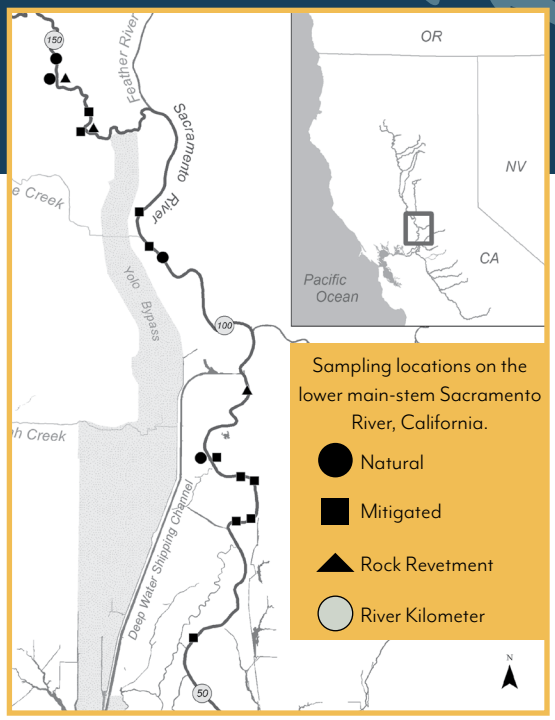
Sacramento River Bank Protection Project

Project dates: 2011-2015 | **Budget:** $500,000/year

Collaborators: U.S. Army Corps of Engineers (USACE), U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), California Department of Water Resources (DWR), and California Department of Fish and Wildlife (CDFW)

Project Reference: Brian Mulvey, U.S. Army Corps of Engineers

Location: Sacramento River, California, between river kilometer 38 and 150



Objectives

This interagency long-term monitoring project used boat electrofishing surveys to evaluate juvenile Chinook salmon habitat use of various levee repair designs on the Sacramento River. Microhabitat characteristics and piscivorous fish abundance were also evaluated.

Methods

Surveys sampled various shoreline types including riprap banks, various levee mitigated designs (e.g., setback levees, wetland trenches), and reference sites dominated by naturally established vegetation.

- Occupancy Sampling

  Point-specific presence or absence of juvenile Chinook salmon and other species was determined using a video camera mounted underneath the bow of the electrofishing boat.

- Habitat Characteristics

  Depth, current velocity, substrate type, temperature, instream structure, and vegetation cover were measured at every sampling point, paired with occupancy sampling. Fish habitat use and maturation of levee repair sites were also surveyed with photo point monitoring and sonar technology.

- Interagency Collaboration

  Complimentary project components implemented under an interagency work group included an evaluation of available food resources based on invertebrate drift, associated dietary composition of rearing salmonids, and use of acoustic telemetry to investigate residency duration and movement patterns of tagged juvenile salmonids and select predatory species.

Representative illustration of the different shoreline categories sampled in this study: (A) rock revetment, (B) mitigated, and (C) natural.

Key Findings

1. Habitat use by juvenile Chinook salmon was significantly higher at natural and mitigated shorelines in the lower reaches of the Sacramento River than at unmitigated banks.
2. Bank slope, substrate type, and instream cover (woody material and submerged terrestrial vegetation) were highly associated with juvenile Chinook salmon habitat use.

Literature: Hellmair, M., Peterson, M., Mulvey, B., Young, K., Montgomery J., & Fuller, A. 2018. Physical Characteristics Influencing Nearshore Habitat Use by Juvenile Chinook Salmon in the Sacramento River, California. North American Journal of Fisheries Management 38 (4): 959-970. https://doi.org/10.1002/nafm.10201