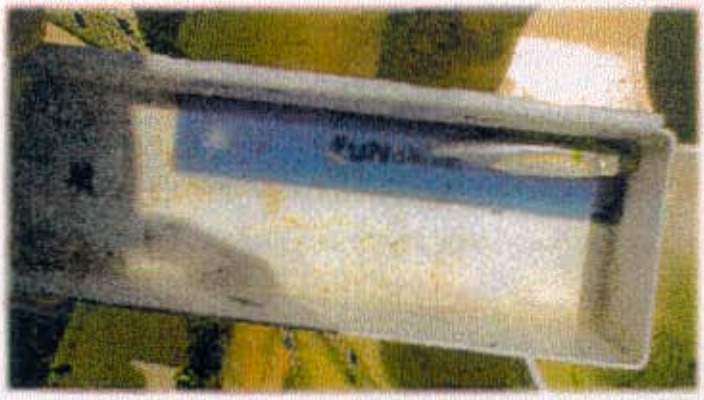
Newsletter
SAN JOAQUIN RIVER AGREEMENT
June 2000

Methods Refined for VAMP 2000 Fisheries Study

For the second year in a row, Dr. Chuck Hansen and crew spent 6 weeks in April and May "fishing" selected Delta sites near Antioch and Chipps Island for tagged juvenile Chinook salmon. These fish, marked with a coded wire clipped to their adipose fin, had been released earlier in the spring at various locations along the San Joaquin River as part of the Vernalis Adaptive Management Program (VAMP). At Antioch, the crew navigated a Kodiak trawl, towed between two skiffs, through high wind and wave conditions to collect the young salmon. Adult Delta smelt were collected in relatively high numbers too, and special efforts were made to reduce adverse effects of collection activities on their population.

Skiffs pull kodiak trawl near Antioch



Measuring marked Salmon smolt

Scientist retrieve samples from Delta

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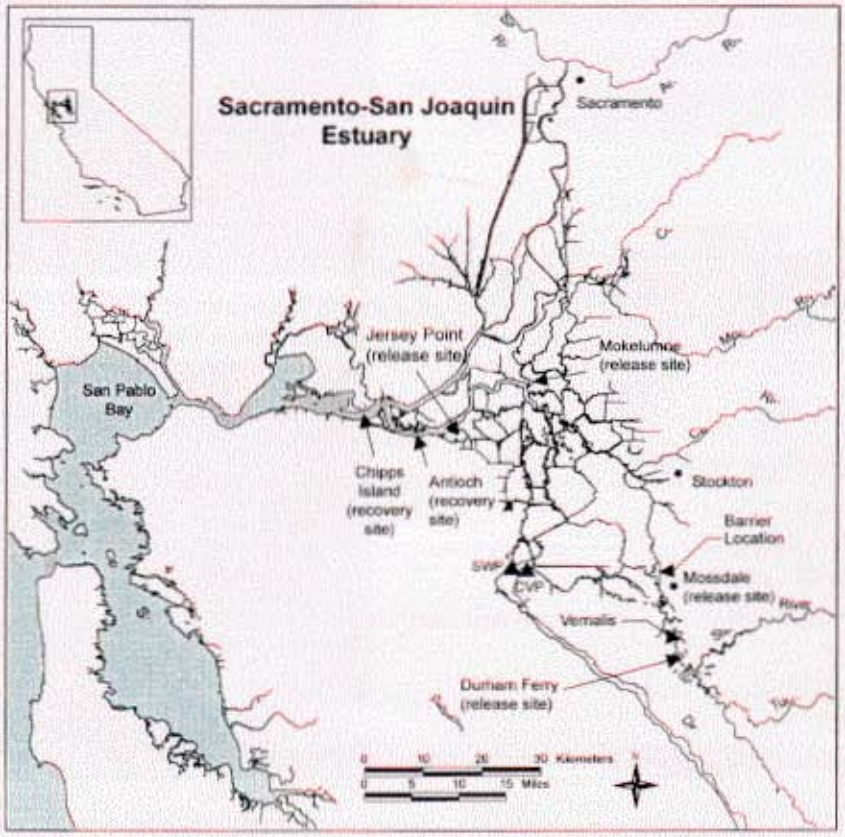
The VAMP 2000 studies implemented several improvements adopted by the VAMP Technical Work Group:

- Relocating the upstream release point for marked salmon from Mossdale to Durham Ferry, approximately 11 miles further upstream in the San Joaquin River. The Durham Ferry location will likely be part of the VAMP in all years, with and without installation of the Old River Barrier;
- Releasing additional marked salmon at Mossdale to provide comparative survival estimates for juvenile Chinook salmon produced in the Merced River Fish Hatchery and released at Durham Ferry and at Mossdale;
- Releasing additional marked fish downstream at Jersey Point as a control group to test the collection efficiency of the recapture sampling methods;
- Making one additional release of marked Mokelumne River Fish Hatchery salmon into the lower Mokelumne River near the confluence with the San Joaquin River to provide information on smolt survival within the central Delta region; and
- Relocating one of the recapture sites from Jersey Point downstream to a location near Antioch.

Small groups of marked salmon from each of the release groups were held for 2 days in large mesh cages at the release sites. The fish were held to determine the mortality rate associated with handling and trucking. Survival was high in all groups. Physiological studies yielded information on the general health and condition of fish released as part of these tests.

Water temperatures were monitored at locations throughout the lower San Joaquin River and Delta. Other investigations have found that elevated water temperatures affect the survival of juvenile salmon smolt. Water temperature readings along with daily Vernalis flows and daily State Water Project (SWP) and Central Valley Project (CVP) export rates will be used to document key environmental conditions occurring during this year's study period.

Sampling was authorized under a scientific collection permit issued by the California Department of Fish and Game (CDFG), and under formal consultation with the U.S. Fish and Wildlife Service (FWS) and National Marine Fisheries Service for the incidental collection of fish species listed under the California and Federal Endangered Species Acts.



