

UMATILLA BASIN NATURAL PRODUCTION MONITORING AND EVALUATION

9000501

SHORT DESCRIPTION:

Evaluate the success of natural production of salmon and steelhead resulting from the Umatilla Fisheries Restoration Program. Specifically evaluate the implementation of the Umatilla Hatchery Master Plan with respect to adult salmon and steelhead passage, natural production, and tribal harvest.

SPONSOR/CONTRACTOR: CTUIR

Confederated Tribes of the Umatilla Indian Reservation
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GOALS

GENERAL:

Adaptive management (research or M&E), Program coordination or planning

WATERSHED:

Research, M&E

ANADROMOUS FISH:

Research, M&E

NPPC PROGRAM MEASURE:

7.1A.1, 7.4I.2, 4I.2

RELATION TO MEASURE:

Provides Monitoring and Evaluation for these Measures - the primary effort to measure the natural production success of the Umatilla fisheries restoration program.

OTHER PLANNING DOCUMENTS:

Umatilla Subbasin Plan, Umatilla Basin and Hatchery Annual Operating Plan, Wy Kan Ush Me Wa Kush Wit and Umatilla Hatchery Master Plan.

TARGET STOCK

Umatilla River / Tanner Creek Coho Salmon

Umatilla River / Mid-Colombian River Fall
Chinook Salmon

Umatilla River / Carson Spring Chinook Salmon

Umatilla River Summer Steelhead

LIFE STAGE

Egg, Parr, Smolt, Adult

Egg, Parr, Smolt, Adult

Egg, Parr, Smolt, Adult

Egg, Parr, Smolt, Adult

MGMT CODE (see below)

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S,W

AFFECTED STOCK

Umatilla River Bull Trout

BENEFIT OR DETRIMENT

Beneficial; Informational

BACKGROUND

Stream name:

Umatilla River and tributaries

Stream miles affected:

89

LAND AREA INFORMATION

Subbasin:

Umatilla River

Land ownership:

80% Private, 20% Public

Acres affected:

HISTORY:

Beginning in the early 1980's, the Confederated Tribes of the Umatilla Indian Reservation and Oregon Department of Fish & Wildlife began implementing a comprehensive plan to supplement steelhead and re-establish salmon runs in the Umatilla River Basin. This project monitors and evaluates how successful salmon and steelhead reproduce naturally and how they negotiate passage facilities. Knowledge from this effort assists managers to improve fall & spring chinook, coho salmon, and steelhead restoration efforts.

BIOLOGICAL RESULTS ACHIEVED:

Successful natural production of spring and fall chinook, and coho salmon has been documented (adults spawned and progeny sampled) in 1992-1997. Indian and non-Indian spring and fall chinook, and coho salmon fisheries (one or all three) have been opened and monitored in the Umatilla River in four of the last seven years. Adult passage facilities have been evaluated, and baseline data established for salmonid abundance, and habitat quality and quantity throughout the Umatilla Basin. This project in itself will not directly achieve biological results but valuable information gained will be critical for fish managers to apply to Umatilla Basin restoration efforts which directly effect biological results.

PROJECT REPORTS AND PAPERS:

Contractor submitted annual and quarterly reports since inception.

ADAPTIVE MANAGEMENT IMPLICATIONS:

This project's primary purpose is to evaluate the results of various ongoing projects in the Umatilla Basin to provide managers information necessary to further refine management actions. Some findings are already influencing management decisions, however, most information regarding the natural reproductive success of hatchery supplemented stocks is forthcoming.

PURPOSE AND METHODS
SPECIFIC MEASUREABLE OBJECTIVES:

1. Estimate the amount of existing and potential spawning and rearing habitat for summer steelhead, spring and fall chinook, and coho.
2. Determine species distribution, composition, abundance and densities of fish throughout the Umatilla Basin.
3. Determine natural spawning success, spawning habitat utilization, prespawning mortality, and number of redds per adult anadromous salmonid passed above three mile dam by species.
4. Estimate natural smolt production and survival rates of anadromous salmonids at various life history stages.
5. Determine salmonid life history characteristics.
6. Determine the genetic and ecological effects of supplementation on native steelhead and resident trout in the Umatilla Basin.
7. Determine if hatchery supplementation enhances production of natural steelhead.
8. Estimate tribal harvest of adult salmon and steelhead returning to the Umatilla River Basin.
9. Determine passage effectiveness of adult passage facilities

