

# YAKIMA/KLICKITAT MONITORING AND EVALUATION PROGRAM

9506300

## SHORT DESCRIPTION:

Support to participate in the planning and implementation of the monitoring and evaluation plans for the YKFP.

## SPONSOR/CONTRACTOR: YIN

Yakama Indian Nation  
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## SUB-CONTRACTORS:

DOUG NEELEY, CONSULTANT; ALDEN RESEARCH LABS, CONSULTANTS; SUMMIT TECHNOLOGY

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## GOALS

### GENERAL:

Supports a healthy Columbia basin, Maintains biological diversity, Maintains genetic integrity, Increases run sizes or populations, Adaptive management (research or M&E), Program coordination or planning

### ANADROMOUS FISH:

Research, M&E

### NPPC PROGRAM MEASURE:

7.4K.1

### RELATION TO MEASURE:

This project facilitates the planning and implementation of the Monitoring and Evaluation program for the above mentioned Yakima/Klickitat Fisheries project.

### BIOLOGICAL OPINION ID:

N/A

### OTHER PLANNING DOCUMENTS:

The YKFP is specifically 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.

### TARGET STOCK

### LIFE STAGE

### MGMT CODE (see below)

Naches River Spring Chinook	Monitoring pre-spawning adults through smolt.	N-W
American River Spring Chinook	Monitoring pre-spawning adults through smolt.	N-W
Steelhead	Monitoring pre-spawning adults through smolt	N-P(?)-W
Fall Chinook Yakima River	Egg through adult	S-N-W
Fall Chinook Marion Dr.	Egg through adult	S-N-W
Coho	Pre-smolt through returning adult.	S-N-or P (?)
Upper Yakima Spring Chinook	Pre-spawning adult through smolt	S-N-W

### AFFECTED STOCK

### BENEFIT OR DETRIMENT

Mutualists	Beneficial
Pathogens	Beneficial
Competitors	Detrimental
Predators	Beneficial

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## BACKGROUND

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### Stream name:

Yakima & Tributaries

### Stream miles affected:

33 Yakima 650 miles

### Subbasin:

Yakima River

### Land ownership:

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. The monitoring component of the YKFP has always been included in the costs associated for planning, construction, implementation, and operation of this large scale research project.

## BIOLOGICAL RESULTS ACHIEVED:

Smolt and adult monitoring capabilities have been developed for salmonid stocks in the Yakima Basin.

## PROJECT REPORTS AND PAPERS:

Through the YKFP, the YIN as the Lead Agency, has participated in developing the following essential documents that have implications on the monitoring and evaluation capabilities of the project; 1. Project Status Report, 2. Uncertainty Resolution Plan, 3. Revised/Final Environmental Impact Statement, 4. Final Cle Elum Hatchery Design, 5. Memorandum of Understanding (MOU) w/ Washington State, 6. Memorandum of Understanding w/BPA in process, 7. Spring Chinook Monitoring Plans. We also participated in the following YKFP functions: 1. Policy Group Meetings, (co-managers with WA state. 2. Science/Technical Advisory Committee, 3. FISHNET Coordination, 4. Project Annual Review, 5. Management/Organizational format for YKFP. 6. Implemented/Coordinated other Task Order functions, consistent with Goals and Objectives of YKFP and Lead Agency. 7. Water resource and fish passage activities. 8. Monitoring & Implementation Planning Team. Hoffman, A. et.al. 1994. Experimental Design for Testing Differences in Survival Among Salmonid Populations. Bonneville Power Administration.

Fast, D. E. et al. 1989. Yakima/Klickitat Natural Production and Enhancement Program. Prepared for Bonneville Power Administration. Project No. 88-120. Grante DE AI79 88BP93203.

Hubble, J. D. et al. 1990. Yakima/Klickitat Natural Production and Enhancement Program. Prepared for Bonneville Power Administration. Project No. 88-120. Grante DE AI79 88BP93203.

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## ADAPTIVE MANAGEMENT IMPLICATIONS:

Adaptive management is the conscious decision in favor of action designed to increase understanding as opposed to inaction in the face of uncertainty. The Y/KFP has followed this concept of adaptive management throughout the planning and implementation phases of this project. The project plan for information feedback to management decisions is described in detail in section 2.2 "Adaptive Management" of the Final EIS for the project. This adaptive management process utilizes an annual cycle of information/data collection, analysis, reporting, amending the Project Status Report (PSR), and revising activities for upcoming year to address new information. The adaptive management process has resulted in the managers decision to downsize the initial phase of the supplementation project from an all stock initiative to the single stock program using the Upper Yakima Spring Chinook population. Information developed in this first phase will be utilized through the adaptive management

process to proceed with planning and implementation of additional stocks within the Yakima basin.

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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 may be 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 .

### **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. This program plans and implements the monitoring and evaluation of the upper Yakima spring chinook from pre-spawning adult through outmigrating smolt and as retraining adults to the Yakima basin.

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 purpose of this program is to monitor and evaluate supplementation to determine if it succeeded in increasing natural production of the target population.

