plant diversity and structural complexity in the vicinity.

Acclimation Ponds

Ellisforde Pond

Modifications to the existing pond structure would involve excavating a 10-square-foot area within an unvegetated rock quarry and light construction traffic and staging on an existing unvegetated gravel pad. No short- or long-term effects to any plant communities are anticipated from either construction or operation of the site.

Tonasket Pond

No construction is proposed at Tonasket Pond, so the plant communities would not likely change. Operation of the site is not expected to alter existing plant communities.

Bonaparte Pond

All proposed construction would occur within the existing pond, and access and staging would be confined to an existing unvegetated gravel pad. No short- or long-term adverse impacts to plant communities are anticipated from either construction or operation.

Riverside Pond

About 15 acres of pasture and 2,000 square feet of scrub-shrub riparian habitat would be temporarily altered through vegetation removal, soil disturbance, and soil compaction. About 4 acres of pasture and 1,000 square feet of riparian habitat would be permanently developed. About an acre of pasture would be converted to impervious surface. No wetlands were detected and none would be affected at the site.

The riparian habitat includes willows, hawthorn, snowberry, and rose. Some individual plants would be permanently lost to accommodate the water intake, pump station and outlet pipe. Revegetation with native species may be possible. Material excavated from the site would be re-used for construction fill, but re-use is not expected to result in the spread of noxious weeds since none were observed on site. Long-term operation of the site is expected to have no effects on native plant communities or wetlands.

St. Mary's Mission Pond

Proposed construction at St. Mary's Mission pond would temporarily alter a small (less than 1 acre) portion of the fallow field around the site. Spread of non-native species present in the field should be adequately managed by implementing prescribed BMPs.

Omak Pond

Construction of the proposed Omak Pond would temporarily alter about 7 acres of fallow field and mixed-use development along Brooks Tracts Road. About 2 acres would be permanently developed; less than 1 acre would be converted to impervious surface. No adverse effects to native plant communities are expected because the field is composed of non-native, weedy species. No wetlands would be affected as none exist at the site.

Construction of the water intake, pump station and outlet structure would alter about 1,000 square feet of riparian habitat occupied by dogwood, rose, snowberry, and hawthorn. BMPs implemented to retain and restore native riparian vegetation, reduce the spread of noxious weeds, and prevent erosion during construction should adequately protect other vegetation. Long-term operation of the site is expected to have no effects on native plant communities or wetlands.

No Action Alternative

With the No Action Alternative, vegetative conditions and trends at all sites would continue unaffected. None of the impacts associated with construction or operation of the proposed project would occur. No direct changes to plant communities are likely.

3.4.3 Cumulative Effects

Decreases in native plant communities in the Okanogan subbasin occur primarily from agricultural, residential, and commercial development. As the population of the area increases, more development would be expected and more native plant communities would be lost. The proposed project would contribute a regionally minor loss of native shrub-steppe and riparian plant communities, including loss of individual plants of species deemed culturally important to the Colville Tribes. The project also entails a minor increase in the potential to locally spread noxious weeds. Increased demand for recreational sites and recreation access as a result of this project and others may further contribute to loss of native plant communities (especially riparian areas) and spread of weeds. The effects associated with the proposed project are individually minor, but are part of a continuing pattern in the region.

3.5 Geologic Hazards, and Soils

3.5.1 Affected Environment

Geology

The proposed CJHP sites lie at the boundary between the Okanogan-Selkirk Highlands and the Columbia Plateau physiographic provinces (Galster, Coombs, and Waldron 1989). The Okanogan-Selkirk Highlands are a mixture of various types of metamorphic rocks that have been intruded by younger granitic rocks. The Columbia Plateau is characterized by multiple layers of basalt from lava flows that occurred during the Miocene era. Volcanic and sedimentary rocks layers that have been deformed by folding and other geologic processes surround the Okanogan Valley.

The region was modified by Pleistocene glaciers that moved southward across the Okanogan-Selkirk Highlands, the Columbia River Valley, and onto the Columbia Plateau. The ice left a variety of glacial debris, including glacial till; morainal deposits; outwash sand and gravel; and fine-grained lacustrine silt, fine sand, and clay. Following the glacial retreat, the Missoula floods resulted in catastrophic erosion within the Columbia Basin and deposition of coarse-grained sediments (sands, gravels, cobbles, and boulders) in many areas along the Columbia River. The Columbia River has cut downward through the glacial sediments and into the granitic bedrock of the Okanogan-Selkirk Highlands, creating a steep-walled, terraced inner valley within the broad, older valley. The broad, older valley is about 1,000 feet deep and 12,000 feet wide in some areas. The Okanogan River has also cut downward through the glacial sediments creating well-developed glaciated river terraces comprised of silt, sand, and gravel.

Project Site Soils and Groundwater

Construction records for Chief Joseph Dam indicate 10 to 100 feet of permeable gravel and cobbles overlies the granitic bedrock at the proposed hatchery site. The gravel and cobbles are overlain by “dump moraine” and over 100 feet of glacial till consisting of large boulders and blocks of basalt, siltstone, and sandstone in a matrix of sand, silt, and gravel. The proposed hatchery site, used as a staging area during dam construction, was subject to extensive ground disturbance, including filling, grading, road construction and

shoreline stabilization (Weaver and Shannon 2006). Borings in the vicinity of the hatchery suggest the presence of groundwater at or near the tailwater elevation of the dam (generally between elevations 780 and 790 feet elevation).

Near-surface soils information is inferred from an extrapolation of data mapped along the south shore of the Columbia River based on the Douglas County Soil Survey which was conducted primarily for erosion potential. In summary, the near surface soils at the hatchery have a low to moderate susceptibility to erosion.

All the acclimation pond sites are expected to be underlain by alluvial soils consisting of sand, gravel and cobbles based on existing geologic maps (Stoffel et al. 1991), the topography of the area, and photographic interpretation. The soils have a low to moderate susceptibility to erosion. Bedrock is expected to occur at depths greater than 30 feet. Groundwater at the site is expected at about 10 feet deep, which is probably controlled by the surface water elevation of the nearest river.

Geological Hazards

Slope Stability

According to slope stability mapping conducted in 1991 by Stoffel et al (1991), no landslide-prone areas exist at the hatchery site or the sites of the proposed water supply sources, pipelines, roads, and housing area. However, localized areas of instability may exist along the Columbia River shoreline due to surface water runoff or infiltration. Large-scale instability related to stream-bank erosion and reservoir level fluctuations is not evident in the topographic features along the right bank or from geologic mapping.

No areas of instability have been mapped near any of the acclimation ponds (Stoffel et al. 1991). Although localized areas of instability may exist along river banks, large-scale instability related to streambank erosion is unlikely at the pond sites due to the straight nature of the channel and lack of stream cutbanks.

Seismic Conditions

Numerous faults and fractures occur within the granitic bedrock, but the mapping reveals no active faults within 5 miles of proposed project sites. Although there are contact places where two different rock types come together near the Riverside and Omak sites, they are not assumed to be active faults. Historically, no significant earthquakes (magnitude 4 or higher) have occurred within 10 miles of the project sites. The soils underlying the sites are generally not susceptible to earthquake-induced liquefaction.

3.5.2 Environmental Consequences

Proposed Project

Operation of the hatchery, housing, and acclimations ponds is not expected to affect soils or geologic hazards at the proposed project sites.

Soils, Erosion and Sediment Transport

Construction of the hatchery and new acclimation ponds would require excavations for buildings, ponds, roadways, pipelines and other utilities. About 16,000 cubic yards (cy) of soil and rock may be excavated for hatchery facilities and about 3,000 cy would be excavated at the housing site. From 3,000 to 11,000 cubic yards of soil would be excavated for the new Riverside and Omak acclimation ponds and associated pipelines and pump stations. Improper excavation can affect erosion and sediment transport. The proposed project would employ BMPs during construction to reduce erosion and off-site sediment transport. Some of the techniques include:

- Restricting construction traffic to designated work areas
- Applying dust abatement on construction roads to reduce airborne particulates
- Balancing earthwork cuts and fills to reduce import and export of materials
- Covering long term soil stockpiles to reduce wind erosion
- Reseeding disturbed areas with approved native vegetation

Increased erosion potential can occur when working across and through stream banks and other slopes. The hatchery and housing sites are located on relatively flat ground and are not expected to stimulate erosion or to be affected by erosion. Construction of the hatchery and new ponds' water intakes could result in minor increased erosion potential to the locality of the area where the pipe enters the water. A Hydraulic Project Approval, USACE 404 permits, and ESA consultation would likely require additional erosion and sedimentation prevention practices. Pipelines to the hatchery headbox from the well field, relief tunnel and reservoir inlet would be carefully designed, constructed and monitored for leakage that could impact slope stability.

Slope Stability

It is not expected that the hatchery or the new acclimation ponds would affect or be affected by unstable slopes. The proposed facilities would not be located in areas of slope instability. Cuts and fills at the hatchery and acclimation ponds are generally less than about 10 feet, although the relief tunnel pump station at the hatchery (Figure 2-4) would be about 80 feet deep. The amount of earthwork and the proximity of the facilities to nearby slopes are not expected to result in conditions that destabilize the slopes. Structures and facilities for water containment can contribute to slope destabilization depending upon their locations and whether or not they are watertight, but the project incorporates measures to avoid water leakage, including lining all ponds and other water-retention facilities. The pipelines that are attached to the face of the dam, extending from the irrigation opening, would be exposed to allow visual inspection for any leakage that could affect the embankment slope below the dam. Underground pipelines from the irrigation opening and the relief tunnel would be monitored to assure the embankment slopes are not affected. Short shafts may be used to support pipelines on steep slopes to provide adequate support and avoid near-surface soils that may be loose.

Seismic Considerations

None of the project components would be located over known active faults. The buildings and facilities would be designed to the 2003 International Building Code to resist earthquake ground shaking corresponding to an earthquake having a 2% probability of occurrence in 50 years, which corresponds to a 2,475 year recurrence interval.

No Action Alternative

Under the No Action alternative, the proposed hatchery and acclimation ponds would not be built. None of the effects discussed above would occur.

3.5.3 Cumulative Effects

The contributions of the CJHP to erosion and sediment transport, slope instability, and seismic concerns would be negligible to non-existent. Erosion and sediment transport would be controlled through BMPs and permit requirements. The project facilities would be designed and built to avoid contributions to slope instability. No sites are located in areas of active seismic faults and all would be built to accepted earthquake standards.

3.6 Hydrology, Floodplains, and Water Quality

3.6.1 Affected Environment

Hydrology

Okanogan River

The Okanogan River originates in British Columbia and flows through a series of large lakes (both natural and manmade) before reaching the United States. The watershed encompasses about 2,600 square miles within the State of Washington and about 6,300 square miles in British Columbia (WDOE 1995). The Okanogan River within Washington flows about 79 miles from the outlet of Osoyoos Lake on the Canadian border to the Columbia River (Lake Pateros) at RM 533.5 near Brewster, Washington (Entrix, Inc., Golder Associates, and Washington Conservation Commission 2004). The influence of Wells Dam on the Columbia River causes the Okanogan River flow to back up and become essentially slack water to about RM 15.1.

Okanogan River flow is regulated by dams at three lakes: Osoyoos in the United States, and Skaha and Okanagan in Canada. Flow is regulated to meet several objectives including flood control, preferred lake elevations, and enhancement of fish production (CTCR 2005a). Okanogan River flow is monitored just downstream of Lake Osoyoos at RM 77.5 by the U.S. Geological Survey (USGS) Oroville gauge (station 12439500). Downstream gauges are near Tonasket at RM 50.8 (station 12445000) and Malott at RM 17.0 (station 12447200). The Ellisforde, Tonasket, and Bonaparte irrigation/acclimation ponds are located upstream of the Tonasket gauge. The proposed Riverside and Omak ponds would be located between the Tonasket and the Malott gauges.

Average annual flows of the Okanogan River have not changed much since gauging began in 1911 (WDOE 1995), but seasonal timing and duration of flows have changed substantially. Due to flow regulation by dams, peak flows are lower and low flows are higher than before. Flows increase in May during spring snowmelt and typically peak in late June. Low flows occur from mid-August to September and remain low throughout the winter. Average monthly flows during peak spring runoff measured at the Tonasket gauge approach 10,000 cfs in late June (Figure 3-1); flood flows during this period can be over 25,000 cfs (USGS no date). Low flows in late summer and fall typically average between 1,000 and 1,500 cfs, but have been recorded as low as 400 cfs from 1995 to 2004 (as measured at the Tonasket gauge).

Dams and other diversions for flood control and irrigation affect flows in the Okanogan River watershed. About 105,414 acre-feet of surface water are diverted annually for irrigation (Entrix, Inc., Golder Associates, and Washington Conservation Commission 2004). WDOE has issued surface water rights for 107,160 acre-feet and estimates potential future use near about 500 cfs.

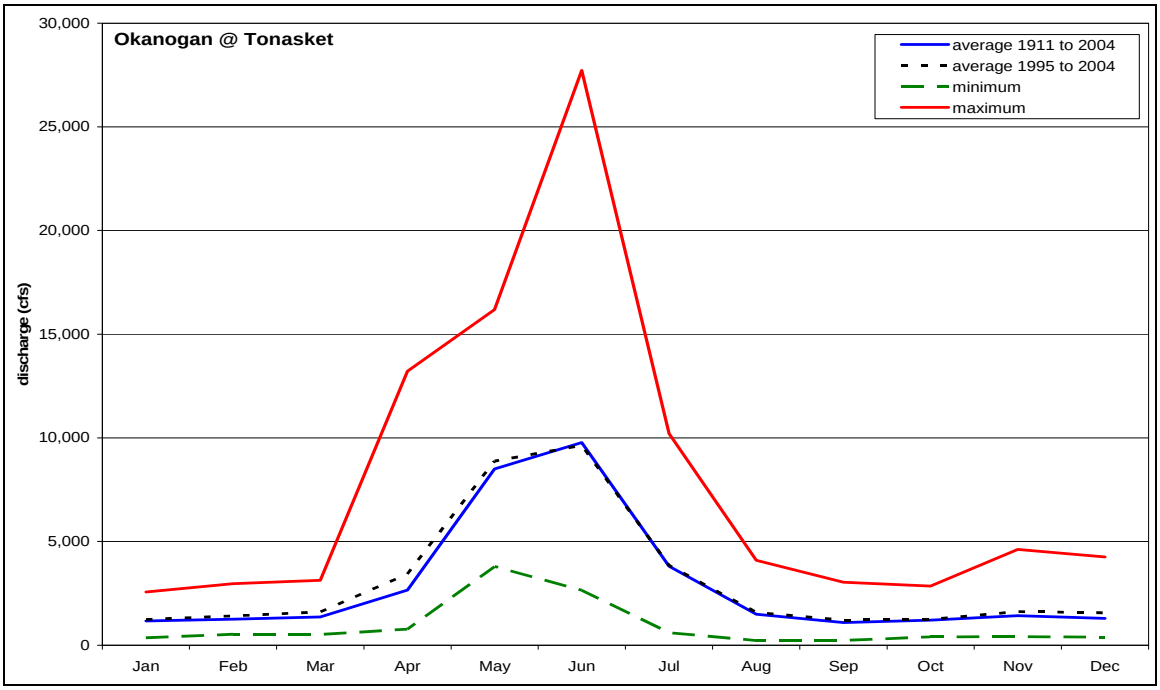


Figure 3-1. Okanogan River Average Monthly Discharge at the USGS Okanogan near Tonasket Gauge (Station 12445000)

Minimum in-stream flows for the Okanogan River were set by rule by WDOE in 1976. Between Tonasket and the river's mouth, minimum flows must range from 600 to 3,800 cfs. For the upper Okanogan River, minimum flows must range from 300 to 500 cfs. Flows fall below these levels an average of 60 days per year in the reach below the confluence with the Similkameen River and 100 days per year above this point (WDOE 1995). WDOE has closed all perennial streams in the watershed to issuance of further water right permits between May 1 and October 1 (WDOE 1995).

Omak Creek

The Omak Creek subbasin is entirely within the Colville Reservation. The 22-mile-long creek has a drainage area of about 140 square miles. It flows into the Okanogan River at RM 31. Elevations within the Omak Creek subbasin range from 860 feet at its mouth to 6,774 feet at Moses Mountain. WDOE has collected flow data since 2002 at the Omak Creek gauge (station I.D. 49C100) at RM 5.5. The USGS operated the station from 1972 to 1978. Based on this very limited record, high flows occur in the spring and are variable, averaging between 25 and 100 cfs (Figure 3-2), and low flows occur in the late summer averaging less than 5 cfs (Figure 3-2). Flows in the winter average near 10 to 15 cfs, but may drop to as low as 1 cfs. The stream can go dry. CTCR (2002) reported that Omak Creek is not altered by irrigation use. Surface water rights and claims on Omak Creek amount to 2.8 cfs (WDOE 2002a). Water rights adjudication for Omak Creek is incomplete pending judicial action as of 2008. When available, 2 cfs is taken at the St. Mary's Mission Pond between October and April for fish rearing.

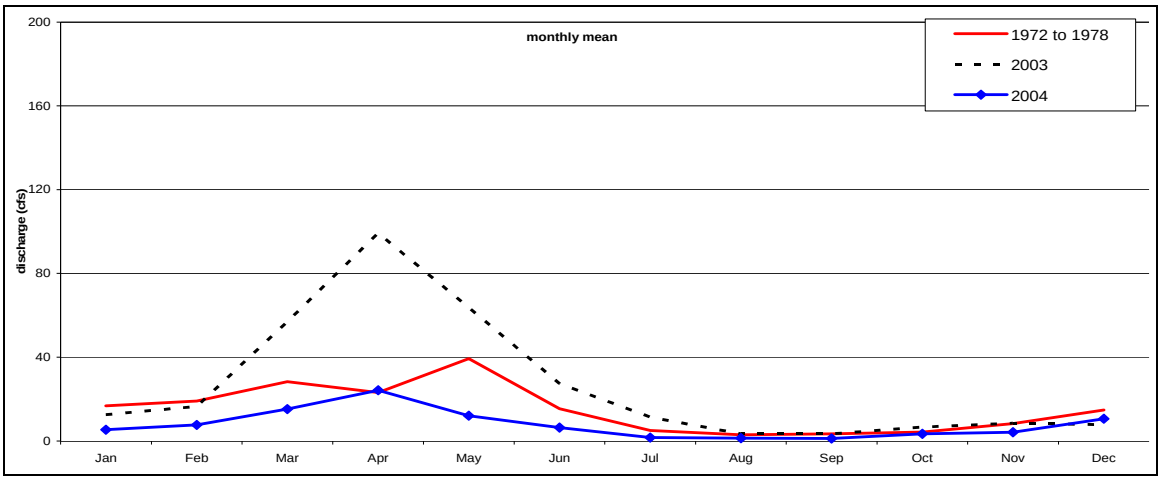


Figure 3-2. Omak Creek Average Monthly Discharge (USGS and WDOE data from RM 5.5)

Columbia River near Chief Joseph Dam

Lake Pateros occupies the 30 mile stretch of the Columbia River from Chief Joseph Dam downstream to Wells Dam. Rufus Woods Lake extends 51 miles from Chief Joseph Dam upstream to Grand Coulee Dam. Chief Joseph Dam is a run-of-river hydroelectric project, and Rufus Woods Lake is not used for flood control. Its depth fluctuates very little throughout the year (between elevations 950 feet and 956 feet normally). The dam's tailwater is at 780 feet, with levels exceeding 790 feet about 5% of the time.

Investigations of geologic conditions at the hatchery site indicated that only the lower 20 to 30 feet of material overlying bedrock appears to be hydraulically connected to the Columbia River. The upper 60 to 70 feet of silty, gravelly sand substrate does not hold water (Sweet, Edwards & Associates 1986).

An aquifer underlies the right abutment of Chief Joseph Dam. A 1,000-foot long relief tunnel was installed in the aquifer beneath the dam abutment to control groundwater flows and seepage pressure. The tunnel flows nearly 100 cfs. This tunnel is proposed as a source of water for the Chief Joseph Hatchery.

Bridgeport State Park and the Lake Woods Golf Course use the aquifer near the park. Well pumping tests indicated there is a high level of conductivity between the aquifer and the reservoir; the reservoir recharges the aquifer. The proposed well field for hatchery water would use this aquifer.

Floodplains

Executive Order 11988 (Floodplain Management) directs federal agencies to evaluate the potential effects of their actions in 100-year flood zones shown on Federal Emergency Management Agency (FEMA) flood insurance rate maps. In the project area, only the Okanogan River has a FEMA-mapped floodplain (Figure 3-3). The Okanogan River floodplain averages about a mile wide and descends from 920 feet in elevation at the Canadian border to 780 feet at the confluence with the Columbia River. The hatchery, housing, well field, and St. Mary's Mission Pond would not be within the floodplain. Bonaparte, Ellisforde, and Tonasket ponds already exist within the floodplain, and the Riverside and Omak ponds are proposed within the floodplain.

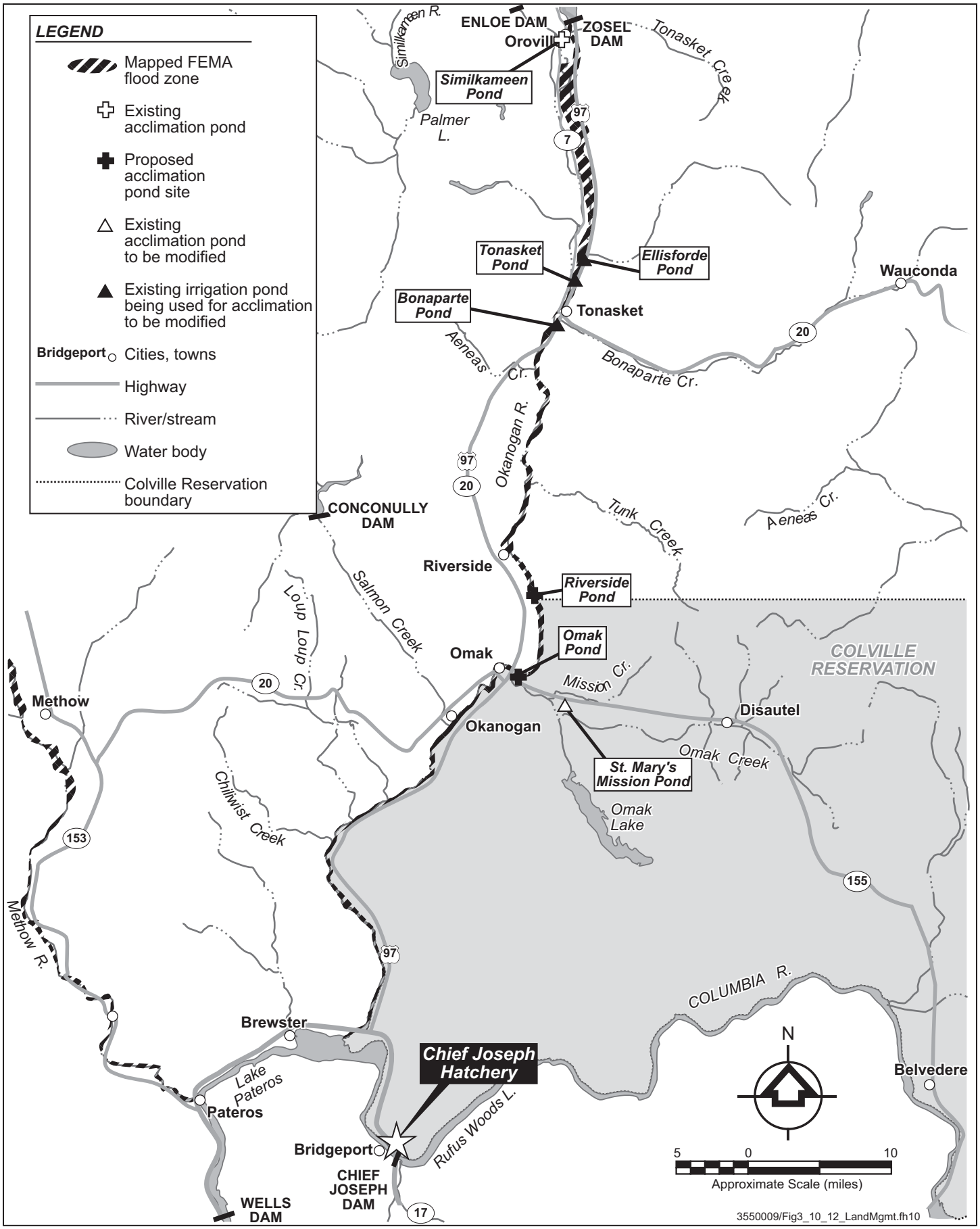
Water Quality

In 2006, WDOE adopted standards for surface waters of the State (Chapter 173-201A WAC) based on a statewide classification system of designated uses. While the 2006 standards cannot be cited as the federal standard under the Clean Water Act until approved by the EPA, WDOE implemented the 2006 standards in December 2006 to the fullest extent of their authority. EPA previously approved portions of the 2003 standards (which are incorporated in the 2006 standards); however, EPA approval is pending for important water quality standards such as water temperature and dissolved oxygen.

The Colville Tribes have jurisdiction over the water quality on their reservation lands. Although the classification terminologies between the State and Colville Tribes differ, the water quality standards are essentially the same. The Okanogan River and Omak Creek are designated by the state as Class A and by Colville Tribal law as Class II waters, each entity's "excellent" designation. This means the waters generally exceed the requirements for all designated uses, which include: 1) domestic and other water supply; 2) salmonid and other fish migration, rearing, spawning, and harvesting; 3) wildlife habitat; 4) recreation, such as swimming, boating, fishing and aesthetic enjoyment; and 5) commerce and navigation. Colville Tribal law includes an additional use for ceremonial and religious purposes for their Class II waters.

Okanogan River

The Okanogan River is on WDOE's Clean Water Act 303(d) list of impaired and threatened water bodies requiring additional pollution controls for failure to meet standards for temperature, dissolved oxygen, and pH. Fecal coliform bacteria, nutrient and turbidity levels are generally at acceptable levels for most of the year, but excursions



Colville Tribes
CHIEF JOSEPH HATCHERY PROGRAM
DRAFT ENVIRONMENTAL IMPACT STATEMENT

Figure 3-3.
Project Area Land Management; FEMA Flood Zones

TETRA TECH/KCM

beyond criteria occur. Excursions beyond criteria for various other organic contaminants and arsenic have also been recorded (WDOE 2009).

WDOE (1997) notes consistent late summer water temperature exceedences of maximum criteria from 1983-1993 in the Okanogan River. The 2004 303(d) list notes that Malott station exceeded the state maximum standard of 18°C 13 of 55 times for samples taken from 1993-2001 with high temperatures usually occurring in July, August, and September (Figure 3-4). There was also one excursion from criteria in 2002. These occurrences are a result of natural phenomena (low gradient and solar radiation on upstream lakes) exacerbated by summer low flows caused by irrigation withdrawals, poor riparian conditions, and increased temperatures in water released from dams (Entrix, Inc., Golder Associates, and Washington Conservation Commission 2004).

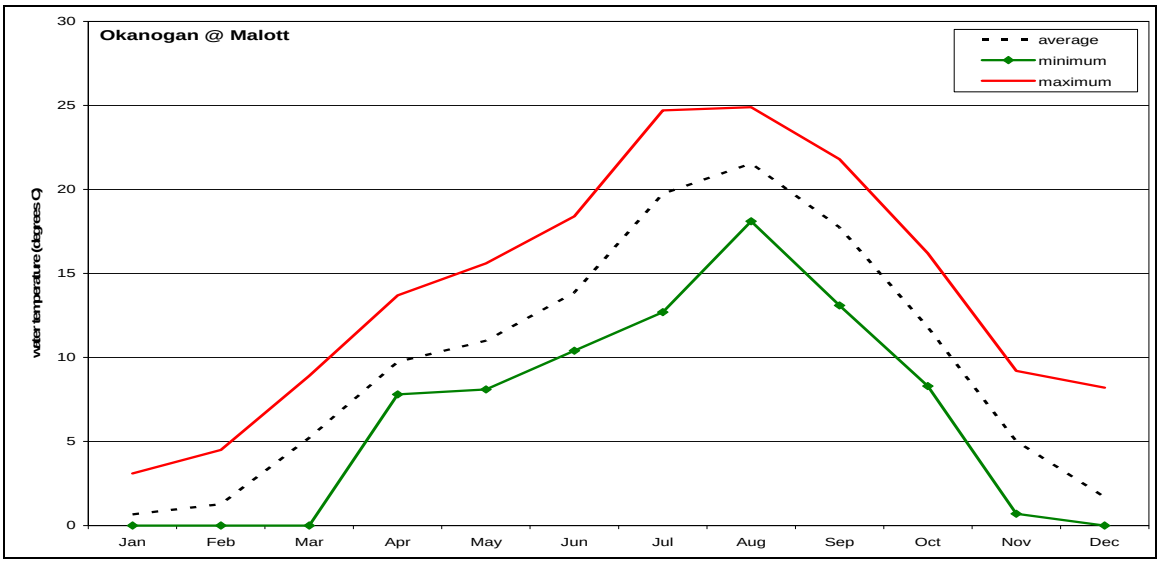


Figure 3-4. Okanogan River Average Monthly Water Temperature at Malott (WDOE grab samples 1977 to 2004)

Dissolved oxygen in the Okanogan River system is generally at or above Class A standards (at least 8 mg/l) even during the summer when water temperatures are highest (Entrix, Inc. Golder Associates, and Washington Conservation Commission 2004). WDOE listed the Okanogan River on the 2004 303(d) list as impaired because monitoring at Oroville showed that dissolved oxygen standards were not met for 4 out of 50 samples taken from 1993 to 2001. There were single excursions beyond criteria in 2002, 2003, 2004, 2005 and 2006. Typically, Okanogan River dissolved oxygen exceeds 12 mg/l from November to March and reaches the lowest levels (7 to 8 mg/l) from July to September.

The state standard for Class A waters is for pH between 6.5 and 8.5. Okanogan River pH values generally range between 7.0 and 9.0. The river is listed on the WDOE 2004 303(d) list as impaired because values were recorded above 8.5 (WDOE 2004). There were eight excursions of high pH values in 2004, 2005 and 2006 (WDOE 2009).

The CTCR (2005a) reported that pH has remained consistent over time between the upper and lower Okanogan River and the Similkameen River. The lack of yearly fluctuation indicates that the Okanogan subbasin has excellent buffering characteristics, protecting it from fluctuating pH levels.

Data collected from monitoring sites from 1977 to 1997 indicate that fecal coliform is well below state standards (WDOE 1997). From 1977 to 2004, the monthly mean count has been below 50 colonies per 100 ml except for measurements taken in June for which the typical mean was less than 75 colonies per 100 ml. State standards allow for up to 10% of samples to exceed standard as long as the mean value of samples is below 100 colonies per 100 ml. WDOE (2009) indicates excursions beyond criteria in 1988, 2005 and 2008.

Nitrates (nitrate-nitrite and ammonia) and phosphorus in the Okanogan River were at acceptable levels for Class A waters (less than 0.2 mg/l) from 1977 to 2004 (Entrix, Inc., Golder Associates, and Washington Conservation Commission 2004). CTCR (2005a) reported that the nitrogen to phosphorus ratio in the Okanogan River subbasin suggests that nitrogen is limiting aquatic biological productivity.

State standards do not specify target turbidity levels for rivers, but allow only limited turbidity increases over background levels due to human actions. In most streams, there are periods when the water is relatively turbid and contains variable amounts of suspended sediments (Bjornn and Reiser 1991). Turbidity spikes up to about 80 Nephelometric Turbidity Units (NTU) in the Okanogan River occur during the peak runoff in the spring, but generally turbidity is less than 10 NTU (as measured at Malott). WDOE (2002) recorded seven excursions beyond criteria between 1992 and 2001.

Omak Creek

Omak Creek is on the Colville Reservation under the water quality jurisdiction of the Colville Tribes and EPA. Data from Omak Creek is limited; however, data from the WDOE 303(d) list shows that Omak Creek does not meet state Class A criteria for temperature, DO, and pH. Major factors affecting water quality in Omak Creek are believed to be accelerated sediment yield from uplands and stream banks (NRCS 1995) and poor riparian conditions due to livestock grazing on stream banks. Peak water temperatures exceeded 24°C between 1997 and 2002 (Entrix, Inc., Golder Associates, and Washington Conservation Commission 2004). Because high temperatures reduce oxygen saturation potential, low DO is a concern.