CRITICAL UNCERTAINTIES:

The Umatilla Hatchery Master Plan identified the following four critical uncertainties that the UBNPME project will address:

- 1) What is observed natural production success and estimated natural production potential for each anadromous salmonid species in the Umatilla Basin?
- 2) Will supplementation enhance summer steelhead?
- 3) What extent will supplementation impact the genetic diversity and life history characteristics of native steelhead and resident rainbow trout?
- 4) Do newly constructed adult passage facilities provide for effective upstream migration?

BIOLOGICAL NEED:

The general UBNPME program goal and need is to evaluate natural production of salmon and steelhead resulting from the Umatilla Fisheries Restoration Program. Specifically, the project will evaluate the implementation of the Umatilla Hatchery Master Plan with respect to natural production, genetic and ecological risk, and tribal harvest.

HYPOTHESIS TO BE TESTED:

Null Hypotheses.

1. Steelhead supplementation enhances natural production of steelhead population in the Umatilla River.
2. Artificially produced coho, fall and spring chinook salmon will spawn and produce viable, naturally producing, runs.
3. Newly constructed passage facilities provide adequate passage for adult anadromous salmon.
4. Hatchery produced adults will spawn naturally and their progeny will utilize the available habitat in the Umatilla Basin.
5. Steelhead supplementation efforts do not adversely affect the genetic diversity and life history characteristics of native steelhead.

Alternate hypotheses are simply the antitheses of the null hypotheses.

METHODS:

UBNPME project methods: 1) estimate the amount of existing and potential spawning and rearing habitat for summer steelhead, spring and fall chinook, and coho salmon in the Umatilla Basin; 2) determine species distribution, composition, abundance and densities of fish throughout the Umatilla Basin; 3) determine natural spawning success, spawning habitat utilization, prespawning mortality, and number of redds per adult anadromous salmonid passed above three mile dam by species; 4) estimate natural smolt production and survival rates of anadromous salmonids at various life history stages; 5) determine salmonid life history characteristics; 6) determine the genetic and ecological effects of supplementation on native steelhead and resident trout in the Umatilla; 7) determine if hatchery supplementation enhances production of natural steelhead; 8) estimate Tribal harvest of adult salmon and steelhead returning to the Umatilla River Basin; and 9) monitor passage of adult salmon and steelhead.

PLANNED ACTIVITIES

SCHEDULE:

<u>Planning Phase</u>	<u>Start</u> 1992	<u>End</u> 2007	<u>Subcontractor</u>
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Task Planning is updated annually and incorporates new findings, available resources and manager's informational needs.

<u>Implementation Phase</u>	<u>Start</u> 1992	<u>End</u> 2007	<u>Subcontractor</u>
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Task Continue to monitor and evaluate the adult fish passage and natural production success of the re-established salmon and supplemented steelhead populations in the Umatilla River Basin. Complete establishment of baseline data for future comparisons and evaluation of natural production, quantity of suitable salmonid habitat, rearing densities, spawning success and distribution. Research/evaluation is expected to occur from 1992-2007. After 2007, the project emphasis is expected to shift to monitoring only.

PROJECT COMPLETION DATE:

2007

OUTCOMES, MONITORING AND EVALUATION

SUMMARY OF EXPECTED OUTCOMES

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

Direct benefits are derived through adaptive management decisions based on the information gathered through the monitoring and evaluation processes. The information obtained through this project will have direct application to the management of anadromous stocks in the entire Pacific Northwest as well as the Umatilla Basin.

Present utilization and conservation potential of target population or area:

Provide information to assist managers in maintaining and enhancing salmon and steelhead returns.

Assumed historic status of utilization and conservation potential:

Three of the four Umatilla River anadromous species were extinct for seventy years.

