

INTEGRATION OF THE ENVIRONMENTAL WATER ACCOUNT WITH OTHER ENVIRONMENTAL WATER PROGRAMS

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Environmental water management programs

There are four environmental water management programs currently active in the Central Valley. They include the Calfed Environmental Water Account (EWA), the Central Valley Project Improvement Act (CVPIA) Section 3406 (b)(2) water (commonly referred to as b2 water), the CVPIA Section 3406 (b)(3) Water Acquisition Program (referred to as WAP or b3), and the Calfed Environmental Water Program (EWP). The EWP has been scaled back from its original design and is only active in the Clear Creek drainage at present (fall 2006).

For the most part, the three active environmental water programs complement each other but have differing goals and priorities due to each having specific authorization with a distinct purpose and funding source. This report summarizes the water management programs and how they coordinate and integrate with a specific emphasis on the EWA.

The **EWA** is a multi-objective program that prioritizes protection of listed species in the Bay-Delta estuary beyond the regulatory baseline through environmentally beneficial changes in State Water Project (SWP) and Central Valley Project (CVP) operations at no uncompensated cost to the project's water users. The EWA provides species protection and contributes to ESA regulatory commitments for SWP and CVP operations. In the context of the Calfed Single Blueprint, the EWA has been primarily focused on the Calfed Ecosystem Restoration Program's (ERP) objective to reduce the adverse impacts of diversions at the state and federal pumps in the Delta.

The CVPIA **(b)(2)** and **(b)(3)** programs' primary purposes are to implement fish restoration measures that contribute to doubling anadromous fish production; (b)(2) water has a secondary purpose of assisting in meeting the 1995 WQCP and post-1992 ESA requirements. The (b)(2) fish actions are implemented on Clear Creek, the Sacramento, American, and Stanislaus rivers, and in the Sacramento-San Joaquin Delta. Pursuant to the Calfed ROD, the CVPIA (b)(2) water and the Vernalis Adaptive Management Program (VAMP) which gets its supplemental water from the CVPIA (b)(3) WAP Program, are considered part of the Tier 1 baseline level of protection provided by existing regulations and operational flexibility. Tier 2 is defined as the EWA assets combined with the benefits of the ERP, including the EWP. Please see Table 1, Figures 1 and 2 for more detailed information about these programs.

1. Environmental Water Account (EWA): A cooperative Calfed program whose purpose is to provide protection to the fish of the Bay-Delta estuary beyond the regulatory baseline through environmentally beneficial changes in SWP/CVP operations at no uncompensated cost to the project's water users. The EWA program acquires and manages water to curtail exports in the Delta and augment instream flows to protect listed species and provide ESA regulatory commitments. The EWA has been funded from Proposition 204 and Proposition 50 funds and purchases surface water and groundwater from willing sellers both north and south of the Delta. The EWA agencies responsible for managing EWA assets and implementing EWA fish actions are the California Dept. of Water Resources (DWR), California Dept. of Fish and Game (CDFG), the U.S. Fish and Wildlife Service (FWS), U.S. Bureau of Reclamation (USBR), and the National Marine Fisheries Service (NOAA Fisheries). The technical basis for EWA fish actions includes published literature, CDFG reports, IEP investigations, Biological Opinions for Delta smelt and listed salmonids, Delta smelt and Chinook salmon Decision Trees based on real-time monitoring, and annual external scientific reviews by the EWA Technical Review Panel. EWA fish actions are monitored, evaluated, and may be modified based on the best science available.

The EWA was first implemented in water year (WY) 2001 and annual EWA fish actions have ranged from 123,000 to 348,000 acre-feet (AF). The majority of the EWA fish actions taken to date have been Delta export curtailments. EWA purchases have been made both south and north of the Delta, usually from willing sellers in larger tributaries upstream of the Delta that have significant surface storage. Projected cross-Delta conveyance capacity to San Luis Reservoir is a key consideration when deciding how much water to buy upstream of the Delta in a given year type. Consequently, most transfers of EWA water from upstream tributaries to San Luis Reservoir are based on available pumping capacity in summer. However, a few EWA transfers have been timed to augment upstream flows and improve instream habitat conditions for fish. Since its inception, EWA fish actions have been integrated and coordinated with other (b)(2) and WAP fish actions. The integration and coordination occurs through weekly meetings of the EWA Team (EWAT), the b2 Interagency Team (b2IT), the Data Assessment Team (DAT), and the Water Operations Management Team (WOMT) and will be described below.

2. Section 3406 (b)(2): A CVPIA program that dedicates and manages annually 800,000 acre-feet (AF) of CVP water to augment instream flows in Clear Creek, the Sacramento, American, and Stanislaus rivers or curtail exports in the Delta for the primary purpose of fish, wildlife, and habitat restoration; to assist meeting the WQCP, and to help meet post-1992 ESA obligations.