Measurements in Omak Creek in 1990 showed that turbidity was less than 20 NTU most of the year. The highest turbidities appear to occur in April and May when several samples were between 20 and 100 NTU and some exceeded 100 NTU (Entrix, Inc., Golder Associates, and Washington Conservation Commission 2004). State maximum standards for fecal coliform bacteria, nitrates, ammonia and phosphate have also been exceeded in Omak Creek. Livestock and septic tanks are thought to be the reason.

Columbia River

Water quality has been improving in Rufus Woods Lake and the mid-Columbia River since the 1980s (Beak Consultants and Rensel Associates 1999; Rensel 1996; Rensel 1989). Until recently, biological production in the lake and river was considered to be nitrogen-limited or not limited by the nutrient content in the water. With the closing of fertilizer plants in British Columbia, primary biological productivity is now heavily phosphorus-limited. Total phosphorus measurements for Rufus Woods Lake in 1995 averaged 30 µg/l; orthophosphate is below detection limits (USACE 2000). In 2004 phosphorus ranged from about 5 to 10 µg/l.

Sediment and turbidity in Rufus Woods Lake are generally low. However, turbidity can increase during spring runoff due to higher levels of suspended solids in snowmelt (USACE 2000). Spring and summer flows may also carry higher turbidity levels due to phytoplankton blooms primarily caused by longer days and warmer water temperatures.

Total dissolved gas (TDG) in the upper Columbia River and near Chief Joseph Dam can exceed state maximum standards. TDG is influenced primarily by Grand Coulee Dam and Canadian dam operations upstream. TDG spikes reaching 140% have been observed in Rufus Woods Lake (USACE 2000). A number of excursions beyond the maximum standard occurred in 2000 and 2002 according to WDOW 303d listings (WDOE 2009).

The Columbia River immediately upstream and downstream of Chief Joseph Dam is on WDOE's Clean Water Act 303(d) list for elevated water temperature conditions only according to WDOE (2009). In 2001, a very dry year, exceedences of maximum temperature criteria occurred 39 of 243 days in the tailwater below the dam and 104 of 361 days in the forebay above the dam. Surface water temperatures in Rufus Woods Lake range throughout the year from about 3°C to 22°C as measured in the forebay (Univ. of Washington 2000). Water temperature data are also collected downstream of Chief Joseph Dam at station CHQW. Because Rufus Woods Lake temperatures can exceed those required for salmon production during the summer and fall, multiple water supply sources are being proposed for the Chief Joseph Hatchery. Water in the Chief Joseph Dam relief tunnel sampled over several decades was substantially cooler than the reservoir water during the summer and fall and warmer in the winter and spring.

Water quality from all three proposed hatchery water sources is generally good, with only a few limited instances exceeding recommendations for hatchery use (USACE 2004). Occasional elevated levels of pH and aluminum were reported. The WDOE water quality classification of the Columbia River at Chief Joseph Dam is Class A (excellent).

3.6.2 Environmental Consequences

Proposed Project

Hydrology

Construction Effects

Construction of the CJHP facilities would entail working in the Columbia and Okanogan rivers. Installation of water intakes, pump stations and outlets at acclimation ponds and the hatchery outfall would dewater areas less than 2,000 square feet each. Dewatering would involve placing cofferdams to isolate the work areas from the main river channels, then pumping the water out to sediment settling ponds. Water would then be filtered and returned to the rivers. Placement of the cofferdams and water pumping are not expected to affect river flow patterns or volume because no water would be consumed.

Operations Effects

Hatchery water would come from Rufus Woods Lake, the Chief Joseph Dam relief tunnel, and groundwater wells. Because of the addition of groundwater from the wells, slightly more water would be discharged to the Columbia River than is diverted. Maximum flow derived from groundwater and pumped through the hatchery and then released at the outfall would be about 25 cfs, which is about 0.05% of the total Columbia River flow at its minimum average flow.

Diversion of water from the relief tunnel to the hatchery would have no effect upon the aquifer since the relief tunnel is already in operation. The proposed well field would have a minimal effect on the aquifer because the aquifer is very pervious and is recharged from the reservoir. The well field is not expected to affect the water surface in upslope areas more than 200 feet away, but this assumption would be tested before implementation. The proposed well field is not expected to adversely affect the Bridgeport State Park well because it would be 500 feet downstream and at a higher elevation than the Park's well. Preliminary analysis of aquifer conditions by hydrogeologists indicates that there is no potential to affect existing wells.

At the acclimation ponds, the diversion of water from the Okanogan River and Omak Creek would reduce stream flows between the water intakes and outlets (the "bypass reach") by the amount of water taken into each pond. The effect of these diversions depends on the bypass length, percent of total river flow diverted, and the season of diversion (typically October through April annually). Ellisforde, Tonasket, and Bonaparte ponds would divert up to 25 cfs each; their bypass reaches are less than 200 feet long. The Riverside and Omak sites would divert up to 15 cfs each. The Riverside bypass reach would be about 300 feet long, and the Omak bypass reach would be about 1,300 feet long. The minimum river flow near all these ponds has been about 400 cfs over the last ten years (measured at the Tonasket gauge), so diverting water for fish acclimation would reduce Okanogan River flows about 4% to 6% at the bypass reaches.

The 600-foot bypass reach of Omak Creek at St. Mary's Mission Pond would continue to be affected by water diversion at the same level as occurs under existing conditions. Up

to 2 cfs is withdrawn from October to April. Flows in the winter average 10 to 15 cfs, but may drop to 1 cfs. Therefore, on average, flows in the bypass reach may be reduced by as much as 13% to 20%. During very low winter flows, the 2 cfs pond requirement may exceed the water available in Omak Creek, and if the full amount is diverted Omak Creek would go dry.

Operation of the hatchery and acclimation ponds would not affect irrigation withdrawals because program use would be non-consumptive. In the Okanogan subbasin, the Oroville-Tonasket Irrigation District and the CJHP would coordinate the shared seasonal use of three OTID ponds to serve irrigation and fish production needs.

Floodplains

Construction Effects

The hatchery, housing, and well field sites and St. Mary's Mission Pond are not proposed in FEMA-mapped floodplains, so no effects to floodplains are expected.

The proposed modifications to Bonaparte, Ellisforde and Tonasket ponds would not change current topography or river flows, so the Okanogan River 100-year floodplain would not be affected.

The Riverside and Omak ponds would be newly built within the Okanogan River 100-year floodplain, but there are no practical alternatives for these facilities. The pond surfaces would be near the existing ground level with some ground contouring necessary to establish a level platform for them. The ponds should have very little effect if any on river flow even at flood stage due to their low profiles, and the expansive size and low gradient of the floodplain at these locations.

Operations Effects

Because the hatchery, housing, well field, and St. Mary's Mission Pond are not proposed in designated floodplains, operations at these facilities would not affect floodplains.

If flooding occurs at the Bonaparte, Ellisforde, Tonasket, Riverside, or Omak ponds, pond infrastructure could be damaged. Loss of fish would not be expected because flood flows would most likely occur between April and July when the ponds would not be in use for fish rearing.

Water Quality

Construction Effects

In-stream work would require a Clean Water Act Section 404 permit from the USACE, WDOE Section 401 water quality certification, and Hydraulic Project Approval from WDFW. Local shoreline permits from the County and/or the Colville Tribes may also be required. Dewatering guidelines established by Washington Department of Ecology (WDOE) would be followed to protect water quality where appropriate.

A storm water pollution prevention plan would be designed and implemented to limit turbid water runoff from work areas. In addition, BMPs would be required to remove suspended sediment from waters pumped out of in-stream work areas, to isolate areas of excavation and grading by installing silt fences or similar devices, and to curb erosion between earth work areas and surface waters with straw bales, matting and similar techniques. The potential for introducing petroleum products and other toxic substances from construction equipment into the rivers would be reduced by keeping equipment in excellent condition and performing all refueling and maintenance operations well away from the water and riparian areas.

Even with these measures, a short-term decrease in water quality through inadvertent releases of minor amounts of sediment or pollutants to the rivers may occur. Rain events during construction increase the risk of water quality degradation from soil erosion and introduction of storm water runoff containing other pollutants. Any substances entering surface waters would most likely be greatly diluted by the increased water volume in the water body during such an event.

Operations Effects

Hatchery programs use water for incubation, rearing and acclimation of juvenile fish, and adult holding. Rearing and acclimation ponds use the most water. The CJHP must comply with all federal, state and tribal water quality standards for effluent discharges and federal and state regulations on use of chemicals and fish food. The CJHP has been designed to comply with these requirements, and all necessary permits and approvals would be obtained prior to operations. Water quality would be periodically monitored at all facilities so that problems may be detected and remedied.

At existing acclimation sites, flow, pH, total suspended sediments, total phosphorus, dissolved oxygen, and water temperature are monitored and have remained within the acceptable ranges established in the National Pollution Discharge Elimination System (NPDES) permits. It is expected that the amount of sediment and nutrients introduced into the waters from the hatchery and acclimation ponds would not affect the overall water quality of the Columbia River, Okanogan River, and Omak Creek. Introduction of nutrients may, in fact, produce beneficial effects as significant settling of natural nutrient load occurs in upstream reservoirs.

All of the water used in the hatchery and ponds would be discharged back to their source rivers after use and after settling/treatment to remove fish waste and unconsumed food. Most hatchery water would be detained for one hour before discharge. Solid materials in the rearing raceways would be vacuumed periodically and then routed through aeration and settling ponds to remove solids and excess nutrients. Concentrated wastes from the settling ponds would be removed about once a year and disposed of at approved dry land locations, possibly as agricultural fertilizer. Space is available on site for additional waste treatment facilities in response to technology advances or changes in regulatory requirements. Although hatchery personnel would be trained in proper storage and use, toxic chemicals and antibiotics (used to control diseases in fish) may still be introduced into water bodies as a result of spills or human error at hatcheries.

Although solar heating of rearing and acclimation pond water could occur, the temperatures of pond and hatchery waters are not expected to markedly exceed the temperatures of their source streams. When returned to their streams, the waters should mix quickly, so thermal effects would be very minor and confined near the outlet pipes.

To meet critical temperature requirements, hatchery incubation water may be routed through chillers. When returned to the Columbia River, this cooler water is expected to mix rapidly with the ambient water, so thermal effects would be very limited (due to the very high volume of receiving waters) and confined near the hatchery discharge pipe.

The nutrient content of Okanogan subbasin waters would increase as more adult salmon return to spawn and their carcasses accumulate. This would most likely be beneficial to the aquatic environment. Historically, large numbers of salmon carcasses likely made the nutrient content of the water quite high, contributing to the availability of food organisms for juvenile salmon. The dissolved nutrients would also benefit other aquatic species as well as terrestrial flora and fauna.

It is possible that very large numbers of salmon carcasses could contribute excess nutrients to the aquatic environment. In this case, algal blooms may occur particularly in areas of slow currents and low, warmer water. Algal blooms can cause turbidity and increased biological oxygen demand. Although the number of decomposing carcasses needed to create such eutrophic conditions is unknown, it is surmised that it could number in the tens or even hundreds of thousands. It is not expected that the proposed project would produce so many salmon carcasses that excess nutrification of the Okanogan subbasin would occur.

There is some concern that decomposing salmon could contribute polychlorinated biphenyls (PCBs) and other environmentally persistent chemicals such as DDT (Missildine 2005). Salmon can ingest these chemicals while in the marine environment and store them in their body fats. Salmon could release the toxic chemicals in freshwater when they die after spawning. Krummel et al. (2003) found that PCB concentrations in the sediment of Alaskan lakes increased seven-fold after the return of adult sockeye salmon for spawning. Puget Sound Ambient Monitoring Program data show that coho and Chinook salmon in the Pacific Northwest are contaminated with PCBs. These data suggest that if an increase in adult spawning occurs in an area that has not had high numbers of spawners in decades, an increase of PCBs and other persistent organic pollutants could occur. Though it is not expected that the CJHP would produce salmon in numbers that would substantially affect water quality in the Okanogan subbasin, water quality monitoring would occur to detect problems. Adjustments to the program to reduce carcass loading could be made to reduce water quality degradation.

No Action Alternative

The No Action Alternative would mean current conditions would continue. Hydrology and water quality would continue to be affected as they have in the past. Trends in development within the 100-year floodplain would continue. Additional nutrients would not be contributed to the ecosystem through additional salmon carcasses.

3.6.3 Cumulative Effects

Continual structural development within the 100-year floodplain of the Okanogan River restricts the natural ability of the river to moderate the magnitude and duration of flows, maintain water quality, and provide nutrients to riparian ecosystems. The CJHP would develop two acclimation ponds within the floodplain which individually would result in a negligible addition to the loss of natural floodplain functions, but combined with other actions, could incrementally contribute to degradation of floodplain functions. The project, if successful in returning large runs of salmon, could also incrementally add to the demand for recreational infrastructure to be built within the 100-year floodplain, and could add a source of nutrients via decomposing salmon carcasses.

Despite all precautions, protections, and permit provisions, the project could incrementally contribute to water quality degradation when added to past and future projects. But, overall pollutant levels and trends would not be expected to change substantially over time. The CJHP is not expected to contribute to non-compliance with water quality standards; therefore, the proposed program would be consistent with state water quality anti-degradation provisions.

3.7 Land Use, Transportation and Recreation

3.7.1 Affected Environment

Land Use

The project sites are in unincorporated Okanogan County on lands owned by the USACE, the Oroville-Tonasket Irrigation District (OTID), the Colville Tribes, BPA, and Washington State Parks and Recreation Commission (WSPRC). The USACE has authority over land use and construction permitting for projects on their land; the Colville Tribes have authority for land use and construction permitting on tribal trust lands; and Okanogan County has authority for land use and construction permitting for all other non-federal ownership in the county. The hatchery site is owned by the USACE, which also operates the visitor orientation area to the west. The water intake and pipeline are also proposed on USACE land. The housing site, owned by WSPRC, is undeveloped open space amidst native shrub-steppe plant communities near a golf course and orchard.

Ellisforde and Tonasket ponds are irrigation ponds on the Okanogan River owned and operated by the OTID. Nearby land uses are orchards, pastures, and rural farm homes. Bonaparte Pond, another irrigation pond owned by OTID, sits along the Okanogan River next to a WDFW public fishing and boat launch access site, a fruit orchard, the Cascade Columbia River Railroad, and US Highway 97. Commercial establishments exist across the highway. All three of these ponds have been modified for fish acclimation.

The Riverside Pond site, owned by BPA, is a fallow hay field with a farm house and outbuildings. It is divided by the Cascade Columbia River Railroad, but a road links parcels on both sides of the tracks.

St. Mary's Mission Pond occupies about an acre in a fallow field owned by the Colville Tribes along Omak Creek.

The Omak Pond site, also owned by the Colville Tribes, contains a barn, a shed and a house used by the Colville Tribes' Fish and Wildlife staff. The proposed acclimation pond, along with associated facilities, would occupy about two acres in a pasture. The adjacent lands are also used as pasture and rural home sites.

Only the sites adjacent to the Okanogan River are within a Federal Emergency Management Agency (FEMA) mapped flood zone (Figure 3-3). The Columbia River near the hatchery site does not have a defined flood zone because water levels are controlled by the operation of Wells and Chief Joseph dams. Omak Creek does not have a flood zone because of its small size.

Transportation

General transportation patterns in the Okanogan valley are typical of lightly populated rural agricultural communities in central and eastern Washington. Passenger vehicles account for about 80% to 90% of the total road use while commercial trucks including farm machinery account for the rest. Traffic increases near larger communities compared to more rural locations. Truck traffic has a seasonal pattern, increasing when agricultural harvesting and transport to market is occurring. Table 3-5 shows the characteristics of the roads adjacent to the CJHP project sites.

The Washington Department of Transportation (WSDOT) monitors traffic use on US Highway 97 and State Highway 17 in the project area. The average daily traffic volumes reported along Highway 97 in 2008 were 2,900 vehicles near Monse and 3,800 vehicles near Okanogan (WSDOT 2009). Trucks comprised 12 percent and 17 percent of the total use of these segments respectively. The average daily traffic volumes reported in 2008 for Highway 97 near Riverside and Ellisforde were 5,100 and 3,200 vehicles respectively (WSDOT 2009). The average daily traffic volume on Highway 17 between Bridgeport and Highway 97 in 2008 was 2,100 vehicles with 10 percent being trucks.

Recreation

Recreation and tourism are important in the Okanogan County economy (Section 3.8) and make a substantial contribution to the quality of life for local residents. The most popular activities are sightseeing, picnicking, and driving for pleasure (Interagency Committee for Outdoor Recreation, 2002), but hunting and fishing are also important. Recreation resources within the project area include developed facilities, use areas, and boat ramps along the Columbia River from Pateros to Chief Joseph Dam and from the mouth of the Okanogan River to the Canadian border. There are no wild and scenic rivers or other special recreational land designations in the vicinity of the project sites (i.e. National Parks, National Recreation Areas, wilderness, wildlife preserves, etc.).

Most recreation near Chief Joseph Dam is oriented to the Columbia River and includes the two USACE visitor facilities at the dam itself. At the base of Chief Joseph Dam, the Right Bank Fishing Area provides a fishing site for Colville Tribal members only and a spillway viewpoint open to all visitors (USACE 2002). The USACE also maintains a spillway scenic overlook on the upstream side of the same abutment. The site is linked to USACE's North Shore Trail, a two-mile-long paved route from the visitor orientation

Table 3-5. Highways, Roads and Railroads in the Project Vicinity

Road Name and Number	Ownership & Classification	Project sites accessed	Lanes & Speed	Importance in Region
US Highway 97 (Okanogan Scenic Byway)	Washington State, Rural-Principal arterial	All sites accessed via US 97 and local roads	2 12-ft paved lanes with 8 ft paved shoulders; 60 mph	Primary access to Okanogan Valley.
Highway 17	Washington State, Rural-Minor arterial	Provides access to hatchery site from Bridgeport and Omak	2 paved lanes, 23 ft road with 8 ft paved shoulders; 60 mph	Access between Bridgeport and US 97
Highway 7	Okanogan County	Accesses Tonasket Pond from Town of Tonasket via a local gravel road	2 paved lanes, 24 ft road with 2-3 ft gravel shoulders; 35 mph	Accesses west side of Okanogan River
Half-Sun Way	Private (on USACE land)	Accesses hatchery and housing sites	2 paved lanes, 20 ft road with 2 ft gravel shoulders; 15-35 mph	Access from WA 17 across USACE land to CJD, Bridgeport State Park, Lake Woods Golf Course
Omak Riverside Eastside Road	Okanogan County	Accesses Riverside Pond site	2 paved lanes, 24 ft road with 2-3 ft gravel shoulders; 35 mph	East side of Okanogan River between Omak and Riverside
Brooks Tracts Road	Okanogan County	Accesses Omak Pond site from US 97 or WA 155	2 paved lanes, 16 ft road with 2-3 ft gravel shoulders; 25 mph	Accesses rural areas along Okanogan River outside Omak
North Omak Lake Road	Okanogan County	Accesses St. Mary's Mission Pond	24-ft paved road with 2-3 ft gravel shoulders narrows to 16-18 ft road with no shoulders; 35 mph	Accesses rural areas between WA 155 and Omak Lake
Cascade Columbia River Railroad	RailAmerica	Crosses Riverside site; adjacent to Bonaparte and Ellisforde ponds with crossing access	Single Track	Wenatchee to Oroville

Sources: WSDOT 1998, WSDOT 2000, WSDOT 2004

area upstream to various viewpoints. Adjacent to the Chief Joseph powerhouse, USACE provides covered picnic shelters and a children's play area.

The Lake Woods Golf Course is on 80 acres along Half-Sun Way about two miles upstream of the dam. The 9-hole course skirts Rufus Woods Lake and has limited amenities. Bridgeport State Park, managed by WSPRC, provides both day use and camping facilities on 712 acres of rolling grassy terrain fronting Rufus Woods Lake for about a mile. Water sports and fishing for kokanee, trout, and walleye pike are popular activities. From 2000 to 2005, Bridgeport Park visitation ranged from 65,000 to 82,500 per year (S. Minkler, WSPRC, personal communication, December 20, 2005).

Sightseeing, walking, and fishing are the primary recreational uses along the Okanogan River which is paralleled by US Highway 97 from the town of Pateros north to the

Canadian border. This route is designated as the Okanogan Scenic Byway and follows part of the historic Cariboo Trail.

Recreational fishing occurs either from river banks or boats. Fishing opportunities for salmonids in Okanogan River are limited. Fishing for trout is not permitted. With spring Chinook extirpated, steelhead listed as an endangered species, and limited populations of summer/fall Chinook, recreational salmon fishing has been closed or highly restricted in most years (NPCC 2004). WDFW does, however, allow salmon fishing in the lower 1/2 mile of river downstream of the Highway 97 Bridge. On rare occasions, the rest of the Okanogan River is open for salmon fishing when runs exceed a certain size in a given year (NPCC 2004). Steelhead fishing is limited to only hatchery-origin fish in the Okanogan River, and seasonal openings are highly unpredictable. Fishing for other game and non-native species is permitted, although some restrictions apply.

3.7.2 Environmental Consequences

Proposed Project

Land Use

Hatchery and Housing Sites

The Chief Joseph Dam-Rufus Woods Lake Master Plan designates the area for the proposed hatchery as multiple resource management (USACE 2002). Land under this classification may be managed for one or more uses including low density recreation, inactive/future recreation areas, fish and wildlife management, or vegetation management. Resource objectives for this land use classification include (1) restoration of wildlife habitat; (2) maintain and protect habitats for existing wildlife species; (3) control weed species; and (4) provide some public use of the area. Construction of the hatchery would not be consistent with these identified resource objectives as the hatchery would not restore, maintain, or protect existing wildlife habitat. It would reduce the available habitat. However, USACE personnel involved in project planning have not indicated that hatchery development would be an inappropriate use of this site (CTCR 2004). The hatchery water supply pipelines are proposed on USACE land designated for project operations, multiple resource management, or recreation. A hatchery water supply would be consistent with this designation. The housing site is on WSPRC land classified as open space by Okanogan County.

Acclimation Pond Sites

Ellisforde, Bonaparte, and Tonasket ponds are existing irrigation ponds that have been adapted for fish rearing. The use of these ponds under the proposed project is not a change from existing land uses. Continued use of the sites for fish rearing is consistent with the Minimum Requirement District zoning established by Okanogan County.

The proposed Riverside Pond would occupy about 4 acres of undeveloped land, which would represent a change in land use from agriculture production to an industrial facility for aquaculture. The proposed use change is consistent with the Minimum Requirement District zoning established by Okanogan County.

St. Mary's Mission Pond is located on Colville tribal land that is zoned as "Shoreline Management". Continued use of the site for fish acclimation is consistent with the requirements of the Shoreline Management zone.

Omak Pond is proposed in a fallow field on Colville tribal land that is also zoned "Shoreline Management." The development and use of an acclimation pond on this site would represent a change in the land use from rural residential to aquaculture production, but that change would be consistent with Shoreline Management zoning.

Transportation

Construction Effects

Construction of the hatchery, housing and new ponds is expected to have minor to substantial impacts on traffic depending upon the road involved. Vehicles, particularly trucks, on local roads would increase, but not to levels unsupportable by the road system.

Hatchery and Housing Sites

Transporting materials and equipment to the project sites would increase truck traffic on Highways 17 and 97 and Half-Sun Way intermittently during construction (about 20 months). Construction traffic would increase daily truck traffic about 4% on Highway 17 (250 additional truck trips per day) and 1.5% on Highway 97 (655 additional truck trips per day). Construction traffic would represent the majority of large truck traffic on Half-Sun Way. About 100 workers may be present on the construction sites at one time. Conflicts between large trucks, commuting workers, residents, and recreational travelers may occur during the summer recreation season and, to a lesser extent year-round.

Hatchery Water Supply Pipelines

The pipeline providing water from the north embankment of Chief Joseph Dam would extend along a non-public maintenance road. Construction would be coordinated with USACE to ensure access to the dam is provided as needed.

The well field pipeline would be routed along Half-Sun Way. Public access would be limited to one lane during construction. Signage, flaggers and other safety measures would be used to control traffic. Most construction would occur outside of the recreation season to reduce conflicts, but disruption and minor delays would be likely for local residents and recreationists accessing the state park and golf course for about a year.

Acclimation Pond Sites

Construction of new acclimation ponds may take up to 7 months, while modification of existing ponds would take less time. Up to 20 workers may be present on sites where new ponds would be built; fewer workers would be required to modify existing ponds. During construction, intermittent transport of construction materials and equipment, debris, excess soil, and workers would affect local traffic composition and volume.

Construction of Riverside Pond would substantially increase truck traffic on Omak Riverside Eastside Road and, to a lesser extent, on Highway 97 as excavated material is hauled off-site. The proposed gravel access road would reduce the potential for conflicts with other users of the Omak Riverside Eastside Road by allowing for staging of construction vehicles off the main road. The existing railroad crossing within the Riverside site would be upgraded to allow access of limited clearance vehicles. All necessary permits from the railway owner would be obtained, and appropriate safety measures would be taken at the crossing.

Construction of the Omak Pond would substantially increase traffic on the Brooks Tracts Road, the Omak Riverside Eastside Road, and Highway 155. The Brooks Tracts Road would be most impacted as it is the primary access to several homes and the Colville Tribes' fish and wildlife field office, is quite narrow, and has no shoulders. Large trucks delivering construction materials or hauling excavated dirt or debris from the site would conflict with other road users for a few weeks. The water supply pipeline for Omak Pond would be buried in the shoulder of the road which would restrict the available road width for public access. Appropriate construction signage and flaggers would be used to ensure safe one-way vehicle access near the construction site.

Operations Effects

The traffic increases attributable to hatchery operations would be very small, consisting primarily of 8 to 15 employees commuting to work at the hatchery complex year round and to acclimation ponds from October to April, and trucks transporting fish from the hatchery to acclimation ponds from late-October to early-November. Based on the fall closure dates for the State Park and golf course, fish transport traffic would not conflict with recreational traffic on Half-Sun Way.

Recreation

Construction Effects

Hatchery and Housing Sites

The USACE visitor orientation area, Bridgeport State Park and the Lake Woods Golf Course are accessible only via Half-Sun Way, so construction and recreational traffic would conflict for about 20 months, largely during the summer. Coordination with park managers on construction sequencing to minimize conflicts with recreation users would occur. Still, construction would be visually evident and audible to visitors. The visitor orientation area, Bridgeport State Park and Lake Woods Golf Course may experience some leisure-time and lunchtime use by workers during hatchery and housing construction although it is very difficult to estimate to what degree. Use of the USACE's North Shore Trail in the vicinity of the hatchery site, housing site and water pipeline/wellfield routes would be disrupted during construction. About 300 feet of the trail would be realigned to skirt the southeastern edge of the hatchery complex near where the administration/visitor center building is proposed.

Acclimation Ponds

Construction and modification of acclimation ponds would have negligible effects on recreation due to the short duration of activity, limited land disturbance and typical recreational uses near the sites. Generally, recreation uses near the sites include some bank and boat-based fishing, hunting and driving for pleasure. Recreation visitors along US Highway 97, the Okanogan Scenic Byway, may encounter the truck traffic associated with pond work, and may experience occasional slowing or stopping.

Operations Effects

Once built, the hatchery and houses are not expected to adversely affect recreation at Bridgeport State Park or Lake Woods Golf Course. The visibility of the new facilities may attract motorists on US Highway 97, which may increase use of the nearby USACE visitor orientation area and the State Park. The hatchery administration/visitor facility may draw additional educational groups and visitors. It would provide an opportunity to disseminate interpretive information about the fishery and its importance to local culture. This facility would complement the information kiosks already provided by the adjacent USACE visitor orientation area. By providing additional recreational opportunities and promoting awareness of the environment and natural resource management, this facility would be consistent with values identified in Okanogan County's Outdoor Recreation Comprehensive Plan (2004). Views from the North Shore Trail near the hatchery and housing sites would change with the presence of new buildings and associated features. Aside from a short distance where the trail goes on the upslope past the hatchery office building and bus parking area, no obstruction of river views is expected at the hatchery site. River views may be altered from the trail as hikers approach the house area and associated features from either direction.

The proposed hatchery program is expected to increase returns of summer/fall Chinook and spring Chinook salmon to the Okanogan River and Columbia River below Chief Joseph Dam, which could increase the potential for tribal and recreational fishing and tourist visitation. When escapement reaches levels that can sustain the artificial propagation program and when natural spawning objectives are met, the remaining salmon could be available for a tribal and recreational fishery. While it is not possible to predict how many salmon may be available for fishing or viewing in a given year, production levels under the CJHP assume surplus fish would return. Increased bank fishing and sightseeing along the Columbia and Okanogan rivers could result in some minor increase vegetation and soil trampling, littering, and trespass. Existing boat launch sites (Chief Tonasket and the Bonaparte launches) are expected to accommodate some level of increased use. The new Riverside and Omak ponds could return salmon to a reach of the Okanogan River not currently served by developed recreation sites, which could put some pressure on local authorities to provide access and facilities.

No Action Alternative

Land Use

No land use changes are expected at the sites under the no action alternative; all sites would likely continue to be used as they are currently. Agricultural land and wildlife habitat would be developed for other purposes at existing rates in the general area.

Transportation

Traffic levels and usage patterns are expected to continue as they are currently, changing and expanding as communities grow.

Recreation

Recreation traffic, pursuits, visitation, and attractions would continue as they currently are. The Chief Joseph Dam and associated visitor facilities, Bridgeport State Park and Lake Woods Golf Course would continue to be key attractions, providing a predictable setting for returning visitors. Traffic on Half-Sun Way would increase only if park and golf course visitation increased. Salmon fishing opportunities would occur to the extent current Okanogan subbasin fish propagation programs allow. It is expected that these programs would be modified over time and may provide more fishing opportunities.

3.7.3 Cumulative Effects

The land use changes proposed at the hatchery, housing, Riverside and Omak pond sites would contribute 31 acres of permanent development to the gradual conversion of agricultural land and wildlife habitat lands in the region.

Significant changes in transportation modes, routes or traffic levels are not expected within the region in the foreseeable future. The project would contribute to increases in traffic with the most substantial cumulative contributions occurring during construction and near construction sites. During long-term operations of facilities, the project would only contribute incrementally to growing use.

The proposed project combined with other fishery improvement projects in the region would likely increase salmon populations in the Okanogan River and the Columbia River below Chief Joseph Dam. This would probably increase demand for fishing and may result in increased pressure to add boat launches and other recreation facilities and designate and regulate fishing seasons and areas wherever increased salmon are present.

3.8 Socioeconomics

3.8.1 Affected Environment

The general area for socioeconomic effects includes Chelan, Douglas, and Okanogan counties. The primary communities include:

Wenatchee, Chelan County	Omak, Okanogan County
East Wenatchee, Douglas County	Okanogan, Okanogan County

Bridgeport, Douglas County	Pateros, Okanogan County
Brewster, Okanogan County	Tonasket, Okanogan County

Omak, Okanogan and Tonasket are near the acclimation pond sites. Wenatchee and East Wenatchee, about 90 miles south of the hatchery site, are the nearest large population and economic activity centers.

Brewster, Bridgeport, and Pateros are closest to the hatchery site. Their populations are relatively small and stable (about 2,000 or fewer residents each) with a well-represented Hispanic component (Office of Financial Management 2005a; Washington State Data Book 2003). Okanogan and Omak are slightly larger communities (2,000 to 5,000 residents each) nearer the acclimation ponds. Their populations include many American Indians probably due to the proximity of the Colville Indian Reservation. The Colville Indian Reservation covers about 2,100 square miles in Okanogan and Ferry counties (CTCR 2005b). The Confederated Tribes of the Colville Reservation is a federally recognized American Indian Tribe and Sovereign Nation.

The per capita income of the area is low compared to Washington in general (Table 3-6). Although county unemployment rates are stable and comparable to the statewide average, they may be higher within the small communities (Washington State Data Book 2008) primarily due to changes in the viability of the tree fruit industry and agriculture within the area (B. Brammer, Crane & Crane, and E. Parisel, Brewster Heights Packing, personal communications, October 2005). Employment opportunities are better in Wenatchee and East Wenatchee, which have more diversified economies.

