CAPTIVE BROODSTOCK ARTIFICIAL PROPAGATION 5520700

SHORT DESCRIPTION:

The Captive Broodstock Artificial Propagation project began in 1995 with a captive broodstock plan being cooperatively developed by the USFWS, ODFW and the NPT. This led to the collection of juvenile chinook salmon from the Lostine River, Catherine Creek and the upper Grande Ronde River to place into the captive broodstock program in an attempt to preserve these populations from extirpation. Juveniles would be reared in captivity to adults and gametes taken and reared to smolt size within a hatchery program. Acclimated smolts would then be released into each stream in an attempt to return a threshold number of spawning adults back to each stream.

SPONSOR/CONTRACTOR: USFWS/LSRCP/NPT
US. Fish and Wildlife Service\Lower snake River Compensation
PlanProgram\Nez Perce Tribe Department of Fisheries
Resources management
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GOALS

GENERAL:

Supports a healthy Columbia basin, Maintains biological diversity, Maintains genetic integrity, Increases run sizes or populations

ANADROMOUS FISH:

Production

NPPC PROGRAM MEASURE:

7.4D

RELATION TO MEASURE:

Measure 7.4.D.2 directs the funding of captive broodstock demonstration projects identified under the coordinated habitat and production process. Captive brood programs have the potential to rapidly increase adult fish numbers, while retaining genetic diversity of severely depleted wild or naturally spawning stocks of salmon (NPPC 1994).

BIOLOGICAL OPINION ID:

Section 10 permit.

OTHER PLANNING DOCUMENTS:

Captive broodstock programs for the three Grande Ronde River chinook populations were identified as a high priority for hatchery intervention in the NMFS(1995) draft recovery plan.

TARGET STOCK	LIFE STAGE	MGMT CODE (see below)
Lostine River chinook	All life stages	L; S; W.

BACKGROUND

STREAM AREA AFFECTED

Stream name:

Lostine River

Subbasin:

Grande Ronde River

Stream miles affected:

Entire drainage

Land ownership:

Both.

Hydro project mitigated:

The NPPC (1994) directs the Council to develop a program to protect, mitigate and enhance fish and wildlife on the Columbia River and its tributaries.....

affected by the development, operation and
management of [hydroelectric projects].....

HISTORY:
The Captive Broodstock Artificial Propagation project is a high priority Tribal supplementation project that was recommended in 1994 by the Nez Perce Tribe as either a captive broodstock or a conventional hatchery supplementation project. A conventional hatchery approach or captive broodstock program are both possibilities to preserve and recover chinook salmon in the Lostine River. The Tribe has worked cooperatively with the ODFW, USFWS in the planning and development of a Section 10 permit for collection of captive broodstock juvenile chinook salmon from the Lostine River in 1995. We have further participated in CONSPOT meetings and a captive broodstock management plan in 1996 which outlines the program approach. The USFWS has funded the Tribe for monitoring and evaluation activities in 1997 through the LSRCP program. Participation by the Tribe in 1998 and beyond will require funds for cooperative planning, management coordination, implementation and monitoring and evaluation of the Lostine River captive broodstock program.

BIOLOGICAL RESULTS ACHIEVED:
Juvenile listed chinook salmon have been collected from the Lostine River in 1995 and 1996. Precocial male salmon have been sampled for cryopreservation purposes by the NPT in 1996. The Lostine River population has been reared in both a freshwater rearing strategy at Bonneville Hatchery, and a saltwater rearing strategy at the NMFS Manchester lab. The first four year old spawners should be available in 1998 from the 1994 brood year fish.

PROJECT REPORTS AND PAPERS:
None to date other than the captive broodstock plan Section 10 permit.

ADAPTIVE MANAGEMENT IMPLICATIONS:
Project has just commenced and information on juvenile rearing conducted by ODFW is providing initial information and feedback on the program. The NPT is just hiring staff to participate in this project. Precocial male development was higher than anticipated for the brood year 1994 fish, collected in 1995. That is being compared to other captive broodstock programs to determine why and if it will continue to affect jacking rates.

PURPOSE AND METHODS

SPECIFIC MEASUREABLE OBJECTIVES:
management objectives are to: 1) prevent extirpation of Lostine River chinook salmon, 2) maintain genetic diversity of the artificially propagated chinook population, and 3) maintain genetic diversity in the wild chinook salmon population. This program plans to rear and release 150,000 acclimated smolts in an attempt to return at least 150 spawning adults to the Lostine River.