The (b)(2) program was authorized by the CVPIA in 1992 and the implementing agencies are the FWS and USBR, in coordination with CDFG, DWR, and (NOAA Fisheries). The technical basis for (b)(2) fish actions is found in Anadromous Fish Restoration Program (AFRP) documents, Interagency

Ecological Program (IEP) and CDFG reports, and in the CVPIA mandate to double the natural production of anadromous fish in all Central Valley rivers and streams. The AFRP documents summarize the flow-related limiting factors as: (1) inadequate timing and/or magnitude of flow to provide suitable conditions for one or more life stage of anadromous fish; (2) water temperatures that exceed tolerances of one or more life stage; and (3) direct and indirect impacts of CVP and SWP Delta pumping. The implementation of (b)(2) fish actions in CVP streams and in the Delta are monitored, evaluated, and may be modified based on the best available science.

Since 1993, this dedicated CVP water for (b)(2) fish actions has been applied to improve instream conditions for anadromous fishes, primarily salmon and steelhead. It has also been directed to help protect species listed under the federal Endangered Species Act and to assist in meeting the CVP share of protecting the Delta through implementation of the State of California's Water Quality Control Program (WQCP). It is currently implemented consistent with Interior's May 2003 (b)(2) Policy. To date, actions under this program have included improved instream flows, Delta export curtailments, and Delta Cross Channel gate closures. These efforts have provided benefits for salmonids primarily in the form of improved adult immigration flows, better instream flows and temperatures for spawning, incubation, and juvenile rearing; and improved flows for juvenile outmigration. The (b)(2) fish actions have also helped to reduce mortality of both anadromous fish and the listed delta smelt in proximity to pumping facilities in the Delta. Application of dedicated water to meet these fish needs may also assist in restoring riparian and adjacent wetland habitats and estuarine areas, and may provide associated wildlife benefits.

Since 2001, Interior has coordinated and integrated the implementation of Section 3406 (b)(2) fish actions with the implementation of the EWA fish actions. See the discussion below.

3. Section 3406 (b)(3) Water Acquisition Program (WAP): A CVPIA program that acquires additional water for instream purposes to supplement the 800,000 AF of (b)(2) water, as well as level 4 refuge water to supplement level 2 refuge water and meet Interior's obligations under Section 3406 (d)(2) of the CVPIA.

The WAP was authorized by the CVPIA in 1992 and the implementing agencies are FWS and USBR, in coordination with CDFG, DWR, and NOAA Fisheries. The technical basis for WAP actions is found in AFRP documents, IEP and CDFG reports, and in the CVPIA mandate to double the natural production of anadromous fish. In the near future, WAP acquisitions and management will be based on a Decision Support Model (DSM) which integrates hydrology, biology, and economic data. The DSM focuses on the value to anadromous fish by producing four alternative approaches on 19 streams, with relative rankings totaling 76 water acquisition alternatives. This model and water appraisal technical guidelines currently being developed by the WAP will be available for

use by the EWP as well.

Interior has focused its efforts to acquire water in those areas offering opportunities to augment flows primarily for salmonids on non-CVP streams to contribute toward meeting the CVPIA's anadromous fish doubling goals. The main WAP acquisitions for instream flow augmentation have taken place on the San Joaquin River tributaries (Merced, Tuolumne, and Stanislaus Rivers) and Battle Creek.

Since 1994, annual WAP purchases for instream flow augmentation have ranged from 33,000 AF to 172,000 AF. In the lower San Joaquin drainage, WAP acquired approximately 895,000 AF of water between 1994 - 2006 in the Stanislaus, Tuolumne, Merced, and lower San Joaquin Rivers for fall-run Chinook salmon. Since WY 1999 the WAP has supported the San Joaquin River Agreement (SJRA) by guaranteeing flows for the Vernalis Adaptive Management Program (VAMP), approximately April 15 – May 15 each year. On Battle Creek supplemental water for anadromous fish was acquired by paying for foregone power generation (approximately 86,500 AF from 1997 to 2001) to benefit Chinook salmon and steelhead.

Since WY 2001, Interior has coordinated and integrated the implementation of Section 3406 (b)(3) WAP fish actions with the implementation of EWA and (b)(2) fish actions during the spring for the VAMP and during the fall for the Chinook salmon upstream migration flows on the Stanislaus and Merced Rivers. See the discussion below.

