

Executive Summary

We will determine the survival and movement patterns of late-fall Chinook salmon (*Oncorhynchus tshawytscha*) smolts and steelhead (*O. mykiss*) smolts as they migrate from the upper Sacramento River, down the mainstem, through the San Francisco Estuary, and into the ocean. These smolts, from Coleman National Fish Hatchery (CNFH) on Battle Creek, will carry individually coded miniature ultrasonic transmitters placed within their peritoneal cavities. Downstream passage and survival of smolts during outmigration will be recorded by automated, transmitter-detecting monitors placed at sites throughout the watershed and in the coastal ocean to the north and south of the Golden Gate. Data from these monitors will allow us to reconstruct each fish's migratory path and ascertain rates of migration, residence times in specific river segments (reaches), bays, and coastal areas, and ultimately survival (or mortality) rates associated with those locations.

This high-resolution ultrasonic tagging-tracking system will provide a comprehensive evaluation of areas with increased mortality, areas important to the animal's life history (e.g., nursery or holding areas), and changes in survival and movement that may be related to natural factors and water project activities. Data from this project can be used to complete a detailed lifecycle model for Central Valley salmonids, which currently is seriously lacking in knowledge of smolt survival and spatial-temporal migratory patterns. Information on movement and survival of salmonid smolts through the river and Delta is important to many CALFED agencies seeking to improve the biological basis and consequences of water management actions.