Table 3-6. County Income and Employment

Sector	Chelan Co.	Douglas Co.	Okanogan Co.	Washington
Per Capita Income (2006)	$29,657	$24,047	$25,850	$38,067
Employment (2008)	36,230	18,520	16,930	3,200,000
Unemployment Rate (2008)	6.7%	6.5%	9.1%	5.3%

Source: Washington State Data Book 2008

The main income and employment sectors in the counties are farms and food processing, local public utility district hydro projects, and tribal forest product and gaming industries (Table 3-6). These are considered basic economic sectors because they bring in substantial revenues from outside sources and support the local service industries.

The Colville Tribes' Forest Products Division is a primary annual revenue source for the area. Other operating revenues come from federal and state agencies. Tribal sources report relatively high levels of unemployment and that there is a need to enhance economic opportunities (CTCR 2005b). The CJHP is viewed by the Colville Tribes as a means of supporting a stable ceremonial and subsistence fishery while possibly benefiting the local recreational economy (CTCR 2004).

Recent housing growth has occurred primarily in the larger communities of Wenatchee and East Wenatchee. New housing development has been low in communities like Brewster and Bridgeport, and median house values in the smaller communities are below

the state average (Washington State Data Book 2008). A review of the multiple listing services for the local project area suggests limited available housing to buy or rent.

3.8.2 Environmental Consequences

Proposed Project

Construction Effects

Permanent population changes are not expected from project construction. The local population may increase temporarily if construction workers from outside the area seek convenient, temporary accommodations rather than returning to their own homes.

Construction would cost about $28.5 million for the summer/fall Chinook program components and about $9.0 million for the spring Chinook component, for a total of about $37.5 million (NPCC 2009) (Table 3-7). Expenditures for labor, materials, and services would likely occur within the local area and throughout the State of Washington primarily at the contractor's discretion.

Construction would provide short-term employment opportunities for local and non-local labor, based on the location of the prime and sub-contractors and the need for skilled and general laborers. Construction would contribute to statewide direct and indirect construction-related expenditures, with corresponding employment and income impacts. The number of local residents who may be employed during construction is not predictable, but the construction work force would likely range from about 20 up to 100 full- and part-time positions at one time depending on the construction phase.

Construction expenditures for the summer/fall Chinook program components lead to total direct and secondary expenditures[3] amounting to about $58.4 million (Table 3-7). This figure includes about $21.4 million in statewide labor income, contributing to about 385 to 425 short-term jobs. For the spring Chinook program component, the total statewide direct and secondary expenditures would be about $18.4 million, which would contribute about $6.7 million in labor income from to about 120 to 135 short-term jobs.

Local temporary housing and lodging opportunities are currently limited and are expected to remain limited during construction. Although a portion of the construction workforce may commute from the Wenatchee-East Wenatchee area, most workers would stay in local motels, other rentals, or use nearby RV parks and temporary RV facilities.

Local utility and municipal services for transportation, power, telephone/computer connections, and sewer are available to meet the needs of project construction and operation (CTCR 2004). Hatchery water would come from the Columbia River and groundwater wells. Population impacts resulting from project construction and operation would not require an investment in new local services beyond those already planned for general development. No new services are required for the project. Temporary increase in local demand for retail goods and services (e.g. fuel, groceries, personal supplies, and restaurants) is likely during construction.

[3] Secondary expenditures are purchases made by persons receiving income from the project.

Table 3-7. Proposed Project Construction and Operation Expenditures

Construction-Operation Component	Direct Capital and Operation Costs	Estimated Total State and Local Expenditures	Estimated Total Labor Income (Statewide)	Estimated Total Potential Employment (Statewide and Local)
Summer/Fall Chinook Program Capital Construction Costs	$28,500,000	$58,425,000	$21,375,000	385-425 (Statewide short-term)
Summer/Fall Chinook Program Operation Costs (Annual)	$1,891,000	$3,876,000 (high range)	$1,418,000 (high range)	8-15 (Local; includes spring Chinook component & monitoring-evaluation)
Spring Chinook Program Capital Construction Costs	$9,000,000	$18,450,000	$6,750,000	120-135 (Statewide short-term)
Spring Chinook Operation Costs (Annual)	$944,000	$1,935,000 (high range)	$708,000 (high range)	Included with summer/fall Chinook program above

Source: NPCC Decision Memorandum, April 2009.

Operations Effects

Operation of the proposed hatchery and acclimation ponds would require a workforce of about 8 to 15 full and part-time positions. Even assuming each employee has additional family members, the effect of the increase in local population on area infrastructure is expected to be slight. Potential population growth related to any improved salmon-related recreational opportunities is also expected to be negligible.

Operating costs for the CJHP (all program components), including labor, supplies, leases, travel, hardware, etc., would be about $2.8 million annually. Total labor salary costs would be about $2.1 million annually in 2009 dollars. It is expected that local residents with appropriate skills and training would be employed by the CJHP.

Permanent housing availability near the hatchery site is limited. The proposed project includes construction of four houses for permanent employees and connections for up to four RVs or camp trailers at the hatchery housing site. It is expected that other employee housing needs would be met by the local supply.

Federal fish hatchery facilities are exempt from local and county property taxes. Currently, there are no payment-in-lieu of taxes agreements with Okanogan County for such facilities (S. Furman, Okanogan County, personal communication, November 2005), so the project would generate no property tax revenues to support local government.

Economic Value of Fisheries

The CJHP, although not a commercial operation, could help establish tribal ceremonial and subsistence fisheries and recreational fisheries that would have economic value. The

economic value for these fisheries is usually expressed in terms of direct net value which measures the change to net social welfare resulting from a project. The value of sport fisheries is also expressed as expenditures. It is the type of value that is used in benefit-cost analyses to assess net economic gains or losses to an economy.

Ceremonial and Subsistence Fisheries

The CJHP is designed in part to help support returning adult Chinook populations to a level where the potential for a predictable ceremonial and subsistence fisheries for the Colville Tribes would be possible. The Colville Tribes' aim is to increase the level of returning adults from less than 1,000 fish to about 8,000 fish annually (CTCR 2004) to meet ceremonial and subsistence demand. Ceremonial and subsistence fisheries are conventionally valued in economic terms at commercial fishing values (about $1-$5/lb for Columbia River tailgate fisheries [direct sales by the angler from a vehicle]). An alternate valuation can be done to reflect the total direct net value. This "total value" approach could help provide an idea of the social welfare value of the fishery. The "total value" per fish applied in Table 3-8 is a value estimate developed for the Washington State Department of Ecology in 2004. It is used here as a "representative value" for a total value estimate. Values for 2009 dollars were based on the 2004 estimates inflated 3% per year.

Table 3-8. Proposed Annual Fish Production Goals above Wells Dam and Estimated Potential Direct Net Economic Value in 2004 Dollars and [2009 Dollars]

Production Type	Estimated Total Adult Production Increase for Fisheries	Estimated Maximum Recreation Fisheries	Estimated Total Direct Net Value per Fish (Representative Value)	Estimated Recreation Direct Net Value per Fish	Estimated Total Direct Net Value for Total Production Increase	Estimated Maximum Direct Net Value for Recreation Increase
Early-arriving Summer/Fall Chinook (Program Components 1 and 2)	3,000-15,000 fish	7,000 fish	$274.00 [$317.64]	$97.50 [$113.03]	$822,000-$1,918,000 [$952,920-$2,223,480]	$682,500 [$791,210]
Late Arriving Summer/Fall Chinook (Program Components 1 and 2)	3,000-14,000 fish	6,000 fish	$274.00 [$317.64]	$97.50 [$113.03]	$822,000-$1,644,000 [$952,920-$1,905,840]	$585,000 [$678,180]
Spring Chinook (Program Component 3)	2,700 (Okanogan Subbasin and CJ Tailrace)	To Be Determined	$274.00 [$317.64]	$97.50 [$113.03]	$739,800 [$857,628]	NA

Source: GDP implicit price deflator for 2004 value estimates; Layton, Brown, and Plummer 1999; Carter ND; Olsen, Richards, and Scott 1991; Huppert et al. 2004; Olsen and White 2004; Confederated Tribes of the Colville Reservation 2004.

Note: These estimates do not include ocean or Lower Columbia River in-river harvest. 2009 dollars estimates based on 2004 dollars inflated 3%/yr.

Table 3-8 shows the direct net value of the total CJHP fishery at ranges of adult fish return. The ceremonial and subsistence fishery value would be a subcomponent of the total direct net value. Depending upon the magnitude of the summer/fall Chinook adult returns, the total direct net value would likely range in 2009 dollars from about $952,920 to $2,223,480 annually for early-arriving fish (based on 3,000 to 15, 000 returning fish) and from about $952,920 to $1,905,840 for late-arriving fish (based on 3,000 to 14,000 returning fish). If estimated at conventional commercial value in 2009 dollars (assuming $15 to $40 per fish), the annual tribal subsistence and ceremonial value would likely be in the $120,000 to $320,000 range (based on the goal of 8,000 fish).

Recreational Fisheries

Direct net values for a recreational fishery are typically higher than commercial values. The recreational fishing direct net values used in Table 3-8 reflect recent value estimates associated with Columbia River Initiative water management studies. Based on the maximum expected run size, the annual direct net value for recreational fish in 2009 dollars would be about $791,210 for early arrivals and about $678,180 for late arrivals.

Estimated recreational fishing expenditures and income impacts are displayed in Table 3-9. Because site-specific data for recreational expenditures are unavailable, these data are based on related sources and the stated assumptions about catch rates per angler day. As such, the value estimates should be acknowledged as representative of what could be expected within the regional economy.

At the local or regional level, annual recreational expenditures in 2009 dollars are estimated to be about $283,500 to $1,134,000 for early-arriving summer/fall Chinook and about $243,000 to $972,000 for late-arriving fish. State-level sales multipliers for recreational expenditures on goods and services average about 2.0 and usually range between about 1.5 to 2.5 (Loomis and Walsh 1997). Consequently, the total state level expenditure impacts will likely exceed the values provided in Table 3-9.

Potential state income effects are based on available ODFW estimates for fresh water salmon fishing (Carter unpublished). Potential state income effects related to sport fishery expenditures are estimated in 2009 dollars to range between $184,624 to $738,500 for early arriving summer/fall Chinook and about $158,250 to $633,000 for late-arriving fish.

Electric Power Rates

BPA anticipates its Fish and Wildlife Program investments will be about $307 million annually for the 2010-2011 period (BPA 2009). This value was factored in to establish BPA's wholesale power rates for the 2010-2011 rate period. In March 2009 the NPCC recommended funding the CJHP. If BPA decides to fund it, funds would be allocated from the established Fish and Wildlife Program budget for 2010-2011, and power rates would not be affected. However, funding CJHP may affect decisions on which other projects are funded in the rate period.

Table 3-9. Proposed Annual Fish Production Goals above Wells Dam and Potential Recreational Fishing Expenditures and Income Estimates in 2004 Dollars and [2009 dollars]

Production Type	Estimated Maximum Increase for Recreational Fisheries	Estimated Recreation Expenditure Per Angler Day 2004$ [2009$]	Estimated Recreation State Personal Income Per Angler Day 2004$ [2009$]	Potential Recreation Expenditures 2004$ [2009$]	Potential State Income Impact 2004$ [2009$]
Early-arriving Summer/Fall Chinook	7,000 fish	$81.00 [$91.16]	$45.50 [$52.75]	$283,500-$1,134,000 [$319,060-$1,276,240]	$159,250-$637,000 [$184,624-$738,500]
Late-arriving Summer/Fall Chinook	6,000 fish	$81.00 [$91.16]	$45.50 [$52.75]	$243,000-$972,000 [$273,480-$1,093,920]	$136,500-$546,000 [$158,250-$633,000]
Spring Chinook	To be determined	$81.00 [$91.16]	$45.50 [$52.75]	NA	NA

Source: GDP implicit price deflator is used for 2004 value estimates. Layton, Brown, and Plummer 1999; USFW 2003; Carter unpublished; Olsen, Richards, and Scott 1991; Huppert et al. 2004; Olsen and White 2004; Confederated Tribes of the Colville Reservation 2004.

Note: For potential recreation expenditures and state income, a catch rate range of one fish per 0.5-2.0 angler days is applied above. Also expenditure data per trip and per fish is highly influenced by varying locations and catch rates and whether the fishery is largely local in nature or export (destination fishery for sport fishermen). Estimates do not include ocean or lower Columbia River in-river recreational harvest. 2009 dollars estimates based on 2004 dollars inflated 3%/yr.

3.8.3 Environmental Justice

Under Executive Order 12898 to the Council of Environmental Quality, environmental justice guidelines have been established to disclose disproportionately high or adverse environmental effects on minority and low income populations. These effects are summarized below.

- Population: no change to minority or low income populations is expected.
- Income/employment: some additional jobs and income may be available to local minorities and low income families during CJHP construction and operations, but no substantial long-term change to employment or income is expected.
- Housing: no changes to housing availability, costs, or quality in the local communities would occur as a result of CJHP.
- Local services: during construction (about 2 years), an increase in demand for local services is likely near the hatchery site (Bridgeport and Pateros), but demand

- Power rates: BPA wholesale power rates would not change due to the CJHP, and it is expected that local PUD rates would similarly be unaffected.

- Ceremonial and subsistence and recreational fisheries: the value (non-monetary) of an improved Colville Tribal ceremonial and subsistence fishery would likely increase the quality of life of Tribal members in general. An improved recreational fishery for the general public would likely benefit other local minorities and low income families as well.

No Action Alternative

With the No Action alternative, Chinook salmon are likely to continue to return above Wells Dam and into the Okanogan subbasin. With current trends and rates of return, it is possible that meaningful social or economic benefits to the region from salmon: 1) may not be realized, 2) may be realized at a much slower pace than with the CJHP, or 3) may be only partially realized in the long term. The uncertainty of future salmon returns and rates makes the likelihood of BPA meeting its mitigation obligation for construction of the upper Columbia River dams equally uncertain.

3.8.4 Cumulative Effects

The CJHP would add relatively few permanent jobs to the region, so the incremental effects on area population, income, and needed to change infrastructure and services would be negligible. The CJHP may combine with other community efforts to contribute a substantial benefit to the social welfare of the Confederated Tribes of the Colville Reservation and local recreationists if the values of potentially increased fisheries are realized and an element of economic diversity is provided. The numerous federal, state, local, and tribal efforts to improve fish populations, river flow, and aquatic habitat in the region should result in salmon population increases which, together, should provide economic benefits.

3.9 Cultural Resources

Cultural resources include prehistoric and historic archaeological sites, historic structures, and traditional cultural properties (places that may or may not have human alterations, but are important to the cultural identity of a community or Indian tribe). The National Historic Preservation Act of 1966, as amended, requires that these resources be inventoried and evaluated for eligibility for listing in the National Register of Historic Places (NRHP) and that project effects be determined. Laws and regulations protecting cultural resources are described in Chapter 4.

3.9.1 Affected Environment

The CJHP area setting is typical of the Columbia Plateau, characterized by geological features, plant and animal communities and waterways that are important to traditional Native American uses. The CJHP project sites along the Okanogan and Columbia rivers

and Omak Creek are lands within the Colville Reservation or lands within the historical homeland of three member tribes of the Colville Tribes: the San Poil-Nespelem, the Moses-Columbia, and the Southern Okanogan. The Colville Tribes comprise descendants of 12 different aboriginal groups: the Wenatchee, Chelan, Entiat, Methow, Okanogan, Nespelem, San Poil, Lakes, Colville, Moses-Columbia, Palus, and Chief Joseph Band of the Nez Perce. Archaeological evidence from reservation sites suggest that the area has been occupied since around 7,000 years ago (CTCR 2000).

Family groups of the Middle Columbia Salish peoples typically dispersed from winter villages in the spring when root crops matured. Salmon fishing spanned May to August, and people tended to gather in fishing camps. Dispersal to hunting grounds began in late summer. Winter villages were constructed in October and November typically in the lowlands along major rivers and near firewood.

The arrival of European goods and diseases greatly altered traditional ways of life. The first direct contact between the people of this area and non-Indians occurred around 1811 when fur traders explored the area (CTCR 2000). By the mid-1800s, the governor of the Washington Territory recommended that reservations be established to relocate Indian tribes to prevent conflicts with settlers. The Colville Reservation was established by Executive Order in 1872 for all non-treaty peoples of northeastern Washington.

Historically, the Okanogan River provided an important subsistence fishery for the Colville Tribes. To take advantage of fish and water, most permanent tribal villages were established along the river (CTCR 2004). With the extirpation of anadromous fish from other parts of the Colville Reservation, the remaining Okanogan and Columbia river fishery is inadequate to meet ceremonial and subsistence needs of tribal members.

Significant historic structures in the CJHP area include the Highway 17 bridge (circa early 1950s, listed in the NRHP (www.nr.nps.gov, site accessed 6/7/06), the Cascade Columbia Railroad paralleling the Okanogan River (built by the Great Northern Railway Company in 1910, actively in use, not listed in the NRHP), and Chief Joseph Dam (completed in 1954) area including Rufus Woods Lake (designated as the Rufus Woods Lake Archaeological District, determined to be eligible for NRHP listing (USACE 2002)).

3.9.2 Environmental Consequences

The National Historic Preservation Act of 1966 (U.S.C. 470 et seq., as amended) Section 106 requires federal agencies to consider the effect of any proposed undertakings on properties listed in, or eligible for listing in, the NRHP. BPA contracted with Colville Tribes' History and Archaeology Program to survey the CJHP sites for cultural resources, to determine their importance as traditional use sites, and to determine the effects of proposed activities on the resources. Background literature searches and a combination of pedestrian and subsurface shovel testing surveys were conducted. Findings were consulted upon with the Washington State Historic Preservation Office and Colville Tribes' Tribal Historic Preservation Officer and concurrence was expressed. Additional consultation to resolve adverse effects would proceed if the CJHP is implemented.

Proposed Project

Hatchery Site

The hatchery site was used as a staging area during construction of Chief Joseph Dam in the early 1950s and was subject to extensive ground disturbance that included grading, filling, road construction, and shoreline stabilization. The area was originally surveyed prior to construction of the dam, and no artifacts were found, and subsequent surveys by the USACE in 1976 and the Colville Tribes in 2002 identified no cultural materials, so no additional field investigations were performed there.

Pedestrian surveys and limited shovel testing were conducted on the well field site. No cultural materials were observed, no standing historic structures were present, and the area was determined to not have a high probability for cultural resources. The water pipeline routes and about 1,500 feet along the Chief Joseph Dam relief tunnel were surveyed, and no historic cultural materials were found.

Three historic properties are visible in the vicinity of the hatchery site: the Highway 17 bridge, a section of wagon road, and the Chief Joseph Dam. The hatchery would modify the background setting of these historic resources, but its appearance and function would be consistent with structures typically associated with large dams. The hatchery would not affect the historical significance of listed or eligible sites.

Housing Site

The pedestrian survey of the housing site revealed no archaeological sites. The entire area of potential effect is within a stabilized dune field and is not a high probability area for cultural resources. Construction and occupancy would not affect known cultural sites or traditional cultural properties.

Ellisforde, Tonasket, Bonaparte and St. Mary's Mission Ponds

Most modifications to these existing irrigation and acclimation ponds would occur within the developed areas, resulting in little to no new ground disturbance. Where ground disturbance or cultural materials were likely, pedestrian and shovel test surveys were conducted. No archaeological materials or historic structures were identified, so no known cultural sites or traditional cultural properties would be affected.

Riverside Pond

This site received a pedestrian survey and shovel testing. One spot yielded artifacts and debitage (Weaver and Shannon 2006). The layout of proposed facilities at this site was changed to avoid this spot, so no effect to cultural resources is expected. However, if construction reveals additional cultural resources, work would stop until the finds could be properly assessed and consultation with the State Historic Preservation Office and Tribal Historic Preservation Officer occurs.

The Cascade Columbia Railroad crosses the property. An existing road crossing would be used for project access, but no new effects to the railroad are likely. No other historic structures exist on this site.

Omak Pond

Development of a new fish acclimation pond, water supply intake and pipeline, and outlet pipe to the Okanogan River would occur in proximity to a National Register-eligible site, 45OK188 (Weaver and Shannon 2006). Pedestrian surveys and shovel testing identified another site that is recorded as potentially eligible for NRHP listing.

Digging the pond and water supply lines would require excavation of an extensive area to a depth of about 3.5 feet. It is unlikely that cultural material could be avoided by this action, so BPA and the Colville Tribes agreed to an exploration and mitigation plan to address effects to cultural materials. Remote sensing, data recovery excavations, construction monitoring, and long-term curation of artifacts has been mutually accepted.

Traditional Cultural Properties

Research indicates that while there are traditional cultural properties near or within the CJHP sites, no adverse effects are anticipated (Weaver and Shannon 2006). Traditional cultural resources (native plants and animals used by the Tribes) are also present in the general area, but the project would affect them very little, except the salmon runs. The three components of the CJHP would result in different levels and different timing of Chinook salmon returns to the Okanogan subbasin, which affects their potential cultural and/or subsistence use by the CTCR. While return levels and timing are highly dependent upon ocean and river conditions, it can generally be concluded that the greater the number of healthy smolts released, the greater the number of adult fish that may return to the Okanogan subbasin, and the greater likelihood of Tribal ceremonial and subsistence use. Considering any or all of the three CJHP components can be implemented, their traditional cultural resource use potential is as follows:

- Program Component 1: Production of 1,100,000 summer/fall Chinook smolts. Returning adult fish would be expected to meet escapement needs, increasing their abundance and distribution throughout the Okanogan subbasin. Adoption of this component alone would probably limit an increased and sustainable tribal ceremonial or subsistence harvest to a narrow run season.

- Program Component 2: Production of 500,000 early-arriving and 400,000 late-arriving summer/fall Chinook smolts added to Program Component 1 would be expected to meet escapement needs and provide enough fish to increase and sustain a tribal ceremonial and subsistence fishery for a longer season. Implementation of only Program Component 2 would probably limit traditional cultural uses to two narrow run seasons.

- Program Component 3: Production of 900,000 spring Chinook smolts would be expected to add another element to a stable ceremonial and subsistence fishery for tribal members over time.

No Action Alternative

With the No Action Alternative, cultural resources and traditional cultural properties would remain unaffected except as has already taken place during surveys and data recovery excavations. Salmon production would not significantly increase and tribal ceremonial and subsistence use of this traditional cultural resource would likely be unchanged from current conditions.

3.9.3 Cumulative Effects

Construction of CJHP facilities would contribute to a continuum of development and policies that affect historic cultural values and resources (e.g., agricultural production, housing and infrastructure development, regional fish management policies, and ocean and river harvest of salmon). The CJHP, in conjunction with other fishery management efforts, would help increase populations of Chinook salmon, a culturally important resource. Cultural resource investigations conducted as part of this project contribute cumulatively to the body of knowledge of history and uses of the area.

3.10 Air, Climate Change, Noise and Public Safety

3.10.1 Affected Environment

Air

The Environmental Protection Agency (EPA) and WDOE have responsibility for air quality in Okanogan County. WDOE has adopted the National Ambient Air Quality Standards (NAAQS) established by the EPA. Washington State ambient air quality standards have been established for total suspended particles, particulate matter (PM_{10} and $PM_{2.5}$), ozone, carbon monoxide, sulfur dioxide, nitrogen dioxide, and lead. While WDOE concerns itself with regional air quality, EPA has jurisdiction over air quality on the Colville Reservation until the Colville Tribes adopt their own air resource management program.

There is very little specific information about air quality in Okanogan County or the Colville Reservation. No baseline data for particulate matter exists, and ambient air quality standards have not been established. Generally, the location, terrain, and wind patterns result in optimum conditions for maintaining high air quality through the Okanogan Valley. Visual observations indicate that the largest source of suspended fine particles appears to be road dust from vehicles. Since Okanogan County's economy is based primarily on rural agriculture, the relatively sparse population tends to indicate that pollution would be fairly low.

Fugitive dust represents a common pollutant generated during construction. State regulations require that the owner or operator of any source of fugitive dust shall take reasonable precautions to prevent fugitive dust from becoming airborne and shall maintain and operate the source to minimize emissions. Construction equipment may also be a prominent local source of exhaust emissions.

Climate Change

Currently, no published thresholds exist for measuring the significance of an individual project's cumulative contribution to global climate change. Global climate change is a cumulative impact; a project participates in this potential impact through its incremental contribution combined with the cumulative increase of all other sources of greenhouse gases (GHG) in the world. However, if a proposed project implements appropriate actions relevant to reducing its cumulative contributions to GHG emissions, the proposed project could be considered to have a less than significant impact to global climate change.

In considering whether to fund the CJHP, it is BPA's policy that:

"Whenever program personnel determine that the results would be meaningful, practical, and consistent with BPA programs and needs, BPA shall apply energy conservation, energy efficiency, and environmentally preferable criteria to purchases. In preparing solicitations and evaluating and selecting offers for award, BPA shall consider these criteria along with other best buy factors. In doing so, BPA should consider energy use and efficiency labels and, as they become available, energy efficiency standards" (Bonneville Purchasing Instructions: 6.14 Energy Conservation and Environmental Considerations, October 2005).

Noise

Okanogan County has adopted Washington State's regulations for maximum environmental noise levels (WAC 173-60). The Washington Administrative Code establishes three environmental districts for noise abatement. Class A applies to residential areas; Class B applies commercial areas; and Class C applies to industrial areas. Noise originating from temporary construction sites is exempt from these regulations except where the noise affects Class A receptors at night. No baseline for existing background noise levels has been established Okanogan County or the proposed project sites.

Noise levels at all project sites are typical of rural areas of eastern Washington. Noise sources near the hatchery and housing sites are dominated by Chief Joseph Dam and powerhouse and include Half-Sun Way, State Highway 17, and the Columbia River. Noise sources near the acclimation pond sites are flowing river water and wind through riparian vegetation. Bonaparte and Ellisforde ponds are on Highway 97 and the Cascade Columbia River Railroad where there is additional continuous traffic noise and intermittent noise from trains. The Riverside site also has intermittent train noise.

Public Safety

Numerous tribal, federal, state, county, and city agencies provide public health and safety resources for the Okanogan Valley. The Okanogan County Sheriff's office serves as the communications link between the public and the emergency service providers (Okanogan County 2005). Within the Colville Reservation, the Colville Tribes provide additional public health and emergency services including law enforcement, fire protection, and

health and medical treatment. Colville Tribal services are coordinated with county services as appropriate. Available health and medical services within the county including the North Valley Hospital in Tonasket, Mid-Valley Hospital in Omak, and the Okanogan Douglas Hospital in Brewster. Each offers emergency room services. Fire protection is provided by the county. The Omak, Tonasket, Riverside, and Brewster/Pateros fire districts have fire stations that are staffed by volunteer fire-fighters.

The risk of intentional destructive acts (terrorism, sabotage or extreme vandalism) or catastrophic accidents is very low in remote, lightly populated, relatively unindustrialized Okanogan County. Wildfires or damage to the Columbia River dams would be the most threatening events. Effective forest and rangeland wildfire protection and suppression measures are coordinated among the Washington Department of Natural Resources, U.S. Forest Service, and the Colville Tribes Natural Resources fire management staff. The Chief Joseph Dam is a highly protected, secure federal facility.

Dam structure as affected by hatchery water supply is described as follows:

> Relief Tunnel Connection. The existing relief tunnel extends from the base of Monolith No. 1 in a northwest direction for about 1,020 feet. A series of relief wells are constructed beneath the relief tunnel to intercept water infiltration from the downstream right bank. The water from the relief wells travels by gravity down the tunnel into a sump located in Monolith No. 1. Water in the sump then travels to the river downstream of the dam through a sloping four-foot diameter drain line which terminates at the face of the right training wall at the base of Monolith No. 5.
>
> Reservoir Water Connection. This inlet was built during the initial dam construction for the supply of irrigation water, but never put into service. The inlet is closed at the upstream face of the monolith by a 1-foot thick reinforced concrete wall and at the downstream face with an 8-inch thick masonry wall. A gallery is incorporated into the interconnecting passageway to accommodate piping, valves, and controls. The gallery opens to an access corridor which provides egress via the right access tower stairs.

Contaminants such as DDT and PCBs are potentially present in salmon (see Section 3.6.2 Water Quality) and could have public health implications. Fish consumption advisories have been issued for eastern Washington, although not specifically for salmon.

3.10.2 Environmental Consequences

Proposed Project

Air

Construction Effects

Air quality effects would be short term and localized, ceasing once construction is complete. Fugitive dust from land clearing, grading, excavation, wind erosion of

stockpiles, and construction traffic on unpaved roads would be the main air pollutant. Vehicle emissions would also add particulates and other pollutants in the air near construction activity. Most construction activity would occur at the hatchery, housing, hatchery water pipelines, and the Riverside and Omak pond sites. Construction activities at the St. Mary's Mission, Ellisforde, and Bonaparte pond sites require little ground disturbance and are expected to create very minor amounts of dust.

Hatchery construction would have the greatest potential for generating fugitive dust because the area to be cleared is relatively large and activity is expected to last about 2 years. Implementing the measures below should keep construction dust within the Washington State standards for PM 10 and PM 2.5.

- Limit the amount of ground disturbed at one time to the smallest area possible.
- Apply water or other dust abatement compounds on unpaved roads, stockpiles and excavated areas.
- Cover stockpiles or excavated areas that would remain exposed for several weeks.

Operations Effects

Operation of the hatchery facilities and ponds is not expected to produce fugitive dust or other air pollutants in excessive amounts. Soil exposed during construction would be landscaped to reduce the potential for wind erosion. Access roads would be graveled or paved to prevent dust and erosion. Electrical power would be used to run pumps and other mechanical systems, avoiding combustion exhaust.

Climate Change

Even though an individual project such as CJHP does not generate enough GHG emissions to significantly influence global climate change, it is reasonable to say there will be some immeasurable, incremental contribution from construction and long-term operations primarily related to vehicle use.

The proposed CJHP design includes numerous measures to reduce GHG and have a less than significant impact to global climate change by designing buildings and facilities that require less energy or meet higher energy efficiency standards than other designs. For example, insulation, roofing and building materials would have high energy efficiency ratings; heating systems would be electric, not natural gas or wood; cooling systems where needed would use environmentally friendly refrigerant or evaporative cooling; green building materials and Energy Star ratings would be considered where functionally and economically feasible; gravity feed water systems and/or energy efficient pumps would be employed where practicable; and refuse disposal would be reduced through aggressive materials and refuse recycling.

Noise

Construction Effects

The hatchery, housing, and acclimation ponds sites are in areas characterized as rural residential, agriculture, or industrial. Noise is expected to be generated by equipment, vehicles, and personnel during facility construction. Due to the rural or industrial setting of most of the project sites, it is not anticipated that construction noise would exceed the standards identified for Class A or Class B receptors. Although temporary construction noise is exempt from State of Washington noise regulations (except where it affects Class A receptors at night), the noise effects at each project site are discussed below.

Hatchery Site

A continuous level of considerable noise would be generated during daylight work hours over the two year construction period. The USACE Chief Joseph Dam offices and industrial facilities across the Columbia River would be the nearest point of human hearing reception. Noise from Chief Joseph Dam turbine outflow would likely mask all hatchery construction noise.

Housing Site

Construction is expected to take about seven months from October through April during daylight hours. Golfers at Lake Woods Golf Course would be the nearest receptors during the late-spring or early-fall recreation season.

Hatchery Water Supply

Drilling and testing of well sites would take about a year, introducing continuous noise during the day that would likely be audible to Bridgeport State Park users. Burying the water supply pipeline along Half-Sun Way would take several months and would be heard at the park and golf course.

Acclimation Ponds

Riverside Pond would be constructed in a rural hay farming area. Three residences within a mile of the site would likely experience daytime construction noise and traffic for about seven months. Omak Pond would be constructed within 1/2 mile of 15 rural residences. Daytime construction noise would also be heard for about seven months.

Intermittent noise would be generated at the existing Bonaparte, Tonasket, Ellisforde, and St. Mary's Mission ponds during minor construction and maintenance activities.

Operations Effects

During standard operation, the hatchery and acclimation ponds would generate intermittent noise at low levels. The water pumping systems would be the most audible. The noise generated on these sites is not expected to exceed the Washington State Class A and Class B standards.

