

# YAKIMA RIVER CLE ELUM HATCHERY OPERATION & MAINTENANCE

9701300

## SHORT DESCRIPTION:

Operate and maintain the Upper Yakima Spring Chinook facility, which consists of two adult holding ponds, twenty raceways, egg incubation facilities, groundwater wells, river pump station, settling pond for waste treatment, storage building, offices and research facilities. (Includes the three acclimation sites when constructed in 1998.) Through the operation of these facilities, the managers will learn more about the impacts and to test for the best methods for carrying out hatchery production and supplementation of natural production of Spring Chinook. This operation will be implemented under the "adaptive management" concept.

## SPONSOR/CONTRACTOR: YKFP

Yakama Indian Nation  
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## SUB-CONTRACTORS:

Washington Department of Fish & Wildlife

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## GOALS

### GENERAL:

Supports a healthy Columbia basin, Maintains biological diversity, Maintains genetic integrity, Increases run sizes or populations, Provides needed habitat protection, Adaptive management (research or M&E), Program coordination or planning, Basinwide, Education, Passage

### ANADROMOUS FISH:

Production, O&M, Research, M&E

### NPPC PROGRAM MEASURE:

7.4K.1

### RELATION TO MEASURE:

This phase of the Project, the design, construction and operation of the Upper Yakima River Spring Chinook facilities, will implement the process of determining the impacts of hatchery produced spring Chinook on wild populations. The management of the facilities will allow the managers to learn more about the impacts and to test for the best methods for carrying out hatchery production and supplementation of natural production of spring Chinook.

### OTHER PLANNING DOCUMENTS:

The YKFP, which the Upper Yakima Spring Chinook Facilities is apart of, is specifically listed in WY Kan Ush Me Wa Kush Wit, under Subbasin Plans, Yakima River, Recommended Actions for the Yakima River System, Part(9a) Page 59, Spring Chinook; Part (9b), Page 60, Fall Chinook; Part (c),Page 60, Summer Chinook; part (9d), page 60, Coho; Part (9e), Page 60, Sockeye; and part (9f), Page 60-61, Steelhead.

### TARGET STOCK

Upper Yakima Spring Chinook

### LIFE STAGE

Pre-spawning adult through smolt

### MGMT CODE (see below)

S-N-W

### AFFECTED STOCK

Mutualists

Pathogens

Competitors

Predators

### BENEFIT OR DETRIMENT

Beneficial

Beneficial

Detrimental

Beneficial

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## BACKGROUND

Stream name:

Subbasin:

Yakima River & Tributaries

Yakima

**Stream miles affected:**

**Land ownership:**

Yakima 650 miles

Tribal, State, Private & Federal

**HISTORY:**

The YKFP has been in the Fish and Wildlife plan since 1982. The Yakima phase of the Project initially included an all stock initiative. There still remains an all stock initiative but it will be implemented through a phase in process. The Policy Group's preferred alternative that's included within the FEIS is to implement the supplementation aspects for Spring Chinook and develop and implement a monitoring plan for the Coho that are currently released in the basin. The other stocks will be implemented through a tiering process. The Upper Yakima River spring Chinook Supplementation Facility (Cle Elum) is currently under construction with scheduled completion for late Spring. The three acclimation sites will enter the design phase starting in 1997 with construction scheduled to start in 1998. The Klickitat aspect of the Project currently is doing fishery surveys, population monitoring, habitat inventory, and engineering surveys of passage barriers in the Klickitat River watershed. This is consistent with the Preliminary Design Report.

**BIOLOGICAL RESULTS ACHIEVED:**

N/A.

**PROJECT REPORTS AND PAPERS:**

N/A

**ADAPTIVE MANAGEMENT IMPLICATIONS:**

Although the formal utilization of Adaptive Management will be used in the operational aspects of the Project, the Policy Group, in cooperation with BPA, has exercised this concept up to this point through the Policy Group (co-managers) format. Adaptive management is the conscious decision in favor of action designed to increase understanding as opposed to inaction in the face of uncertainty. With this concept, the introduction and familiarization is in place and ongoing. It's been deemed that adaptive management is essential as the principals of supplementation are tested and explored. Adaptive management will be implemented and employed during the operation of the UYSCF.

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**PURPOSE AND METHODS**

**SPECIFIC MEASUREABLE OBJECTIVES:**

1) To test the assumption that new supplementation techniques can be used in the Yakima River Basin to increase natural production and to improve harvest opportunities, while maintaining the long-term genetic fitness of the native salmonid populations and keeping adverse ecological interactions within acceptable limits; 2) To provide knowledge about the use of supplementation, so that it maybe used to enhance anadromous fisheries throughout the Columbia River Basin.