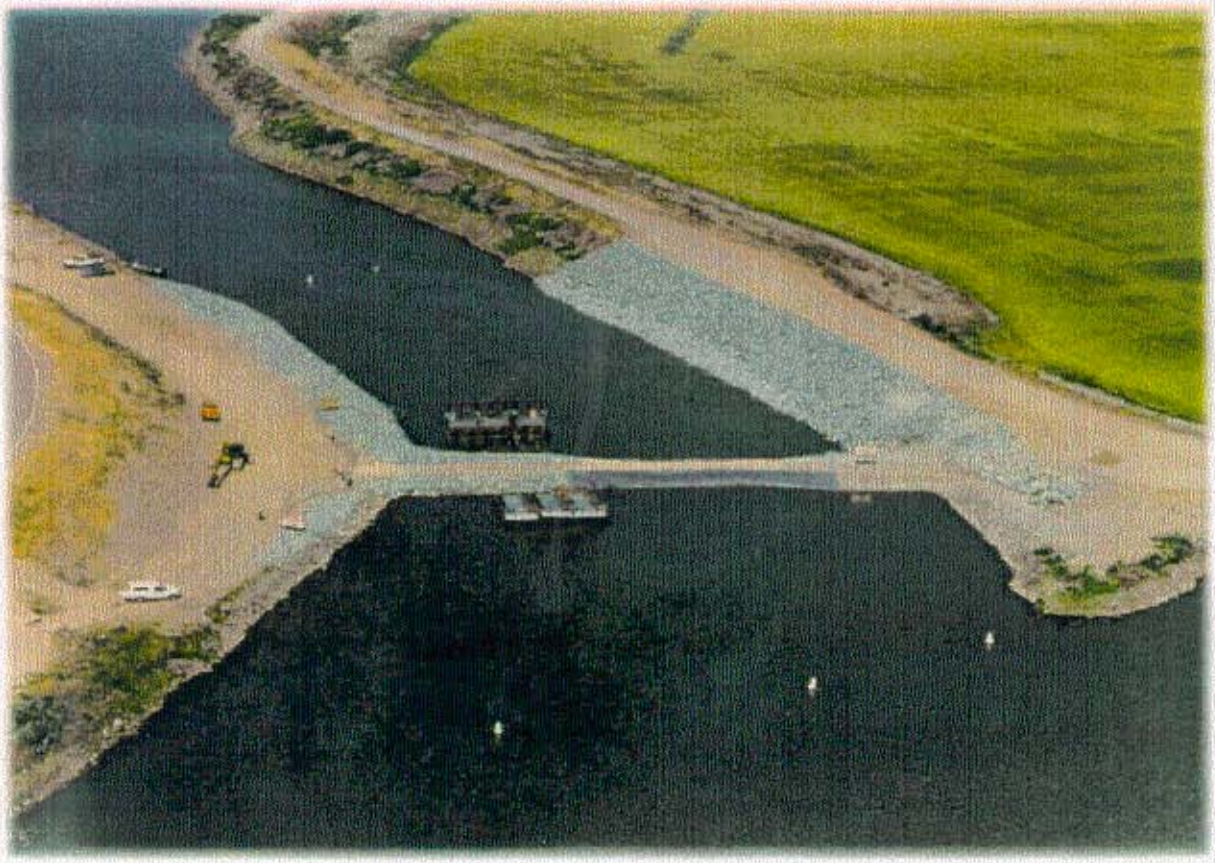
Currently, Hansen and his technical team and Pat Brandes and her FWS staff are busy compiling and reviewing study data. The marked salmon captured and frozen during this spring's "fishing expedition" will be examined later this summer. Once the data are validated as part of the quality assurance program, estimates of juvenile Chinook salmon survival rate will be calculated. A technical report will be issued in the fall and used by the Technical Work Group to design next year's survival studies.

Ingenious Design Fortifies Head of Old River Barrier

Innovative thinking and diligence enabled engineers at the California Department of Water Resources (DWR) to install a stronger, multi-feature Head of Old River Barrier this year. "DWR's ingenious design enhances the ability to deal with unusual flow situations that could arise," said Dan Fults, Project Administrator for the San Joaquin River Group Authority, "and the new culverts provide the flexibility to mitigate for lower water levels."

VAMP 2000 operations mark the first time all four program components—barrier, flows, export controls, and fish monitoring—have been employed during the April-May study period. The barrier was first constructed in 1992 and has been used five times over the years to improve the survival of San Joaquin River Chinook salmon smolt by keeping them from entering Old River. As part of the South Delta Temporary Barriers Project, which was initiated in response to issues raised by the South Delta Water Agency, the structure also mitigates the low water levels and improves water circulation and quality in the south Delta.

The initial target date for operation of the barrier corresponded to the VAMP fish release and the pulse flow schedule. Despite engineering design, permitting, and construction challenges, DWR was able to complete construction by the April 16 deadline.