Public Safety

Construction Effects

For construction workers, safety risks may include falling, cutting and crushing hazards, and heavy vehicular equipment hazards. The potential for injuries depends upon contractor experience, proper supervision and training of workers, and adherence to BMPs and state and federal safety standards. Risks to the general public would be negligible as they would be excluded from construction sites.

Emergency services during construction would be available through initial contact with the Okanogan County Sheriff's office via a phone call to "911". Although Okanogan County is a large rural area with few developed communities and the project sites are widespread, police, fire, EMT, and hospital services are available from key communities dispersed throughout the county, thus minimizing response time. Additional staffing from these services is not expected to be needed to handle the amount and type of emergencies that may occur during the project's construction phase.

Dam safety and public safety effects from construction of the hatchery water supply at the dam are not considered significant based on the following assessment by USACE Seattle District.

> Relief Tunnel Connection. From a structural perspective, construction of the relief tunnel connection would have little, if any, effect on the dam itself. Exposure of a portion of the face of the monolith at the base of the shaft would result in some reduction in overturning resistance, but the contribution would be limited by the relatively small exposed area and limited leverage at this location. Verification of monolith stability accounting for the presence of the new vertical shaft is in process. Regarding the connection to the drainage tunnel, stresses in the monolith concrete are typically low and would tend to bridge around the new conduit.
>
> Reservoir Water Connection. The proposed method of incorporating the irrigation intake is consistent with the original design intent and therefore does not present any inherent structural risks. A 30-inch gate valve with manual control would be located in the water line in the monolith interior as a safety precaution and to allow maintenance, if needed.

Because hatchery staff would monitor returning adult salmon tissue for evidence of contaminants, and would issue advisories as appropriate to those who might consume harvested hatchery salmon, it is unlikely that CJHP produced fish would constitute a health risk. The water quality concerns potentially posed by DDT and PCB would also bear monitoring with respect to human consumption of fish in general.

Operations Effects

To prevent unauthorized access and for public safety, the hatchery and acclimation ponds would be fenced and gated. Access to the Riverside Pond across the Cascade Columbia River Railroad grade would require signage to caution vehicles to beware of trains.

Chemicals that may be used at the hatchery include chlorine, formalin, iodaphor, and sodium thiosulphate. Staff would be trained in their proper use, transport, handling and storage to minimize dangers of over-exposure or accidental release to the environment. Appropriate safety equipment would be provided, and chemicals would be stored in areas designed to contain the chemical in the event of a spill according to the Washington Industrial Safety and Health Administration regulations, the Uniform Fire Code, and other applicable regulations. Any used absorbent materials containing controlled chemicals would be disposed consistent with the Material Safety Data Sheet and applicable federal, state, and local regulations.

Existing emergency service providers are within 15 miles of all project sites, so even a very catastrophic injury or incident should receive relatively prompt response. The risks of intentional destructive acts (terrorism, sabotage or extreme vandalism) or catastrophic accidents should not change with the existence of the hatchery or acclimation ponds.

No Action Alternative

Under the No Action Alternative, noise, air and public safety would remain unchanged from the current situation. No construction would take place at the hatchery, housing site, or ponds.

3.10.3 Cumulative Effects

For the duration of construction, the cumulative air quality near the hatchery, housing and Omak and Riverside pond sites would likely be adversely affected by dust and perhaps vehicle emissions. These effects would dissipate daily, and entirely once construction is complete. Air quality impacts would comply with Washington State regulations.

The hatchery would add to the ambient noise level but would not exceed Washington State noise standards. Since the area is already dominated by the noise from the dam, the effect is considered negligible. Because the area around the housing site is not expected to attract more development, the housing site itself is the only sound source nearby other natural ambient sound, so no cumulative effect exists. Minor pump and water flow noises at the acclimation ponds would be practically undetectable from nearby receptors.

No cumulative effects are expected to public health.

3.11 Aesthetics

3.11.1 Affected Environment

Hatchery Site

Although the hatchery site sits on a plateau along the Columbia River and in close proximity to the Chief Joseph Dam, the visual quality of the site is considered low. The site was heavily modified during construction of the dam, has been graded, irrigated, and planted to non-native grasses. The site is a gently westward-sloping, grass-covered plateau about 70 to 100 feet above the Columbia River and about 150 feet below the top of the Columbia Plateau. It is not considered visually distinctive or unusual within the

region. Figure 3-5 shows the hatchery site as viewed from across the Columbia River near the Chief Joseph Dam administrative complex, and Figure 3-6 is the view from the USACE visitor orientation area adjacent to the site.

The site is surrounded by shrub-steppe habitat typically found in the non-irrigated portions of the Columbia Basin. No distinctive natural landscape or geological features exist on or near the site.

Chief Joseph Dam, the dam's administrative offices and associated structures are located directly upstream and across the river, and dominate the local viewshed. The Town of Bridgeport is visible about one mile downstream. The USACE visitor orientation area is due west of the proposed hatchery site. Half-Sun Way runs above the north edge of the proposed site. A steep, rocky slope, sparsely covered with sage, scrub brush, and grasses runs from the river edge to the south edge of the site and above Half-Sun Way to the top of the Columbia Plateau.

Views of the site are unrestricted from the dam's visitor center across the river, from the USACE visitor orientation area along the slope to the west, and from Half-Sun Way. Views partially restricted by slope occur from the tribal fishing area east of the site near the base of the dam. The number of viewers from these vantage points depends on seasonal recreational and tribal fishing opportunities.

Travelers on State Highway 17 get brief views of the site, varying from restricted to unrestricted. To slower moving traffic along Half-Sun Way, unrestricted foreground views of the site are available for a longer duration. About 5% of the 2,250 residents of Bridgeport (about 1 mile down river) may have restricted views of the site. Viewing durations are estimated to range from less than a minute up to eight hours per visit.

Housing Site

The housing site is located east and upslope of the hatchery complex site above Half-Sun Way and southwest of the Lake Woods Golf Course. This undeveloped site is sparsely covered with native shrub-steppe vegetation and is visible to travelers on Half-Sun Way and the North Shore Trail. The number of potential viewers varies with traffic flow on Half-Sun Way and seasonal use of the golf course, state park, North Shore Trail, and the trailhead. The visual quality of the site is considered to be low due to the lack of visually significant characteristics in the view corridor.

Ellisforde Pond

Ellisforde Pond is in an agricultural area with orchards south of the site and east of US Highway 97. The site includes an existing fenced irrigation pond which has already been modified for fish rearing. Agricultural workers may have infrequent unrestricted views of the site from the orchard to the south. Local travelers and sightseers have partially restricted foreground views from Highway 97. These views are partially restricted by the elevated tracks of the Cascade Columbia River Railroad and the orchard to the south. Views of the site from the Okanogan River are restricted by riparian vegetation growing on the river bank. The visual quality of the site is considered to be low due to the lack of visually significant characteristics.

Tonasket Pond

Tonasket Pond, an existing irrigation pond with pumping equipment, is in an area of relatively flat farm land abutting steep bluffs sparsely covered in native vegetation. Local travelers on State Highway 7 and residents of several nearby farmhouses have unrestricted foreground views of the site. Recreational viewers have restricted foreground views from the Okanogan River due to dense riparian vegetation. The visual quality of this site is considered low due to the lack of visually significant characteristics.

Bonaparte Pond

Bonaparte Pond is near the Town of Tonasket between the Okanogan River and the Cascade Columbia River Railroad and US Highway 97. The visual character of the area changes from agricultural to commercial/industrial upon approaching Tonasket. The site consists of an existing irrigation/acclimation pond and pump system within a fenced, graveled yard. Traveler's foreground views are partially restricted by the elevated railroad tracks. Foreground views from the Okanogan River are restricted by trees and brush growing on the river bank. Partially restricted mid-ground views of the site may be available from the commercial/industrial areas northeast of the pond. The visual quality of the site is considered to be low due to the lack of visually significant characteristics.

Riverside Pond

Riverside Pond would be located between the Okanogan River and the Cascade Columbia River Railroad west of Omak/Riverside Eastside Road. The visual character of the general area is relatively flat farm lands below steep bluffs covered in native shrub-steppe vegetation. The site is currently a hay and alfalfa field. A farmhouse is directly across the Okanogan River from the site.

Visitors and local residents have unrestricted foreground views from Omak/Riverside Eastside Road and adjacent croplands. Restricted foreground and mid-ground views may be available from the Okanogan River and the farmhouse across the river, although visibility is restricted by dense riparian vegetation. The overall visual quality of the proposed site is considered low due to the lack of visually significant characteristics.

St. Mary's Mission Pond

St. Mary's Mission Pond is in an area of rural agricultural and undeveloped land. The site is a flat fallow field already developed with a concrete acclimation pond/raceway with steel grate cover and pump equipment. Local travelers and recreational viewers have unrestricted foreground views of the site from North Omak Lake Road. Views of the site from the north are restricted by vegetation growing along Omak Creek. The site has low visual quality due to the lack of visually significant characteristics.

Omak Pond

The Omak Pond site is on Brooks Tracts Road near the Colville Tribes' Fish & Wildlife Department's office. The general area has rural agricultural/residential character. Nearby residents have unrestricted foreground views of the site. Partially restricted mid-

ground views of the site may be available from the residential areas on the bluff across the Okanogan River from the site. Other potential views are restricted by well established trees surrounding most of the site. The visual quality of this site is considered to be low due to the lack of visually distinct characteristics.

3.11.2 Environmental Consequences

Potential effects on aesthetic resources include temporary visual changes during construction and permanent visual changes as a result of construction and operation of project facilities. The most visually sensitive viewers include sightseers and local travelers along State Highway 17 and US Highway 97, workers at the Chief Joseph Dam complex, and residents near some of the pond sites.

Construction Effects

Hatchery Site

Construction activities would occur constantly for about 2 years primarily during daylight hours. Construction workers and equipment would be observable from key viewpoints, particularly from the USACE visitor orientation area adjacent to the site. Construction activities would also occasionally generate fugitive dust which could partially obscure views depending upon the amount of dust generated at any one time. Dust abatement practices would help reduce this impact. During the construction period, low to moderate impacts would occur to the visual quality in the general area.

Housing Site

Housing construction would be visible from Half-Sun Way, the North Shore Trail, the trailhead, and the west end of the Lake Woods Golf Course. Construction activities would be apparent during daylight hours for about seven months. Fugitive dust also would be occasionally visible from these view points. Housing construction would have a low impact on visual resources because the views would be of short duration and the number of viewers would be limited.

Acclimation Ponds

Construction activity and a little dust may be noticeable for 2 to 5 months at the existing facilities of Ellisforde Pond, Tonasket Pond and Bonaparte Pond as proposed minor improvements and installation of monitoring and telemetry systems occur.

Construction of Riverside Pond would be obvious to users of Omak/Riverside Eastside Road and local residents for about 7 months as views of construction workers, heavy equipment, supply vehicles, and dust would be apparent. Dust abatement would curtail the effects occasionally.

At St. Mary's Mission Pond, the visual effects of proposed modifications would last about 2 months. Overall the facility would appear no different except a little dust may be temporarily created and a chain link security fence would enclose the pond.

Omak Pond construction would be obvious to nearby residents and users of the Brooks Tracts Road for about 7 months. Construction workers, heavy equipment, supply vehicles, and dust would be seen regularly. Water supply pipeline trenching along Brooks Tracts Road and trucks hauling excavated material would be the most noticeable activities. Dust abatement would be especially important at this site.

Operations Effects

Hatchery Site

After construction, the visual character of the hatchery site would change from a grass-covered, irrigated field to that of a fenced, industrial fish hatchery facility (Figure 3-7). Visually, the facility would introduce a 20,000 square foot hatchery support building approximately 25 to 35 feet high; a 4,000 square foot administration building and visitor center, approximately 20 to 30 feet high; a head works structure and other low-height structures (approximately 1 to 4 feet high) including fish rearing raceways, waste treatment pond, adult holding tanks and fish ladder.

The main production area and adult fish holding facility would be surrounded by chain-link security fencing providing 24-hour restricted access. The administration building and visitor center would also be fenced for security, but the gates would be open during normal hours of operation to allow visitor access.

The security fence surrounding the facility would be black vinyl-coated chain link in order to reduce its visual contrast. Neutral colors would be used on building roofs and exteriors to reduce their visual effect. Architectural elements which are suggestive of the culture of the Colville Confederated Tribes would be incorporated into the building design. The main hatchery building would be located on the north side of the site to reduce its prominence. The adjacent service yard area would be paved to support year-round activity and limit dust.

Once completed, the hatchery would enhance the experience of visitors and sightseers by providing visual and educational opportunities within the visitor center. The hatchery would be visible from the Chief Joseph Dam administration and maintenance facilities across the Columbia River. USACE workers would have extended views of the site and are therefore more likely to be affected by the visual quality of hatchery features.

While some views of the site from parts of the Town of Bridgeport may be altered, the distance from the site makes the visual effect considerably lower. Also, since the site is well below the top of the rim of the Columbia River plateau, the structures would have little effect local skyline views. While the working area of the hatchery would be restricted to public access, the perimeter of the facility could be connected to the existing public trail system and the existing USACE visitor orientation area in a manner compatible with current uses. The view across the site from these public areas is currently dominated by Chief Joseph Dam and powerhouse. It is not an uninterrupted, natural scenic view.

Housing Site

The visual character of the 23-acre housing site would change from undeveloped shrub-steppe habitat to low-density housing (3 structures). Building roofs and exteriors would be of natural-colored materials to reduce their visual prominence. Driveways and access roads would be unpaved, producing some occasional fugitive dust. Landscaping would be a mix of traditional lawns, flowerbeds and gardens, and native vegetation. The equipment storage area and the four proposed temporary housing spots (RV or camp trailer pads) would be situated to minimize their visibility from the golf course, but the entire site would be visible to users of the North Shore Trail and trailhead in the vicinity.

Acclimation Ponds

The proposed modifications and operation of existing facilities at Ellisforde, Tonasket, Bonaparte, and St. Mary's Mission ponds should be unnoticeable to the casual viewer as they are not expected to change the area's visual character or scenic quality.

The new Riverside Pond would not significantly change the visual character of the area from that of rural farm land. Omak Pond would be a more apparent alteration among adjacent small farms and rural homes. If the ponds are roofed (funding permitting), they would appear similar to other irrigation ponds or buildings typical of the river corridor. Building roofs and exteriors would be of natural-colored materials to reduce their visual prominence. If not roofed, the ponds would be surrounded by chain link fences and gravel perimeters for vehicle access. The uncovered configurations would probably be less visible.

Views by local travelers and residents of the Riverside Pond site in particular would be restricted by existing vegetation along both banks of the Okanogan River, the elevated tracks of the Cascade Columbia River Railroad, and its distance from US Highway 97. Operations and maintenance activities would have low visual impact due to short view durations, the limited number of viewers, the limited number of people working at the facilities, and the seasonal nature of the activities (October to April annually).

3.11.3 Cumulative Effects

Anticipated development patterns around Chief Joseph Dam would likely include industrial and public use facilities which are similar in appearance to those found today, most of which support the operation of Chief Joseph Dam. The hatchery and employee housing would add to the accumulation of development in the vicinity of Chief Joseph Dam, but would likely be overshadowed by the dam and its associated facilities. The hatchery would not be expected to substantially alter the visual character of the area or contrast with existing or potential future development.

The low-profile of the new below-grade Riverside and Omak ponds would not be expected to contribute to adverse cumulative effects on the viewshed within the Okanogan River valley as views of irrigation ponds and similar buildings in the area are

not uncommon. There should be no cumulative impacts associated with modifications at the other acclimation ponds.

The CJHP, together with other fish protection and enhancement efforts in the watershed, could add a significant element of visual quality through chances to seasonally view salmon as they migrate to spawn in the Okanogan Basin and the Columbia River below Chief Joseph Dam.

3.12 Unavoidable Adverse Effects and Irreversible and Irretrievable Commitment of Resources

The CJHP would entail irreversible and irretrievable commitments of some agricultural land (about 6 acres), some shrub-steppe habitat (about 10 acres), some non-native vegetation shrub-steppe habitat (about 20 acres), and riparian vegetation (less than 1 acre) where new development is proposed (hatchery complex, housing site and two new ponds). The stream reaches between the intakes and outlets of the ponds would have slightly lower total flow when water is diverted for fish acclimation (October through April annually). Placement of new facilities within floodplains could also reduce floodplain function to some minor, localized degree. Building materials, fuel, equipment and operational supplies comprised of various materials such as rock, metals, wood, glass, plastic, petroleum products and other chemicals would be installed and/or consumed at all sites.

3.13 Short-term Use of the Environment and Effects on Long-term Productivity

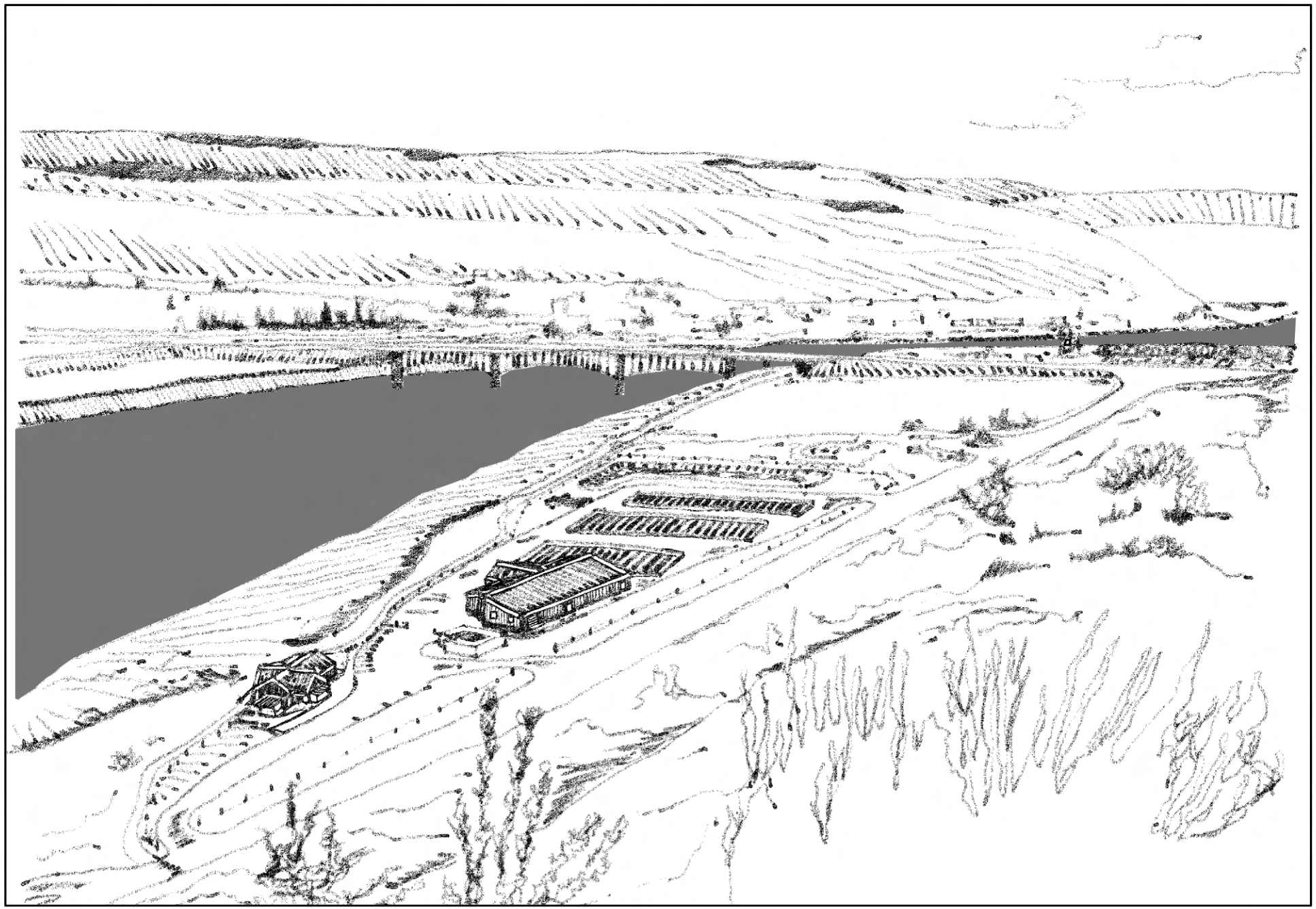
The CJHP is expected to greatly enhance productivity of the aquatic environment through salmon population increases, from which other aquatic and terrestrial species including humans may derive benefits. The lands developed as a hatchery complex, employee housing and acclimation ponds would be permanently taken out of vegetative productivity. Construction activities would temporarily affect more land than would be permanently developed with hatchery structures, but long-term productivity would not likely be adversely affected because of the measures that would be taken to restore disturbed, undeveloped areas to pre-existing condition or better (replanting with native species, weed control, standard construction BMPs, etc.). The stream reaches between the intakes and outlets of the ponds would have slightly lower total flow when water is diverted for fish acclimation (October through April, outside the normal irrigation season). Some incremental amount of greenhouse gases would be emitted during construction and hatchery operation, which would add to global climate change, but energy efficiency considerations in project design would make this contribution insignificant at local and global scales. The No Action alternative would not significantly change the aquatic environment or alter any terrestrial sites.

3.14 Additional Mitigation Measures

The CJHP design process incorporated many measures to help avoid, minimize or compensate for potential adverse effects. For example, to prevent potential damage from intentional destructive acts (i.e. vandals, sabotage, terrorist acts), certain security

Figure 3-5. View of the Proposed Hatchery Site from the South Side of the Columbia River

Figure 3-6. View of the Hatchery Site from Visitor Orientation Area



Colville Tribes
CHIEF JOSEPH HATCHERY PROGRAM
DRAFT ENVIRONMENTAL IMPACT STATEMENT

Figure 3-7

Architect's Rendering of the Proposed Chief Joseph Hatchery

TETRA TECH/KCM

measures are included. Security fencing, gates and lighting are proposed at the hatchery, and employee housing was relocated from the hatchery complex to a separate location to control visitors at the hatchery complex and the vicinity of Chief Joseph Dam in off-duty hours. Moving the housing also ameliorates the aesthetics of the hatchery complex somewhat from the dam site and USACE visitor orientation area as does selecting common building materials and architectural design for all structures to be as congruent as possible with other structures nearby. Other examples include using native vegetation, vegetation screens and weed control when re-landscaping disturbed areas; using standard construction BMPs to prevent erosion and pollution contamination; using dust abatement to protect air quality at disturbed areas; dewatering in-stream work areas, scheduling in-stream work during low river flows, and filtering pump-return water to lessen sedimentation and provide safer work conditions; and having a cultural resources specialist present to monitor site clearing, excavation and foundation preparation activities at sites with potentially sensitive cultural resources.

If this project proceeds to final design and implementation, other mitigation measures may be applied as required to secure permits, approvals, leases, rights-of-way, or other instruments, or to respond to conditions that may have changed or may be different than anticipated in the preliminary planning process.

CHAPTER 4: CONSULTATION AND COORDINATION

Numerous federal, state, and local environmental laws and administrative requirements must be satisfied prior to initiation of the proposed project. Compliance with these regulatory requirements is examined in this chapter. The intent of each law, regulation, ordinance, or guideline is described, followed by an assessment of the proposed project's compliance/consistency.

4.1 National Environmental Policy Act

The National Environmental Policy Act of 1969 as amended (42 USC 4321 et seq.) requires federal agencies to assess and disclose the effects of proposed actions on the environment. This EIS has been compiled to meet NEPA requirements, enabling BPA, the Colville Tribes, and the other agencies involved to consider and disclose the potential environmental consequences of and mitigation for the proposed action.

BPA and the Colville Tribes conducted formal scoping meetings and informal outreach efforts with interested and potentially affected parties. The identified key issues were used to guide the environmental analysis. Copies of the draft EIS were sent to the relevant agencies, organizations, and interested parties for review and comment (Appendix A). After a formal public comment period on the draft EIS, responses to comments and additions, corrections, or clarifications to the analysis (Appendix C) constitute the final EIS. The final EIS will be used by federal decision-makers to determine if they wish to proceed with the Chief Joseph Hatchery Program.

4.2 Wildlife and Habitat

4.2.1 Federal Endangered Species Act

The Endangered Species Act of 1973 and its amendments (ESA, 16 USC 1531 et seq.) require federal agencies to ensure that their actions do not jeopardize endangered or threatened species or their critical habitats. Sources of information for the potential occurrence of sensitive species and their habitats in the project area include NOAA Fisheries, USFWS, and the Washington Natural Heritage Database. Each was consulted during formulation of the EIS for lists of threatened, endangered, sensitive, or candidate species and presence of habitat. Based on this information, a Biological Assessment was prepared and submitted to USFWS and NOAA Fisheries on May 5, 2006 for formal ESA Section 7 consultation. USFWS concurred with the findings of the Biological Assessment (BA) in regards to ESA-protected species under their purview on June 9, 2006 with three recommendations:

1. Captured bull trout should be radio-tagged and tracked, and these activities should be covered by ESA Section 10 permit

2. Tracking should be coordinated with other entities to provide comprehensive coverage and cost efficiency

3. Annual reports of bull trout observations, captures and tagging are requested.

NOAA Fisheries responded with a Biological Opinion dated July 7, 2008 that concluded the actions proposed in the Biological Assessment are not likely to jeopardize the continued existence of endangered Upper Columbia River (UCR) spring Chinook or endangered UCR steelhead, nor result in the destruction or adverse modification of critical habitat (NMFS 2008). To minimize authorized incidental take of protected species, the Biological Opinion contained seven Reasonable and Prudent Measures:

1. The BPA/Colville Tribes shall minimize adverse effects on listed salmon and steelhead in all hatchery facility construction or modification activities as described in the BA.

2. The BPA/Colville Tribes shall minimize adverse effects on listed salmon and steelhead in hatchery program operational practices by reducing encounters with non-target species where possible and requiring live release of all ESA-listed fish not authorized for retention in a separate ESA consultation or permit.

3. The BPA/Colville Tribes shall manage their programs to minimize the risk of adverse demographic, ecological, and genetic effects on listed salmon and steelhead, including potential interbreeding of unlisted, hatchery-origin salmon and listed salmon, in the UCR basin.

4. The BPA/Colville Tribes shall coordinate the production and monitoring of unlisted salmon with other fishery co-managers and other hatchery production programs in the UCR region.

5. The BPA/Colville Tribes shall monitor and evaluate the artificial propagation programs and shall minimize impact on listed and natural-origin salmon and steelhead when conducting the monitoring and evaluation activities.

6. The BPA/Colville Tribes shall provide reports to the Salmon Recovery Division of NMFS, Northwest Region, for all artificial propagation, research, monitoring and evaluation activities proposed in the BA.

7. The BPA/Colville Tribes shall comply with all ESA requirements and provisions within the Incidental Take Statement of the Biological Opinion (NMFS 2008, pp. 96-102).

The numerous terms and conditions that implement the reasonable and prudent measures described above (NMFS 2008, pp. 98-102) have been adopted by the BPA and CCT so that the CJHP would be considered exempt from the prohibitions of ESA section 9.

The Biological Opinion also contained consultation on Essential Fish Habitat (EFH) under the Magnuson-Stevens Act. It was determined that EFH would not likely be adversely affected by the proposed action, and the following Conservation Recommendations were applied by NMFS and adopted by BPA and the Colville Tribes:

1. The BPA/Colville Tribes shall operate the artificial propagation programs consistent with the conservation measures and best management practices as described in the BA and the Biological Opinion.

2. Measures shall be applied to ensure that artificially propagated salmon are ready to actively migrate to the ocean with minimal delay. To meet this condition, fish must be released at a uniform size and state of smoltification.

3. The BPA/Colville Tribes shall monitor and evaluate the artificial propagation programs including the distribution and composition of hatchery program spawners in the natural environment.

4. The BPA/Colville Tribes shall investigate the potential use of surplus hatchery adults for nutrient enhancement in local area streams to increase the habitat resources in the Okanogan Basin.

5. All artificially propagated Chinook salmon shall be externally marked with an adipose fin clipped prior to release. At least a portion of each hatchery release group shall be internally tagged (e.g., coded-wire tag or passive integrated transponder tag) for monitoring and evaluation purposes.

4.2.2 Fish and Wildlife Conservation

The Fish and Wildlife Coordination Act of 1934 (16 USC 661 et seq.) requires federal agencies to consult with the USFWS and state fish and wildlife agencies when "waters of any stream or other body of water are proposed or authorized, permitted or licensed to be impounded, diverted…..or otherwise controlled or modified" by permit or license. Provisions of the Pacific Northwest Electric Power Planning and Conservation Act of 1980 (6 USC 839 et seq.) are intended to protect, mitigate, and enhance fish and wildlife of the Columbia River and its tributaries. Other federal acts and laws, such as the Fish and Wildlife Conservation Act of 1980 (16 USC 2901 et seq.), encourage federal agencies to conserve and promote conservation of game and non-game species and their habitats.

The proposed action would divert waters of the Columbia and Okanogan rivers and Omak Creek to rear and acclimate Chinook salmon. This use would not consume the water, but would use it briefly and then discharge it back into the river. This use would enhance restoration of Okanogan summer/fall Chinook and Upper Columbia River spring Chinook, increasing their abundance, productivity, distribution, and diversity. A copy of this EIS has been sent to the USFWS for consultation under the Fish and Wildlife Coordination Act. Sections 3.2 and 3.3 of this EIS describe the potential effects to fish and wildlife resources.

4.3 Heritage Conservation and Cultural Resources Protection

The National Historic Preservation Act of 1966 as amended (16 USC 470) requires federal agencies with land management or permitting authority to take into account the potential effects of their undertakings on properties that are listed or eligible for listing on the National Register of Historic Places (NRHP). Consultation must occur with the State

Historic Preservation Office and relevant Tribal Historic Preservation Officer regarding the inventory and evaluation of properties potentially eligible for National Register nomination and to determine whether the project undertaking would adversely affect them. Cultural resource surveys were conducted at each proposed project site where ground disturbance may occur (Sections 3.9). Findings were consulted upon with the Washington State Historic Preservation Office and Colville Tribes' Tribal Historic Preservation Officer and concurrence was expressed. Additional consultation to resolve adverse effects would proceed if the CJHP is implemented.

Facilities proposed on federal or Tribal land will follow the requirements of the Archaeological Resource Protection Act (16 USC 470 et seq.). Archaeological Resource Protection Act requirements must be followed should archaeological resources be removed from the hatchery site, housing site or Riverside or Omak pond sites. The Archaeological and Historic Preservation Act (16 USC 469 et seq.) directs federal agencies to notify the Secretary of the Interior if they find that a federal action might cause the destruction of significant scientific, prehistoric or archaeological data. Section 3.9 discusses the likelihood of encountering cultural materials at the proposed construction sites.

Executive Order 13175, Consultation and Coordination with Indian Tribes, states that the U. S. government will continue to work with Indian Tribes on a government-to-government basis to address issues concerning tribal self-government, trust resources, and Indian tribal treaty and other rights. The Chief Joseph Hatchery Project (sponsored by the Confederated Tribes of the Colville Reservation) would contribute to the spirit of intergovernmental cooperation, and upon implementation, has the potential to enhance the culturally significant tribal ceremonial and subsistence fishery for Chinook salmon in the Okanogan River and the Columbia River below Chief Joseph Dam.

4.4 Floodplain/Wetlands Assessment

Executive Orders 11988, Floodplain Management and Executive Order 11990, Protection of Wetlands, require the protection of these areas. If either would be affected or altered by project facilities, the effects must be disclosed. Section 3.4 and 3.6 of this EIS describe the effects of the proposed project on wetlands and FEMA-mapped floodplains.

4.4.1 Resource Description

A narrow corridor along the Okanogan River is designated as a floodplain by FEMA (Figure 3-3) (FEMA 1981 and 1997). The Columbia River floodplain near the hatchery site has not been mapped by FEMA, probably because of the flow regulation attributable to Chief Joseph and Wells dams. Omak Creek, a small tributary to the Okanogan River, has not had its floodplain mapped by FEMA either.

Each proposed project site was inspected to determine the presence of hydrophytic vegetation and other key wetland indicators. Two wetland areas were identified: a constructed wetland adjacent to Tonasket Pond and patches of narrow-leaved willow at the hatchery site. The Tonasket Pond wetland was constructed by OTID and is watered by irrigation outflow from the pond. The willow patches near the hatchery site result from irrigation seepage and total less than 0.5 acres.

