

FINAL REPORT

on the

COOPERATIVE AGREEMENT

14-16-0001-90515

between

FISH AND WILDLIFE SERVICE

UNITED STATES DEPARTMENT OF INTERIOR

and the

NORTHERN CALIFORNIA INDIAN DEVELOPMENT COUNCIL

YUOK ACCELERATED STOCKING PROGRAM

KLAMATH RIVER LATE RUN FALL CHINOOK

FY 90

ABSTRACT

The majority of tributaries to the Yurok Reservation on the lower 40 miles of the Klamath River are severely degraded and suffer from low stock abundance. Most major tributaries are not open to natural restocking through straying due to severe aggradation at creek mouths which restricts access to spawning migration until after the first rains in November.

It is the current objective of the Yurok Accelerated Stocking Program to utilize natural late run fall chinook, which seek spawning grounds in November and December, to reseed the lower Klamath Tributaries.

The strategy of the overall program is to gillnet capture late run brood stock from the mainstem Klamath, spawn and incubate the eggs at two central facilities (one up river, one down river) and rear the resultant fry to subyearling or yearling size at various streamside facilities for release into those streams.

Six separate small scale integrated facilities have been developed and operated towards this goal.

These late running chinook are endemic to the lower river and stock sizes are limited. Which to date has been the limiting factor of the total program.

During the winter of 1989 The Bureau of Indian Affairs' brood capture program was able to deliver to all program facilities a total of 86,700 green eggs. From those eggs a total of 36,550 yearlings and 25,750 subyearlings were released into select tributaries. An additional 5,600 non program fish were reared and released.

The program was administered by the Northern California Indian Development Council and funded by the Klamath Basin Restoration Act which is administered by the Department of Interior, USFWS FAO Yreka.

INTRODUCTION

Late run fall chinook salmon, endemic to the lower 40 miles of the Klamath River and its tributaries, are severely depressed due to both manmade and natural habitat degradation.

Six separate small scale integrated facilities have been developed which are operated to restore natural spawning late run fall chinook in select streams tributary to the Klamath River and the Yurok Reservation.

The strategy of the overall program is to gillnet capture adult late run brood stock from the main stem Klamath, spawn and incubate the eggs at two central facilities (one upriver, one downriver) and rear the resultant fry to 90 per pound or yearling size at various streamside facilities for release into those streams.

Individual components of the integrated program have been in operation for varying lengths of time and funded and administered through various agencies. In FY 90 the total program was consolidated and administered by Northern California Indian Development Council Inc. (NCIDC) with funding for the total program being provided by the Klamath River Basin Restoration Program, United States Fish and Wildlife Service, FAO Yreka.

The Bureau of Indian Affairs, Northern California Agency funded the gill net capture of brood stock and the operation of a capture and counting weir on Hunter Creek which provided eggs for all components of the program.

DISCRIPTION OF THE STUDY AREA

All facilities and operations of the program are within the exterior boundaries of the Yurok Reservation which encompasses the lower 40 miles of the Klamath River.

Down River Projects:

Spruce Creek Incubation and Early Rearing Facility
 Spruce Creek is a secondary small short run stream which is tributary to Hunter Creek. Hunter Creek which is at approximately river mile one on the north bank of the Klamath estuary is fed by Spruce at approximately stream mile one.

The facility at Spruce Creek is the central location for initial incubation of eggs and early rearing of fry.

Eyed eggs from this facility are transferred to the High Prairie and Omagar Facilities described below, and fry are moved from this facility to Hunter Creek for continued rearing.

Hunter Creek Cage Rearing Facility

Hunter Creek is the largest tributary to the Klamath estuary with an approximately 24 square mile drainage. It enters the estuary at approximately river mile 1.3 on the north bank.

The Hunter Creek instream cage rearing operation is located immediately downstream of the Requa Road bridge at approximate stream mile one.

Salmon fry, which are transferred from the Spruce incubation facility, are reared to yearling size in large mesh cages placed directly in the stream flow from approximately mid-June through late October and released on site.