Coordination/Integration Process

Coordination (i.e., the discussion of what to do) and integration (i.e., deciding jointly what to do) of these three environmental water programs takes place at weekly meetings of the EWAT, B2IT, DAT, WOMT and monthly meetings of the Calfed Operations Group. The (b)(2) water and EWA are closely coordinated and integrated to maximize fishery benefits. A monthly planning model guides decisions made jointly regarding implementation of EWA, (b)(2) and WAP fish actions; daily operations are discussed at WOMT, EWAT, B2IT, and DAT weekly meetings. See the attached Fish Action Decision Process for more information.

Other coordination efforts take place on a less frequent or on an as-needed basis. For example, the EWA coordinates with the Delta Smelt Working Group, EWA Science Advisors, Operations and Fishery Forum, ERP Implementing Agency Managers, AFRP Habitat Restoration Coordinators, American River Operations Group, and others at their respective meetings or whenever project operations require their input.

Examples of Integration and Coordination of EWA fish actions with the other environmental water management programs

The EWA, (b)(2) and WAP have been integrated each year since 2001 to help implement the San Joaquin River Agreement (SJRA). The SJRA is a consensus based approach to implementing the State Water Resources Control Board 1995 Water Quality Control Plan for the lower San Joaquin River and the Bay-Delta. A key part of the SJRA is the Vernalis Adaptive Management Program (VAMP). VAMP is designed to protect juvenile Chinook salmon migrating from the San Joaquin River tributaries (Stanislaus, Tuolumne, and Merced rivers) through the Delta; it is also a scientifically recognized experiment to determine how salmon survival rates change in response to alterations in San Joaquin flows and SWP/CVP exports with the installation of the Head of Old River barrier (HORB). VAMP employs an adaptive management strategy to use current knowledge of hydrology and environmental conditions to protect Chinook salmon smolt passage, while gathering information to allow more efficient protection in the future.¹

The VAMP provides for a 31-day pulse flow (target flow) in the San Joaquin River at Vernalis from approximately April 15 – May 15, along with a corresponding reduction in SWP/CVP exports (see Table 2), with the HORB in place. Under the SJRA, several water districts agreed to provide the supplemental water, limited to a maximum of 110,000 AF, needed to achieve the VAMP target flows. Annually the WAP pays the water districts to ensure that the VAMP supplemental water is provided from the San Joaquin tributaries during April-May (see Figures 3-6). VAMP supplemental water releases are integrated and coordinated with releases of (b)(2) water on the Stanislaus River.

While operating pursuant to VAMP, the EWA is used to implement SWP export curtailments beyond the Calfed ROD baseline and (b)(2) water is used to implement CVP export curtailments beyond the CVPIA baseline (see figures 7-10). In 2001 and 2002, several Federal District Court decisions resulted in a modification to how (b)(2) water is accounted, thus reducing the amount of (b)(2) fish actions that could be implemented each year. Consequently, the EWA has been used to implement export reductions at the CVP facilities (primarily after the VAMP period) in addition to the export reductions at the SWP facilities.

EWA fish actions are coordinated and integrated with other water management actions as well. For example, annually in October, the SJRA and the WAP release 15,000 AF of water on the Stanislaus River and 12,500 AF of water on the Merced River to improve upstream migration of adult Chinook salmon and increase available salmon spawning and egg incubation habitat. In fall 2001, the EWA and WAP river releases were integrated on the Merced River. The EWA and (b)(2) river releases were integrated on the American River in fall 2001 and 2002. The EWA is coordinated with SWP operations on the Feather River and

¹ (2003 Annual Technical Report, San Joaquin River Group Authority).

EWA water has been acquired and released from the Yuba River in most years.

The EWA fish actions will continue to be integrated and coordinated with (b)(2) fish actions and VAMP implementation. All water management programs will consider additional opportunities for integration and coordination with the other environmental water management efforts and ERP restoration measures. Each integration and coordination opportunity is unique, yet in the context of the overall Calfed Program contributes to the overall goal of ecosystem restoration.

EWA Upstream actions to date

Since WY 2001 most EWA fish actions have been export curtailments to protect listed fish species near the SWP pumps in the Delta. Several EWA fish actions also curtailed exports at the CVP pumps. As described above, from April 15 through May 15, the export reductions at the SWP using EWA were integrated and coordinated with CVP export reductions using (b)(2) water and the VAMP flow releases using WAP and (b)(2) water from the San Joaquin River tributaries.

The majority of the EWA upstream activities were transfers in which surface water purchased by the EWA was released at an upstream reservoir and moved to San Luis Reservoir via the SWP pumps. These were not considered “fish” actions but were transfers to repay prior EWA debt. For the most part these transfers took place on the Yuba River during the summer months using the 500 cfs of dedicated capacity guaranteed to the EWA by the Operating Principles Agreement in order to pump it into San Luis Reservoir.

