

Big Chico and Butte Creeks Spring-run Chinook Salmon Juvenile Life History Evaluation

Scope of the Project: The project area includes Butte Creek downstream of Centerville Head Dam, inclusive of the Butte Sink and the Sutter Bypass (Butte and Sutter Counties) and Big Chico Creek from Higgins Hole to the confluence with the mainstem Sacramento River (Butte County). The objectives of the project are to document adult spring-run chinook salmon (SRCS) abundance, time of alevin emergence, instream rearing and emigration patterns, size at emigration, duration of emigration, and a measure of relative abundance.

Adult run size will be determined by snorkel survey. All other objectives will be met by continuous trapping of juvenile salmon during the outmigration period (October through June). All migratory fish species present in the system are captured, so valuable information is gained about steelhead, fall- and late-fall-run chinook salmon and many other species. In Butte Creek, wild juvenile spring-run salmon will be coded-wire tagged (CWT), providing essential information regarding growth rates and habitat use in the Butte Sink and Sutter Bypass. Also, information that will be gained from Sacramento River and Delta anadromous fishery studies includes (through tag recaptures): Timing of entry into main stem Sacramento River, main stem emigration timing and duration, Delta entry and rearing patterns, and occurrence and timing at the State and Federal pumping facilities.

An additional component of the project will be to evaluate survival of chinook salmon that use the Sutter Bypass for rearing. Coleman National Fish Hatchery (NFH) CWT fall- or late-fall-run chinook salmon will be released into the Sutter Bypass and mainstem Sacramento River to evaluate differential survival for chinook salmon that use the Sutter Bypass for rearing versus those that use the mainstem Sacramento River and Delta. These CWT salmon will be approximately 45 mm in fork length on March 1, which is the same average size that Butte Creek SRCS will be at that time. If additional Coleman CWT salmon are available, an additional paired release will evaluate differential survival for salmon that use the West side of the Bypass versus the East side. Since survival determination will be based on ocean harvest rates, the cost to this project is negligible. Any funding required to mark Coleman NFH salmon will be obtained from a source outside of AFRP.

Fish trapping locations for Butte Creek will be at 1) Parrott-Phelan Dam: One to two rotary screw traps and one diversion screen trap. 2) Sutter Bypass, West Borrow, Weir 1 (Sutter National Wildlife Refuge): One rotary screw trap. 3) East Borrow, Weir 2: One rotary screw trap. 4) Sutter Bypass below Willow Slough (exact location not yet determined): One rotary screw trap. Stream-side coded-wire tagging of naturally-produced Butte Creek SRCS will occur near the Parrott-Phelan Diversion Dam. The fish trapping location for Big Chico Creek will be near the Bidwell Park golf course (exact location not yet determined).

Justification: Significant management actions have been implemented and are planned to restore spring-run chinook salmon and steelhead populations in Butte and Big Chico Creeks. This study is essential for evaluating the effectiveness of these management activities. Life history strategy information is needed for Butte Creek in dry and critically dry water-year types, and even the basic life history information is not yet known for Big Chico Creek.

Because the fish traps capture all migrating fishes, this project will benefit chinook salmon, steelhead rainbow trout, American shad, white sturgeon, and striped bass. All of these species have been captured in the Butte Creek fish traps - the last three in the lower Butte Creek traps only. All species captured are recorded and a sub-sample is measured to the nearest mm fork length.

Monitoring and Data Evaluation: The California Department of Fish and Game, Sacramento Valley & Central Sierra Region, is solely responsible for collection and analysis of the data. This project will work closely with other monitoring programs, such as the steelhead monitoring program and the splittail evaluation program. By the nature of the trapping configuration at Parrott-Phelan Diversion Dam, the diversion screen trapping effort acts as a monitoring program for that structure. Future trapping sites - especially in the Sutter Bypass - could be utilized in the same way.

Work to be Performed and Deliverables:

September 15 2000: Juvenile Sampling Begins
July 1, 2001 (approximately): Juvenile Sampling Ends
August 15, 2001: Adult Surveys Begin
September 30, 2001 (approximately): Adult Surveys End
December 1, 2001: Draft Report Complete
January 30, 2002: Final Report Complete

The estimated cost for the programs is \$135,000, for the October 1, 2000 to September 30, 2001 time period. It is requested that 100% of this funding be transmitted to the CSUChico Research Foundation.