High Prairie Early Rearing Facility

High Prairie Creek is tributary to the Klamath estuary at approximately River mile 1.1 on the north bank. It flows through the Yurok Experimental Forest within the boundaries of which the facility is located.

The facility consists of enclosed hatch box and 8'x 24' fiberglass rearing tank.

Eyed eggs are received from the Spruce facility and hatched and reared to approximately 90 per pound for release into High Prairie approximately mid-June.

Omagar Creek Early Rearing Facility

Omagar Creek is tributary to the Klamath River at approximately river mile 10.5 entering the River on the southeast bank.

The facility consists of an enclosed incubation shed with one bank of incubators, and a 8'x 24' fiberglass rearing tank.

Eyed eggs are received from the Spruce facility and hatched and reared to approximately mid-June when they are released into the Klamath River.

Up River Projects

Cappell Creek Incubation and Rearing Facility
Cappell Creek is tributary to the Klamath River at river mile 32 on the northeast bank.

The facility, which was constructed by the Bureau of Indian Affairs in FY86 consists of an enclosed incubation room with two banks of incubators, a covered early rearing area with juvenile tanks, and three 8'x 24 fiberglass outdoor rearing tanks.

Green eggs or brood stock are received from the Bureau funded capture project. Eggs are incubated, hatched, and the resultant fry reared at this facility. A portion of the fry are transported to the Pecwan instream cage rearing operation at Pecwan. Fry retained at Cappell are reared to yearling and released on site.

Pecwan Creek Cage Rearing

Pecwan Creek is tributary to the Klamath at river mile 25.3 entering on the northeast bank.

Pecwan Creek has been the site of artificially reared yearling salmon since 1980. Most of those fish were reared in a large rearing tank. In 1987 the program was modified to use instream rearing cages. All fish prior to FY 90 were Iron Gate Hatchery stock. In FY90 were received from the Cappell Facility which were from natural late run gill net captured brood.

METHODS AND MATERIALS

Eggs were received at the Spruce Creek and Cappell incubation and rearing facilities from the Bureau of Indian Affairs' late run gill net capture program.

These eggs are incubated to the eyed stage at the Spruce facility and then approximately two thirds of the egg production are transferred to the High Prairie and Omagar tank rearing facilities for hatchout and rearing to the approximate 90 per pound stage for release into those creeks.

The one third of production remaining at Spruce are tank reared on site until approximately 90 per pound size and then transferred to instream rearing cages located in Hunter

Creek where they are reared until yearling release in late October.

Eggs incubated at the Cappell facility are reared to approximately 90/pound stage then approximately one half the production is removed to the Pecwan cage program for instream rearing to yearling size and released on site. The remaining one half of Cappell production is reared for yearling release into Cappell Creek.

The incubation and tank rearing facilities are all gravity fed systems which use spa filters during incubation. Heath incubation trays are used at the Spruce, Cappell and Omagar facilities, a wooden hatch box is used at the High Prairie facility. All cages are constructed of wood frames and plastic coated wire mesh. There is no electricity at any of the sites.

Once alvens are of sufficient size for handling they are removed to small feeding troughs and initial feeding is begun. Fry are then transferred to rearing tanks. All fish are fed BioDiet semimoist food by hand at both tank and instream cage sites.

Coded wire tags were applied to the majority of the fish, with identifying adipose fin clips. Late in the tagging program equipment malfunction resulted in less than desirable tag retention, and a water shortage at Omagar prevented completion of tagging at that facility. Coded wire tag reports are on file.

RESULTS AND DISCUSSION

Down River Projects:

Spruce Creek Incubation and Rearing Facility

A total of 49,037 eggs were received by the facility from the Bureau's gill net capture program and Hunter Creek capture and counting weir. These eggs were from 11 natural late run fall chinook females which were gill net captured in the mainstem Klamath, and two females captured at the Hunter Creek weir.