4.4.2 Floodplain/Wetlands Effects

Modifications of the intakes and outlets at the existing irrigation ponds would occur within the Okanogan River floodplain and riparian areas, as would the new construction of Riverside and Omak ponds. These activities would not substantially reduce or impair the Okanogan River floodplain due to its width and gradient at these locations. Similarly, the proposed hatchery outfall and fish ladder would not obstruct the passage of flow in the Columbia River channel below Chief Joseph Dam.

Construction would not occur in or affect any natural wetland areas outside the riparian areas. The constructed wetland at Tonasket Pond would not be affected because no activities are proposed there (Section 3.4.2). Near the hatchery site, a few small patches of willows supported by irrigation seepage would be eliminated by construction. Salvage of the willows for cuttings for revegetation is planned. No long-term effects to wetlands at any sites are expected.

4.4.3 Alternatives

Where new construction is proposed, facilities have been sited to avoid wetlands if possible. Water supply intakes and hatchery/acclimation pond outlets are water dependent uses, and it is not feasible to locate these facilities outside of the floodplain and riparian areas. Construction of Riverside and Omak ponds would be within the FEMA-mapped Okanogan River floodplain, but no practical alternatives exist for siting these two ponds. Several alternative designs and other sites were investigated, but were found to render no substantial difference in effects to floodplains. It is essential that the ponds be located to use the river waters for imprinting and acclimation of juvenile salmon and to allow smolts to eventually volitional release into the rivers for out-migration.

4.4.4 Mitigation

Steps taken to avoid or minimize adverse effects on floodplains include limiting the profile of structures to alter the least amount of in-stream, stream-side and floodplain area and not unnecessarily hinder the passage of flow. In addition, Best Management Practices will be incorporated into the final design and construction protocols to minimize the short-term effects of in-stream or near-stream construction on the river channels. The amount of new construction within floodplains has also been reduced by proposing to use several existing irrigation ponds along the Okanogan River for fish acclimation and release.

4.5 Other Consultation and Compliance Requirements

4.5.1 State, Area-wide, and Local Plans and Approval

Various federal, state, tribal, and local permits and approvals would be required to implement the Chief Joseph Hatchery Program. Project components on federal land include the Chief Joseph Hatchery and the housing site (USACE) and the Riverside site (BPA). State and federal permits may apply to construction and operations at these sites. Facilities on the Colville Reservation (the proposed Omak Pond and modifications to St. Mary's Mission Pond) would require tribal governmental approval. Modifications to

Bonaparte, Ellisforde and Tonasket ponds may require federal, state, Okanogan County and Oroville-Tonasket Irrigation District approvals prior to construction (Table 4-1).

The hatchery and acclimation ponds are water-dependent uses, so water rights and in-water work permits are required. Elements would be incorporated into project design to assure consistency with the appropriate authorizations once they are known.

In-stream construction requires a Hydraulic Project Approval from Washington State or the Colville Tribes, depending on the work location which would specify when in-water work can occur and what measures would be needed to protect channels, riparian zones and water quality. In addition, a Shoreline Substantial Development Permit may be required from Okanogan County (under authority delegated by WDOE) or the Colville Tribes for working within 200 feet of a waterway. This permit would stipulate conditions for near-water construction activities. Okanogan County and the Tribes may also require an approval to allow construction within a designated floodplain to assure that appropriate design measures are included. On state owned aquatic lands, Washington Department of Natural Resources (WDNR) has review and approval authority for any new structures.

Table 4-1. Permits and Other Approvals Expected to be Required for the Hatchery and Acclimation Ponds

Permit or Approval	Permitting Agency / Authority	Permit Timeline
Water Rights and Wells (Groundwater and surface water)	CTCR and WDOE	1 year
NPDES for Hatchery Discharge	EPA	6 months – 1 year
Corps Clean Water Act Sections 404/10	USACE	6 months – 1 year
ESA and Intake Screening	NOAA Fisheries and USFWS	6 months
Water Quality Certification (Section 401)	CTCR and WDOE	90 days
NPDES Stormwater General Permit for Construction	EPA and WDOE	45 days
Hydraulic Project Approval	CTCR and WDFW	6 months – 1 year
Floodplain Approval	CTCR and Okanogan County	120 days
Use of State Owned Aquatic Lands	WDNR	90 days
Shoreline Substantial Development Permit	CTCR and Okanogan County	120 days
Land Use/Building Permits	CTCR and Okanogan County	120 days
Utility Franchise	Okanogan County	90 days
Railroad Crossing	Cascade Columbia River Railroad	6 months – 1 year

4.5.2 Clean Water Act

The Clean Water Act of 1977 (33 U.S.C. 1251 et seq.) is the principal federal law governing water pollution control. It regulates discharges into waters of the United States. Two of the primary instruments for implementing this act are the National

Pollutant Discharge Elimination System (NPDES) and the state water quality certification program, both of which are delegated by the federal government to WDOE to administer. The NPDES will be required to operate hatchery facilities while the water quality certification program will define specific construction-related mitigation measures that contractors must follow. Applications will be made to WDOE for both permits when final facility design is developed, including firm construction schedules and quantities and quality of hatchery discharges. In addition, a Section 404 permit will be sought from the USACE for the discharge of dredged or fill material into waters of the United States.

4.5.3 Farmland Protection Policy Act

The Farmland Protection Policy Act (7 U.S.C. 4201 et seq.) directs federal agencies to identify and quantify adverse effects of federal programs on farmlands. The purpose of the act is to minimize the number of programs that unnecessarily contribute to the conversion of agricultural land to non-agricultural purposes.

Two project facilities, the Riverside and the Omak acclimation ponds, would be constructed on lands currently used for agriculture. A third site, St. Mary's Mission Pond, is located within the perimeter of a fallow field; however, modifications would affect very little of this field and would not preclude agricultural use from occurring on the remainder of the site. Other project facilities would not affect farmland.

The Riverside Pond site, owned by BPA, is part of a 60 acre parcel that has been used in the past for hay and grass production, although it currently lies fallow. About 15 acres of this parcel would be disturbed temporarily by construction activities, and about 4 acres would be permanently converted from farmland to an acclimation pond, access road, pump station, etc. The rest of the parcel could be leased or managed for continued agricultural production or to provide wildlife forage and cover.

The Omak Pond site is a four acre field that once may have been in productive agricultural use, but currently lies fallow. This parcel is designated by the Colville Tribes as Rural and also is within the tribal Shoreline Management planning area. Two acres of this parcel would be permanently converted from farmland use to an acclimation pond, access road, and pump station. The conversion of this farmland to other uses would be inconsistent with the tribal planning guidance for rural areas.

4.5.4 Noise Control Act

The Noise Control Act of 1972 (42 U.S.C.490 et seq.) promotes an environment free from noise that jeopardizes human health and welfare. Federal and state regulations establish guidelines that implement the intent of the act. No local noise standards exist for areas that would be affected by the proposed action. No noise in excess of state, federal and tribal standards is expected from this project (Section 3.10). Temporary construction noise during daylight hours is exempt from state and federal standards.

4.5.5 Clean Air Act

Emissions produced by construction and operation of the proposed project facilities must meet standards of the Clean Air Act and the amendments of 1970 (42 USC 741 et seq.).

In Washington, the authority for ensuring compliance with this act is delegated to WDOE. The proposed action would not violate current clean air standards, as described in Section 3.10.

4.5.6 Resource Conservation and Recovery Act (RCRA), Toxic Substances Control Act (TSCA) and Federal Insecticide, Fungicide and Rodenticide Act (FIFRA)

The federal Resource Conservation and Recovery Act (42 USC 692 et seq.) regulates the disposal of hazardous wastes. The Toxic Substances Control Act (15 USC 2601) gives authority to the EPA to regulate substances that present unreasonable risks to public health and the environment. The federal Insecticide, Fungicide and Rodenticide Act (7 USC 136 et seq.) authorized the EPA to prescribe conditions for use of pesticides. Construction, operation and maintenance of the proposed facilities would meet the guidelines for use, handling, storage, and disposal of such hazardous substances (Sections 3.6 and 3.10. Necessary permits would be obtained if regulated pesticide products are used.

4.5.7 Environmental Justice

Executive Order 12898 directs federal agencies to consider the effects of their programs, policies and activities on minority and low-income populations. Federal agencies are required to assess environmental justice concerns in the NEPA analysis. The potential for the Chief Joseph Hatchery Project to affect low-income communities and minority populations is summarized in Section 3.8.3.

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APPENDIX A
LIST OF AGENCIES, ORGANIZATIONS AND PERSONS CONTACTED

The project mailing list contains about 200 contacts including tribes; public officials; local, state and federal agencies; news media; potentially interested or affected landowners; interest groups; businesses; special districts; libraries; and the media. They have directly received or have been instructed on how to receive all project information, and were contacted to solicit review and comment on the draft EIS.

Tribes or Tribal Groups

Burns Paiute Tribe
Coeur d'Alene Tribe
Columbia River Intertribal Fish Commission
Confederated Tribes and Bands of the Yakama Nation
Confederated Tribes of the Colville Reservation
Confederated Tribes of the Umatilla Indian Reservation
Confederated Tribes of the Warm Springs Reservation
Kalispel Indian Community of the Kalispel Reservation
Kootenai Tribe of Idaho
Nez Perce Tribe
Nisqually Indian Tribe
Shoshone-Bannock Tribes of Fort Hall
Spokane Tribe of Indians
Tulalip Tribes of the Tulalip Reservation
Upper Columbia United Tribes

Washington Public Officials

Governor Christine Gregoire
US Senator Maria Cantwell
US Senator Pat Murray
US Representative Cathy McMorris
State Senator Linda Evans-Parlette
State Senator Bob Morton
State Representative Mike Armstrong
State Representative Cary Condotta
State Representative Joel Kretz
State Representative Bob Sump

Local Governments

Okanogan County, WA
Cities, WA
- Brewster
- Bridgeport
- Okanogan

Omak
Tonasket

Washington State Government

Department of Ecology
Department of Natural Resources
Department of Fish & Wildlife
Parks and Recreation Commission
Department of Transportation
Department of Water Resources

Federal Agencies

Army Corps of Engineers
Bonneville Power Administration
Bureau of Indian Affairs
Bureau of Land Management
Bureau of Reclamation
Department of Energy
Environmental Protection Agency
Federal Emergency Management Agency
Fish and Wildlife Service
Forest Service
NOAA National Marine Fisheries Service
Natural Resources Conservation Service

News Media

The Columbia Basin Bulletin
The Chronicle, Omak WA
The Methow Valley News, Twisp WA
The Spokesman Review, Spokane WA
The Wenatchee World, Wenatchee WA
Various radio stations covering the Okanogan Subbasin and the greater project area

Libraries

Brewster Library
Bridgeport Library
Coulee City Library
East Wenatchee Library
Grand Coulee Library
Leavenworth Library
Okanogan Library
Omak Library
Oroville Library

Pateros Library
Wenatchee Library

Businesses, Special Interests, and Other Organizations

American Rivers
Blue Bird, Inc.
Cascade and Columbia River Railroad
Chelan County PUD
Colville Tribal Enterprises Corporation
Conservation Northwest
Douglas County PUD
Grant County PUD
H J Properties
Lakewood Golf Club, Inc.
Longanecker Orchards, Inc.
Midway Oroville Building Supply
Native Fish Society
Northwest Power and Conservation Council
Nespelem Valley Electric Cooperative
Okanogan County PUD
Okanogan Tourism Council
Save Our Wild Salmon Coalition
Sierra Club
Trout Unlimited
V and B Properties LLC
Whitestone Cattle Company LLC

Other Interested or Potentially Affected Parties, including Local Landowners

Approximately 100 separate contacts

APPENDIX B
FISH, WILDLIFE AND PLANT SPECIES IN THE GENERAL AREA

Table B-1. Fish Species Occurring in the Okanogan River Subbasin and the Columbia River between Wells and Chief Joseph Dams

Okanogan Subbasin	Columbia River	Common Name	Scientific Name	Federal Status	State Status	Native?
	X	White sturgeon	*Acipenser tranmontanus*			Yes
	X	Lake whitefish	*Coreganus clupeaformis*			Yes
X		Westslope cutthroat trout	*Onchorhynchus clarki lewisi*	SoC		Yes
X		Lahonton cutthroat trout	*Onchorhynchus clarki lewisi*			No
X	X	Rainbow trout	*Onchorhynchus mykiss*			Yes
X	X	Redband trout	*Onchorhynchus mykiss*	SoC		Yes
X	X	Upper Columbia River summer steelhead trout	*Onchorhynchus mykiss*	T	C	Yes
X	X	Sockeye salmon	*Onchorhynchus nerka*			Yes
X	X	Kokanee	*Onchorhynchus nerka*			Yes
X	X	Upper Columbia River summer/fall Chinook salmon	*Onchorhynchus tshawytscha*	N	C	Yes
X	X	Upper Columbia River spring Chinook salmon	*Onchorhynchus tshawytscha*	E	C	Yes
X		Pygmy whitefish	*Prosopium coulteri*	SoC	S	Yes
X	X	Mountain whitefish	*Prosopium williamsoni*			Yes
	X	Brown trout	*Salmo trutta*			No
	X	Bull trout	*Salvelinus confluentus*	T	C	Yes
X		Brook trout	*Salvelinus fontinalis*			No
X		Lake trout	*Salvelinus namaycush*			No
X	X	Chiselmouth	*Acrocheilus alutaceus*			Yes
X		Grass carp	*Ctenopharyngodon idella*			No
	X	Common carp	*Cyprinus carpio*			No
X	X	Peamouth	*Mylocheilus caurinus*			Yes
X	X	Northern pikeminnow	*Ptychocheilus oregonensis*			Yes
X	X	Longnose dace	*Rhinichthys cataractae*			Yes
X	X	Leopard dace	*Rhinichthys falcatus*	none	C	Yes
X	X	Umatilla dace	*Rhinichthys umatilla*	none	C	Yes
X	X	Speckled dace	*Rhinichthys osculus*			Yes
X	X	Redside shiner	*Richardsonius balteatus*			Yes

Okanogan Subbasin	Columbia River	Common Name	Scientific Name	Federal Status	State Status	Native?
X	X	Longnose sucker	*Catostomus catostomus*			Yes
X	X	Bridgelip sucker	*Catostomus columbianus*			Yes
X	X	Largescale sucker	*Catostomus macrocheilus*			Yes
X	X	Burbot	*Lota lota*			Yes
	X	Pumpkinseed	*Lepomis gibbosus*			No
X	X	Smallmouth bass	*Micropterus dolomieu*			No
X	X	Largemouth bass	*Micropterus salmoides*			No
	X	Black crappie	*Pomoxis nigromaculatus*			No
	X	Yellow perch	*Perca flavescens*			No
	X	Walleye	*Stizostedion vitreum vitreum*			No
X	X	Prickly sculpin	*Cottus asper*			Yes
	X	Mottled sculpin	*Cottus bairdi*			Yes
X	X	Torrent sculpin	*Cottus rhotheus*			Yes

Sources: WDFW 2005; Wydoski and Whitney 2003

E – Federal endangered species
T – Federal threatened species
SoC – Federal species of concern
S – Washington State sensitive species
C – Washington State candidate species
N – Not warranted

Table B-2. Wildlife Species and Associated Habitats in the General Area

Common Name	Scientific Name	Habitats
BIRDS		
Canada goose	*Branta canadensis*	A, OW, R, W
Brandt	*Brant bernicala*	OW, R, W
Mallard	*Anas platyrhynchos*	OW, R, W
Common loon	*Gavia immer*	OW, R, W
Yellow-billed loon	*Gavia adamsii*	OW, S/I
Green-winged teal	*Anas crecca*	OW, R, W
Lesser scaup	*Aythay affinis*	OW, R, W
Greater scaup	*Aythya marila*	OW, R, W
Barrow's goldeneye	*Bucephala islandica*	OW, R, W
Common goldeneye	*Bucephala clangula*	OW, R, W
Hooded merganser	*Lophodytes cucullatus*	OW, R, W
Common merganser	*Mergus merganser*	OW, R, W
Bufflehead	*Bucephala albeola*	OW, R, W
Wood duck	*Aix spousa*	OW, R, W
Northern pintail	*Anas acuta*	OW, R, W
Redhead	*Aythya americana*	OW, R, W
American widgeon	*Anas americana*	OW, R, W
Gadwall	*Anas strepera*	OW, R, W
Canvasback	*Aythya valisineria*	OW, R, W
Ringneck duck	*Aythya collaris*	OW, R, W
Killdeer	*Charadrius vociferous*	A, MD, OW, R, W
Great blue heron	*Ardea herodias*	A, R, W
Ring-billed gull	*Larus delawarensis*	MD, OW, R
California gull	*L. californicus*	MD, OW, R
Bald eagle	*Haliaetus leucocephalus*	OW, R, W
Golden eagle	*Aquila chrysaetos*	S-S
Osprey	*Pandion haliaetus*	OW, R
Red-tailed hawk	*Buteo jamaicensis*	A, R
Swainson's hawk	*B. swainsoni*	A
American kestrel	*Falco sparverius*	A, S-S
Northern harrier	*Circus cyaneus*	A, S-S
Loggerhead shrike	*Lanius ludovicianus*	S-S
Turkey vulture	*Cathartes aura*	A, OW, S-S
Burrowing owl	*Athene cunicularia*	S-S
Short-eared owl	*Asio flammeus*	S-S
Great Horned owl	*Bubo virginianus*	S-S
California quail	*Callipepla californica*	A, R, S-S

Common Name	Scientific Name	Habitats
Gray partridge	*Perdix perdix*	A, S-S
Chukar	*Alectoris chukar*	A, R, S-S
Ruffed grouse	*Bonasa umbellus*	A, R
Ring-necked pheasant	*Phasianus colchicus*	A
Merriam's turkey	*Meleagris gallopavo*	A, S-S
Mourning dove	*Zenaida macroura*	A, R
Downy woodpecker	*Picoides pubescens*	R
Lewis' woodpecker	*Melanerpes lewis*	R
Northern flicker	*Colaptes aurates*	R
Yellow warbler	*Dendroica petechia*	W
Northern oriole	*Icterus galbula*	R
Black-capped chickadee	*Parus atricapillus*	R
Western kingbird	*Tyrannus veticalis*	W
House finch	*Carpodacus mexicanus*	MD, R, S-S
Spotted towhee	*Pipilo maculates*	R
Sage thrasher	*Oreoscoptes montanus*	S-S
Sage sparrow	*Amphispiza belli*	S-S
Brewer's sparrow	*Spizella breweri*	S-S
Grasshopper sparrow	*Ammodramus savannarum*	S-S
Belted kingfisher	*Ceryle alcyon*	OW, R
Yellow-headed blackbird	*Xanthocephalus xanthocephalus*	W
Red-winged blackbird	*Agelaius phoeniceus*	R, W
Brewer's blackbird	*Euphagus cyanocephalus*	OW, R, W
Black-billed magpie	*Pica pica*	MD, OW, R
American crow	*Corvus brachyrhynchos*	A, MD, OW, R, W
Common raven	*C. corax*	A, R, W
European starling	*Sturnus vulgaris*	A, MD, R
MAMMALS		
Mule deer	*Odocoileus hemionus*	A, R, S-S
White-tailed deer	*O. virginianus* ssp. ochrourus	A, R, S-S
Bobcat	*Felis rufus*	R, S-S, W
Black bear	*Ursus americanus*	A, MD, R, W
Coyote	*Canis latrans*	A, MD, S-S
Raccoon	*Procyon lotor*	MD, R, S/I
River otter	*Lutra Canadensis*	OW, R, S/I
Muskrat	*Ondatra zibethicus*	OW, R, S/I
Beaver	*Castor canadensis*	OW, R, S/I
Mink	*Mustela vison*	R, S/I
Yellow-bellied marmot	*Marmota flaviventris*	S-S
Porcupine	*Erethizon dorsatus*	S-S

Common Name	Scientific Name	Habitats
Bushy woodrat	*Neotoma cinerea*	S-S
Sage vole	*Lemmiscus curtatus*	S-S
Water vole	*Microtus richardsoni*	R
Merriam's shrew	*Sorex merriami*	S-S
Water shrew	*Sorex palustris*	R, W
Cottontail rabbit	*Sylvilagus spp.*	A
Pallid bat	*Antrozous pallidus*	A, OW
Western pipistrelle (bat)	*Pipistrellus hesperus*	A, OW
Long-legged bat	*Myotis volans*	A, OW
Spotted bat	*Euderma maculata*	A, OW
California bat	*Myotis californicus*	R, A, MD
Townsend's big-eared bat	*Plecotus townsendii*	A, MD
REPTILES		
Sagebrush lizard	*Sceloporus graciosus*	S-S
Northern Alligator lizard	*Elgaria coerulea*	A
Western Fence lizard	*S. occidentalis*	A
Western skink	*Eumeces skiltoniamus*	A
Common garter snake	*Thamnophis sirtalis*	A, MD, R
Gopher snake	*Pituophis melanoleucus*	A, MD, R
Western rattlesnake	*Crotalus vividis*	MD, SS
Western garter snake	*Thamnophis elegans*	A, MD, R
Painted turtle	*Chrysemys picta*	OW, W

Note: A = Agriculture; MD = Mixed-use Development; OW = Open Water; R = Riparian; S/I = Shoreline; S-S = Shrub-Steppe; W = Wetland

Table B-3. Culturally Significant Plant Species Potentially Occurring in the General Area

Common Name	Scientific Name	Habitats
Desert-parsleys	*Lomatium* spp.	SS
Onions	*Allium* spp.	SS
Lilies	*Calochortus* spp.; *Fritillaria* spp.; *Lilium* spp.; *Erythronium* spp.	R, W
Sagebrush	*Artemesia* spp.	SS
Currants	*Ribes* spp.	R
Bitterroot	*Lewisia rediviva*	SS
Serviceberry	*Amelanchier alnifolia*	R
Hawthorn	*Crataegus* spp.	R
Bunchgrasses	*Agropyron* spp.; *Elymus* spp.	SS
Brodiaea	*Brodiaea* spp.	SS
Buttercup	*Ranunculus* spp.	R, W
Tules	*Scirpus* spp.	R, W
Willows	*Salix* spp.	R, W
Cottonwood	*Populus balsamifera* ssp. *trichopcarpa*	R, W
Rabbitbrush	*Chrysothamus* spp.	SS
Sumac	*Rhus glabra*	R
Yarrow	*Achillea millefolium*	A, MD, SS,
Plantain	*Plantago* spp.	A, MD, R,
Wild rose	*Rosa* spp.	R, W
Dogwood	*Cornus* spp.	R, W
Balsamroot	*Balsamorhiza sagittata*	SS
Buckwheat	*Eriogonum* spp.	SS
Ricegrass	*Oryzopsis* spp.	SS
Cherry	*Prunus* spp.	R
Alders	*Alnus* spp.	R
Asters	*Aster* spp.	SS
Thimbleberry	*Rubus parviflorus*	R
Horsetail	*Equisetum* spp.	R
Raspberry	*Rubus* spp.	R
Poison Ivy	*Toxicodendron radicans*	R
Elderberry	*Sambucus* spp.	R
Oregon grape	*Berberis aquifolium*	R
Arnica	*Arnica* spp.	R, SS
Angelica	*Angelica* spp.	R, W
Spirea	*Spiraea* spp.	R, W
Pachistima	*Pachistima myrsinites*	R

Common Name	Scientific Name	Habitats
Vetch	*Vicia* spp.	A, R
Bluebell	*Mertensia paniculata*	R
Lupine	*Lupinus* spp.	SS
Valarian	*Valeriana* spp.	R
Snowberry	*Symphoricarpos albus*	R
Solomon seal	*Smilacina* spp.	R
Fairybells	*Disporum* spp.	R
Stinging nettle	*Urtica dioica*	R, W
Prickly pears	*Opuntia* spp.	SS
Mint	*Mentha* spp.	R, W
Bedstraw	*Galium* spp.	MD, R
Strawberry	*Fragaria* spp.	MD, R
Mule ears	*Wyethia glabra*	MD, R, S-S
Mullein	*Verbascum thapsus*	A, MD, SS
Mountain sweet cicely	*Osmorhiza chilensis*	R
Ryegrass	*Lolium perenne*	A, MD
Dandelion	*Taraxacum* spp.	A, MD

Note: A = Agriculture; MD = Mixed-use Development; R = Riparian; SS = Shrub-Steppe; W = Wetland;

Table B-4. Potential Noxious Weeds in the Okanogan River Subbasin

Common Name[1]	Scientific Name	State Status[2]	County Status[3]
Russian knapweed	*Acroptilon repens*	B	B/C reduction
Jointed goatgrass	*Aegilops cylindrica*	C	
Whitetop	*Cardaria draba*	C	B/C reduction
Musk thistle	*Carduus nutans*	B3	New invader, B-designate
Spotted knapweed	*Centaurea biebersteinii*	B3	B/C reduction
Diffuse knapweed	*Centaurea diffusa*	B	B/C reduction
Yellow star thistle	*Centaurea solstitialis*	B3	New invader
Rush skeletonweed	*Chondrilla juncea*	B3	New invader
Canada thistle	*Cirsium arvense*	C	B/C suppression
Poison hemlock	*Conium maculatum*	C	
Field bindweed	*Convolvulus arvensis*	C	
Common crupina	*Crupina vulgaris*	A	A
Scotch broom	*Cytisus scoparius*	B3	B-designate
Wolf's milk	*Euphorbia esula*	B3	B-designate
Orange hawkweed	*Hieracium aurantiacum*	B3	New invader
Meadow hawkweed	*Hieracium caespitosum*	B3	New invader
Dalmatian toadflax	*Linaria dalmatica*	B3	B-designate
Yellow toadflax	*Linaria vulgaris*	C	New invader, B/C reduction
Purple loosestrife	*Lythrum salicaria*	B3	B-designate
Scotch thistle	*Onopordum acanthium*	B3	New invader, B-designate
Reed canarygrass	*Phalaris arundinacea*	C	
Russian thistle	*Salsola iberica Sennen*		B/C suppression
Tansy ragwort	*Senecio jacobaea*	B3	B-designate
Silverleaf nightshade	*Solanum elaeagnifolium*	A	A
Buffalobur nightshade	*Solanum rostratum*	A	A
Johnsongrass	*Sorghum halepense*	A	A
Puncturevine	*Tribulus terrestris*	B	B/C suppression
Mullein	*Verbascum thapsus*		B/C suppression

[1] List of species potentially present based on Ashley and Stovall 2004.

[2] State status based on Washington State Noxious Weed Control Board, 2007
A: Non-native species with limited distribution; state law requires eradication. B: Species established in some regions but are of limited distribution or not present in other regions of the state; treatment varies by region. B3: designated for control in Region 3 which includes Okanogan County. C: species widely established or of special agricultural concern; designation allows counties to enforce control, if desired.

[3] County status based on Okanogan County Noxious Weed Control Board, 2007
New invader: Okanogan County reserves the right to develop and coordinate control programs, which may pose a very serious threat in the county while not yet recognized by the state as class A. A: Okanogan County adopted the state class A species. B-designate: Okanogan County adopted the state Region 3 class B species; control means prevention of all seed production within a single year with the goal being to reduce the plant's acreage to where eradication is possible. B/C reduction: Includes state class B and C species that are too widespread to be controlled or eradicated county-wide; the long-term goal is to reduce the area occupied, especially high-priority areas such as roadways, driveways and property boundaries. B/C suppression: Includes state class B and C species that are so widespread that prevention of seed reproduction within a single season is not practical. Nonetheless, the county encourages landowners to control them.

APPENDIX C
COMMENTS ON THE DRAFT EIS AND RESPONSES

In May 2007, the Chief Joseph Hatchery Program Draft EIS was sent to agencies, groups, individuals, and libraries for public review and comment. Public hearings were held in Okanogan, Washington (June 6, 2007) and at Chief Joseph Dam near Bridgeport, Washington (June 7, 2007) during the 45-day public review and comment period, which ended on June 18, 2007. To allow incoming mail to clear the postal system, the time period to receive written comments was extended to June 27.

Comments received by BPA on the draft EIS came as letters, project-specific comment forms and electronic mail. Each comment document was numbered in the order in which they were received (i.e., CJH-001 to CJH-010), and individual comments within each document were identified and numbered (e.g. 1, 2, 3, etc.). Copies of the original comment documents showing the numbered comments are included in this appendix. Each document is followed by the official agency responses for each numbered comment.

Responses to individual comments show where specific analysis or other information has been supplemented or updated in the main text of this final EIS. Other changes to the EIS have also been made to improve its formatting, presentation and appearance; clarify certain terminology; correct typographic errors; add updated data to cover time that has lapsed since the draft EIS was developed; supplement the discussion of options eliminated from detailed study (new Appendix D); and update the table of contents and index. Individually and collectively, these changes are minor in nature and are not substantive enough to warrant developing a supplemental EIS for additional public review and comment.

Comment on **Chief Joseph Hatchery Program** **CJH-001**
View open comment periods on http://www.bpa.gov/comment

Comment #

1 I am concerned about the fish hatchery hooking up to Bridgeport sewer system. I believe that Bridgeport's current sewer capacity is very limited and will not be able to support this facility without a major upgrade to its current capacity. So if the hatchery can't hookup to Bridgeport's sewer system and the on-site buried drain field disposal option is prohibit due to soil conditions or other factors what is the solution to the hatchery waste disposal problem as per ref 2.1.5 Utilities and Water Supply stated below. Thank You

Roland Shumate
Bridgeport, WA 98813

2.1.5 Utilities and Water Supply The utilities and water supply systems would be installed as part of the hatchery complex construction over about two years. Electric power for the hatchery complex and water supply pumps would be provided by Nespelem Valley Electric Cooperative, whose lines currently span the sites. A new 125kv /480kv transformer and several hundred feet of overhead power line within the hatchery site would be installed. The existing telephone service along Half-Sun Way would be extended approximately 1,000 feet to the hatchery. Two sanitary sewer options being considered are an on-site disposal system or a force main connecting to the City of Bridgeport's service. Domestic wastewater from the hatchery would be relatively minor and could easily be handled by an on-site buried drain field disposal system. However, if soil conditions or other factors are found to prohibit this option, then a lift station and force main could be considered. Although not expected to be needed, the lift station /force main option would consist of a 2,000-gallon buried concrete tank, 2 submersible pumps, and a 2- to 4-inch-diameter plastic pipe extending about 3,000 feet to Bridgeport's nearest sewer main.

CJH-001
Response 1

Soil and hydrologic conditions at the hatchery site appear to be suitable for a small on-site wastewater system consisting of appropriately sized septic tanks and drain fields to treat effluent from facility toilets, showers, sinks, etc. (EIS Section 2.1.5). If it is discovered later that for some reason an alternative is needed and if the City of Bridgeport's sewer system cannot accept additional flow as currently built, BPA would explore how to fund the expansion of the city's system and what the impacts of that expansion would be. Other options may also be examined such as piping to a location that has suitable soils and conditions for a septic system, or a small package treatment system that improves water quality before discharge.

* * * * *

Comment #

1 We support the creation of the Fish Hatchery and believe it is needed for many purposes. There are significant concerns raised about the EIS contentions of limited impacts, however. Comments from our Chief Joseph Dam Project Office, Environmental Resources Section, Civil Projects Branch, and Water Management Section follow:

2 General: All aerial photos appear to be over 20 years old and do not reflect current conditions and facilities in place. New aerials should be used for an accurate representation of the project impacts.

3 General: In many of the figures, particularly the aerial photos with superimposed text and drawings, much of the text is illegible. Request improved versions.

4 Sec. 2.1.4: States "A paved access road would also be built from the existing fishing access down to the bank of the Columbia River where the fish ladder and adult collection/holding facility would be installed." The current gravel road is single-lane and opened only during the day in the summer due to hazardous conditions. There have been multiple washouts and vehicle accidents on this road. There would be significant engineering effort and cutting into the hillside to create a safe paved road in this location. The EIS should address the impacts of the road construction.

5 Sec. 2.1.4: This specific implementation seems to be relegating the effects on our visitors and existing recreational facilities to a minor status. In contrast, we believe the impacts will be greater than stated, and possibly significant, unless they are fully accounted for and mitigated by careful design, planted barriers and location of supporting facilities.

