San Joaquin River Basin adult Chinook salmon escapement monitoring

Point person: Tim Heyne, Senior Environmental Scientist

Lead Agency: California Department of Fish and Game

<u>Questions/Objectives</u>:

- 1. Estimate fall run Chinook salmon annual escapement for the three major tributaries, Stanislaus, Tuolumne, and Merced River, of San Joaquin River.
- 2. Determine ratio of hatchery origin and natural salmon to spawning population
- 3. Collect biological data such as sex, and length.
- 4. Collect biological samples such as scales, otoliths, and fin tissue.
- 5. Collect Code-wire tag from adipose-fin clipped salmon

Description: San Joaquin River Basin adult Chinook salmon escapement monitoring consists of redd counts, live fish counts and carcass counts on Stanislaus, Tuolumne, and Merced Rivers. Survey reach is 26 river miles from Goodwin Dam on Stanislaus River, 29 river miles from La Grange Dam on Tuolumne River, and 26 river miles from Crocker-Huffman Dam on Merced River. Each reach is surveyed once a week from most upstream access point to downstream from October to December of each year, and survey may extend to January if needed.

Surveys are conducted using drift boat to collect all visible carcasses. Carcasses being tagged for mark-recapture analysis are processed for biological data (sex and length) and biological samples (scales, otoliths, and fin tissue) individually. All untagged carcasses are chopped in half to prevent repeat counting. Heads are collected from adipose fin clipped salmon for coded-wire tag (CWT) recovery. CWTs are processed to obtain origin of the fish. Live fish and redd counts are recorded for spawning time and distribution analysis. Scales and otoliths are processed to construct spawning cohort. Fin tissue is used in DNA analysis if requested or properly funded.

Escapement is estimated using a close-population mark-recapture model such as Adjusted Peterson, modified Schaefer, or Jolly-Seber models. The California Central Valley Chinook salmon escapement monitoring plan issued by DFG recommends using an open-population mark-recapture model such as Cormack-Jolly-Seber model. New estimate will be generated using the recommended method and compares to the estimates generated by other methods and the number recorded by device counter such as an Alaskan counting weir.

Project Duration: October – December

Counties: Stanislaus, and Merced

Resources required: Estimate cost: \$300,000

Deliverables and dates: Report for each tributary, and a basin wide summary report.