CRITICAL UNCERTAINTIES:
We acknowledge that captive broodstock technology is unproven and that uncertainty exists in terms of its application to preserve threatened chinook salmon populations. Since this program is experimental in nature it will attempt to answer many of these uncertainties as the project progresses. Some of the uncertainties include: maturation of adults at the correct time and age; quality of adult gametes; potential domestication effects; genetic effect to both the artificially propagated population and the wild population once captive brood adults return to spawn; fitness of the captive brood adults.

BIOLOGICAL NEED:
The Lostine River chinook salmon population has declined from an estimated 893 redds in 1957 to 11 redds in 1995. Significant decline in population numbers has occurred over the past four decades and the population now exists below a threshold number of spawning adults (150). The reduction of spawning escapements below this threshold indicates a higher and ucceptable demographic risk to this population. A captive broodstock program was initiated to attempt to maximize the species reproductive potential and to preserve the population through use of acclimated smolt releases to return a threshold number of spawning chinook salmon adults to the Lostine River. A conventional hatchery program may also be implemented if adult return numbers warrant.

HYPOTHESIS TO BE TESTED:
Not research oriented.

ALTERNATIVE APPROACHES:
Conventional hatchery propagation was considered and still may be pursued along with or instead of the captive broodstock approach. Use of Rapid River chinook as a brood source was considered but was not consistent with the NMFS (1995) draft recovery plan; this approach was chosen by one of the salmon managers (CTUIR). A no intervention approach was considered but the risk of extirpation of these populations was high and valuable genetic resources could be lost. Translocation of these chinook populations was not considered and may provide a management approach for threatened snake River chinook salmon.

METHODS:
Juvenile listed chinook salmon are collected randomly each year (500) during the summer in the Lostine River. The sample size was established through modeling to determine how many juveniles are needed to ultimately produce 150,000 smolts. Model input variables from other captive broodstock programs were used to estimate growth, survival at different life stages, maturation schedules, sex ratios at age and fecundities. Fish are transported to Lookingglass Fish Hatchery and reared until about smolt size at which time they are transferred to either Bonneville Hatchery (freshwater rearing) or to the Manchester lab (saltwater reari ng). Each fish is PIT tagged as a juvenile to provide individual information on growth, maturation and spawning. Standard fish culture, feeding and health monitoring and disease treatment guidelines are followed as identified in the captive broodstock plan. Monitoring and evaluation is conducted to follow fish growth, conversion of different feeds, fish health and maturation in the freshwater rearing and saltwater rearing strategies. Specific culture methods, rearing containers, feeding, maturation and spawning protocols and monitoring during the captive juvenile period, captive adult period and the F1 generation period are outlined in the captive broodstock plan.

PLANNED ACTIVITIES

SCHEDULE:

Planning Phase **Start** 10/96 **End** ongoing **Subcontractor** NA.

Task Attend CONSPOT meetings. Development and modification of Section 10 permits.

Implementation Phase **Start** 4/97 **End** on **Subcontractor**

Task Collect juvenile chinook; conduct monthly M&E at Lookingglass Hatchery with ODFW; conduct M&E activities at Bonneville Hatchery and Manchester Lab; maintain captive broodstock database with ODFW; prepare cooperative annual reports; management recommendations to refine project.

CONSTRAINTS OR FACTORS THAT MAY CAUSE SCHEDULE OR BUDGET CHANGES:
Annual abundance of spawning adults and juvenile chinook salmon in the Lostine River. Hatchery catastrophe; total failure of the captive broodstock program; switch to a conventional hatchery program; decision of management of the adult trapping and smolt acclimation facilities.

OUTCOMES, MONITORING AND EVALUATION

SUMMARY OF EXPECTED OUTCOMES

Expected performance of target population or quality change in land area affected:
The expected outcome is for the captive broodstock program to return some number of adult salmon to Lostine River to preserve the chinook population for the short term.

Present utilization and convservation potential of target population or area:
Almost all of the listed snake River chinook populations are below threshold numbers of spawning adults in each population/stream. Presently there is no consumptive fisheries on the Lostine River. A weak but recoverable population exists.

Assumed historic status of utilization and conservation potential:
The Lostine River once provided for both Tribal subsistence and sport fishing opportunities. A recent high redd count of 893 redds was estimated in 1957.