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

Adult Spring Chinook - Hatchery Production 10,000; Natural Production 1,000; Total 11,000
Adult Fall Chinook - Hatchery Production 10,000; Natural Production 11,000; Total 21,000
Adult Summer Steelhead - Hatchery Production 10,000; Natural Production 4,000; Total 14,000
Adult Coho Salmon - Hatchery Production 6,000; Natural Production Undetermined; Total 6,000
TOTAL - 47,670

Contribution toward long-term goal:

Provide information to assist managers in maintaining and enhancing salmon and steelhead returns.

Assessment of effects on project outcomes of critical uncertainty:

This project is the assessment, monitoring and evaluation effort for the Umatilla River restoration project.

Information products:

Information derived from this project is disseminated through monthly meetings and quarterly and annual reports. Tribal, state and federal managers and researches discuss current findings and explore best options for management and research during the monthly River Operations Meetings and the Umatilla River Basin Research Oversight Committee Meetings. Managers have immediate access to this project results for timely adaptive management decisions. The information obtained through this project may also have direct application to the management of anadromous stocks in systems throughout the Pacific Northwest.

Coordination outcomes:

We cooperate on a weekly/monthly basis with the Oregon Department of Fish and Wildlife in many common activities and interests which include: natural production monitoring, habitat evaluation, marking, estimation of abundance and survival of downstream migrants, harvest monitoring, stream temperature monitoring, passage evaluations, and mark retention studies. We cooperate with the US Forest Service with habitat surveys and stream temperature monitoring. We also cooperate with the Bureau of Reclamation in passage facility operations, collecting and monitoring juvenile migrants, and water temperature monitoring.

MONITORING APPROACH

Because all endemic salmon were extinct in the Umatilla Basin, restoration efforts required the introduction of non-endemic stocks. This project is the only monitoring and evaluation effort documenting how well those non-endemic stocks reproduce naturally. Determining the success of steelhead supplementation efforts is the other major focus of this project. Uncertainty regarding the success of steelhead supplementation remains. This project will help determine how successful supplementation efforts can be in boosting total steelhead returns. We examine and monitor all freshwater life history phases of salmon and steelhead. The information we provide assists management in evaluating the performance of the Umatilla Basin Restoration Project and has implications for the entire region.

Provisions to monitor population status or habitat quality:

This project provides monitoring and evaluation for the entire Umatilla Basin restoration effort.

Data analysis and evaluation:

Information derived from this project is disseminated through monthly meetings and quarterly and annual reports. Tribal, state and federal managers and researches discuss current findings and explore best options for management and research during the monthly River Operations Meetings and the Umatilla River Basin Research Oversight Committee Meetings. Managers have immediate access to this project results for timely adaptive management decisions. The information obtained through this project may also have direct application to the management of anadromous stocks in systems throughout the Pacific Northwest.

Information feed back to management decisions:

Information derived from this project is disseminated through monthly meetings and quarterly and annual reports. Tribal, state and federal managers and researches discuss current findings and explore best options for management and research during the monthly River Operations Meetings and the Umatilla River Basin Research Oversight Committee Meetings. Managers have immediate access to this project results for timely adaptive management decisions. The information obtained through this project may also have direct application to the management of anadromous stocks in systems throughout the Pacific Northwest.

Critical uncertainties affecting project's outcomes:

A progeny mark is a research tool that we would like to see examined, developed and tested. A progeny mark is a material administered to female parents that is detectable in the tissue of their progeny. One approach would be a benign compound (or element such as strontium) that can be quickly assimilated into the eggs or carried in with a delivery medium. The benign material would be placed in adult, hatchery, female salmon and steelhead collected at traps and weirs (such as the Three Mile Falls Dam Trap on the Umatilla River). The marked adults would be released for natural spawning. The marker would need to be absorbed by the eggs prior to spawning and then incorporated in the fry's tissue during the first stages of growth. The chemical compositions of otolith centers from a sample of naturally produced progeny would indicate the ratios of progeny from marked and unmarked females. This work would be an extension of work done on sockeye salmon to determine if juvenile salmon had an anadromous or resident female parent. Researchers found that the higher strontium concentrations in anadromous sockeye (because of the higher strontium concentrations in the ocean) were passed on to their progeny and were detectable in the center of the progeny's otoliths. The difference in the progeny mark would be its artificial placement in adult females during their upstream migration. If successful, researchers would have a tool to determine the relative success of different salmonid stocks and groups reproducing naturally.