Sec. 2.1.4: The hatchery location is probably preordained by need to be close to the river on available land. The hatchery adjoins Chief Joseph Dam's Orientation Area not the misnomer "Visitor Center" as stated on page 2-5. The area serves as the primary entry point for visitors to the Chief Joseph Dam Project. The extensive North Shore Trail System begins at a trailhead at the Orientation Area, goes to a viewing platform along the river, and then follows the river bank until it crosses Half-Sun Way just before the Lower Spillway Road, then continues a varying path all the way to Bridgeport State Park. Aerial photography (Figure 2-2) dates from before the creation of the Orientation Area, i.e. before 1988 and all subsequent recreational development. Using such an old photograph implies that the land has been sitting there undeveloped. The hatchery will certainly affect visitor aesthetics and the use of these recreational facilities.

6 Sec. 2.1.4: The Orientation Area is one of the most heavily used areas of the Chief Joseph Dam Project. It serves as a highway rest area for a very large stretch of highway. It is the first chance that the Project has to impart information and form an impression in our visitors' minds. It is hard to judge if the fish hatchery will augment or detract from the visitors using this Orientation Area as currently presented in this plan. To clearly resolve that issue, visitor facilities should be developed into this hatchery complex and directly connected to the central Orientation area walkways, so visitors can easily walk into the hatchery area if they choose. That would create a net positive effect. Since visitors would likely stay longer in that case another parking area along Half-Sun Way should be created to handle the volume.

Comment #

7 Sec. 2.1.4: To best augment our visitors' experience, the hatchery visitor facilities should be on the West end i.e. next to the Orientation Area. The current design shows them on the East end near the Lower Spillway Rd. If they are kept at that location, these facilities will not augment the Orientation Area nor will these facilities be visited by as many visitors.

8 Sec. 2.1.4: The Labyrinth/Maze were added to the Orientation Area to augment our visitors' experience. The Labyrinth is on the East side of the North Shore (NS) Trail just South of the central Orientation Area. The hatchery development as shown then would butt up against the whole East side of the Orientation Area, the Labyrinth, and the portion of the NS Trail that goes from the trailhead to the Viewing Platform on the bank of the river. The development would also be North and East of the trail as it continues along the riverbank and then goes inland to cross Half-Sun Way.

Labyrinths use the concept of a meditative journey to a physical center to achieve a spiritual journey to one's center. The visual distraction and perhaps audio distraction of an adjoining fish hatchery would be quite counterproductive to the Labyrinth's goal. That effect needs to be diminished by design and also by perhaps a naturally appearing series of vegetative barriers to isolate the Labyrinth users from the hatchery.

9 Sec. 2.1.4: The text on page 2-5 describes that raceway waste would be pumped to the west end of the complex and treated there. The west end of the complex is immediately joining the Orientation Area, with Labyrinth and the NS Trail System. Are there any odors produced by this waste treatment that are incompatible with recreating visitors? Will there be odors produced during concentrated waste removal? The location of these waste treatment ponds should be relocated to as far away from recreating visitors as possible. We suggest along Half-Sun Way where no trail goes by the area.

10 Sec. 2.1.4: The text on page 2-5 describes realigning 300 feet of the NS Trail, but doesn't identify which 300 feet so it is hard to judge the impact of that realignment.

11 Sec. 2.1.4: The waterlines on figure 2-2 will need to interface with the Lower Spillway Fishing Area development. That development includes steps down to the right training wall from the parking lot. The NS Trail on the right terrace would also need to be gone under. The well water lines appear to follow exactly the same path as the NS Trail does as it ascends the hill to the upper terrace.

12 Sec. 2.1.4: The housing area for the hatchery is planned for WA state land essentially right across Half-Sun Way from the Dunes Trailhead on the NS Trail. Mitigation for the effect of this housing area on the aesthetics of those recreating on the trail will be needed. It is strongly suggested that naturally appearing dunes and vegetation be used to screen this housing area from visitors using the trailhead, trail, golf course and traveling to and from all the facilities of Bridgeport State Park. A previous hatchery housing development, at the hatchery adjoining the Corps' Big Hole Gravel Pit, included the unsightly development of a vehicle junkyard on hatchery land. Such developments need to be strongly prohibited at this proposed housing area.

Comment #

Sec. 2.1.4: Access to this housing area and also all utility lines serving it (and the hatchery) will need to account for the NS trail which is on the N side of Half-Sun Way. The housing area might better be located for our purposes not so far east, so it would not be as easily seen by visitors who use Bridgeport State Park and the NS Trail. Access could then be using the existing dirt road that goes north from Half-Sun Way (opposite the Corps Pump Rd.) to service the high BPA towers or by having access off of the existing Jack Wells Cutoff Rd.

Figure 2-3: Much of the text in the figure is illegible. In particular, we cannot tell whether the proposed wet well for collecting relief tunnel water is shown. Also don't know if proposed pipelines are shown.

13 Figure 2-4 (Hatchery Water Supply Features): Points out the locations for the 3 water supply sources, but no features or details of the design are really shown. It would be better if a larger scale could be used so that more individual features, as they are currently known, could be depicted.

14 Sec. 2.1.5, 3rd to last para.: Change 3rd to last sentence to include the fact that a new set of stoplogs would be needed.

15 Sec. 2.1.5, last para: Summer temperatures of relief tunnel water may actually be more suitable for desired conditions, because temperatures in relief tunnel water are 180^{o} out of phase with reservoir temperatures.

16 Sec. 3.2.1, and Sec. 3.2.2: These sections do not mention findings of Ashbrook et al (2006), which documents movement of radio-tagged adult summer/fall Chinook in the Chief Joseph Dam tailrace and into tributaries above Wells Dam. This study was done in part specifically to inform the location of the hatchery attraction ladder. Suggest all relevant results of the study be incorporated into appropriate locations in the EIS.

Ashbrook, C.E.,, E.A. Schwartz, C.M. Waldbillig, and KW. Hassel. 2006. Migration and movement patterns of adult Chinook salmon (*Oncorhynchus tshawytscha*) above Wells Dam. Report submitted to Colville Confederated Tribes and Bonneville Power Administration. Washington Dept. of Fish and Wildlife, Olympia, Washington. 74 pp.

17 Sec. 3.4.2: Yes, terraces were seeded to 2 species of non-native grasses. These grasses were selected because they had high tolerance to herbicide application for broadleaf control (intent of original conversion was noxious weed control then later wildlife habitat), drought tolerance in event of potential periodic irrigation failures, and tight soil holding capabilities. No native species provides this combination while allowing maximum effort for noxious weed control.

18 Sec. 3.4.2: Impacts to shrub steppe and sagebrush/bitterbrush vegetation are probably understated. Once this habitat is gone, it is gone forever. We realize that the entire area upstream from the VOA will be converted but suggest we minimize disturbances elsewhere. Concern is statements about 3 houses and storage area and "trailer park" etc. in the proposed housing plan. Seems pretty vague.

Comment #

19 Appendix B: Suggest changing "resident" designation to "native." "Resident" generally means non-anadromous.

20 Sec. 3.5.2, Slope Stability, 2nd to last sentence: Pipelines are actually buried, for seismic and security reasons, rather than being exposed.

21 Section 3.6.1 Affected Environment, Water Quality, 1st para: The 2006 Washington Dept. of Ecology (WDE) standards were approved by the EPA on December 21, 2006.

22 Section 3.6.1 Affected Environment, Water Quality, 2nd para: This paragraph should note the classification of the Columbia River at Chief Joseph Dam. The WDE standards are slightly different than the Colville Tribe standards for the Columbia River. For example, the Colville Tribe classifies the Columbia as Class I above the dam and Class II below the dam, while the WDE classifies the Columbia above and below the dam as a Non-Core Salmon/Trout designation. Temperature criteria are different for the WDE and Tribe standards.

23 Sec. 3.6.1, Affected Environment, Water Quality, Columbia River, 1st para: States "Total phosphorous [sp] measurements for Rufus Woods Lake in 1995 averaged 30 mg/L." Units are incorrect; should be µg/L. Should also update nutrient data. Total phosphorus concentrations measured in Rufus Woods Lake during 2004 ranged from about 5 to 10 µg/L.

24 Sec. 3.6.1, Affected Environment, Water Quality, Columbia River, 4th para.: Full year temperature data are collected downstream of the dam at the tailwater station CHQW. Last sentence needs clarifying; what does "elevated" mean in reference to pH? Do you mean that values tended toward basic rather than acidic?

25 Sec. 3.9, Cultural Resources: Does not appear to have accounted for all relevant site documentation from Corps of Engineers. We will supply needed information separately. Contact Lawr Salo, USACE Seattle District, 206-764-3630.

Table 4-1; and Appendix A: Suggest inclusion of consultation with, and concurrence from, the Washington Department of Archeology and Historic Preservation (DAHP)/State Historic Preservation Office (SHPO) concerning determinations under Sec. 106 of National Historic Preservation Act. Suggest also including specific documentation of Tribal Historic Preservation Office consultation as well.

CJH-002

Response 1

Thank you for recognizing the values of the proposed hatchery and your support.

Response 2

Figure 2-2a has been added to the final EIS. It is a larger, more recent aerial photograph showing current conditions and existing facilities. The proposed hatchery complex site layout is superimposed on the image. Figure 2-2a is also available for viewing electronically so that one may zoom into specific areas of interest at http://www.efw.bpa.gov/environmental_services/Document_Library/Chief_Joseph/.

Response 3

Unfortunately, many of the figures in the draft EIS did not reproduce as clearly as expected at the standard 8.5- by 11-inch published size. In the final EIS, BPA has attempted to improve this situation. Also, the draft EIS and final EIS are available electronically so that one may zoom in on any figures at scales better than the printed versions.
http://www.efw.bpa.gov/environmental_services/Document_Library/Chief_Joseph/

The print versions of the draft and final EIS come with a compact disk which includes figures that can be viewed in a similar manner.

Response 4

The final EIS has been revised in Section 2.1.4 to state that the access road to the proposed adult holding area and turnaround would be upgraded and partially paved to provide safer year-round passage. During final design, the Colville Tribes and US Army Corps of Engineers (USACE, the road managers) would be consulted to determine what additional improvements are necessary to accommodate year-round hatchery operations and continued seasonal recreational use. Retaining walls, erosion prevention measures and common Best Management Practices may be employed to lessen roadway reconstruction impacts on the hillside, if necessary. Environmental impacts associated with such improvements would not likely be substantially different from the effects already analyzed and presented in the EIS.

Response 5

The proposed locations of facilities within the hatchery site are largely dependent on engineering practicality and certain physical site characteristics. The design, layout and proposed mitigation measures for environmental effects may undergo minor modifications during the final design phase (should BPA decide to fund the project), but broad scale rearrangement is not desirable from an operational perspective. That is, access control of non-hatchery personnel is very important for security and safety reasons. The USACE would continue to be consulted throughout the final design phase as has been occurring during the conceptual design phase to help improve matters of mutual interest when feasible.

The generic terms ‘visitor center’ and ‘visitor area’ were used in the draft EIS for brevity to refer to the USACE’s Chief Joseph Dam Visitor Orientation Area. Generally in the text and figures of the EIS, the site is more appropriately referred to as the visitor orientation area. Specifically, the visitor orientation area is acknowledged as an existing development and analyzed for impacts in Sections 2.1 Proposed Project, 3.3 Wildlife, 3.7

Land Use, Transportation and Recreation, 3.11 Aesthetics and 3.14 Additional Mitigation Measures. The visitor orientation area is also shown in Figures 2-2, 2-2a (new addition to the final EIS), 2-3, and 3-10.

Section 3.7.2 Recreation, Construction Effects, Hatchery and Housing Sites has been revised in the final EIS to recognize that the visitor orientation area is also accessible via Half-Sun Way, so recreation and construction traffic would interface there for about 20 months during project construction. Section 3.7.2 has also been modified to state that use of the North Shore Trail near the proposed hatchery would be disrupted during facility construction, and that about 300 feet of the trail in the eastern most portion of the project area would be realigned to the south to accommodate hatchery facilities.

Response 6

Hatchery visitation would be allowed, but would be limited to scheduled, structured tours with regulated access to specific areas only. Allowing the general public to walk freely through the hatchery area from the visitor orientation area would create unacceptable safety, security, liability and operational issues (e.g. personal accidents, property damage, interference or conflicts during critical fish culture operations, greater potential for disease transfer). At the visitor orientation area, well managed signage could be used to direct people to the proposed hatchery visitor area location at appropriate times.

Response 7

The hatchery's administrative office and visitor facilities are proposed on the east end of the site (nearest the dam) based on the site's shape (narrow at the east end) and the following criteria:

- Make efficient use of the limited space available to meet the hatchery production and operational goals
- Achieve engineering practicality, like gravity flow of water through the hatchery with minimal earthwork and logical flow of operations.
- Locate hatchery personnel offices near the fish ladder and adult holding raceways for security and operational purposes.
- Accommodate public access to the office and visitor area, but restrict access to critical areas.

Response 8

A detailed landscaping plan would be part of the final design phase should BPA decide to fund the hatchery project. To attempt to screen the hatchery from view from the labyrinth/maze at the visitor orientation area, decisions could be made during final design to reduce visibility through the security fence or to supplement the vegetation (preferably with native species) on the 200- to 300-foot wide strip of land between the sites. The existing irrigation system between the visitor orientation area and the hatchery site could help facilitate this.

However, considering that the visitor orientation area affords an unobstructed view of the magnitude of Chief Joseph Dam and its large transmission system and associated structures, it is likely that the typical viewer's experience would not be markedly diminished by the presence of the proposed hatchery. It is possible that the typical visitor's experience may be enhanced by introducing an attractive element of

mitigation for fisheries impacts to the setting of the dam, its associated facilities and nearby developed recreation sites.

Response 9

The proposed raceway waste treatment and settling ponds are shown in EIS Figure 2-3. The North Shore Trail would pass within 50 feet to the south of them, but the heart of the visitor orientation area would be more than 400 feet away to the northwest (with a westerly prevailing wind direction). Typically, there may be some mildly unpleasant odors at times in the immediate vicinity of hatchery settling ponds, but no pungent or noxious odors would likely be detected farther away. The closest proposed facilities to the visitor orientation area would be the two rearing ponds which would have no odor. To move the settling ponds to the higher side of the site would be cost-prohibitive and add significant engineering technical difficulty and environmental impacts due to deep excavations directly below Half-Sun Way.

Response 10

Specifically, 300 feet of the North Shore Trail along the southeastern edge of the hatchery site near the proposed office building, then uphill to the east towards the Half-Sun Way crosswalk would need to be realigned more to the south (but still on the plateau) to accommodate hatchery development. See EIS Figure 2-2a. The eastern most segment of the new trail alignment would be designed and built to allow the casual hiker to easily traverse the slightly steeper contours encountered at this locale while minimizing the potential for erosion and the need for trail maintenance.

Response 11

The waterlines shown on EIS Figure 2-4 would be trenched under existing trails and roads. Trail and road surfaces would be fully restored after pipeline construction.

Response 12

In the early phases of project planning, a site farther west and closer to the hatchery complex was considered for hatchery personnel housing. The USACE discouraged this site because of its visibility from Chief Joseph Dam. The proposed site was selected with the consensus of the Washington State Parks and Recreation Commission which controls the parcel and other undeveloped land in the vicinity of Bridgeport State Park and the Lake Woods Golf Course. See also Appendix D.

The concern expressed about the potential for adverse reactions from recreationists upon viewing the housing site is acknowledged in EIS Sections 3.7 Recreation and 3.11 Aesthetics. Both sections have been slightly revised in the final EIS to include the specific vantage point of North Shore Trail users.

A detailed landscaping plan for the housing site would be part of the final design phase should BPA decide to fund the project. Decisions could be made through the landscaping plan to try to reduce the visibility or screen the housing from view from the trailhead. It is likely that the housing site could only be slightly obscured from view from the trailhead and Half-Sun Way. The housing site would likely remain very visible to users of the trail in the vicinity of the housing site. The Confederated Colville Tribes as managers of the housing site would be responsible in the long-term to assure equipment storage and property maintenance actions are sensitive to viewing by others.

Response 13

EIS Figure 2-4 points to the Proposed Relief Tunnel Pump Station location near the base of Chief Joseph Dam, the Proposed Reservoir Water Supply Tap and the well field pipeline route (white print). The pipeline routes are shown as heavy black lines. Also see CJH 002, Response 3 above.

EIS Section 2.1.5 describes the major elements of the water supply system using terms and a level of detail that BPA thought was appropriate for the average reader of the EIS. More detailed information on the system has been provided to certain USACE personnel through numerous review and consultation efforts to date. Additional consultation with the USACE would occur on these elements if the project proceeds to the final design phase. Available preliminary engineering design drawings of specific features can be provided by BPA to any parties on request.

Response 14

EIS Section 2.1.5 states that a pipeline shutoff would be installed in an existing slot at the reservoir water inlet. Section 2.1.5 has been modified to add that new stop logs or a custom gate well panel would be installed in the existing stop log slot. This feature would be designed so that it could be quickly lowered into position to seal off water flow through the irrigation tap in case of emergency.

Response 15

EIS Section 3.6.1 (last paragraph) acknowledges that the difference in summer water temperatures between the relief tunnel and Lake Rufus Woods is important for providing optimum fish production conditions.

Response 16

EIS Section 2.1.2 describes the Ashbrook et al 2006 study, although it does not cite it directly because it was a work in progress (pre-draft) at the time of development of the draft EIS. The Ashbrook study has been added to the citations in Chapter 6: References for the final EIS.

An objective of the Ashbrook et al study was to determine whether the proposed hatchery ladder would be in a suitable location to draw adult Chinook salmon into the hatchery. Applying radio telemetry techniques, Ashbrook found that most fish (70%) were first detected in the vicinity of Chief Joseph Dam migrating along the right bank where the hatchery ladder is proposed. Chinook spent more time along the right bank of the river in the vicinity of the proposed hatchery than along the river's left bank. Also, once in the area, most fish moved between both banks of the river. These data suggest that the ladder should be successful in attracting Chinook.

Response 17

Thank you for explaining the objectives in choosing the species seeded onto the proposed hatchery site in the past (EIS Section 3.4.1). The proposed plans for management of vegetation after hatchery construction would afford an opportunity to landscape with more native species while continuing to control weeds (EIS Section 3.4.2).

Response 18

EIS Section 3.4.2 and Table 2-3 describe the possible changes to vegetation at and around the proposed hatchery staff housing site. The estimate of about 5 acres of existing bitterbrush shrub-steppe habitat that would be permanently replaced by site development seems appropriate, perhaps over-estimated, by looking at the site plan (Figure 2-5).

Response 19

EIS Appendix B Table B-1 has been revised in the final EIS to change the word "resident" to "native."

Response 20

Pipelines would be buried as stated in EIS Section 2.1.5. The pipeline segment on the face of Chief Joseph Dam would be exposed. This segment was designed according to USACE guidance in the preliminary design phase. All pipeline segments on USACE land would be reviewed with USACE during final design.

Response 21

As of July 10, 2007, the Environmental Protection Agency (EPA) has approved only some of the Washington Department of Ecology (WDOE) 2003 Standards (EPA 2007), as stated in EIS Section 3.6.1. The explanation and Table 1 below provide more specific details about the approval status of the water quality standards that are applicable to the Chief Joseph Hatchery Program (CJHP).

> On March 22, 2006, EPA completed a review of specific aquatic life designated uses and associated temperature criteria contained in the State of Washington's July 2003 revised water quality standards (WQS). EPA disapproved the aquatic life designated use and associated temperature criteria applied to specific water bodies in Washington. In June 2006, Washington proposed revised WQS to address EPA's March 2006 disapproval action. The revised WQS, which were adopted by Washington State on November 20, 2006, were received by EPA on December 8, 2006. EPA is currently undertaking ESA consultation[1] with USFWS and NOAA Fisheries to approve Washington's 2003 standards for which EPA has not yet provided a determination and to approve any additional revised WQS contained in Washington's 2006 revisions.

Table 1. EPA approval status of water quality standards applicable to the CJHP.

EPA Approved 2003 and 2006 Standards[1]	**2003 and 2006 Standards Not Approved by EPA; 1997 Standards in Effect for Federal Clean Water Act Certification**
Fresh water recreation, water supply, and miscellaneous uses.	Fresh water aquatic life designated uses
Toxics and aesthetics narrative	Fresh water aquatic life numeric and narrative temperature criteria
Variance procedures	Fresh water aquatic life numeric dissolved

[1] EPA. 2007. Biological Evaluation of the revised Washington water quality standards, April 10, 2007. Prepared for the USFWS and NOAA Fisheries. EPA Agency, Region 10, Seattle, WA.

EPA Approved 2003 and 2006 Standards[1]	2003 and 2006 Standards Not Approved by EPA; 1997 Standards in Effect for Federal Clean Water Act Certification
	oxygen criteria and dissolved oxygen provision
Site specific criteria	Fresh water aquatic life total dissolved gas criteria provision, special fish passage exemption for the Snake and Columbia Rivers
Use attainability analysis	Waters requiring supplemental spawning and incubation protection for salmonid species
Water quality offsets	Natural and irreversible human conditions
Anti-degradation policy	Procedures for applying criteria
Short term modifications	Use designations in fresh waters
Fresh water narrative temperature criteria	
Fresh water dissolved oxygen narrative criteria	

[1] These provisions were either 1) formally approved by EPA; (2) are a non-substantive change to the 1997 water quality standards that does not require EPA approval; (3) a water quality standard which does not require EPA approval, or (4) a water quality standard where EPA has determined it has no discretionary authority.

Response 22

The WDOE water quality classification of the Columbia River at Chief Joseph Dam is Class A ("excellent") per the 1997 standards. EIS Section 3.6.1 has been modified to include this omission. Thank you for the further explanation of WDOE and Colville Tribes' standards and designations. It is important to note that the WDOE classification below Chief Joseph Dam as Non-Core Salmon/Trout has not been approved by the EPA. See Table 2 below for the EPA approved standards for each CJHP area stream reach.

Table 2. Water quality parameters most applicable to CJHP, and associated EPA approved water quality standard criteria.

Facilities	Ellisforde, Tonasket, Bonaparte, Riverside and Omak ponds	Chief Joseph Hatchery	Omak Creek Pond
River Reach	Okanogan River	Columbia River	Omak Creek
Subject to:	State Criteria	State Criteria	CTCR Criteria
Classification	Class A (freshwater criteria)	Class A (freshwater criteria)	Class II (freshwater criteria)
Temperature Criteria	Temperature shall not exceed 18.0ºC due to human activities. When natural conditions exceed 18.0ºC, no temperature increase is allowed which will raise the receiving water temperature more than 0.3ºC. Incremental temperature increases resulting from point source activities shall not, at any time, exceed t=28/(T+7) in freshwater. Incremental temperature increases resulting from nonpoint source activities	Columbia River from Washington-Oregon border (RM 309.3) to Grand Coulee Dam (RM596.6). Special condition from Washington-Oregon border (RM 309.3) to Priest Rapids Dam (RM 397.1). Temperature shall not exceed 20.0°C due to human activities. When natural conditions exceed 20.0°C, no temperature increase will be allowed which will raise the receiving	Temperature - shall not exceed 18.0ºC due to human activities. Temperature increases shall not, at any time, exceed t=28/(T+7). (I) When natural conditions exceed 18.0ºC, no temperature increase is allowed which will raise the receiving water temperature more than 0.3ºC. (ii) For purposes hereof, "t" represents the permissive temperature change across the dilution zone; and "T"

	shall not exceed 2.8ºC. For purposes hereof, "t" represents the maximum permissible temperature increase measured at a mixing zone boundary; and "T" represents the background temperature as measured at a point or points unaffected by the discharge and representative of the highest ambient water temperature in the vicinity of the discharge.	water temperature by greater than 0.3°C; nor shall such temperature increases, at any time, exceed t=34/(T+9). Special condition - special fish passage exemption as described in WAC 173-201A-060 (4) (b).	represents the highest existing temperature in this water classification outside of any dilution zone. (iii) Provided that temperature increase resulting from non-point source activities shall not exceed 2.8ºC, and the maximum water temperature shall not exceed 18.3ºC.
TDG Criteria	TDG shall not exceed 110% of saturation at any point of sample collection.	TDG must also not exceed an average of 120% as measured in the tailrace of each dam. Averages are based on the 12 highest hourly readings of TDG in any day. Also, there is a maximum TDG one-hour average of 125%, relative to atmospheric pressure, during spillage for fish passage. These temporary, special TDG conditions for the Columbia and Snake rivers are to be reviewed by 2003.	TDG shall not exceed 110% of saturation at any point of sample collection.
DO Criteria	Freshwater - dissolved oxygen shall exceed 8.0 mg/L.		
pH Criteria	pH shall be within the range of 6.5 to 8.5 (freshwater) with a human-caused variation within the above range of less than 0.5 units.		
Turbidity	Turbidity shall not exceed 5 NTU over background turbidity when the background turbidity is 50 NTU or less, or have more than a 10% increase when background turbidity is more than 50 NTU.		
Nutrient Criteria	Nutrient criteria only apply to lakes and reservoirs (with a mean detention time greater than fifteen days) under the 1997 standards. For rivers and streams, criteria for nutrients, such as ammonia, nitrate, nitrite, phosphorus, etc. are covered under toxic, radioactive, or deleterious materials criteria.		Nutrients are not specifically mentioned in the CTCR standards.
Bacteria Criteria	Fecal coliform levels must not exceed a geometric mean value of 100 colonies/100 mL, with no more than 10% of all samples (or any single sample when less than ten sample points exist) exceeding 200 colonies/100 mL		Fecal coliform organisms shall not exceed a geometric mean value of 100 organisms/100 mL, with no more than 10% of samples exceeding 200 organisms/100 mL.
Toxic, radioactive, or deleterious materials	Toxic, radioactive, or deleterious material concentrations shall be below those which have the potential either singularly or cumulatively to adversely affect characteristic water uses, cause acute or chronic conditions to the most sensitive biota dependent upon those waters, or adversely affect public health, as determined by the department (see WAC 173-201A-040 and 173-201A-050).		Concentrations shall be below those of public health significance, or which may cause acute or chronic toxic conditions to the aquatic biota, or which may adversely affect any water use.

Response 23

The units of measure for phosphorus concentration in Lake Rufus Woods shown in EIS Section 3.6.1 have been corrected to reflect µg/l. The 2004 data has been added to the EIS analysis, and the section has been updated to show changes through 2008.

Response 24

EIS Section 3.6.1 has been revised to add that water temperature data is collected downstream of Chief Joseph Dam at station CHQW. The term "elevated levels of pH"

refers to higher pH values (i.e. more basic). According to USACE (2004), the irrigation well near the proposed hatchery site had higher pH levels (probably due to local geological influences) exceeding the WDFW recommended criteria for aquaculture of 8.0, but were still less than the WDOE and CTCR chronic criteria of 8.5. The relief tunnel water and forebay water pH ranged from 7.7 to 7.9, falling within the recommended ranges of WDFW (6.5 to 8), WDOE (6.5 to 8.5), CTCR (6.5 to 8.5), and EPA (6.0 to 9.0).

Response 25

EIS Sections 3.9 and 4.3 discuss the status of cultural resources investigation, effects and consultation relevant to the proposed project sites. Background research conducted for each site included a review of information documented by the USACE, although details were only provided in the EIS when they had relevance to the project effects analysis. Since Section 4.3 is specifically devoted to a discussion of consultation regarding cultural resources protection, that information was not repeated in Table 4-1. Section 4.3 has been updated in the EIS to show the outcome of consultations with the Washington State Historic Preservation Office and the Colville Tribes' Tribal Historic Preservation Officer.

Appendix A intends to reflect the breadth of parties contacted in project scoping and review and comment of the draft EIS. It is not intended to be a specific, exhaustive list of all individuals or entities contacted during all phases of project planning.

Since the EIS discusses the outcomes of consultations with other agencies in its text, copies of official correspondence relative to consultations have not been included to reduce costs and volume of ancillary materials in the EIS. Copies of the correspondence may be made available by BPA on request.

* * * * *

REC: 06/11/07

CJH-003

June 6, 2007

Re: BPA-KEC-4

To Whom It May Concern:

Comment #

1 I support the efforts for the Chief Joseph Hatchery. This facility will be of great benefit to the Colville Tribe, Okanogan County, and others. The effect on the economy and a better understanding are real bonuses.

Old residents tell of the past numbers of fish runs. It is time the tribes and other residents of the area have such a plan implemented. This already has taken place in the mid and lower Columbia River areas.

This plans fits well with the area's changing character, Agriculture, Recreation, ect.

The big picture also may include a major enhancement of Ft. Okanogan Tourist Center by the "Friends of Ft. Okanogan".

The Okanogan River basin can also improve with possible water storages.

The city of Tonasket, as well as others, have/or using fish-viewing to attract visitors. In British Columbia, the Adams River is a fine example.

This project will benefit all with fish and education about the area.

I am looking forward to seeing this project come into being.

Sincerely,

Ralph E. Longanecker

CJH-003

Response 1

Thank you for recognizing the values of the proposed hatchery program and for your support.

* * * * *

WASHINGTON STATE DEPARTMENT OF
Natural Resources

DOUG SUTHERLAND
Commissioner of Public Lands

REC: 6/15/07

CJH-004

June 11, 2007

Bonneville Power Administration
Public Affairs Office – DKC-7
PO Box 14428
Portland, OR 97293-4428

Subject: Draft Environmental Impact Study for Chief Joseph Hatchery Program (DOE/EIS-0384)

To Whom It May Concern:

Comment #

Thank you for the opportunity to review the Draft EIS for Bonneville Power Administration's Chief Joseph Hatchery Program located on the Okanogan River between Chief Joseph Dam and State Highway 17 at River Mile 543 near Bridgeport, Washington, Okanogan County.

The Department of Natural Resources is steward of Washington's aquatic lands and their resources. Aquatic lands are managed for current and future citizens of the state to sustain long-term ecosystem and economic viability; and to ensure access to the aquatic lands and the benefits derived from them.

Washington DNR's management authority derives from the State's Constitution (Articles XV, XVII, XXVII), Revised Code (RCW 79.02 and 79.105) and Administrative Code (WAC 332-30). As proprietary manager of state-owned aquatic lands Washington State Department of Natural Resources has been directed to manage the lands *"...for the benefit of the public."* in a manner that provides *"...a balance of public benefits[1] for all citizens of the state..."* that includes:

"(1) Encouraging direct public use and access;
(2) Fostering water-dependant uses[2];
(3) Ensuring environmental protection; and
(4) Utilizing renewable resources."

---

[1] WAC 332-30-106 defines public benefit as "...that all of the citizens of the state may derive a direct benefit from departmental actions..."

[2] Water dependent uses are those uses that "...cannot logically exist in any location but on the water." Examples include water-borne commerce; terminals; watercraft construction, repair or maintenance; moorage; aquaculture; and log booming. (RCW 79.90.465)

Comment #

In addition, generating revenue in a manner consistent with subsections (1) through (4) of this section is a public benefit. (RCW 79.105.030)

1 The proposed Chief Joseph Hatchery Program crosses over shorelands and bedlands of the Okanogan River owned by the State of Washington and managed by the DNR. I have reviewed the proposal, and our Department does not have any objections to the project as described. However, I would like to highlight several DNR requirements that pertain to this project:

- Under Section 4, it does not include the Department of Natural Resources as an agency involved in the approval process for this project.

2 - Greater detail is needed on how the waste water from the holding/acclimation ponds will be treated before it is discharged. As currently written, it states "per Sate of Washington environmental regulations."

1 (cont.) - All structures (intakes and discharge pipes) situated on state-owned aquatic lands will require a use authorization from the DNR. An Application for Authorization to Use State-Owned Aquatic Lands is enclosed for this purpose.

DNR reserves the right to comment further on all future amendments and revisions to this project proposal.

Again, we appreciate Bonneville Power Administration's consideration of our comments as proprietary manager of the State-owned aquatic lands within and adjacent to the proposed project boundaries. If you have any questions I may be contacted at (509) 933-3847, ext. 22 or by email at cindy.preston@dnr.wa.gov.