**CRITICAL UNCERTAINTIES:**

The critical uncertainties for the Upper Yakima Spring Chinook program are contained in Volume 3, Planning Status Report , 1994, Tables 5.2 -5.4. This document is on file with BPA or can be provided upon request. The operation of the Upper Yakima spring Chinook Facilities represents the initial phase of the actual implementation of this experimental process to test the concepts of supplementation.

**BIOLOGICAL NEED:**

Purpose and Need: The YKFP responds directly to the need for knowledge of viable means to rebuild and support naturally spawning anadromous fish stocks in the Yakima River Basin. Many anadromous fish stocks are in serious decline in the Pacific Northwest. One response--conventional fish hatcheries--has traditionally produced large numbers of artificially propagated fish to increase harvest opportunities and, in some cases, to bolster natural production. However, important questions regarding hatchery production have risen.

The YKFP is being designed 1) to provide resource managers with knowledge regarding these issues and 2) to identify and apply improved methods to rebuild and support naturally spawning anadromous fish stocks through supplementation. Supplementation aims to rebuild naturally produced spawning runs by raising and acclimating artificially propagated fish into natural streams and by increasing natural production of both naturally and artificially produced fish.

The Upper Yakima Spring Chinook Facilities (including acclimation sites) have been designed to implement these supplementation concepts. these facilities will be operated accordingly utilizing spring chinook broodstock, which will be captured at the Roza Adult Trap.

**HYPOTHESIS TO BE TESTED:**

1) New supplementation techniques can be used in the Yakima River Basin to increase natural production and to improve harvest opportunities, while maintaining the long-term genetic fitness of the native salmonid populations and keeping adverse ecological interactions within acceptable limits. 2) That salmonids reared and released under the New Innovative Treatment(NIT) will survive and returns as adults to the Yakima Basin at a higher rate than fish reared under the Optimum Conventional Treatment (OCT) method. 3) The Upper Yakima Spring Chinook Facilities have been designed to implement and test the concepts of supplementation. this project, through a Memorandum of Agreement, which will include an Annual Operating Plan, will allow the Yakama Indian Nation as the Lead Agency, to operate and maintain these facilities, consistent with the concepts of adaptive management.

**ALTERNATIVE APPROACHES:**

N/A

**JUSTIFICATION FOR PLANNING:**

In no uncertain terms, the Yakama Indian Nation and the State of Washington, through the Fish and Wildlife Department, are co-managers of the resource. The YKFP has been a coordinated project that included all of the planning between the YIN, WDFW and BPA. the Yin has been determined the Lead Agency for the YKFP.

**METHODS:**

Nine replicates of each treatment (OCT and NIT) for Upper Yakima Spring Chinook will be reared in the Cle Elum Hatchery, transferred and released from established acclimation sites. Survival to smolt and adult will be monitored. The M&E team is refining the experimental design under this Project Task Order. A total of 8 1 0,000 Spring Chinook smolts will be produced to provide 18 treatment groups of 45,000 fish. Refer to project #9506800.A detailed description of the experimental design and power analysis exists in the BPA Report "Experimental Design for Testing Differences in Survival Among Salmonid Populations" NOV 1994. Copies of this report can be obtained from BPA or upon request .

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**PLANNED ACTIVITIES**

**SCHEDULE:**

<u>Planning Phase</u>	<u>Start</u> 1982	<u>End</u> Unable to determine at this time	<u>Subcontractor</u>
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**Task** The Yakima/Klickitat fisheries Project (YKFP) will attain the knowledge for viable means to rebuild and maintain naturally spawning anadromous fish stocks in these basins. The Yakima fisheries Project is designed to develop answers for the resource managers on the many questions/concerns relative to hatchery production issues, as we now know them. It will also identify and apply improved methods for carrying out hatchery production and supplementation of natural production. Through supplementation, the goal is to increase the numbers of naturally spawning fish, while maintaining the long-term genetic fitness of the fish population being supplemented and keeping adverse genetic and ecological interactions with non-target species or stocks within acceptable limits. Ultimately, this process would phase out artificial propagation. The Klickitat Basin phase of the project is in the preliminary stages. Currently doing habitat inventory, fish surveys, juvenile salmonid outmigration studies, developing concepts for Northwest Power Planning Council (NPPC) approved YKFP; 1984: Development of a master plan for YKFP was recommended with supplementation included; 1987: NPPC approved master plan. 1990: Environmental Assessment (EA) completed, with a finding of No Significant Impact (FONSI) issued in April, 1990. subsequently, BPA determined that a Environmental Impact Statement (EIS)was needed. Notice of Intent (NOI) issued January, 1991, completed scoping meetings February, 1991. Issued Draft EIS (DEIS) October, 1992. due to magnitude of comments, a Revised DEIS was issued May, 1995. Record of Decision of YFP issued May, 1996. Construction on three acclimation sites to be completed 1998. Adult broodstock collection trap facility completed at Roza Diversion Dam, 1995.