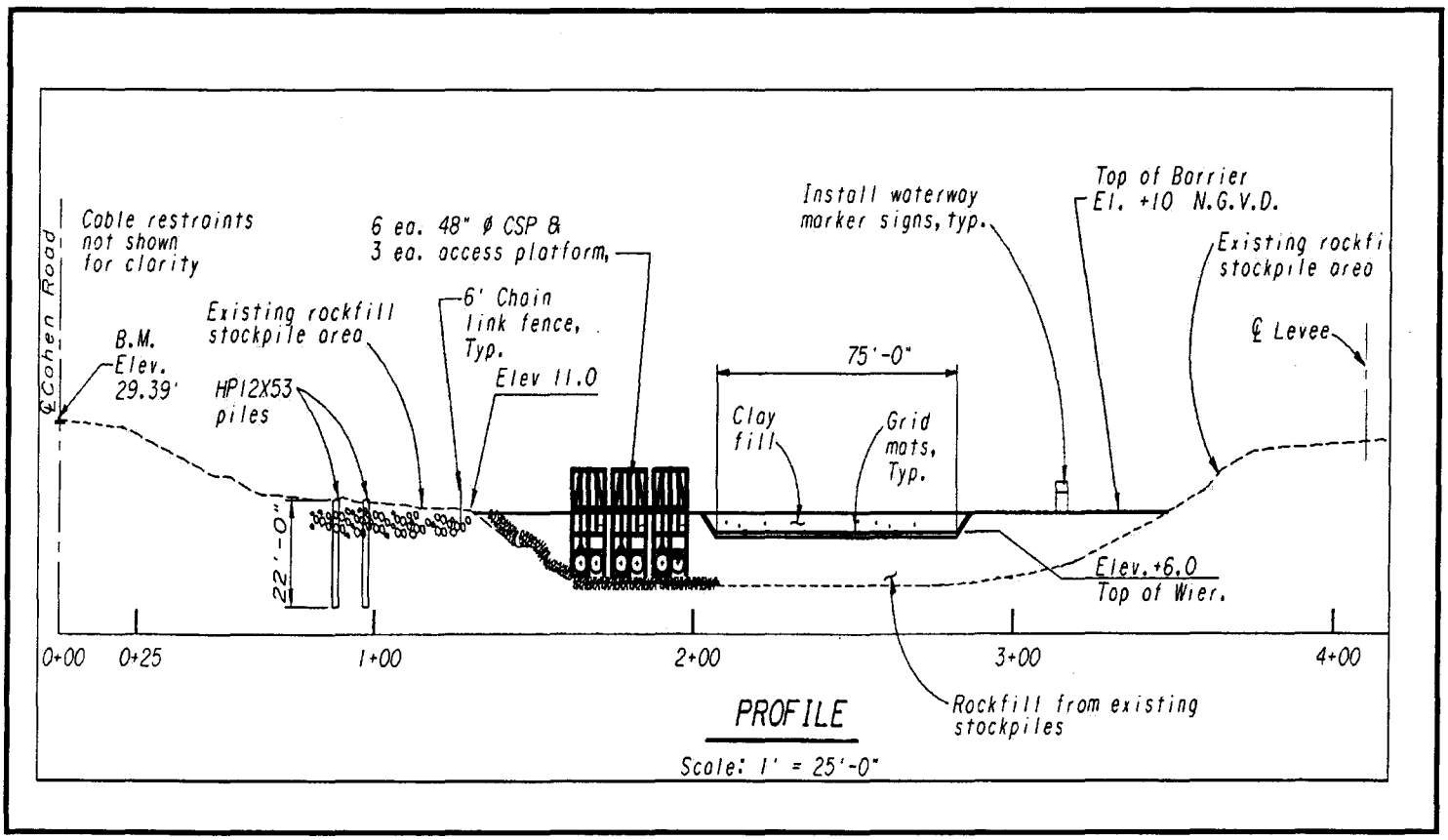


Birdseye view of completed Head of Old River Barrier

Removal work began on May 19, when the weir was breached, and continued for about 3 weeks.

No longer a simple rock barrier blocking the San Joaquin River from flowing into Old River, the barrier now sports six 48-inch operable culverts, a slide gate control structure, a fish monitoring structure, and a clay weir section that can be breached at high flow. The opening of the culverts is controlled by a slide gate control structure located on the upstream side of the barrier. DWR determined when and how long to operate the culverts based on daily modeling and field data on water levels at three locations within the south Delta. The culvert outlet works provide for attachment of CDFG fyke nets, which can be lowered in front of the culvert for fish sampling.

