

INTRODUCTION



Actions associated with the Vernalis Adaptive Management Plan (VAMP) were implemented between April 22 and May 22, 2007 to protect juvenile Chinook salmon and evaluate the survival of marked juvenile Chinook salmon migrating through the Sacramento – San Joaquin Delta. Diminished adult salmon returns and low smolt production at the Merced River Fish Hatchery did not allow for the standard VAMP coded wire tag study. As an alternative an acoustic telemetry study was conducted in 2007. The VAMP period was postponed 7 days from previous years to allow for additional growth of the experimental fish. Fish, tagged with acoustic transmitters, were released on May 3-4 and 10-11, 2007. The water districts maintained stable flow in accordance with the SJRA throughout the April - May study period, as were the export rates. The Delta Smelt workgroup permitted installing the HORB for the 2007 VAMP period. Survival estimates through the Delta were not possible in 2007 due to the lack of acoustic receivers at Jersey Point and Chipps Island. Studies conducted in 2007, represented the eighth year of the VAMP. Results from previous VAMP experiments are available in San Joaquin River Agreement Technical Reports, for each respective year.  Similar coded wire tag (CWT) experiments were conducted prior to the official implementation of VAMP with results available in South Delta Temporary Barriers Annual Reports (DWR 2001 and DWR 1998). This report will describe the experimental design used in 2007, the hydrologic planning and implementation, the additional water supply arrangements and deliveries, fishery monitoring within the San Joaquin River and Old River with the HORB, the acoustic tag experiment and complimentary studies related to VAMP. Conclusions and recommendations for future VAMP studies are also included.

Experimental Design Elements

The VAMP experimental design used in previous years measured salmon smolt survival through the Delta under six different combinations of flow and export rates. The experimental design includes two mark-recapture studies performed each year during the April-May juvenile salmon outmigration period that provide estimates of salmon survival under each set of conditions. During 2007, for the first time since inception of the program, test fish were not available from the Merced River Fish Hatchery to permit a coded wire tag (CWT) study. In lieu of a CWT study an acoustic telemetry study was conducted. A total of 1,000 juvenile Chinook salmon were made available from the Merced River Hatchery (MRH) for the VAMP acoustic study. Study fish were surgically implanted with acoustic transmitters, capable of emitting an electronic signal for up to 3 weeks. It was not possible to estimate Chinook salmon survival through the entire Delta due to the lack of acoustic receivers at Jersey Point and Chipps Island. However, data was collected on salmon smolt behavior and mortality conditions within the South Delta and survival was estimated on the San Joaquin River from Durham Ferry and Mossdale to Stockton.

As described the SJRA and VAMP is an experimental/management program designed to protect juvenile Chinook salmon migrating from the San Joaquin River while at the same time conducting a scientific experiment to determine how salmon survival changes in response to alterations in San Joaquin River flows, SWP/CVP export rates, and the operation of the HORB.

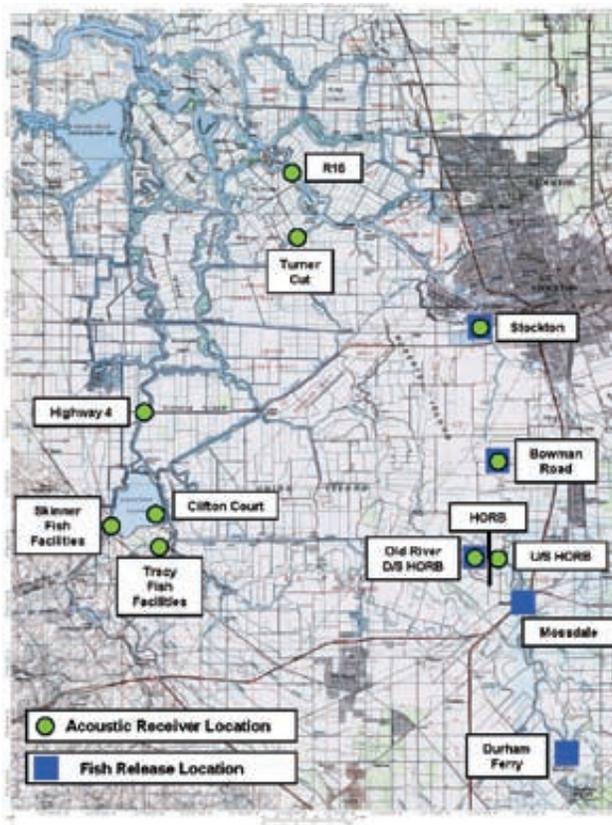


Even though survival estimates could not be determined from the 2007 experiment valuable information on how to implement an acoustic tag experiment was collected. This annual technical report describes the flow and HORB conditions encountered in 2007, the alternative experimental plan, and the findings.

Due to a decline of the delta smelt population in the Bay-Delta estuary the delta smelt workgroup analyzed the potential impacts of installing the HORB. Based on

Figure 1-1

Fish release locations and acoustic receiver locations during the 2007 VAMP experiments.



delta smelt monitoring and particle tracking models the workgroup permitted the HORB be installed in 2007. The 2007 VAMP experimental design included both multiple release locations (Durham Ferry, Mossdale, Old River, Bowman Road and Highway 4 at Stockton), and multiple detection locations, Figure 1-1.

During the 2007 VAMP period the Acoustic Telemetry study was conducted to evaluate movement and survival of acoustic tagged fish detected by acoustic receivers as they moved downstream. Fish were released at Durham Ferry, Mossdale, Old River, Bowman Road and near Stockton over 2 one week period during the VAMP. Ten acoustic receivers located along the lower San Joaquin River, Old River, in south Delta channels and at the export fish facilities were used to track smolt movement throughout the south Delta.

For the 2007 acoustic telemetry study a cadre of biologists were trained by the U.S. Geological Survey's Columbia River Research Laboratory in the proper surgical tagging procedures. The 2007 VAMP program used net pen studies to assess overall condition and health of marked fish used in the acoustic tag study. Improvements were made in 2007 relative to measuring flow in the San Joaquin River downstream of the confluence with Old River.