Sincerely,

for

Cindy Preston, Land Manager
Aquatic Region/Rivers District

Enclosures

cc: Mickey Carter, Environmental Protection Specialist, BPA, PO Box 3621, KEC-4 Portland, OR 97208

CJH-004

Response 1

EIS Section 4.5.1 and Table 4-1 have been modified to reflect that the Washington State Department of Natural Resources (WDNR) has review and permitting authority for proposed actions within State-owned aquatic lands such as the Okanogan River. Thank you for the notification regarding this authority.

Modifications to existing acclimation pond intakes or outfalls and the construction of similar new features at the Omak and Riverside pond sites may be subject to the WDNR's approval. Approval would be sought as part of the State's Joint Aquatic Resources Permit Application or Application for Authorization to Use State-owned Aquatic Lands should BPA decide to implement the project.

Response 2

Waste from the acclimation ponds would meet state requirements WAC 173-221A-100 for Upland Fin Fish Facilities. Criteria for off-line settling ponds are to remove 85% of suspended solids and 90% of the average monthly settle-able solids. Effluent monitoring at 11 WDFW salmon hatcheries from 1993 to 2005 indicates that the normal raceway flow-through water is within these WAC pollutant limits. It is expected that all CJHP facilities would reflect these results. See the detailed CJH-006 Response 5 below for more information and project specific data.

* * * * *

Confederated Tribes and Bands
of the Yakama Nation

Established by the
Treaty of June 9, 1855

June 12, 2007

CJH-005

Ms. Mickey Carter, Environmental Protection Specialist
Bonneville Power Administration
P. O. Box 3621, KEC-4
Portland, OR 97208-3621

Dear Ms. Carter:

The Yakama Nation would like to take this opportunity to comment on the draft EIS for the proposed Chief Joseph Hatchery (CJH). Unfortunately, we were unable to attend any of the scoping meetings for this project. Though we support projects like the CJH that are intended to recover salmon and increase harvest opportunity, we have strong concerns that this EIS purposely avoids discussion of potential impacts to other hatchery programs or harvest regimes.

Comment #

1 Section 1.6, **Issues Beyond the Scope of this EIS**, states that *"Issues associated with fish restoration, harvest levels, hatchery programs in general, or the relative importance/priorities of other on-going fish protection programs or projects are more appropriately addressed in other forums."* The fact is, this project has the potential to significantly affect existing harvest and production plans jointly developed by resource co-managers. We believe that given this potential *"impact"*, the draft EIS needs a substantially expanded description of how CJH planning and operations will be coordinated with on-going downriver production and harvest management processes.

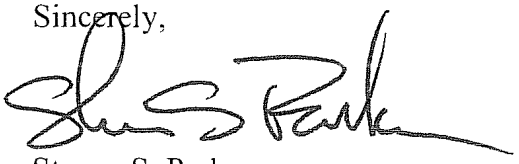
2 Section 1.7, **Relationship to Fish Management Plans, Programs and Projects in the Vicinity,** describes an apparently exhaustive list of major and more minor planning processes, programs and projects. Conspicuously absent from this section is a description of the *U.S. v. Oregon* planning process, which dictates production and harvest management in the entire Columbia River basin. We are mystified by this omission and consider the draft EIS deficient in its analysis of potential impacts of CJH management to on-going co-management processes. Also missing is a description of potential impacts of CJH operations to existing downriver fishery management regimes. As currently written, the draft EIS does not allow the fishery co-managers to evaluate the potential for disruption of on-going downriver fisheries if CCT seeks modifications of existing management plans to achieve CJH broodstock and associated fishery goals. The draft EIS should disclose the intentions of the project sponsor in this regard and describe a process for engaging the relevant co-managers.

3 In Section 2.1, **Proposed Project** (under spring Chinook), the draft EIS discusses potential donor stocks that would be used to initiate the program given that this species is extirpated from the Okanogan Basin. It states that adults in other subbasins in excess of "recovery needs" will be used

as broodstock. We think a better description of what "recovery" means in this context is warranted. A better term is "program" rather than "recovery" because each hatchery program has specific production goals which are legally binding under other agreements. This section also states that *"it is possible that Methow composite stock (currently ESA-listed as Endangered) may eventually be developed for use in place of the Carson stock. Any such decision would be based on consultation with NOAA-Fisheries."* The draft EIS should acknowledge that the Yakama Nation and WDFW also have co-manager jurisdiction and responsibility in these decisions.

We appreciate your consideration of these comments on the draft EIS for the proposed Chief Joseph Hatchery. Please contact me at 509/945-0786, or by email at parker@yakama.com, if you have any questions regarding these comments.

Sincerely,



Steven S. Parker
Fisheries Resource Management Program
Yakama Nation

Cc: Sam Jim, Sr. – Tribal Council
Philip Rigdon – DNR
Paul Ward – FRMP
Tim Weaver – Counsel
Olney Patt, Jr. - CRITFC

CJH-005

Response 1

EIS Section 1.7 describes the general relationship of the proposed Chief Joseph Hatchery Program (CJHP) with various fish management plans, programs and projects in the Columbia River basin and Okanogan River subbasin. Annually, hatchery production and harvest coordination would occur with the Washington Department of Fish and Wildlife pursuant to the *Agreement between the Confederated Tribes of the Colville Reservation and the Washington Department of Fish and Wildlife on Jointly Managed Salmon and Steelhead Populations* signed on June 5, 2007. Washington Department of Fish and Wildlife is also a party to *U.S. v. Oregon* and would ensure that concerns from that process are reflected in the CJHP production and harvest plans developed with the Colville Tribes. CJHP production would also be coordinated by the Colville Tribes through a steering committee that would include the CJHP's cost-sharing partners and through the mid-Columbia Habitat Conservation Plan Hatchery Committee. Other coordination efforts would occur as needed.

The CJHP coordination efforts would require increased contact and closer cooperation between the Colville Tribes and other Columbia River fishery management entities. Because the *U.S. v. Oregon* litigation arose in part to allow tribal fishers to catch a fair proportion of the region's harvestable salmon surplus, the parties to that litigation now co-manage the fishery amicably. BPA expects that those parties would use their skills at resolving *U.S. v. Oregon* challenges to integrate the CJHP into regional production and fisheries management processes.

Whether CJHP production would affect downriver fish production and harvest implies socio-economic ramifications. EIS section 3.8.2 explains that the CJHP production is seen as an additive component to the larger Columbia River fishery aimed at returning more adult Chinook to the Okanogan River and the Columbia River in greater than historical numbers for potentially benefiting the Colville Tribes and local communities without adversely affecting downriver production or harvest regimes.

Response 2

Although the *U.S. v Oregon* process has continuing jurisdiction over fisheries in the lower Columbia River, it does not directly control fish production and harvest management for the Colville Tribes, who are not a party to the litigation (see Master Plan section 7.2.3). CJHP production and harvest would mainly be coordinated via the procedures described in *Agreement between the Confederated Tribes of the Colville Reservation and the Washington Department of Fish and Wildlife on Jointly Managed Salmon and Steelhead Populations* signed on June 5, 2007.

The proposed CJHP would be affected by various harvest management plans and forums, and may, in return, lead to changes in downstream harvest management plans and programs, including those of the Pacific Salmon Treaty, Pacific Fishery Management Council, and the Columbia River Compact, which includes the deliberations of the *U.S. v Oregon* processes. The CJHP Master Plan, incorporated by reference in EIS Section 1.4, describes in more detail the relationship of the CJHP to other local and regional fish management efforts particularly in Sections 6.6 and 6.7 and Chapter 7. The Master Plan may be viewed at:
http://www.efw.bpa.gov/environmental_services/Document_Library/Chief_Joseph/).

CJHP operations would enhance the fisheries of *U.S. v Oregon* parties including the Yakama Nation. Adults returning from the CJHP would increase the run of

summer/fall Chinook and spring Chinook that would, in many years, allow more adults to be harvested in Zone 1-6 fisheries at a specified harvest rate (recently constrained by ESA limitations). Increased run sizes from CJHP would also allow higher harvest rates when not constrained by ESA limitations. While escapement numbers would likely need to be increased (more salmon allowed past fisheries), this change would be expected to be more than offset by the increase in total adults provided by CJHP.

At this time, new language is being negotiated in the *U.S. v Oregon* process that accounts for the escapement needs of CJHP. As presently worded, the *U.S. v Oregon* parties would discuss whether to modify the *U.S. v Oregon* management agreement to increase escapement to meet broodstock needs of the CJHP with the construction of the Chief Joseph Hatchery.

Response 3

EIS Section 2.1.1 discusses the potential spring Chinook donor stocks considered for use in the CJHP. It is agreed that the phrase "other adult fish in excess of program needs" more appropriately describes the potential spring Chinook broodstock source for CJHP. EIS Section 2.1.1 has been revised accordingly.

The Colville Tribes would coordinate with the U.S. Fish and Wildlife Service (owner/operator of the Leavenworth and the Winthrop national fish hatcheries) and NOAA Fisheries (which oversees the ESA protection for Chinook salmon) about the need, availability and suitability of spring Chinook broodstock for CJHP. It is acknowledged that the Yakama Nation and Washington Department of Fish and Wildlife have co-manager jurisdiction and some responsibility in the spring Chinook broodstock availability decisions. The Colville Tribes would coordinate on these decisions as appropriate with federal fisheries regulators, the Yakama Nation and Washington Department of Fish and Wildlife in existing management forums. The Leavenworth and Winthrop fish hatchery programs typically have surplus adult returns exceeding their program needs. Since the broodstock for the CJHP spring Chinook component would not take precedence over the needs of existing hatchery programs, no impacts to existing programs from securing CJHP broodstock as described would be expected.

* * * * *

REC: 06/18/07

CJH-006

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, WA 98101

JUN 14 2007

Reply To
Attn Of: ETPA-088

Ref: 05-039-BPA

Mickey Carter, Environmental Protection Specialist
Bonneville Power Administration
P.O. Box 3621, KEC-4
Portland, OR 97208-3621

Dear Mr. Carter:

Comment #

The U.S. Environmental Protection Agency (EPA) has reviewed the draft Environmental Impact Statement (EIS) for **Chief Joseph Hatchery Project** (CEQ No. 20070174) in accordance with our responsibilities under the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act. Section 309, independent of NEPA, specifically directs EPA to review and comment in writing on the environmental impacts associated with all major federal actions. Under our policies and procedures, we evaluate the document's adequacy in meeting NEPA requirements.

The EIS describes a Chinook salmon hatchery production program sponsored by the Confederated Tribes of the Colville Reservation (Colville Tribe). The proposed action is to build a hatchery near the base of Chief Joseph Dam on the Columbia River for incubation, rearing and release of summer/fall and spring Chinook salmon. Three existing irrigation ponds, one existing salmon acclimation pond, and two new acclimation ponds on the Okanogan River would be used for final rearing, imprinting and volitional release of Chinook smolts. The facilities would produce salmon to sustain tribal ceremonial and subsistence fisheries and enhance the potential for a recreational fishery for the general public.

1 We support the Colville Tribe's desire to sustain tribal ceremonial and subsistence fisheries and their interest in returning natural Chinook salmon runs to the Okanogan River basin. We also support the use of NATURES criteria for rearing and the mitigation measures that will be implemented to address non-target and ESA-listed species that may be taken incidentally during harvest operations.

The EIS provides some information on the current water quality conditions at the proposed facilities' sites; however, information for some of the facilities is incomplete. In addition, while the document states that actions will be taken to comply with all applicable water quality standards, it does not provide information that demonstrates that applicable water quality standards will be met at all the proposed facilities. We have discussed these concerns in detail in our enclosed comments.

We have assigned a rating of EC-2 (Environmental Concerns - Insufficient information) to the draft EIS. This rating and a summary of our comments will be published in the *Federal Register*. A copy of the rating system used in conducting our review is enclosed for your reference.

Thank you for the opportunity to review this EIS. If you would like to discuss these comments in detail, please contact Mike Letourneau at (206) 553-6382.

Sincerely,

Christine Reichgott, Manager
NEPA Review Unit

Enclosure

Chief Joseph Hatchery Program
Detailed Comments

Comment #

Water Quality

2 The EIS indicates that the project will be subject to Colville Tribal and Washington State water quality standards (WQS). However, the document does not discuss which standards will be applicable to the various components of the project (e.g., hatchery, rearing ponds). The EIS needs to include a clear discussion on the appropriate Tribal and state WQS that apply to the different components of the proposed project. It would be advantageous to present the WQS in a table format for comparison purposes.

3 The Okanogan River is on Washington Department of Ecology's (WDOE) Clean Water Act (CWA) Section 303(d) list of impaired and threatened water bodies for failure to meet temperature, dissolved oxygen (DO) and pH water quality standards. In addition, the EIS states that total dissolved gas (TDG) and temperatures of the Columbia River in the vicinity of the proposed hatchery exceed WDOE water quality standards, and Columbia River water that supplies all three proposed hatchery water sources exceed recommended pH and aluminum hatchery use criteria. However, it is not clear whether this area of the Columbia River is also CWA Section 303(d) listed as impaired or threatened and whether the elevated pH and aluminum concentrations would exceed WQS when discharged.

4 The EIS states that water discharged from the hatchery into the Columbia River, at times may be a different temperature than the receiving water. It further states that the discharge water is expected to rapidly mix with the river water and the effect would be negligible. Also, the document discusses how solar heating of rearing and acclimation pond water could occur and when returned to their appropriate streams, would mix quickly so thermal effects would be very minor and confined near the outlet pipes. While the document states that the rearing ponds are monitored and currently meet applicable National Pollution Discharge Elimination System (NPDES) permit requirements it does not discuss whether similar impacts can be expected from the newly constructed ponds or if proposed modifications to existing ponds will continue to meet NPDES permit requirements.

5 The EIS needs to clearly state whether the Columbia River in the vicinity of the proposed hatchery is CWA Section 303(d) listed for any water quality criteria and whether the elevated pH and aluminum concentrations in the water proposed for use at the hatchery, will meet applicable WQS when discharged. In addition, the EIS needs to provide accurate estimates of the water quality components for the discharges at all of the rearing and holding ponds, and the proposed hatchery. The EIS should evaluate the ambient water quality at the discharge points for the proposed facilities and the discharges from similar facilities in place elsewhere, and demonstrate that the proposed facility discharges will meet applicable water quality standards.

6 Discussions in the EIS indicate that while low, there is the potential to exceed nutrient WQS as a result of decomposition of large numbers of salmon carcasses in streams and rivers. In addition, there is the potential that returning salmon may contain concentrations of polycholorinated biphenyls (PCBs) and persistent chemicals such as the pesticide DDT, and that

Comment #

decomposing salmon carcasses may result in elevated concentrations of these persistent contaminants. While the EIS states that adjustments in the program would be made if either of these issues degrade water quality, it does not indicate what monitoring will be performed to determine whether water quality is degraded. The EIS should discuss what kind of monitoring (e.g., ambient water, salmon tissue) will be conducted to evaluate potential nutrient and persistent contaminant impacts.

7 Water will be diverted from the Okanogan River and Omak Creek for use at the acclimation ponds. These diversions will reduce Okanogan River flows about 4% to 6% at the bypass reaches. The EIS should discuss the impacts the decreased flow will have in the vicinity of the bypass reaches and demonstrate that water quality standards, in particular beneficial uses will be met despite the reduced flows.

CJH-006

Response 1

Thank you for recognizing the values of the proposed hatchery and your support.

Response 2

The two tables presented above in CJH-002 Response 21 and Response 22 specify which water quality standards may apply to proposed facilities and operations by river reach.

Response 3

EIS Section 3.6.1, Water Quality, Columbia River, has been modified to reflect that the Columbia River immediately upstream and downstream of Chief Joseph Dam is on WDOE's Clean Water Act 303(d) list for elevated water temperature conditions only according to http://apps.ecy.wa.gov/wats/WATSQBEHome.asp. It is not anticipated that hatchery water would exceed pH or aluminum water quality standards since it would be a mix of flow from the three available water sources when discharged so that any effect from one source would be moderated by the others to be within an acceptable range.

Response 4

Monitoring at the existing irrigation/acclimation ponds has shown that flow, pH, total suspended sediments, total phosphorus, dissolved oxygen and water temperature are within the acceptable ranges established in the NPDES permits. New or upgraded CJHP facilities would be designed to meet EPA-approved water quality standards. The NPDES permitting system, implemented by WDOE, would ensure water quality compliance at each facility. NPDES permits would require monitoring to ensure that discharges complied with applicable water quality standards and laws. If monitoring showed that these standards were not being achieved, then actions would be implemented in consultation with WDOE to ensure compliance.

Response 5

The new CJHP facilities would fall under the "NPDES General Permits for Small but Numerous Point Sources of Pollution." The General Permit program was established in recognition that for new sources the environmental baseline may be slightly degraded from the ambient condition because the permit allows some level of pollutants to be discharged to the water body. However, the water body would not be allowed to exceed the applicable water quality standards.

The off-line treatment of start tank, acclimation pond or raceway waste cleaning planned in the CJHP would be subject to the following WAC 173-221A-100 (Upland Fin-fish Facilities) criteria:

- Total suspended solids —Average monthly removal of 85 percent.
- Settle-able solids—Average monthly removal of 90 percent.
- Instantaneous maximum total suspended solids concentration—Not in excess of 100 milligrams per liter (mg/l) of effluent.
- Instantaneous maximum settle-able solids concentration in the off-line settling basin effluent—Not in excess of 1.0 milliliter per liter (ml/l) of effluent.

Flows that pass through the normal hatchery flow path (over start tank, pond and raceway water level control weirs or stand pipes) must meet the following:

- The instantaneous maximum total suspended solids concentration in the effluent at the point of discharge to the receiving environment shall not exceed 15 mg/l of effluent.
- The average total suspended solids concentration in the effluent at the point of discharge to the receiving environment shall not exceed 5 mg/l of effluent.
- The average settle-able solids concentration in the effluent at the point of discharge to the receiving environment shall not exceed 0.1 ml/l of effluent.
- Effluent limitations shall apply as net values, provided the criteria contained in 40 CFR 122.45 (net gross allowance) are met.

Effluent monitoring at 11 WDFW salmon hatcheries from 1993 to 2005 indicates that the normal raceway flow-through water is within the WAC pollutant limits described above. It is expected that all CJHP facilities would not exceed these limits either. Table 3 shows the projected volumes of Chief Joseph Hatchery by-products expected in the untreated hatchery flow-through water. These figures were derived by application of hatchery waste equations provided by fish feed manufacturers to the projected feed volumes used on a monthly average basis. All of these projections are within the WAC criteria. It is expected that all CJHP facilities would reflect these results.

Table 3. Projected Chief Joseph Hatchery Effluent Characteristics

Mo.	Feed	Flow Rate	Nitrogen		Ammonia		Phosphorus		BOD5		Suspended Solids	
	(kg/day)	(cfs)	(kg/day)	(mg/l)	(kg/day)	(mg/l)	(kg/day)	(mg/l)	(kg/day)	(mg/l)	(kg/day)	(ml/l)
Jan	148	33.3	0.7	0.01	0.5	0.01	0.1	0.002	3.0	0.04	0.7	0.01
Feb	157	39.2	0.8	0.01	0.5	0.01	0.1	0.001	3.2	0.03	0.7	0.01
Mar	206	45.2	1.0	0.01	0.7	0.01	0.2	0.002	4.1	0.04	0.9	0.01
Apr	275	53.4	1.4	0.01	0.9	0.01	0.2	0.002	5.6	0.04	1.2	0.01
May	91	25.8	0.4	0.01	0.3	0.00	0.1	0.001	1.8	0.03	0.4	0.01
Jun	162	23.3	0.8	0.01	0.6	0.01	0.1	0.003	3.3	0.06	0.7	0.01
Jul	165	25.3	0.8	0.01	0.6	0.01	0.1	0.002	3.3	0.05	0.7	0.01
Aug	228	31.7	1.1	0.01	0.8	0.01	0.2	0.003	4.6	0.06	1.0	0.01
Sep	291	38.7	1.4	0.02	1.0	0.01	0.3	0.003	5.9	0.06	1.3	0.01
Oct	382	46.1	1.9	0.02	1.3	0.01	0.3	0.003	7.7	0.07	1.7	0.02
Nov	251	39.6	1.2	0.01	0.9	0.01	0.2	0.002	5.1	0.05	1.1	0.01
Dec	207	30.3	1.0	0.01	0.7	0.01	0.2	0.002	4.2	0.06	0.9	0.01

Response 6

EIS Section 3.6.2 Water Quality, Operations Effects intended to state that if monitoring of water quality by a regulatory agency (such as WDOE's ambient water quality monitoring or CTCR monitoring) detected degradation attributable to nutrients and persistent chemicals of spawned-out hatchery salmon carcasses, then CJHP managers would consider taking action with hatchery operations to help ameliorate the situation. The potential for salmon carcasses to amass in such numbers to cause a problem is so remote that no specific monitoring in the Okanogan River is part of the proposed project.

Response 7

The Okanogan River is designated by WDOE as a Class A freshwater body with beneficial uses identified as primary contact recreation; domestic, industrial, agricultural and stock water supply; wildlife; harvesting; commerce/navigation; boating; aesthetics; salmonid migration, rearing, spawning, and harvesting; other fish migration, rearing, spawning, and harvesting; clam, oyster, and mussel rearing, spawning, and harvesting; and crustaceans and other shellfish (crabs, shrimp, crayfish, scallops, etc.) rearing, spawning, and harvesting. WDOE adopted minimum instream flow requirements for the Okanogan River which vary by reach and by month to protect beneficial river uses (defined in WRIA 49, WAC 173-549). Tables 4 and 5 summarize the minimum instream flow requirements by month for the Lower and Middle Okanogan River.

Ellisforde, Tonasket, and Bonaparte ponds are located in the Middle Okanogan River. Each facility would withdraw 25 cfs, pass this flow through the acclimation pond and release 25 cfs back to the river. The bypass reach for each of these facilities would be less than 200 feet long.

Omak and Riverside ponds are proposed in the Lower Okanogan River reach. Each facility would withdraw 15 cfs, pass this flow through the acclimation pond and release 15 cfs back into the river. The bypass reach for Omak Pond would be about 1,300 feet long and the Riverside Pond bypass reach would be about 300 feet long.

For fish rearing purposes, all ponds would be in use from October through April. Based on recent measured flows (1995 to 2004) in these reaches, diverting 15 cfs at each facility in the Lower Okanogan River reach (Riverside and Omak ponds) or 25 cfs at each facility in the Middle Okanogan River (Ellisforde, Tonasket, and Bonaparte ponds) would not cause average flows in the bypass reaches to fall below the minimum instream flow requirements (Tables 4 and 5). However, during drier years, low monthly average flow conditions presently do not meet these defined minimum levels; and so diversions at each facility would further decrease flows that already do not meet minimum flow requirements.

These minimum flow requirements were adopted by WDOE to protect the identified beneficial uses. Under most water years, the minimum flow requirements would be realized in the river and in the bypass reaches, and therefore, by definition, beneficial uses would be realized. However, during dry years, minimum flow requirements would typically not be realized in the entire length of the river (including the bypass reaches), so some negative effect on beneficial uses of the entire river system would be expected. Since no specific data is available to determine the magnitude of deleterious effects to beneficial uses under conditions of less than minimum flow requirements, the representation in the EIS Section 3.6.2 of a percentage of river flow reduction within the relatively short bypass reaches at each pond gives at least some indication of context and intensity of any additive effect. Incidentally, the 4 to 6% reduction in river flows at each pond bypass reach was based on the minimum river flow recorded in the last 10 years as a worst case scenario. It is important to note that water withdrawal for the ponds would occur between October and April when most other beneficial uses of the river would not likely be affected.

Table 4. Lower Okanogan River minimum instream flow requirements (WAC 173-549) compared to monthly flows measured at USGS Malott Gauge (1995-2004) and compared to proposed diversion of 15 cfs at the Riverside and Omak pond sites.

Month	Lower Okanogan River minimum instream flow	Monthly average flow	Monthly average minimum flow	Monthly average flow minus 15 cfs diversion	Monthly average minimum flow minus 15 cfs diversion
Oct	750	1279	605	1264	590
Nov	950	1686	574	1671	559
Dec	900	1612	565	1597	550
Jan	830	1287	540	1272	525
Feb	820	1473	569	1458	554
Mar	880	1716	601	1701	586
Apr	925	3548	928	3533	913

Note: Shading denotes non-compliance with the minimum instream flow requirements.

Table 5. Middle Okanogan River minimum instream flow requirements (WAC 173-549) compared to monthly flows measured at USGS Tonasket Gauge (1995-2004) and compared to proposed diversion of 25 cfs at the Ellisforde, Tonasket and Bonaparte ponds.

Month	Middle Okanogan River minimum instream flow	Monthly average flow	Monthly average minimum flow	Monthly average flow minus 25 cfs diversion	Monthly average minimum flow minus 25 cfs diversion
Oct	730	1243	403	1218	378
Nov	900	1626	413	1601	388
Dec	850	1561	399	1536	374
Jan	800	1243	360	1218	335
Feb	800	1413	532	1388	507
Mar	800	1607	525	1582	500
Apr	925	3427	770	3402	745

Note: Shading denotes non-compliance with the minimum instream flow requirements.

* * * * *

REC 06/19/07

CJH-007

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
15 West Yakima Avenue, Suite 200 • Yakima, Washington 98902-3452 • (509) 575-2490

June 13, 2007

Mickey Carter
Bonneville Power Administration
Public Affairs – DKC-7
P.O. Box 14428
Portland, OR 97293-4428

Dear Mr. Carter:

Thank you for the opportunity to comment on the draft environmental impact statement for the Chief Joseph Hatchery Program. We have reviewed the documents and have the following comments.

Comment #

Water Resources

1 If the well field will be located on State lands to provide water to the hatchery and/or acclimation ponds it will require an application to the Department of Ecology for a water right permit.

2 If test wells have already been drilled on State land, then please contact Ecology, Central Region, for technical assistance as soon as possible.

3 It must be noted that the project may fall within the Instream Resources Protection Plan for the Okanogan River basin (WAC 173-548) and that all waters in continuity with the system will be recognized as part of the river water. All uses under state jurisdiction, except single domestic, will be subject to instream flows. If the new Methow Valley Water Resources management program under Chapter 173-548A WAC has been adopted at the time work commences on this planned development and the development is within state jurisdiction, the project must be consistent with, and go through local plan review for assessment of compliance.

4 If there are existing water right holders along the proposed bypass reach(es), interruption or interference in the availability of water must be considered. Chapter 173-150 WAC

Comment #

provides for the protection of existing rights against impairment.

2 (cont.) All water wells constructed shall be in accordance with the provisions of Chapter 173-160 WAC by a driller licensed in the State of Washington. A well report must be submitted to the Department of Ecology within 30 days after completion of a well.

1 (cont.) If surface water will be diverted for any part of this project, it may require an application from the Department of Ecology for a water right permit.

5 Construction of any dam or dike falling under state jurisdiction and which is capable of impounding water to a depth of 10 feet or more at any point, or will impound a volume of 10 acre feet or more at normal pool level, will require a reservoir permit from the Department of Ecology prior to construction.

2 (cont.) In regards to employee housing, any ground water withdrawals from wells on state lands in excess of 5,000 gallons per day or for the irrigation of more than ½ acre of lawn or noncommercial garden will require a permit from the Department of Ecology.

If you have any questions concerning the Water Resources comments, please contact Breean Zimmerman at (509) 454-7647.

Water Quality

6 For any areas that are outside the Colville Reservation boundary; an NPDES Construction Stormwater General Permit from the Washington State Department of Ecology is required if there is a potential for stormwater discharge from a construction site with more than one acre of disturbed ground. This permit requires that the SEPA checklist fully disclose anticipated activities including building, road construction and utility placements. Obtaining a permit is a minimum of a 38 day process and may take up to 60 days if the original SEPA does not disclose all proposed activities.

The permit requires that Stormwater Pollution Prevention Plan (Erosion Sediment Control Plan) is prepared and implemented for all permitted construction sites. These control measures must be able to prevent soil from being carried into surface water (this includes storm drains) by stormwater runoff. Permit coverage and erosion control measures must be in place prior to any clearing, grading or construction.

More information on the stormwater program may be found on Ecology's stormwater website at: http://www.ecy.wa.gov/programs/wq/stormwater/construction/ . Please

submit an application or contact Ray Latham at the Dept. of Ecology, (509) 575-2807, with questions about this permit.

Sincerely,

Gwen Clear

Gwen Clear
Environmental Review Coordinator
Central Regional Office

CJH-007
Response 1

Table 4-1 in the EIS acknowledges that water rights permits from Washington State Department of Ecology (WDOE) would be required for wells proposed on state lands and any other water withdrawals.

CJH-007
Response 2

If the project is implemented, all necessary permits for wells would be obtained, and permit terms and conditions including reporting requirements would be followed.

In 2006, a 12-inch test well and two 6-inch observation wells were developed at Bridgeport State Park. Well reports with logs, location data and proposed uses were supplied to the CTCR Environmental Trust on May 21, 2007 based on the understanding that the CTCR had jurisdiction within reservation boundaries. Recently, it has been clarified that WDOE has jurisdiction because the wells are on state-owned land within reservation boundaries (personal communication, D. Nice, TetraTech, with A. Hoselton, WDOE, August 29, 2007). Therefore, consultation with WDOE and CTCR Environmental Trust will occur to ensure that all wells meet all applicable regulatory requirements.

The proposed water source for the employee housing would be a shared well that would provide less than 5,000 gallons a day to be developed on land to be acquired from Washington State.

CJH-007
Response 3

If built, the proposed project would comply with all applicable regulations concerning in-stream flows to the extent possible (see CJH-006 Response 7 above). The reference in this comment to compliance with water resources plans under WAC 173-548 and WAC 173-548A regarding the Methow River basin, WRIA 48, is understood to mean compliance with water resources plans under WAC 173-549 pertinent to the Okanogan River basin, WRIA 49.

CJH-007
Response 4

Within the project's proposed bypass reaches, no water diversions are known to exist. Landowners and water users near each proposed facility were contacted during project scoping and the review and comment period for the draft EIS and no concerns over affects on specific water rights were received. However, water rights in the Okanogan River subbasin have not been fully adjudicated, so it is possible that unsubstantiated or undocumented claims exist and diversions occur. Because the proposed facilities would divert water from October through April and all use would be non-consumptive, operations would not be expected to interrupt or interfere with the availability of water for other water users upstream, downstream or below ground near each bypass reach.

CJH-007
Response 5

Since no dikes or impoundments of water more than 10 feet deep or more than 10 acre feet in volume are proposed, a reservoir or dam safety permit is not required for the project.

CJH-007
Response 6

EIS Section 4.5.2 and Table 4-1 acknowledge that NPDES permits would be required for certain project facilities. All terms and conditions of applicable permits including development, implementation and monitoring of storm water pollution or erosion control plans would be adhered to during project construction and operations. Section 1.3 mentions the possibility of using the EIS to help with any Washington State agency SEPA or permitting decisions.

* * * * *

REC: 06/20/07

Comment #

Proposed Chief Joseph Hatchery Program

CJH-008

I have the following comments about the Chief Joseph Hatchery Program Draft Environmental Impact Statement:

1 I see the hatchery as a huge, even magnificent environmental impact.

the efficiency & the footprint are as environmentally sound as is possible. 9 on a scale of 1—10.

the Fish and their spread & allocation seem to be state of the art relative to known science.

Simply put— I see no negative environmental impact.

on the critical side, because of the huge environmental pluses, I would like to see plans for expansion & extension in the future. Let's Double the size!

P.S. I appreciate the hard work of BPA & our good neighbors the Colville Tribe & especially Joe Peone, Fish & Wildlife Director.

Name ED PARISEAU (The Johns Farm) Rate Payer!

Address

City

Zip 98812

☒ I am not currently on your mail list. Please add me to your mail list.

Please mail your comments by **June 18, 2007** to:
Bonneville Power Administration
Communications – DKC-7
PO Box 14428
Portland, OR 97293-4428

Fax (503) 230-3285, e-mail to *comment@bpa.gov* or submit them through the BPA Web site at *www.bpa.gov/comment/*.

CJH-008
Response 1

Thank you for recognizing the values of the proposed hatchery and for your appreciation of the hard work undertaken by so many to carefully design the project facilities and fish production program. Due to biological and physical site-related constraints however, it is not likely that the project or production program could be expanded significantly over what is proposed in the EIS and Master Plan.