The base of the barrier was increased to 100 feet and the crest elevation is at 10 feet mean sea level. The top of the barrier is built with a 75-feet wide notch protected with concrete grid mats and back-filled with clay. The larger barrier can withstand flows up to 8,500 cubic feet per second (cfs) before the weir section would need to be breached. The weir allows DWR to breach and remove the barrier under a more controlled condition. Prior to the main barrier construction, the contractor armored downstream levee slopes with riprap, added culvert bedding to the channel, and laid a 100-foot riprap scour pad for the downstream culvert exit. Steel piles were driven to secure placement of the prefabricated culvert structure. Concrete grid mats line the weir. An impermeable membrane protects the upstream side of the compacted clay backfill from wave erosion.



Profile Section of Head of Old River Barrier

SWRCB Reaffirms San Joaquin River Agreement

On December 29, 1999, the State Water Resources Control Board (SWRCB) issued Water Rights Decision 1641 (D-1641), adopting in its entirety the provisions of the San Joaquin River Agreement (Agreement). The Agreement is now the sole method by which the flow-dependent objectives of the 1995 Bay-Delta Water Quality Control Plan (Plan) are to be met by all water users in the San Joaquin River Basin. The same day, the SWRCB adopted Resolution 99-117, which certified the Final Environmental Impact Report for the Plan. These actions have been continually challenged before the SWRCB and in several California superior courts.

After the issuance of D-1641, some 21 parties filed petitions for reconsideration. Each petition was reviewed and considered by SWRCB staff and were the subject of a hearing held on March 15, 2000. As a result of the petitions and hearing comments, the SWRCB adopted that same day several technical, grammatical, and other minor changes and issued a Revised D-1641 in accordance with Order WR-2000-02. None of the revisions has any substantive effect on the Agreement or the ability of individual participants to comply with its terms and conditions.

The SWRCB will no longer deal with issues directly related to the Agreement, although it may hear testimony and argument during Phase 8 of the Bay-Delta water right hearing, which is of general concern to the parties to the Agreement.

VAMP 2000 Hydrology Chronicle

In keeping with the "adaptive management" theme, the VAMP 2000 hydrology played out on a rapidly changing operational landscape. Program planning had to accommodate coincidental fish tests that were scheduled in several of the individual tributaries to the mainstem of the San Joaquin River. Early hydrologic forecasts indicated a "double-step" year with a flow target of 7,000 cfs and a concurrent SWP and CVP export rate of either 3,000 or 1,500 cfs.

The export target of 1,500 cfs emerged as the preferred option from a biological standpoint. A wet February and March produced Vernalis flows so high that it appeared that the flow and export portions of the VAMP might have to be delayed. These high flows cast doubts on the chances of installing the temporary fish barrier at the Head of Old River. However, a sustained dry period created a window of opportunity by returning the hydrologic conditions to the April 15 to May 15 nominal VAMP schedule. The upstream tributaries reduced their releases to help achieve the maximum flow level of 5,000 cfs at Vernalis for barrier construction.

Early hydrologic forecasts indicated that supplemental water in excess of 110,000 acre-feet would be required to achieve a target flow of 7,000 cfs for 31 days. The VAMP, as defined in the Agreement, provides a maximum of 110,000 acre-feet of supplemental water for the purpose of achieving a target pulse flow in the San Joaquin River near Vernalis for a 31-day period between April 1 and May 31. The Agreement also provides for acquiring additional water above the 110,000 acre-feet through purchases by Reclamation from willing sellers. In preparation for this possibility, the Bureau of Reclamation and the San Joaquin River Group Authority (SJRGA) prepared a draft Environmental Assessment and Initial Study for the additional water acquisition.