Of those eggs, 9,482 were transferred when eyed to the Omagar facility, and approximately half of the remaining 39,555 eggs were transferred to the High Prairie facility. 19,750 eggs were retained at Spruce for early rearing.

Resultant fry were transported to the Hunter Creek cages in July for further rearing.

As a pilot program the spawn from one Coho captured at the Hunter Creek weir was incubated. The resultant 2,610 coho fry were released on October 21, 1990 at a weight of 15 per pound. 1,860 of those fish were released in Hunter Creek, and 750 were released in Tarup Creek.

Hunter Creek Cage Rearing Program

The Hunter Creek cages received approximately 17,000 fry weighing an average of 12.93 gram each during the first week of July.

These fish were hand fed and reared until October 21, 1990 at which time 16,350 were released into Hunter Creek at an approximate weight of 30 per pound.

High Prairie Creek Rearing Facility

The High Prairie facility received approximately 19,700 eggs from the Spruce facility. These eggs were incubated and the resultant fry reared until the last week in June, 1990, at which time they were released into High Prairie Creek at a weight of 43 per pound. A total of 15,818 fish were released.

Omagar Creek Rearing Facility

The Omagar facility received 9,482 eyed eggs from the Spruce incubation facility, in addition two females were spawned on site resulting in an additional 10,260 eggs.

Omagar experienced some major egg losses due to fungus and in April relatively high (several thousand) fry losses occurred. Samples were taken by USFWS, FAO Arcata and sent to Federal pathologists for examination. Results were not conclusive, but were hypothesized as coagulated egg yolk disease.

A total of 9,934 fish were transported from the facility for release on August 5, 1990. Of those 4,262 were released in the Klamath River at the mouth of Omagar. The River temperature was 72 degrees F., at 7:00am. Those fish were slowly acclimated to the temperature and released. It was decided that the remaining 5,672 fish would be released in McGarvey Creek. Fish weighed an average of 56 per pound at release.

Up River Projects

Cappell Incubation and Rearing Facility

The Cappell Facility received 27,417 green eggs from the Bureau's gillnet capture program. As with Omagar, several thousand young fry were lost in April samples

were sent with the Omagar samples. The suspected coagulated egg yolk diagnosis applied to Cappell as well.

In August, 1990, S.S. Foote, Interior Pathologist, agreed to do a fish health evaluation of the up river projects. His report (copies on file) reflected good overall health at both the Cappell and Pecwan facilities; with a light benign myxosporean infection a Cappell Creek. An infection which he indicated was of no threat to the smolts.

In July, approximately half the fry at the Cappell facility were moved to Pecwan Creek and placed in rearing cages. The remainder of the fish were held at Cappell and reared to yearling size.

On November 5, 1990 approximately 9,148 fry weighing 12.5 fish per pound were released into Cappell Creek.

An additional approximately 3,000 fry (weight unknown) were released into Cappell Creek on October 22. These Chinook fry were raised separately and were from brood which returned to Cappell Creek fall of 89.

Pecwan Cage Rearing

During July approximately half the fry production of the Cappell facility were received by the instream cages at Pecwan Creek.

The fish were reared until October 22, 1990. A total of 11,053 fry were released weighing an average of 12.5 per pound.

SUMMARY

The majority of tributaries to the Yurok Reservation on the lower 40 miles of the Klamath River suffer from habitat degradation and overall low stock abundance. In addition, most major tributaries are not open to natural restocking through straying due to severe aggradation at creek mouths which restricts access to spawning migration in late fall.

It is the current objective of the Yurok Accelerated Stocking Program to utilize natural late run fall chinook brood stock to reseed the lower Klamath tributaries with fish which will return to spawn naturally in November and December, after rains have opened spawner access.

These late running chinook are endemic to the lower Klamath, and stock sizes are limited. Which to date has been the limiting factor of the program.

The current program goal is to rear and release 100,000 late run fall chinook. During the FY90 season, (winter 1989) the Bureau of Indian Affairs Capture program was only able to obtain 86,700 green eggs for all projects.