* * * * *

Public Utility District No. 1 of Douglas County

1151 Valley Mall Parkway • East Wenatchee, Washington 98802-4497 • 509/884-7191 • FAX 509/884-0553 • www.douglaspud.org

June 18, 2006

CJH-009

Rec'd 6/21/07

Bonneville Power Administration
Public Affairs Office – DKC-7
Post Office Box 14428
Portland, OR 97293-4428

RE: Comments on the Chief Joseph Hatchery Program DEIS of May 2007

To whom it may concern:

Comment #

Public Utility District No. 1 of Douglas County appreciates the opportunity to comment on the Chief Joseph Hatchery Program Draft Environmental Impact Statement DOE/EIS – 0384 of May 2007. We have an interest in this project because of the proximity of the Wells Hydroelectric Project to the proposed project. We are also interested because our neighbors, the Colville Confederated Tribes, are the sponsor.

1 The document emphasizes the recovery of spring and summer/fall populations of Chinook salmon in the Okanogan drainage. Douglas PUD is encouraged by BPA's steps to work with the Colville Confederated Tribes on this project. Chinook in the mainstem Columbia above Wells Dam and in the Okanogan Basin have been impacted from the lower Columbia River dams. This action by BPA shows your willingness to address these impacts and to mitigate for the populations that are affected.

Specific comments to the DEIS are attached. Should you require further clarification, please contact Mr. Rick Klinge of our staff at (509) 881-2244.

Sincerely yours,

Robert W. Clubb, Ph.D.
Chief of Environmental and Regulatory Services

c: Joe Peone, Director, Colville Confederated Tribe's Fish and Wildlife

Attachment
Pcd 99016

Review of DEIS Chief Joseph Hatchery Program
DOE/EIS– 0384 of May 2007

Specific Comments from
Public Utility District No. 1 of Douglas County
East Wenatchee, WA 98802

June 18, 2006

Comment #

2 **Page 1-4, Bottom of the second paragraph**. The statement that distribution of summer/fall Chinook in the Okanogan are not distributed throughout the Okanogan River as you have pointed out is likely due to the homing back to the ponds in the Similkameen River. But one should not assume that fish are returning to this area only to spawn next to the pond they were released from. Distribution of spawning adults in the Okanogan is likely more a function of suitable spawning habitat rather then homing to a release pond.

3 **Page 1-7, 8, Mid-Columbia Habitat Conservation Plans.** As pointed out, the HCP for the mid-Columbia PUDs, and especially for Douglas County PUD, owner and operator of the Wells Project, will not be impacted from the proposed operations of CJHP. For the Wells Project, the juvenile bypass operations provides a route of safe passage from April 12 through August 26, a time when over 95 percent of the spring and summer migrants have been shown to move downstream through the upper Columbia. Adult passage through the two ladders at Wells Dam moves adults above the dam.

4 **Page 2-3, Under Summer/Fall Chinook, second bullet**. We see no reason why you would open up summer/fall Chinook brood collection a month earlier than currently is occurring under the East Bank Program. Collection of adults occurs at the east ladder fish trap at Wells Dam. Trapping generally starts the second week in July and ends the third week in August. Prior to that, some summer Chinook are seen mixed in with spring Chinook adults. A major aspect of the CJHP is to develop the late summer/fall Chinook population as this has been emphasized for some time. Trapping broodstock a month later than is presently occurring would help develop the late portion of the population.

5 **Page 2-8, Fourth paragraph, discussion on fish ladder depth**. The ladder to the CHFH needs to be at a depth that allows Douglas County PUD to exercise the full swing of operations for the Wells Reservoir, which is between 781.0 and 711.0 as recorded at the Wells Project.

6 **Page 2-14, Paragraph on Similkameen Pond**. The Similkameen pond is owned by Chelan PUD and operated by Washington Department of Fish and Wildlife.

7 **Page 3-3, Top paragraph, second line.** Adult summer/fall Chinook salmon that migrate past Wells Dam will spawn in the Columbia and Methow rivers as well as those shown, the Okanogan and Similkameen rivers.

Comment #

8 **Page 3-3, Third paragraph, second line.** Zosel Dam at RM 78.9 on the Okanogan River is not a fish passage barrier. The dam is a low head dam owned by the Washington Department of Ecology. This dam is equipped with two fish ladders that operate the entire year. The fact that tens of thousands of sockeye salmon migrate past Zosel Dam and across the International Border to spawn in British Columbia attests to the fact this dam is not a fish barrier. Recently, the staff from the Okanagan Nation Alliance, while performing sockeye spawning ground surveys, has seen summer/fall Chinook on spawning grounds above Zosel Dam.

CJH-009
Response 1

Thank you for your encouragement and support as BPA and the Colville Tribes attempt to help mitigate for the effects of the Federal Columbia River Power System on Chinook salmon in the Okanogan River subbasin.

CJH-009
Response 2

Summer/fall Chinook historically spawned along the full length of the Okanogan River. Most spawning now occurs in the vicinity of the Similkameen Pond. Habitat conditions there are the highest quality in the Okanogan subbasin. Historical spawning habitats in the middle and lower reaches of the Okanogan River are less suitable largely due to siltation and gravel embeddedness. Habitat quality differences in the Okanogan and Similkameen rivers are believed to be significantly affected by the amount of recent Chinook spawning. Spawning churns gravels and cleans the substrate. By siting acclimation ponds near historical spawning habitat, it is expected that hatchery-origin Chinook would return in greater numbers and spawn more evenly throughout the habitat, cleaning the embedded gravels and increasing the quality of spawning sites annually. By way of example, in the Hanford Reach of the Columbia River, as escapements of Chinook were allowed to increase, the Chinook sought less used spawning sites and, over time, the spawning activity cleaned the gravels and improved their quality.

The final destinations and spawning locations of Chinook in the Okanogan River should be determined mostly by the suitability of spawning habitat and the locations of acclimation ponds from where the Chinook emigrated as juveniles. Which factor is a greater determinant in location of spawning is not ascertainable with current scientific information. However, research with fall Chinook on the Snake River demonstrated that the acclimation site locations had a substantial effect on the location of subsequent adult spawning with the most likely spawning location being near the site from which they were released as juveniles.

Through the CJHP program's monitoring and evaluation plan, the Colville Tribes intend to document changes in egg hatch rate and fry emergence in historical spawning areas. This monitoring should reveal how much habitat quality increases with more spawning activity. Initially, natural recruitment from hatchery-origin Chinook spawning activity may be low, but it should improve over time as habitat is cleansed.

CJH-009
Response 3

Thank you for the added detail on fish passage operations at Wells Dam. It is confirmed that operations of the proposed Chief Joseph Hatchery Program (CJHP) should not negatively affect the mid-Columbia Public Utility District's Habitat Conservation Plans. The CJHP may be able to assist with certain parts of the plan's mitigation requirements, if desired, since the two programs share a common purpose and are in close proximity.

CJH-009
Response 4

The proposed broodstock collection strategy has been reconsidered and modified in the final EIS (Section 2.1.1). Summer/fall Chinook broodstock collection would start

no earlier than current practices (mid-July), but would be extended about two months (into early November) to follow the full historical run curve. Live-capture fishing gear in and near the Okanogan River as well as voluntary fish returns to the Chief Joseph Hatchery would be used for broodstock collection. If results are inadequate, broodstock collection at Wells Dam may occur.

CJH-009
Response 5

The fish ladder at the proposed hatchery is designed to function within the normal elevation range of the tailwater near the base of Chief Joseph Dam of between +775 and +785 feet with occasional rises to +790 feet (based on records from 1955-2005 provided by the US Army Corps of Engineers). If the Douglas County PUD needs to manage the Wells Reservoir to a point that lowers the water level near the base of Chief Joseph Dam to below +775 feet, then the operation of the fish ladder would be curtailed. The objective that operational flexibility of the Federal Columbia River Power System (FCRPS) must be unaffected by the CJHP is contained in EIS Section 1.1. Although Wells Dam is not an FCRPS facility, it is not likely or intended that CJHP operations would have any effect on its operations either.

CJH-009
Response 6

Thank you for the clarification. EIS Section 2.1.7 has been corrected to show that Chelan Public Utility District owns the Similkameen Pond, and the Washington Department of Fish and Wildlife operates it as an acclimation facility.

CJH-009
Response 7

Thank you for the clarification. EIS Section 3.2.1 has been modified to show that adult summer/fall Chinook that migrate past Wells Dam spawn in the Columbia and Methow rivers as well as the Okanogan River subbasin.

CJH-009
Response 8

Thank you for the correction. EIS Section 3.2.1 has been modified to state Zosel Dam is not a fish passage barrier. Steelhead, Chinook and sockeye readily pass the dam.

* * * * *

United States Department of the Interior

BUREAU OF RECLAMATION
Pacific Northwest Region
1150 North Curtis Road, Suite 100
Boise, Idaho 83706-1234

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:

Rec 06/27/07

PN-6540
ENV-6.00

JUN 2 2 2007

CJH-010

Bonneville Power Administration
Public Affairs Office, DKC-7
P.O. Box 14428
Portland, OR 97293-4228

Subject: Comments on Draft Environmental Impact Statement (DEIS) for Chief Joseph Hatchery Program, DOE/EIS-0384

Comment #

Ladies and Gentlemen:

The following comments respond to your April 25, 2007, request for review of the subject document.

1 The proposed project focuses on Upper Columbia River (UCR) summer/fall Chinook salmon and secondarily on UCR spring Chinook salmon. The proposal to propagate out-of-basin Carson spring Chinook salmon stock at the new facility (page 2-3) should be reconsidered in light of a proposed action under the Federal Columbia River Power System Biological Opinion remand to discontinue propagation of the Carson stock at the Entiat National Fish Hatchery and reprogram that facility to propagate a different stock. If one goal of the Chief Joseph Hatchery Program is eventually to restore UCR spring Chinook salmon to the basin, the hatchery program would be advised to work with the appropriate state and Federal agencies to initiate that part of the program with locally derived broodstock rather than out-of-basin broodstock. This may likely be a long-term effort since the UCR spring Chinook salmon is ESA-listed endangered and in low abundance. For all programs at the hatchery, indigenous locally derived broodstock should be considered.

2 On page S-4, the DEIS states that Component 1 is a program designed to increase abundance, distribution, run timing and diversity of naturally spawning summer/fall Chinook salmon within their historical Okanogan subbasin habitat, and that this is a supplementation program to produce 1,100,000 hatchery smolts annually. As the number of naturally produced and naturally spawning summer/fall Chinook salmon increases, will
3 reliance on hatchery production (supplementation) be reduced? Page 3-6 of the DEIS states that the Okanogan River is a low gradient, low velocity system in which production of salmonids is limited in the mainstem by high water temperatures, high sediment, lack of habitat diversity, and in some places, lack of connectivity with the floodplain. Furthermore, the Okanogan River has few stable sources of cold water and a thermal barrier forms each summer at the mouth which affects the upstream passage of fish. With this statement being the case, what is the prospect that Component 1 (or Components 2 and 3 for that matter) of the hatchery program will be successful?

4 The DEIS states that acclimation ponds at various locations in the Okanogan River will result in a broader distribution of returning adult spawners and spread out the spawning activity throughout the river. The DEIS should provide some indication of the extent and quality of potential spawning habitat in the Okanogan River. If substrate quality and other environmental conditions are unsuitable, spawning activity may still be concentrated in a few suitable locations.

Comment #

2 (cont.) On page 1-5 the DEIS should clearly define and describe the "hatchery supplementation program." Is this a program that will be phased out as natural production of fish in the river increases, resulting in increased abundance and distribution of fish, or is it viewed as a long-term program without regard for increased

5 abundance of naturally produced fish? Will supplementation apply differently to summer/fall Chinook salmon and spring Chinook salmon?

6 The propagation of yearling and subyearling summer/fall Chinook salmon from the broodstock to reflect natural diversity and add some necessary flexibility in the program (page 2-3) should be explained in more detail.

7 On page 2-22, describing the Riverside acclimation pond, the DEIS indicates that the discharge from the pond is low velocity onto a flat concrete pad designed to prevent erosion of the river bed. Would this situation have the potential to cause any injury or harm to fish volitionally migrating from the pond?

8 Regarding the discussions of chemical pollutants on page 3-13, it would be useful for the DEIS to provide examples of some of the chemicals that are typically used in fish culture, how these chemicals are used, and how hatchery effluent containing chemicals is treated.

9 Regarding fish health on page 3-14, the DEIS states that hatchery effluent would not be treated even though hatchery intake water will be filtered and UV-filtered to reduce pathogens. It would be advisable to either treat the hatchery effluent as a regular operation, or ensure that there is a contingency plan to contain or treat for any pathogen that does unexpectedly appear in the hatchery.

10 On page 3-16 under interbreeding, the DEIS notes that at least 80 percent of the naturally spawning fish will be natural-origin fish, resulting in about 20 percent of the naturally spawning fish being of hatchery-origin. It does not indicate the proportion of hatchery-origin and natural-origin fish in the hatchery broodstock. Will hatchery broodstock incorporate any natural-origin fish? This issue should be discussed.

6 (cont.) What are the tangible outcomes or results of releasing yearling summer/fall Chinook salmon (page 3-18)? What is their typical life history strategy? Are they ocean-type or stream-type? The last sentence in paragraph 3 on page 3-18 states that upper Columbia River species that are listed (e.g., the UCR spring Chinook salmon and steelhead) all rapidly migrate into and then down the Columbia River as yearling fish. This suggests that the non-listed summer/fall Chinook salmon are ocean-type fish that migrate as subyearlings. So what are some of the potential benefits or advantages, if any, of releasing some UCR summer/fall Chinook salmon as yearlings?

Thank you for your attention to these comments. Please direct technical questions to Mr. Stephen Grabowski at 208-378-5030.

Sincerely,

Karl Wirkus
Deputy Regional Director

CJH-010
Response 1

The Colville Tribes consider the spring Chinook and summer/fall Chinook components of proposed Chief Joseph Hatchery Program (CJHP) to be equally important. Development of local broodstock for all components is proposed, and the CJHP would be coordinated with appropriate federal and state fisheries managers to aid in the recovery of the ESA-listed Upper Columbia River Spring Chinook ESU (EIS Section 2.1.1). BPA will evaluate funding the spring Chinook component of the CJHP in light of its mitigation authority under the Northwest Power Act and relative to the importance of this component to fisheries managers and the general public, and for tribal ceremonial and subsistence uses (EIS Chapter 1).

The Methow composite stock is preferred for broodstock under the CJHP since it is the most local stock remaining and should be the best adapted for reintroduction into the Okanogan River (EIS Section 2.1.1). However, the low abundance of the Methow composite stock after other ESU recovery needs are met makes it uncertain whether adequate numbers would be available in the near future to supply the CJHP.

So, pending the availability of Methow composite stock, the Colville Tribes would propagate the unlisted spring Chinook from Leavenworth National Fish Hatchery in the near term under the CJHP to provide ceremonial and subsistence fishing for tribal members and to test habitat suitability for spring Chinook in the Okanogan River subbasin. Since the Okanogan River subbasin was not designated as critical habitat for the listed ESU, the unlisted spring Chinook could be propagated there. Spring Chinook propagated in the Okanogan could be kept segregated from Methow, Entiat and Wenatchee river populations.

CJH-010
Response 2

The CJHP would be adjusted over time via monitoring and evaluation to optimize natural production. As natural production of summer/fall Chinook increases in the Okanogan and Columbia rivers, the numbers of spawning hatchery-origin Chinook would be reduced. This would be accomplished by increasing the selective harvest of marked hatchery-origin fish and/or shifting progeny releases from acclimation ponds on the Okanogan River to the hatchery on the Columbia River. At higher escapements, the objective would be to keep the proportion of spawning hatchery-origin Chinook under 20% (EIS Section 2.1.3 and Master Plan Appendix H).

The CJHP should be able to continue production even after the natural Chinook population achieves habitat capacity. But, if monitoring indicates that releases of hatchery juveniles in the Okanogan River is limiting the growth and survival of natural-origin juveniles, then production would be reprogrammed for direct releases from the hatchery into the Columbia River. If natural production of summer/fall Chinook is sufficient and reliable enough to meet the recurrent needs of the Colville Tribes and downstream and ocean fishery managers, then hatchery production could be reduced or reprogrammed to other species (e.g. spring Chinook).

CJH-010
Response 3

The successful summer/fall propagation program at the Similkameen Pond indicates that the Okanogan River remains remarkably productive despite certain habitat

problems, so the prospect for success of the CJHP is good. Okanogan summer/fall Chinook demonstrate a higher water temperature tolerance than is indicated for Chinook in general in the scientific literature. To avoid high summer and fall water temperatures, Okanogan juveniles emerge from the gravel and emigrate to rear in the cooler Columbia River and migrate to the ocean. Adults tend to hold and mature in the Columbia while waiting for the typical fall cooling of the Okanogan that occurs prior to spawning season.

CJH-010
Response 4

In the middle and lower reaches of the Okanogan River the quality of spawning gravels is not as high as in the upper Okanogan and Similkameen rivers. See CJH-009 Response 1 above for more detail. Spawning habitat has been degraded by sedimentation and lack of sufficient spawning activity to help keep gravels clean. The Colville Tribes intend to initially allow heavy spawning of hatchery-origin fish in the mid and lower river reaches to bolster this portion of the population and revitalize spawning habitat. This activity has proven successful in the Hanford Reach. If this natural cleansing process does not produce desired results, the use of equipment to scarify the embedded gravels to reduce fine sediments could be proposed in the future to assist spawning distribution.

CJH-010
Response 5

Initially, the summer/fall Chinook and spring Chinook supplementation programs would be substantially different. Spring Chinook have to be reintroduced into the Okanogan River and historical habitats need to be rehabilitated to make this component successful. Since spring Chinook productivity in the upper Columbia River is greatly depressed, a much larger proportion of hatchery-origin fish is needed to supplement the spawning population than is needed for summer/fall Chinook. The recovery time of the spring Chinook population in historical habitats would be expected to be much longer than summer/fall Chinook. However, the objective of the propagation programs of both runs would be to optimize natural productivity and population sustainability.

CJH-010
Response 6

Historically, natural-origin summer/fall Chinook in the Okanogan River were probably juveniles that migrated to the ocean within their first year (sub-yearlings). Currently, a growing proportion of natural-origin adults returning to the Okanogan are the result of a yearling juvenile life history. These are fish that over-winter as juveniles in the Columbia River reservoirs or in the estuary prior to migrating into the ocean the next spring as yearlings.

Hatchery programs in the upper Columbia River currently rear and release larger yearling summer/fall Chinook since these fish survive at a rate about 15 times higher than sub-yearling releases. These higher survival rates are needed to sustain even low future run sizes for mitigation programs.

The CJHP would be initiated with a combination of sub-yearling and yearling releases to balance objectives for survival and life history diversity. Through monitoring and evaluation, sub-yearling and yearling releases would be adjusted to attain adequate survival to satisfy program objectives and to maintain the expression of life history diversity in the population and throughout future runs.

CJH-010
Response 7

A concrete splash pad is proposed in EIS Section 2.1.7 as part of the Riverside Pond water outfall system to provide the worst case scenario for environmental impact analysis of the in-stream area. A concrete pad may not be part of the final design for the outfall, but if it were, it would be designed to protect juvenile fish and bank stability.

CJH-010
Response 8

The types and amounts of chemicals used at a hatchery or rearing facility depend upon site-specific conditions, fish culture practices, species of fish, and types of parasites or disease organisms being treated. Any chemical compounds used to treat fish diseases are either registered with the Food and Drug Administration or may be applied through appropriate Investigational New Animal Drug permits and would be prescribed by a fish health specialist. A list of chemicals typically used in salmonid aquaculture is presented in Table 6.

Generally, the fish culture practices planned for CJHP are designed to reduce the risk of disease and disease transfer and thereby reduce the need for chemical treatments. The types and amounts of chemicals that would be used under CJHP are not currently known, however all chemical handling, application, and disposal would adhere to US Department of Agriculture, state, and other federal regulations to protect human and environmental health (EIS Section 3.2.2). Formalin is the only chemical likely to be used in any significant quantity. The effluent containing formalin would not typically be treated before discharge, but the degree of dilution when combined with the minimum production flows of 25 cfs would be large enough to fall under the maximum allowable formalin concentration in effluent of 25 parts per million.

Table 6. Typical chemicals used in salmonid aquaculture.

Chemical Compound	Application
Chlorine	Disinfect equipment
Iodophore	Disinfect equipment and eggs, facilitate egg hardening
Potassium permanganate	Algaecide, herbicide
Quarternary ammonia	Disinfect equipment
Sodium thisulfate	Disinfect equipment
Calcium chloride	Facilitate egg hardening; assist in osmotic balance maintenance during fish transport
Carbon dioxide with or without sodium bicarbonate	Anesthesia
Fuller's Earth, sodium chloride, sodium sulfite, or urea + tannic acid	Reduce egg adhesiveness and improve egg hatchability
Sodium chloride	Assist in osmotic balance maintenance during fish transport, reduce stress and prevent shock; parasiticide
Tricane methanyl sulfate	Anesthesia commonly used for mass marking

Antibiotics, e.g. erythromycin	Treat juvenile bacterial kidney disease, cold water disease, Columnaris and other gram-negative bacteria; treat adults for furunculosis or used as prophylactic for bacterial kidney disease
Acetic acid	Parasiticide
Calcium oxide	External protozoicide
Formalin	Control fungus, ectoparasites, and Ichthyophthirius multifilis (parasitic protozoan)
Hydrogen peroxide	Treat bacterial gill disease, fungus or ectoparasites
Magnesium sulfate	Treat external trematodes, external crustacean infestations, and infections of intestinal flagellated protozoa
Quarternary ammonia, or potassium permanganate	Bacterial gill disease, Columnaris
Sulfadimethoxine + oretoprim	Treat bacterial kidney disease, cold water disease, furunculosis, and enteric redmouth disease

CJH-010
Response 9

CJHP operations would follow a myriad of contemporary state and federal protocols for reducing the transfer of disease to wild fish. Hatchery intake water would be filtered to reduce some pathogens (particularly for egg incubation), but hatchery effluent is not expected to require special treatment for pathogens since any pathogens that might occur in the hatchery would likely exist in the wild already in similar amounts. Atypical pathogen levels in the hatchery would be managed with isolation and chemical treatments of affected fish and their hatchery environment (if affected). Fish with pathogens not present in the wild would not be released. (EIS Section 3.2.2)

CJH-010
Response 10

The Okanogan Summer/Fall Chinook Hatchery and Genetic Management Plan (Master Plan Appendix D, incorporated by reference in the EIS) specifies broodstock protocols in greater detail. Natural-origin fish would be incorporated into the hatchery broodstock at various proportions depending on the strength of the natural run. To protect the natural population, no more than 20% of natural-origin summer/fall Chinook returning over Wells Dam would be used for broodstock. At lower run sizes, up to 50% of the hatchery broodstock would be natural-origin fish. This proportion increases to 100% of higher runs. Hatchery production would be reduced in any years of insufficient escapement to protect the natural population.

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APPENDIX D
EXPANDED DISCUSSION OF PROGRAM AND FACILITIES OPTIONS THAT WERE ELIMINATED FROM DETAILED ANALYSIS IN THE CJHP EIS

Alternatives Analyzed in the EIS

The Chief Joseph Hatchery Program (CJHP) Environmental Impact Statement (EIS) evaluates two options in detail: the proposed action and a no action alternative. This range of alternatives was determined to be appropriate by the CJHP design team of engineering, environmental and natural resources specialists because:

- There was consensus that the proposed action would best achieve the program's purpose and need (EIS chapter 1).
- Other reasonable alternatives or more environmentally protective options were not identified that would satisfy the purpose and need.
- Issues were not raised that indicated any other alternative was needed to compare with, refine or replace the proposed action.

The EIS process included two formal opportunities for the interested and/or affected public and agencies to scrutinize the alternatives. These reviews yielded no proposals for additional alternatives.

2005 - Issue scoping with the interested/affected public and agencies
2007 - Release of the draft EIS and requisite series of public hearings

Program Options Considered but Not Analyzed in Detail

EIS section 2.3 briefly discusses four program alternatives that were considered by the CJHP design team, but for various reasons were eliminated from detailed development and analysis:

- Improve tributary fish habitat
- Improve fish passage conditions at Columbia River dams
- Reduce ocean and lower Columbia River salmon harvest
- Use, expand or reprogram existing hatchery facilities to accommodate CJHP production

Described below are some other less viable program alternatives that were also not analyzed in detail.

Shift some other existing Chinook production and releases to Okanogan River sites. Changing production and release sites would simply move mitigation benefits from other locations to the Okanogan, which does not satisfy the CJHP purpose of increasing overall Chinook abundance.

Collect broodstock at Wells Dam; continue propagating only early-arriving summer/fall Chinook for release into the lower Okanogan River. Not capturing the complete genetic profile of the Upper Columbia Summer/Fall Chinook ESU and propagating only part of the full run timing of summer/fall Chinook currently adapted to this migratory destination would be contrary

to the CJHP purpose. Also, releasing smolts only into the lower Okanogan River would underutilize miles of upstream spawning habitat.

Reduce Chinook redd superimposition near the Similkameen Hatchery (at Okanogan RM 77) by decreasing production and releases there. This modification would not increase spawning in miles of available Okanogan River habitat between the mouth and the hatchery and would not increase overall Chinook production, contrary to the CJHP purpose.

Facility Options Considered but Not Analyzed in Detail

The CJHP design team considered many alternative sites and configurations for facilities while in the long process of developing and refining the proposed action. The preferred sites and configurations in the proposed action are thought to represent the best balance of functionality, affordability, and environmental protection while satisfying the CJHP's purpose and need. Facility site and configuration options considered but not integrated into the proposed action are discussed below.

Hatchery Options

The proposed action (EIS section 2.1.4). The bench, created during construction of Chief Joseph Dam, is adequately-sized and ideally located for receiving adequate, quality water sources for a fish hatchery of the dimension desired. The proposed site would require relatively minor shaping prior to construction, is in close proximity to ample power supply, and would blend in with other constructed features of the proximal landscape. The land is managed and would be made available for development as a hatchery by the Corps of Engineers, a willing partner with the BPA and Confederated Colville Tribes in mitigating for the effects of the dam on fish and wildlife resources in the area. The site is also a very suitable capture point for migrating adult salmon and release point for hatchery-raised juveniles.

Site Option 1. Develop the hatchery complex somewhere on the Okanogan River. Water quality, quantity and availability concerns, and land suitability and acquisition costs, made this option non-viable.

Site Option 2. Develop the hatchery complex on the Columbia River near the intersection of Half Sun Way and Highway 17. Although water, power supply and land availability would be similar to the proposed action, hatchery construction here would conflict with the Corps of Engineers' Master Plan proposal for a visitor center at this location. Further down river from here, the land form becomes unsuitable for a hatchery and fish ladder/trap, and crucial cool well water quality and supply becomes limiting.

Configuration Option 1. Construct a hatchery effluent detention pond at the hatchery site south of the Corps of Engineers' existing Chief Joseph Dam visitor orientation area. The effluent pond would be incompatible with the visitor orientation area, making it contrary to the Chief Joseph Hatchery Master Plan. The proposed action is to use drum screen filters instead of a pond.

Configuration Option 2. Provide space at the hatchery site to maintain equipment and store fish food. To reduce the hatchery complex size, the existing Tribal trout hatchery (off-site) would be used for some maintenance functions and refrigerated fish food storage.

Configuration Option 3. Connect sanitary sewers at the hatchery site to the City of Bridgeport's sanitary system. This option would require expansion of the City of Bridgeport's wastewater treatment system to accommodate additional load.

Hatchery Water Supply and Pipeline Alignment Options

Develop a well field downstream of Chief Joseph Dam on the left bank of the Columbia River to supply cool water to the hatchery. Due to the high cost and environmental concerns of developing this well field location and piping water across the river, this option was rejected.

Develop a well field 3,000 feet north of the hatchery to supply crucial cool water to the hatchery. Very deep wells would be needed at this location and uncertainty was high whether their capacity would meet hatchery flow requirements.

Withdraw water from Rufus Woods Lake with a pump and pipe system to contribute to hatchery supply. This option would require installing a pipe around the right side of Chief Joseph Dam through a critical fill area that could compromise the dam's structural integrity. Also, the power costs for pumping were determined to be much higher than the proposed action.

Route a floating pipeline (slightly submerged) from the well field to the dam through Lake Rufus Woods. This location would conflict with other reservoir uses such as fishing, boating and other recreation along the north shore. Also, pipeline anchors could introduce slope stability issues.

Submerge the segment of pipeline from the well field to the dam on the bottom of Lake Rufus Woods. Most of the pipeline would be about 200 feet below water with few potential impacts. However, pumping requirements would be considerable and maintenance would be challenging, requiring divers and work in very hazardous conditions. And, this option also would conflict with recreation along the north shore.

Route and bury the pipeline supplying reservoir water under the paved roadway between the dam and the hatchery head box. The cost of asphalt disturbance and repair is prohibitive, and the route is not desired by the Corps of Engineers.

Tap the relief tunnel drain in the tailrace of the dam and install a pump station in the bank downstream of the right training wall. This option would not provide a reliable water supply necessary for hatchery operations due to intermittent shutdowns during dam spill events.

Tap the sump at the downstream end of the relief tunnel and install a pump station either in the existing fill adjacent to the sump or in the bank downstream of the right training wall. These options would be extremely expensive, yet water supply reliability would not be assured due to space limitations, technological constraints and functional uncertainty.

Employee Housing Options

Site Option 1. Provide employee housing at the hatchery site. The 1977 hatchery feasibility study found that space at the hatchery site was too limited to include employee housing.

Site Option 2. Provide employee housing at the existing Tribal trout hatchery. While cost effective, this option placed staff too far from the hatchery for safe, effective operation and emergency response. Operational risks outweighed the potential cost savings.

Site Option 3. Provide employee housing as near the hatchery as possible. An undeveloped site 0.8 miles northeast of the hatchery site on Half-Sun Way was investigated but eventually eliminated from consideration due to visual concerns of the Corps of Engineers. The site is very visible from Chief Joseph Dam. Another potential site 2.5 miles from the hatchery site near Bridgeport State Park and the Lake Woods Golf Course was also considered to be too visually sensitive, and plans for future recreation expansion there would be impacted. A third potential housing site on the embankment north of the hatchery site was eliminated because of visual impacts and extensive road and other infrastructure requirements. The proposed action site is about 2 miles northeast of the hatchery on Half-Sun Way where concerns over proximity to the hatchery and distance from visually sensitive areas and recreation sites is somewhat ameliorated.

Acclimation Pond Options

To make use of fish habitat available throughout the Okanogan River, it is important to locate an economical number of fish rearing and release sites with adequate space between them where adequate water supply is available near desirable fish rearing and spawning habitat, and where land may be acquired at a reasonable cost. Existing irrigation ponds at Ellisforde, Tonasket and Bonaparte provide good fish rearing and release locations in the mid- to upper-Okanogan basin. The cooperation of the Oroville-Tonasket Irrigation District, the owners/managers of these ponds, made the use of these ponds possible and very affordable with limited environmental impacts associated with minor modifications. In the lower to mid-Okanogan, two sites are proposed for development as new fish acclimation ponds.

Riverside Pond Options. The site at RM 41 of the Okanogan River was chosen for the proposed action after investigation of alternate locations in the vicinity (up to RM 49) had much higher acquisition costs, difficult access, and construction and water supply concerns. At the preferred RM 41 site, the initial design had the pond between the Okanogan River and the railroad tracks to avoid running water pipes under the railroad tracks. After more study, the preferred pond location became the side of the railroad tracks opposite away from the river so that it would be out of the river's 100-year flood zone, provide ample space for activities, and alleviate cultural resource concerns.

Omak Pond Options. Land for Omak Pond was readily available since the Confederated Colville Tribes already owned a suitable parcel where their Fish and Wildlife Department office sits (RM 32 of the Okanogan River). Initially, the pond was proposed near the west side of the Fish and Wildlife Department office, but at the request of the Tribes and due to cultural resource concerns, an alternative site between Brooks Tracts Road and the railroad tracks was evaluated.

Developing this site would require a long pipeline to discharge fish to the Okanogan River, including significant disturbance of roadways, driveways, other infrastructure, and additional cultural resource sites. So, the preferred pond location became the east side of the Fish and Wildlife Department office because it is closer to the river, which would make smolt release more convenient and less costly (less piping distance), and less environmentally impacting.

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