**Implementation Phase**    **Start** 1982

**End** Unable to determine at this time

**Subcontractor**

**Task** The Cle Elum Hatchery for Spring Chinook is scheduled to be constructed in 1996 and 1997. Brood stock collection will be in Spring of 1997 at the Roza adult trap. Adults will be spawned in Fall of 1997. Juvenile fish will be reared in the hatchery in 1998. The three acclimation sites will be finalized and construction completed. In 1999 smolts are scheduled to be released from the acclimation sites. the monitoring on the out migrating smolts will begin in 1999 and continue through the duration of the project. the returning adults will be monitored in 2000, 2001, etc. Upper Yakima Spring Chinook Facility (Cle Elum) is scheduled for full construction completion May/June, 1997. O&M Agreement between YIN & BPA for UYSCF operations finalized April 1, 1997. Broodstock collection will be in Spring, 1997 at the Roza adult trap. Adults will be spawned in Fall of 1997. Juvenile fish will be reared in the hatchery in 1998. The three acclimation sites will be finalized (design) and construction completed in 1998. (BPA is the Lead on this activity) In 1999, smolts are scheduled to be released from the acclimation sites. Monitoring on the out migrating smolts will begin in 1999 and continue through the duration of the project. returning adults will be monitored in 2000, 2001, etc. As other stocks are developed, NEPA process will be through a teiring process and similar tasks will be achieved for each respective stock as has been done for Spring Chinook. Monitoring and Evaluation is a vital aspect of YKFP and the facilities that will be utilized will start a certification process in 1997. Normally, their are separate task orders that cover these activities which include a full description of all aspects of the task, including funding need.

**PROJECT COMPLETION DATE:**

Unable to determine at this stage of Project.

**CONSTRAINTS OR FACTORS THAT MAY CAUSE SCHEDULE OR BUDGET CHANGES:**

Some factors that may cause schedule or budget changes include but may not be limited to the following; NEPA issues in the teiring process to FEIS for additional stocks when we reach this stage i.e., Fall Chinook, Steelhead, Coho, etc.: Finalizing land purchases and appropriate permit requirements (land use, well and surface water) for the three acclimation sites: Potential cost over runs for well water development, final archeological review/assessment for acclimation sites; National Pollutants Discharge Elimination System (NPDES) permit if applicable, for acclimation sites; 404 permit from Corps of Engineers, if applicable for acclimation sites.

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## **OUTCOMES, MONITORING AND EVALUATION**

### **SUMMARY OF EXPECTED OUTCOMES**

**Expected performance of target population or quality change in land area affected:**

It is expected that the target population of Spring Chinook will increase as a result of this project. The monitoring aspect of this project will provide information that will contribute to the evaluation of supplementation as a whole technique in rebuilding natural production in salmonid populations. The long term benefits of supplementing natural populations of salmonids will require at least several generators of returning adults for analysis.

**Present utilization and conservation potential of target population or area:**

101B Regarding conservation potential, all extant stocks of anadromous salmonids in the Yakima Basin are depressed, especially summer steelhead. The current utilization potential for extant stocks is low for spring and fall chinook and negligible for summer steelhead.

**Assumed historic status of utilization and conservation potential:**

It has been variously estimated that there were from 600,000 to 900,000 adult salmonids that returned to the Yakima system annually. Through history, these fish were utilized by Native Americans and by other Americans for food and commerce.

**Long term expected utilization and conservation potential for target population or habitat:**

Obviously, the long term desired utilization potential for the target population is to have sufficient adults return to allow for a meaningful harvest by tribal and other fishers after sufficient numbers of adults have met the needed spawning escapement to sustain the population.

**Contribution toward long-term goal:**

It is expected the project will contribute an increase in the number of returning and natural reproducing adults to the target population and information on the feasibility of using supplementation to rebuild natural populations of salmonids.

