Project NF-2008-I-26B
Auke Creek Sockeye Summary 2008

Abstract

As part of a long term study undertaken collaboratively between the University of Alaska (UAF) and NOAA, National Marine Fisheries Service (NMFS), sockeye salmon migrating to Auke Lake via Auke Creek were successfully sampled for DNA analysis by excision of a single axillary process. Capture efficiency of the weir and sampling by UAF and NOAA staff approached 100%. Most sockeye were passed unharmed to continue their migration, but twenty fish were captured at the weir and successfully held, matured, and spawned by NOAA staff at the Auke Creek Station utilizing freshwater drawn deep from Auke Lake. Pre-spawning mortality, fungal disease and IHNV infection rates were minimal or non-existent. The initial year of the study demonstrates the potential for success of the proposed long term evaluation of the genetic effects of enhancement of sockeye populations, an issue of considerable interest for the PSC.

Summary

During the first operational year of the project, NMFS collaborated on the planning and technical aspects of the project, and assumed principal responsibility for the daily operations of the Auke Creek Weir. We were responsible for developing associated sampling procedures for the collection of DNA and for the holding and maturation of adult sockeye that would form the basis for enhanced experimental groups.

The Auke Creek Weir was switched from downstream to upstream capture mode on 7/3/08, and the first sockeye salmon adults were captured and processed at the weir on 7/7/08. Processing involved capturing the fish in the adult trap, crowding them into an area for netting, netting them with small mesh knotless nets to minimize damage. The fish were generally netted singly also to minimize potential damage. The netted fish was walked over to the processing area, and rolled from the net into a neoprene lined tagging cradle, generally without touching the fish. The cradle sat in a large cooler which was partially filled with water. The fish was held in the cradle with either bare hands or wet cotton gloves to minimize slime and scale loss. Total escapement was 1243 adults, 37 jacks. The last sockeye was captured at the weir on 9/12/08. The midpoint of the adult migration was 9/10/08.

As part of normal sampling for Auke Creek Sockeye – scales and size information were also collected from a portion of the migrating sockeye. All individuals had one of their auxiliary processes removed for DNA analysis, an attempt was made to determine the fishes marine age and sex as well. DNA samples were collected by the UAF staff. Scales were taken for aging by NOAA staff. Once the procedure was established, we could process a sockeye in 15-30 seconds. Fish quickly left the weir pool to continue migrating up the creek. No anesthesia was used. Only one mortality was noted during the 2008 weir processing and this fish had entered the weir trap in marginal condition.

We held a total of 20 fish for spawning in the hatchery. They were held in Swedish pond containers (5'l x 5'w x 3'd) using single pass UV- treated Auke Lake deep intake water. Water temperatures ranged from 3.5 to 8 degrees C. We covered the holding tanks to reduce stress. Fish were carried from the weir in a lined PVC tube to again minimize injury and stress. The fish we held were captured on July 18 and 26. We lost one fish from the holding area prior to spawning. All other fish contributed at least some gametes to the process.

We spawned fish on August 28, September 3, 9, and 16. All fish were sacrificed on 9/16/08After finding one female fish to be only partially ripe after sacrificing it, we live spawned the remaining fish. All individuals handled the process well, with no observed fungal growth and no pre-spawning mortality. Standard ADFG spawning protocols for sockeye salmon were used, including water hardening in idophore solution to minimize potential for disease transfer. The eggs were incubated in sub-divided Heath Tray vertical incubators from spawning thru fry emergence. Survival to the eyed stage averaged 82%. Fecundity – measured only in a gross sense; that is number of eggs yielded divided by number of females, was close to 2500. Fry were carried forward to allow for genetic and disease sampling. Disease sampling from adult females ovarian fluids indicated no positives for IHN. The fish were sacrificed during the last week of March 2009. No fry were released in 2009. Fry will not be released into Auke Lake until genetic analysis from samples collect demonstrate suitable variation for the application of analytical techniques to permit confident identification of enhanced and wild sockeye salmon of Auke Lake origin.