Long term expected utilization and conservation potential for target population or habitat:
The desired long term conservation would be to manage for healthy, self-sustaining populations of snake River chinook salmon that would not require the use of hatchery supplementation programs to preserve chinook salmon populations. Given the mortality factors that occur in the hydro system, some form of supplementation may be needed to provide for mitigation and consumptive fishing opportunities.

Contribution toward long-term goal:
The project approach is to preserve chinook salmon populations until limiting factors affecting survival can be addressed and overcome and recovery can occur.

Physical products:
A total of 150,000 smolts would be produced annually for release into the Lostine River to return an estimated 150 spawning adults to the stream.

Environmental attributes affected by the project:
Habitat quality in the Lostine River needs to be maintained so that salmon migration, spawning and rearing requirements are maintained and improved.

Information products:
Annual reports will be developed and presented for regional publication and dissemination.

Coordination outcomes:
This project will be coordinated with the USFWS and the ODFW. coordination should ensure a cooperative and successful project implementation and preclude duplication of effort. CONSPOT participation will provide oversight coordination on a regional level.

MONITORING APPROACH
The project can be monitored in terms of the number of juveniles the captive broodstock program can produce. This short-term information will indicate initial program success. More importantly, the program should be evaluated in terms of the number of returning captive brood adults that return and spawn in the Lostine River. Impacts on genetic diversity of the population scan also be measured.

Provisions to monitor population status or habitat quality:
Monitoring population status is a goal of his project. Annual chinook salmon redd count surveys occur to document the relative abundance spawning chinook salmon in the Lostine River. These are cooperatively conducted by the ODFW and NPT. An adult weir is scheduled for implementation as part of this project which should allow more accurate determination of salmon escapement in this river system.

Critical uncertainties affecting project's outcomes:
Salmon managers need to determine which snake River chinook salmon populations represent unique conservation units that should be preserved with a number of management options. See Monitoring Approach.

EVALUATION

Incorporating new information regarding uncertainties:
Utilization of new information is an ongoing process that allows project refinement and adaptive management to take place.

Increasing public awareness of F&W activities:
This project seeks to preserve the Lostine River chinook salmon population through intervention with a captive broodstock program. It is not an information and education program, per se, and is a short-term measure until improvement in mainstem survival conditions allow for self-sustaining populations of salmon.

RELATIONSHIPS

RELATED BPA PROJECT	RELATIONSHIP
5520600 Listed Stock Gamete Preservation	Preserved genetic material may be used in spawning protocols to promote genetic diversity.
9604400 Grande Ronde Basin Spring Chinook Captive Broodstock Program Capitol Construction Component	ODFW captive broodstock program activities.

RELATED NON-BPA PROJECT	RELATIONSHIP
Lower Snake River Compensation Plan Nez Perce Tribe Evaluation Studies- 1997/USFWS funded.	This project currently provides funding for monitoring and evaluation activities for the Tribe in cooperation with the ODFW.

OPPORTUNITIES FOR COOPERATION:
This project is coordinated closely through the Captive Broodstock Conservation Oversight Team (CONSPOT) established by the USFWS. CONSPOT members, comprised of the salmon managers in snake River basin, have met regularly to coordinate and provide oversight to these activities. We coordinate with the ODFW to ensure a effective and successful program and to ensure Tribal participation.

COSTS AND FTE

FUTURE FUNDING NEEDS: **PAST OBLIGATIONS (incl. 1997 if done):**

FY	$ NEED	% PLAN	% IMPLEMENT	% O AND M
1998	$97,000	10%	90%	0%
1999	$100,000	10%	90%	0%
2000	$105,000	10%	90%	0%
2001	$110,000	10%	90%	0%
2002	$115,000	10%	90%	0%

OTHER NON-FINANCIAL SUPPORTERS:
U.S. Fish and Wildlife Service, Lower snake River Compensation Plan program; Oregon Department of Fish and Wildlife.

LONGER TERM COSTS:
It is anticipated that this program may continue past 2002. Costs are uncertain at this time and will depend if the Tribe manages the adult trapping facility and/or the smolt acclimation facility.

1997 OVERHEAD PERCENT: 29.5%

HOW DOES PERCENTAGE APPLY TO DIRECT COSTS:
Indirect rates apply to a portion of the direct costs, excluding equipment and services.

SUBCONTRACTOR FTE: .