**Indirect biological or environmental changes:**

Productivity of the entire sub-basin could be increased due to the nutrients provided from decaying carcasses of spawned salmonid.

**Physical products:**

A total of 810,000 potential tagged fish, BPA purchased land for UYSC facility and is in process of acquiring land for the three acclimation sites.

**Environmental attributes affected by the project:**

Project is a non-consumptive water utilizer but will have some level of impact on instream flow between point of diversion to where water re-enters mainstem. It will have a positive impact on the side channel where water enters for fish habitat. Direct non-hatchery utilized portions of the land where hatchery is located will be retained for wildlife use.

**Changes assumed or expected for affected environmental attributes:**

During the construction phase of hatchery, wetlands were developed as a replacement factor of the site where hatchery is located which will have a positive long term effect.

**Measure of attribute changes:**

N/A

**Assessment of effects on project outcomes of critical uncertainty:**

The YKFP (Buasck et. al, 1997, in press) has just completed a thorough Monitoring Plan for the upper Yakima spring chinook supplementation program. This document systematically describes how all critical uncertainties involved in the spring chinook project will be assessed.

**Information products:**

This project will periodically update existing enhancement plans for each species and stock as described in the Planning Status Reports(PSRs), evaluate progress toward established goals for ongoing projects and develop new enhancement plans for stocks not currently targeted. Each of these documents is being updated on the previously described annual adaptive management planning cycle.

**Coordination outcomes:**

The Yakama Indian Nation, Washington state, and the Federal agencies will coordinate outcomes of the project through the adaptive management process described in the FEIS and in the project management structure.

**MONITORING APPROACH**

The co-managers of the resource (YIN & WDFW), in cooperation with BPA, have established an operation structure for the YKFP, which establishes a format for participation and decision making for the Project, including the operation of the Upper Yakima Spring Chinook Facility. The region should measure the projects biological outcomes through monitoring of the targeted population, with success indicated by an increase in the population. The project will also provide information on the success of using supplementation to increase salmonid populations.

**Provisions to monitor population status or habitat quality:**

These provisions for the upper Yakima spring chinook program are spelled out in the Monitoring Plan (Busack, et. al, in press). Population status for target and non-target populations will be monitored at smolt monitoring facilities at Roza dam on the upper Yakima and at Chandler juvenile evaluation facility on the lower Yakima River. Returning adults will be monitored at Prosser dam on the lower Yakima and at Roza dam by video analysis and by interrogation of selected adults at the Roza adult collection

facility. Harvest monitoring will also occur in the mainstem Columbia and Yakima. Spawning ground surveys will be conducted to determine locations where acclimated fish spawn.

**Data analysis and evaluation:**

These provisions for the upper Yakima spring chinook program are detailed in the Yakima Fisheries Project Spring Chinook Monitoring Plan developed by the Monitoring Implementation Planning Team (MIPT), (Busacket. al, BPA, in press).

**Information feed back to management decisions:**

The plan for information feedback to management decisions related to this project are described in detail in the FEIS, section 2.2 "Adaptive Management".

**Critical uncertainties affecting project's outcomes:**

The critical uncertainties are being addressed in various methods through this project. First, baseline historical data on life history strategies and resulting survival of populations utilizing these different strategies is being analysed and modeled using Patient/Template Analysis methodology. The monitoring facilities in the system are undergoing a certification process to insure that the physical facilities and operational protocols meet the data collection criteria for the monitoring and evaluation of the experimental design. Also, small scale experiments have been designed and conducted to resolve critical uncertainties regarding the methodologies that will be implemented in the experimental design under implementatin of the full scale project. Ultimately, the only way to evaluate critical uncertainties entailed by an enhancement program is to implement and evaluate the program under an adaptive management process as described previously.

Corollary or broader scale research needs would include studies designed to identify and resolve survival problems in life stages outside the Yakima subbasin. Other research needs would include similar studies for other species and stocks as proposed under the all stock initiative for the YKFP, and also for other subbasins in the Columbia system.

**EVALUATION**

The success of the YKFP can be assessed in several ways. First, the status of the targeted population is being monitored and evaluated to determine if the project increases the natural production over the long term while keeping genetic and interaction effects at an acceptable level. Secondly, the experimental design of the project will provide information on the use of supplementation that will guide the region in making decisions that are important in restoration and rebuilding salmonid stocks in the Pacific Northwest. Thus, even if the project fails to increase natural production, the experimental design of the project will provide information useful in future decisions regarding the use of supplementation through the adaptive management process outlined in the FEIS.