From those green eggs, a total of 62,303 late run juveniles were released from streamside facilities (36,551 yearlings and 25,752 subyearlings).

In addition a approximate 3,000 chinook were reared to yearling size at Cappell from returning brood, and 2,610 yearling Coho were reared at the Spruce facility.

Total fish reared and released 67,913.

In accordance with Section 2(b)(3) of the Klamath Act, Operators and laborers on these projects were from the local Yurok community.

CONCLUSIONS

The importance of retaining and restoring the genetic integrity and populations of these late run endemic salmon is central to the restoration of the Yurok Reservation's fisheries resources.

Though the program has yet to reach its numerical goals, due to limited broodstock, all methods and projects are operating as designed. Funding will be sought in FY91 to continue this program.

SUMMARY OF EXPENDITURES

SALARIES	\$10,996.38
FRINGE	2,872.27
CONTRACTUAL	75,406.00
MATERIAL & SUPPLY	8,299.37
EQUIPMENT	399.00*
FOOD	2,731.30
FREIGHT	1,044.24
OVERHEAD	7410.63

TOTAL PROGRAM COST.....\$109,159.19

* Nonexpendible equipment, one Hach water test kit

U.S. FISH AND WILDLIFE SERVICE
1990 REPORT

This year marks the fifth season we have trapped adult fish on Camp Creek during the months of November, December and sometimes January. One year prior to this fish were trapped in October. In 1986 it was decided to start trapping a late run of chinook salmon that were present in Camp Creek. Our procedure has been to keep every other female chinook adult and an equal number of males. All other fish are passed over the weir. Our goal has been to eventually take enough eggs to provide fish for some of the yearling chinook rearing ponds on selected Klamath River tributaries. So far these late run chinook yearlings have only been raised at our Camp Creek facility. Before fish are released each year, this usually takes place the last week of October, they are marked with maxillary clip (alternating years with a left or right-max clip).

This season trapping commenced on November first as usual. With unusually low flows for this time of year. Our first salmon did not show up until November 15th. To this date we have trapped 55 fish total. This number included 3 steelhead, 8 coho salmon and 41 chinook. Of the 41 chinook salmon 14 were males, 6 were females and 21 were grilse. These included 6 fish that were brood year 1988 (right-max clip) and 5 that were brood year 1987 (left-max clip).

So far we have spawned four females and taken a total of 14,100 eggs. The first first two were spawned on November 29th, which is the latest date for a first spawning. The other two were spawned on December 12th. Unfortunately the eggs from the second spawning were lost due to the extremely cold water temperatures. The first lot of eggs had developed enough to survive the unusually frigid temperatures that were experienced the latter part of December and the first part of January. Water temperatures in Camp Creek were recorded as low as 32 degrees. With the recent storms and more seasonable temperatures we have had reports that Rowdy Creek hatchery on the Smith River has trapped a good number of chinook salmon recently, as well as some fish trapped at the departments weir on the North Fork of the Mad River. We will keep the Camp Creek weir in a little longer to see if we might get some fish also. We have never trapped this late in the season before.

Yearling Chinook salmon for all of the Klamath River Rearing pond sites were released the week of October 22nd to 26th. 169,116 fish were released from Indian, Elk and Bluff Creeks. An additional 11,090 late run chinook were released from Camp Creek pond.

The fish were somewhat smaller this year. Bulk feed was hauled to the pond sites this year and the FHM I had the fish on slightly reduced rations. The DFG is looking into a better system to haul the feed to the pond sites, where the fisheries technicians will not have to reduce the feedings of the fingerlings, causing smaller release sizes.

PLACE	TOTAL	WEIGHT	NOTE
Indian Creek Pond	59,867	@9.5/lb.	(half had CWT'S)
Elk Creek Pond	30,550	@11.0/lb.	(all had CWT'S)
Bluff Creek Pond	78,699	@11.8/lb	(half had CWT'S)
Camp Creek Pond	11,070	@16.0/lb.	(left-max mark)

Safe working practice at the weir site were discussed with all employees and use of a life vest in higher flows.

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