

NONPAREIL DAM ADULT TRAP AND COHO GENETIC PEDIGREE PROJECT

David W. Loomis
ODFW Project Manager
Umpqua Watershed District

Project Description

This study will conduct an experimental supplementation project for coho salmon in Calapooya Creek and tributaries (Umpqua basin), using the following hatchery scenarios: a) hatchery stock released as smolts, b) hatchery stock released as unfed fry, c) first generation wild-type hatchery stock released as smolts, and d) first generation wild type hatchery stock released as unfed fry.

Task 1. Oregon Department of Fish and Wildlife (ODFW) will evaluate the success and genetic implications of these alternative hatchery scenarios using DNA pedigree reconstruction. Adult brood stock will be collected at Winchester Dam on the North Umpqua (hatchery parents from a conventional program) and Nonpareil Dam on Calapooya Creek (wild-type parents from local stream) and subsequent spawning and rearing of fish at Rock Creek hatchery, Butte Falls hatchery, and STEP hatchbox facilities. Unfed fry (400,000) and smolt releases (20,000) will occur from 2002 to 2005. Adult fish at Nonpareil Dam will be genetically sampled and passed from 2002 to 2010.

Task 2. ODFW will establish the pedigree of fish from the hatchery and subsequently above Nonpareil dam. Three generation-lines will be developed to provide replication of the study.

Task 3. ODFW will also measure the size, run time, age, and other characteristics of each returning fish to later determine if any of these factors are important in determining reproductive success.

Project Activities

Task 1. Collection of adult hatchery coho was completed at Winchester Dam for brood years 2001 and 2002. Collection of adult wild coho was completed at Winchester Dam in 2001 and at Nonpareil dam in 2002. In the summer of 2002, an adult fish trap was constructed at Nonpareil Dam and operated during the entire adult coho migration period. This was funded in cooperation with the Oregon Wildlife Heritage Foundation, USFS Job Corps Wolf Creek Center, and the City of Sutherlin.

In 2001, 100 pair of adult hatchery coho (North Umpqua) were spawned at Rock Creek hatchery. The total eggtake for the hatchery fish was 317,898 green eggs. Incubation survival at the hatchery resulted in 198,689 eyed eggs that were distributed to Butte Falls hatchery and STEP hatchboxes. Eyed eggs from each parent group totaling 13,654 were included in the smolt allocation group reared at Butte Falls and a total of 185,035 eggs were distributed to STEP hatchboxes. Also in 2001, 94 pair of wild adult coho (North Umpqua) were spawned at Rock Creek hatchery. The total eggtake was 290,048 green eggs. Incubation survival at the hatchery resulted in 216,566 eyed eggs that were distributed and reared at Butte Falls hatchery (13,813

eggs) and STEP hatchboxes (202,753 eggs) in the same manner as the hatchery parent eggtake groups.

The eggs from both these 2001 hatchery and wild parent groups were randomly mixed during initial rearing and final releases into the Calapooya and its tributaries. A total of 370,576 unfed fry were released in 2002 and 24,373 smolts were released in 2003.

In 2002, 100 pair of adult hatchery coho were collected at Winchester Dam and spawned at Rock Creek hatchery. The total eggtake was 306,664 green eggs. Incubation survival at the hatchery resulted in 290,143 eyed eggs that were distributed to Butte Falls hatchery for smolt rearing (13,756 eggs) and to STEP hatchboxes (276,387 eggs). With the construction of the collection facility at Nonpareil dam, all wild coho adults and jacks returning to the Calapooya were trapped and sorted at this facility. A total of 124 pairs were collected for brood and transported to Rock Creek hatchery. A random selection of 100 pair were actually used as broodstock for the eggtake. An additional 801 coho adults and jacks were sampled and passed over the dam to naturally distribute and spawn in the upper Calapooya subbasin. The total eggtake from the wild fish parents (100 pair) was 274,645 green eggs. Incubation survival at the hatchery resulted in 250,239 eyed eggs that were distributed to Butte Falls hatchery (13,766 eggs) and STEP hatchboxes (236,473 eggs).

The eggs from both these 2002 hatchery and wild parent groups were randomly mixed during initial rearing and final releases into the Calapooya and its tributaries. A total of 491,644 unfed fry were released in 2003. A total of 22,093 "presmolts" are currently being reared at Butte Falls hatchery and are scheduled for release in 2004.

Task 2. Tissue clips and all of the required sampling information have been collected from each coho that has been included in the study activities to date since 2001. These samples and data are currently stored in a locked cabinet at the ODFW Southwest Region office in Roseburg. There are 1629 tissue clips stored in individual sample vials that represent all fish in the study. The genetic sampling protocol and tissue collection and storage has been coordinated with Dr. Michael Blouin at Oregon State University. ODFW and OSU are currently in the process of submitting a specific project proposal to use microsatellite DNA markers that will be sufficient to identify individuals in the population and to match offspring to parents to trace genetic pedigrees of the coho in the study area.

Task 3. The following information has been collected at both Winchester Dam and Nonpareil Dam for 1629 coho: run time at the respective dam, gender, adult size, age, spawning time, and origin (scales). Digital photos have also been taken of each pair of fish spawned in the project for 2001 and 2002. All of this information is available from ODFW, Roseburg.

Project Evaluation

The study has been conducted according to the experimental design as reviewed and approved in 2001. Adult fish trapping and hatchery operations have been successfully completed to date. All genetic sampling and data gathering and recording have been successfully completed for both 2001 and 2002 project activities. Project proposals for 2003-2005 field personnel and supplies and DNA analysis contract services for 2001-2005 genetic work have been submitted or are currently being developed for further review and approval. Adult trapping operations for the third year of the study are scheduled to begin in mid-September 2003.