**Incorporating new information regarding uncertainties:**

This is described in the "Adaptive Management" section of the FEIS.

**Increasing public awareness of F&W activities:**

Public awareness and education have been, and will continue to bean important part of the YKFP. School classes and adult tours are regularly scheduled to visit the monitoring facilities of the project. Classes of students and adults also go on spawning ground surveys with project biologists where they are educated in the habitat needs for natural production of salmonid populations. The project also funds an education component through the local Education School District to coordinate school programs and tours. Project personnel work with Yakima Watershed Council to educate other water users in the basin (irrigators, ranchers, etc.) about salmonid water and habitat needs. Finally, the project has an interpretive center and viewing kiosk located at the hatchery site to educate the public about the natural habitat needs of the salmon and how the supplementation process is designed to help rebuild natural production.

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**RELATIONSHIPS**

**RELATED BPA PROJECT**

**RELATIONSHIP**

9506800 Preliminary Design for Passage and Habitat Improvement in the Klickitat River	Initiates the tasks needed to provide basic information from fisheries surveys, population monitoring, habitat inventory & engineering surveys for passage barriers for Preliminary Design Report.
8812005 Video Monitoring	Estimating adult passage at Roza & Chandler for YKFP objectives, etc. Video Monitoring
8812008 Fisheries Technician Field Activities	Technical personnel support for field data collection, task activities/assignments and special fishery projects consistent with YKFP objectives.
8812009 Quantitative Production Objectives Steelhead/Fall Chinook	Refining objectives for Steelhead/Fall Chinook and assisting selection of appropriate treatment strategies, fish analysis and monitoring plans.
8811500 Hatchery Construction	Construction of Spring Chinook Supplementation Facilities for YKFP.
8812004	Training Assistance for Personnel for YKFP needs, etc. Contracted to Co-Managers, Washington State. Training & Education
9506300 Yakima/Klickitat Monitoring /Evaluation Program	Develop and Test M & E Plans for YKFP
8812010	Chandler Certification study, via estimates of upper Yakima smolt production, will determine performance of hatchery groups to identify impacting factors for monitoring & corrections.
9506300 Yakima/Klickitat Monitoring and Evaluation Program	Develop and test M & E plans for YKFP.
8903000 Effects of Acclimation on the Survival of Spring Chinook Salmon	Effects of acclimation on the survival of Spring Salmon.
5507700 Monitoring of Supplementation Response Variables for YKFP	Monitoring of Supplementation Response Variables for YKFP
95066401	Refinement of marking Methods for YKFP
9506402	Upper Yakima Species Interaction Studies
9506404 Policy/Technical Involvement and Planning for YKFP	Policy/Technical Involvement and Planning, YKFP
9602000	Pit Tag Hatchery Fish-Multiple States
9006900 Yakima Hatchery Final Design	Final design for UYSC Acclimation sites and wells.

**RELATED NON-BPA PROJECT**

Yakima Basin Watershed Council, funds from state and private sources.

Yakima River Basin Water Enhancement Project (YRBWEP), Congressionally funded.

**RELATIONSHIP**

Possibility of cooperative habitat enhancement projects.

Irrigation water conserved by YRBWEP may be allocated in part to benefit fish stocks analyzed by this planning/modeling project.

**OPPORTUNITIES FOR COOPERATION:**

The YIN and WDFW: As co-managers, the two entities will continue to coordinate all aspects of the YKFP, including the operation of the UYSCF, as we apply the concepts of adaptive management. YKFP/BOR: The Bureau of Reclamation provides essential hydrological data to this effort.

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**COSTS AND FTE**

**FUTURE FUNDING NEEDS:**

**PAST OBLIGATIONS (incl. 1997 if done):**

<b>FY</b>	<b>\$ NEED</b>	<b>% PLAN</b>	<b>% IMPLEMENT</b>	<b>% O AND M</b>
1998	\$988,000			100%
1999	\$988,000			100%
2000	\$1,000,000			100%
2001	\$1,000,000			100%
2002	\$1,050,000			100%

**OTHER NON-FINANCIAL SUPPORTERS:**

Yakama Indian Nation, Bureau of Reclamation, Washington State Department of Fish & Wildlife

**1997 OVERHEAD PERCENT:** 26.6% of Base

**HOW DOES PERCENTAGE APPLY TO DIRECT COSTS:**

Applies to all direct costs.

**CONTRACTOR FTE:** 7.5 FTE Equivalent

**SUBCONTRACTOR FTE:** N/A