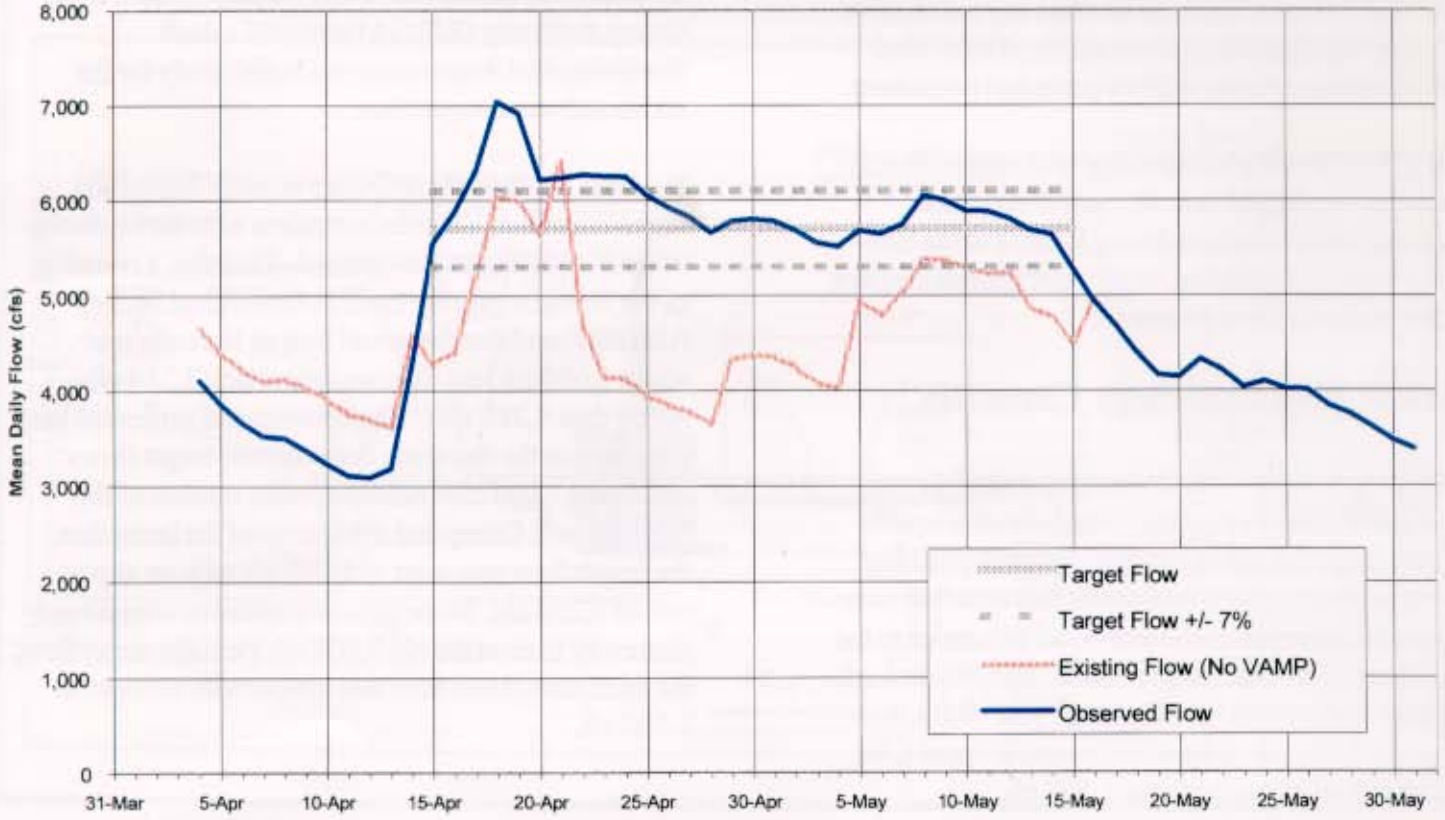
By April 13, upstream tributary releases had begun, timed to arrive at Vernalis coincident with the beginning of the VAMP target flow period. That day, a re-rating of the Vernalis gage by the U.S. Geological Survey (USGS) found that the actual flow at Vernalis was about 1,000 cfs less than was reported (3,210 cfs rather than 4,280 cfs). The recomputed projected base flow was on the threshold between two target flows: 5,700 and 7,000 cfs. After a special session of the Management Group and evaluation of the latest data, the target flow was reset to 5,700 cfs with an export rate of 2,250 cfs. Since tributary releases were already underway to meet the old 7,000 cfs Vernalis target flow, the Stanislaus River flow was temporarily reduced to 1,100 cfs.