### **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.

### **ALTERNATIVE APPROACHES:**

The Yakima Fisheries Project "Final Environmental Impact Statement" DOE? EIS -0169 JAN 1996 describes three alternatives for the project. These are 1) the preferred alternative of Upper Yakima Spring Chinook and the research on existing releases of coho salmon, 2) the Upper Yakima Spring Chinook rearing, acclimation, release research alternative, and 3) the no action alternative. In addition to these three alternatives, the EIS considered five other alternatives, but eliminated them from further analysis . These included 1) passage improvements and other activities, 2) more supplemented stocks, 3) alternative sites, 4) research at existing non-Yakima River Basin Sites, and 5) other research outside the Yakima River Basin.

### **JUSTIFICATION FOR PLANNING:**

N/A

### **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:

<b><u>Planning Phase</u></b>	<b><u>Start</u></b> 1982	<b><u>End</u></b> Unable to determine at this time	<b><u>Subcontractor</u></b>
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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.

<b><u>Implementation Phase</u></b>	<b><u>Start</u></b> 1982	<b><u>End</u></b> Unable to determine at this time	<b><u>Subcontractor</u></b>
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**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 tiering 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, there 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 tiering 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

# 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 generations of returning adults for analysis.

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

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. The monitoring and evaluation program will collect data to determine if this occurs, analyze that data, and report the results to the managers and the region.

### **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 tagged smolts are scheduled for release from the acclimation facilities of this project. The tagged adults that return from those smolts released will be monitored to determine if they contribute to the natural production of the target population. This will be monitored over several generations to determine the input and potential impacts of supplementation.

### **Environmental attributes affected by the project:**

N/A

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

N/A

### **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, state and federal agencies will coordinate changes to the project based on the adaptive management process described previously in this form.

**MONITORING APPROACH**

The region will be able to measure this project's biological outcomes in two distinct areas. First, the production and supplementation aspect of the project will be successful if and when it has succeeded in meeting the project objective of increasing natural production as a result of returning adults from the smolts released through the project. The research aspect of the project should provide the region with information on the utilization of supplementation in restoring salmon runs.

**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) ,(Busack et. 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 implementation 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:**

Once again, 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 be an 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**

8812010	Chandler Certification study, via estimates of upper Yakima smolt production, will determine performance of hatchery groups to identify impacting factors for monitoring & corrections.
9602000	Pit Tag Hatchery Fish-Multiple States
9506404 Policy/Technical Involvement and Planning for YKFP	Policy/Technical Involvement and Planning, YKFP
9506402	Upper Yakima Species Interaction Studies
9506401 Refinement of Marking Methods for YKFP Note - Project Is Closing and Will Note Be Seeking Additional Funds in 1998 and Beyond	Refinement of marking Methods for YKFP
5507700 Monitoring of Supplementation Response Variables for YKFP	Monitoring of Supplementation Response Variables for YKFP
8903000 Effects of Acclimation on the Survival of Spring Chinook Salmon	Effects of acclimation on the survival of Spring Salmon.
9506000 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.
9006900 Yakima Hatchery Final Design	Final design for UYSC Acclimation sites and wells.
8801200 Hatchery Construction	Construction of Spring Chinook Supplementation Facilities for YKFP.
8801200 Quantative Production Objectives Steelhead/Fall Chinook	Refining objectives for Steelhead/Fall Chinook and assisting selection of appropriate treatment strategies, fish analysis and monitoring plans.
8801200 Fisheries Technician Field Activities	Technical personnel support for field data collection, task activities/assignments and special fishery projects consistent with YKFP objectives.
8801200 Video Monitoring	Estimating adult passage at Roza & Chandler for YKFP objectives, etc.
8801200 Training & Education	Training Assistance for Personnel for YKFP needs, etc. Contracted to Co-Managers, Washington State.

**OPPORTUNITIES FOR COOPERATION:**

The YIN and WDFW have and will continue to collaborate in the planning and implementation of the monitoring and evaluation plan through the Monitoring Implementation Planning Team (MIPT) and the creation and refinement of models and the gathering of data needed to run them. YKFP/BOR: The BOR owns and operates the irrigation facilities (dams and irrigation canals) that have the physical facilities that constitute the monitoring sites for the project. BOR also provides essential hydrological data to this effort.

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**COSTS AND FTE**

**1997 Planned:** \$1,550,000

**1996 Unobligated:** \$186,886

**FUTURE FUNDING NEEDS:**

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

<u>FY</u>	<u>\$ NEED</u>	<u>% PLAN</u>	<u>% IMPLEMENT</u>	<u>% O AND M</u>
1998	\$1,500,000	25%	50%	25%
1999	\$1,500,000	20%	50%	30%
2000	\$1,500,000	10%	50%	40%
2001	\$1,500,000	10%	50%	40%
2002	\$1,500,000	10%	50%	40%

**OTHER NON-FINANCIAL SUPPORTERS:**

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

**LONGER TERM COSTS:** \$1,500,000.00 Primarily O&M with some implementation possible

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

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

Applies to all direct costs.

**CONTRACTOR FTE:** 12 FTE Equivalent

**SUBCONTRACTOR FTE:** N/A

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