EVALUATION

Information derived from this project is disseminated through monthly meetings and quarterly and annual reports. Tribal, state and federal managers and researchers discuss current findings and explore best options for management and research during the monthly River Operations Meetings and the Umatilla River Basin Research Oversight Committee Meetings. Local managers have immediate access to this project results for timely adaptive management decisions. The information obtained through this project may also have direct application to the management of anadromous stocks in systems throughout the Pacific Northwest.

Incorporating new information regarding uncertainties:

Information derived from this project is disseminated through monthly meetings and quarterly and annual reports. Tribal, state and federal managers and researchers discuss current findings and explore best options for management and research during the monthly River Operations Meetings and the Umatilla River Basin Research Oversight Committee Meetings. Managers have immediate access to this project results for timely adaptive management decisions. The information obtained through this project may also have direct application to the management of anadromous stocks in systems throughout the Pacific Northwest.

RELATIONSHIPS

RELATED BPA PROJECT

8902401 Evaluation of Juvenile Salmonid Outmigration and Survival in the Lower Umatilla River / ODFW BPA Project

8710001 Umatilla River Basin Anadromous Fish Habitat Enhancement

8802200 Umatilla River Basin Trap and Haul Program

9101400 Umatilla Hatchery Satellites - Design & Construction

8343500 Umatilla Hatchery Satellite Facilities O & M

8403300 Umatilla Hatchery O & M

RELATIONSHIP

Part of the overall Monitoring and Evaluation of the Umatilla River Basin Restoration Project

Same as 8343500

Same as 8343500

Same as 8343500

All listed projects, along with monitoring and evaluation, are components of the overall Umatilla Basin Restoration Program. The monitoring program is specifically related to these other projects by providing critical information for adaptive management.

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RELATED NON-BPA PROJECT

Umatilla Basin Project/USBR

RELATIONSHIP

Part of overall Basin Restoration Program

OPPORTUNITIES FOR COOPERATION:

Information derived from this project is disseminated through monthly meetings and quarterly and annual reports. Tribal, state and federal managers and researches discuss current findings and explore best options for management and research during the monthly River Operations Meetings and the Umatilla River Basin Research Oversight Committee Meetings. Managers have immediate access to this project results for timely adaptive management decisions. The information obtained through this project may also have direct application to the management of anadromous stocks in systems throughout the Pacific Northwest. Furthermore, we cooperate on a weekly/monthly basis with the Oregon Department of Fish and Wildlife in many common activities and interests which include: natural production monitoring, habitat evaluation, marking, estimation of abundance and survival of downstream migrants, harvest monitoring, stream temperature monitoring, passage evaluations and mark retention. We cooperate with the US Forest Service with habitat surveys and stream temperature monitoring. We also cooperate with the Bureau of Reclamation in passage facility operations, collecting and monitoring juvenile migrants, and water temperature monitoring.

COSTS AND FTE

1997 Planned: \$524,815

FUTURE FUNDING NEEDS:

<u>FY</u>	<u>\$ NEED</u>	<u>% PLAN</u>	<u>% IMPLEMENT</u>	<u>% O AND M</u>
1998	\$700,000			
1999	\$700,000			
2000	\$700,000			
2001	\$700,000			
2002	\$700,000			

PAST OBLIGATIONS (incl. 1997 if done):

<u>FY</u>	<u>OBLIGATED</u>
1992	\$376,934
1993	\$469,797
1994	\$547,575
1995	\$639,115
1997	\$524,815

TOTAL: \$2,558,236

Note: Data are past obligations, or amounts committed by year, not amounts billed. Does not include data for related projects.

OTHER NON-FINANCIAL SUPPORTERS:

Oregon Department of Fish and Wildlife, United States Forest Service, United States Bureau of Reclamation

LONGER TERM COSTS: \$700,000

Continued implementation

1997 OVERHEAD PERCENT: 34%

HOW DOES PERCENTAGE APPLY TO DIRECT COSTS:

Percentage applies to all direct project costs except capital equipment and subcontracts.

CONTRACTOR FTE: 10