The upstream releases reached Vernalis on April 15, and the initial ramp-up came off as planned. Data indicated that the ramp-up had leveled out at about 5,500 cfs at Vernalis, well within the acceptable operational range of 7 percent. On April 17, a wet storm moved into the area and dropped record amounts of rainfall on the San Joaquin basin. As a result of the rapid storm runoff and reduced irrigation usage, the Vernalis flows rose dramatically, climbing to what was initially believed to be about 6,400 cfs. As the peak flow was reached, personnel working at the fish barrier reported that water surface in the Old River channel threatened to overtop the barrier. To add to the concern, the USGS reported a re-rating of the Vernalis gage and that the actual flow at Vernalis was about 7,100 cfs or 700 cfs higher than expected. Immediate reductions in tributary releases were implemented. The Tuolumne was reduced by about 1,000 cfs, and the Stanislaus was reduced to 800 cfs. The peak passed uneventfully.

After the first week, the flows settled down to a more predictable pattern. A small storm at the end of the first week in May pushed flows higher again. From April 25 through May 14, the mean daily flow at Vernalis averaged 5,750 cfs, ranging from 5,460 cfs to 6,050 cfs, a range of - 4 to + 6 percent from the target flow.

2000 VAMP
San Joaquin River near Vernalis - Mean Daily Flow
With and Without VAMP

[PRELIMINARY DATA - Subject to Revision]



The graphs below illustrate the mean flow at Vernalis and the mean daily flow from the SJRGA member agencies throughout the 2000 VAMP. Over the entire flow period, April 15 through May 15, the average flow at Vernalis was about 5,900 cfs. Combined SWP and CVP export pumping averaged 2,155 cfs during the target flow period. Early estimates indicate that the average flow at Vernalis would have been about 4,700 cfs without the VAMP operation, so the VAMP operation resulted in a 25 percent increase in the flow at Vernalis. Preliminary accounting indicates that approximately 79,000 acre-feet of supplemental water were provided by the SJRGA agencies.

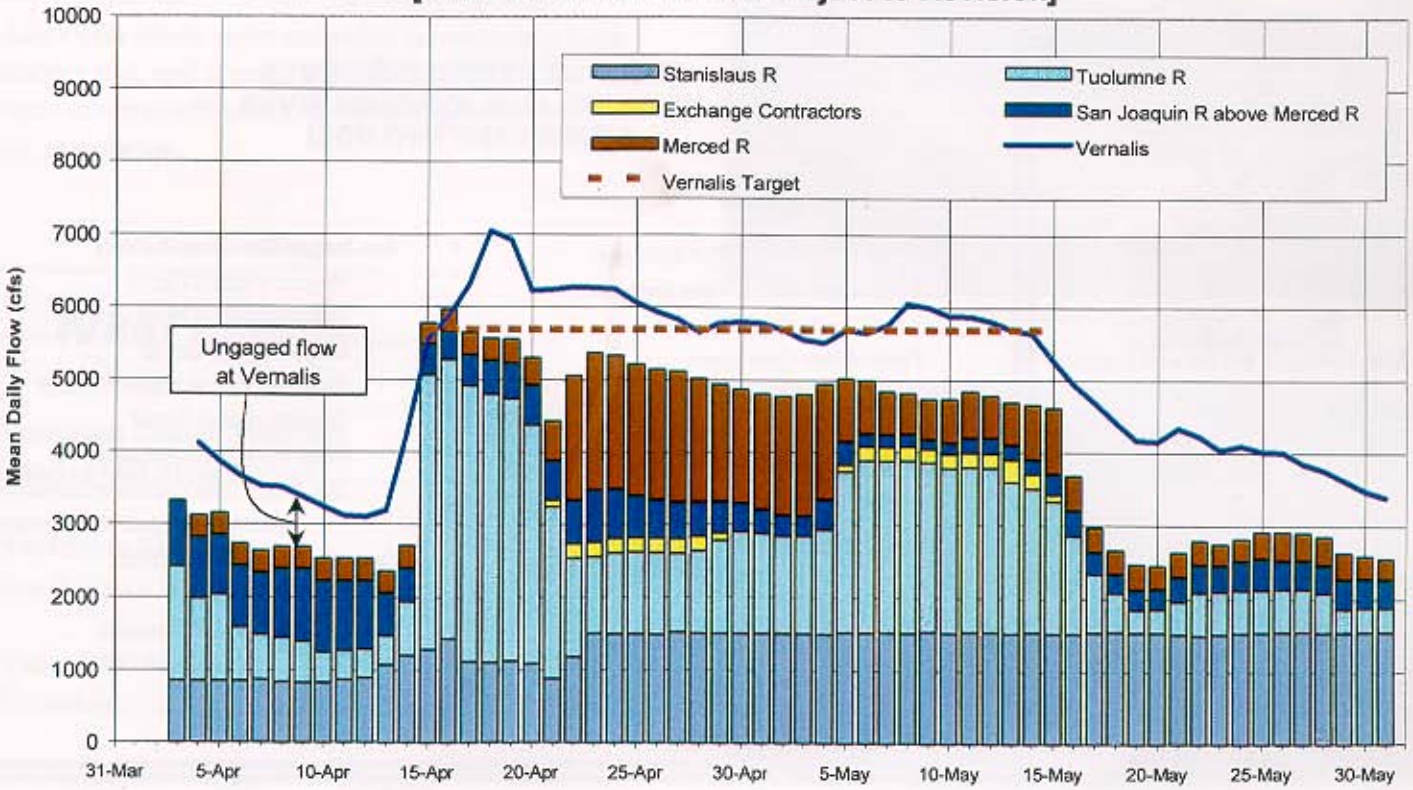
Implementing this year's plan required a tremendous amount of cooperation and communication by the many agencies and stakeholders involved. The Monday, Wednesday, and Friday 6:30 a.m. operations coordination conference calls were faithfully attended, and at important junctures staff from DWR, Reclamation, and the SJRGA agencies made themselves available around the clock. FWS and CDFG staff played a key role in advising and assisting in making critical decisions throughout the process. The VAMP remains an example of diverse group of stakeholders following through on a commitment to "make something larger happen."

2000 VAMP

San Joaquin River near Vernalis - Mean Daily Flow

With Lagged Contributions from Primary Sources

[PRELIMINARY DATA - Subject to Revision]



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Newsletter
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ORGANIZATIONS INVOLVED WITH THE SAN JOAQUIN RIVER AGREEMENT INCLUDE:

California Department of Fish and Game
California Department of Water Resources
City and County of San Francisco
Public Utilities Commission
Department of the Interior
Bureau of Reclamation
Fish and Wildlife Service
Environmental Protection Agency
Kern County Water Agency
Metropolitan Water District of Southern California
Natural Heritage Institute
San Luis and Delta-Mendota Water Authority
San Joaquin River Group Authority
Modesto Irrigation District
Turlock Irrigation District
Merced Irrigation District
South San Joaquin Irrigation District
Oakdale Irrigation District
Friant Water Users Authority
San Joaquin River Exchange Contractors Water Authority and member districts
Santa Clara Valley Water District
State Water Contractors
The Bay Institute of San Francisco

Prepared by Bureau of Reclamation, Mid-Pacific Region, Office of Public Affairs
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