On three occasions EWA transfers were specifically timed during the fall to improve instream conditions for salmon and steelhead. As discussed above, in fall 2001, EWA transfers took place on the Merced River (25,000 AF) and the American River (20,000 AF) to improve flows and instream temperatures for fall run Chinook salmon spawning. Both transfers subsequently were pumped at Banks and used to repay prior EWA debt.

In fall 2002, EWA released 5,000 AF on the American River to improve conditions for fall run Chinook salmon spawning. Of this amount, only 600 AF was captured at the pumps, with the remainder contributing to Delta outflow. The small amount captured and transferred was due to a lack of available pumping capacity at the time of the release.

In addition, the EWA also paid for bypassed power generation due to lower river outlet releases in the American River in fall 2001 and 2002. This allowed for cold water releases below the power penstocks on Folsom Dam, which improved instream temperatures for fall run Chinook salmon spawning. Prior to the lower river outlet releases significant Chinook salmon prespawning mortalities were reported in both years. The EWA compensated the Western Area Power Administration for the foregone electricity.

Additional EWA upstream opportunities

The 2003 EWA Review Panel also recommended that the EWA Team examine upstream opportunities, especially on those streams with at-risk species present (winter-run Chinook, spring-run Chinook, and steelhead). To date, opportunities for EWA acquisitions in these types of streams have not been pursued, largely due to the lack of success encountered by the EWP efforts, which actively focused on these types of streams.

Additional opportunities to coordinate and integrate with other ecosystem restoration and water management programs to meet upstream objectives will occur in the future. As opportunities to use EWA for upstream actions are identified for specific streams, consistent with the EWA goals of providing fish protection and ESA regulatory commitments, the EWA Team will consider the following questions in pursuing a course of action:

- (1) Are ESA-listed fish species present in the specific stream?
- (2) What are the existing flow regimes?
- (3) Are additional fish flows needed?
- (4) Are there other environmental water management programs already being used on the stream?
- (5) What integration or coordination opportunities with the other environmental water management programs exist?
- (6) Are there willing sellers and, if so, how much water is available?
- (7) Can the water be released on a schedule that provides instream benefits for fish and also be exported into San Luis Reservoir?
- (8) What are the hydrologic conditions and project operations, including Delta inflow, balanced or excess conditions, Delta outflow index, export to inflow ratio (E/I), project demands and storage conditions?
- (9) What is the status of EWA assets and budget?

In summary, the EWA fish actions will continue to be integrated and coordinated with (b)(2) fish actions and VAMP implementation. As the EWA Team has gained experience implementing EWA fish actions during the past six years, it has become more knowledgeable and creative in using EWA assets in ways that were not envisioned in 2001. The EWA Team will continue to investigate opportunities to use EWA for upstream fish actions consistent with the EWA goals of providing fish protection and ESA regulatory commitments. The EWA Team remains committed to pursuing coordination and integration opportunities with other Calfed Program elements, specifically the ERP. As one of several environmental water management programs, the EWA contributes a multi-objective, long-term water management strategy for the restoration of the Bay-Delta system.

Table 1. Comparison of the Environmental Water Account, Environmental Water Program, b2, and WAP.

	I. Environmental Water Account	II. Environmental Water Program	III. CVPIA (b)(2) water	IV. Water Acquisition Program
Primary Purpose	Acquire water that can be delivered south of the Delta to replace pumping forgone by CVP/SWP pumps for fish protection and recovery purposes, and augmenting streamflows and Delta outflow. Instream benefits are generally not a primary purpose, but are often a secondary benefit.	Acquire water on streams tributary to the Sacramento and San Joaquin river systems to provide instream benefits to fish and ecological processes. Instream benefits are a primary purpose and all acquisitions must have a demonstrable biological or ecological benefit.	"Dedicate and manage annually 800,000 AF of CVP yield for the primary purpose of implementing the fish, wildlife, and habitat restoration purposes... .. and to help meet WQCP and ESA obligations."	"... for acquisition of a water supply to supplement the quantity of water dedicated to fish and wildlife purposes ... " per CVPIA 3406 (b)(3).
Geographic Range	North and south of the Delta, with the mix depending on cross-Delta capacity, and locations depending on willing sellers of sufficient water volumes from storage reservoirs, groundwater substitution, and groundwater banks.	In 2005 the EWP program was scaled back and current efforts are focused on Clear Creek only.	North and south of the Delta.	Throughout the Central Valley purchased from willing sellers. Includes modification of operations, water banking, conservation, transfers, conjunctive use, fallowing, options, etc.
Stream Preferences	Preference for larger streams with significant reservoir storage, ample water supplies, and a history of water sales.	Preference for smaller spring-run salmon streams, relatively minor amounts of storage, and lacking history of water sales.	Limited to CVP-controlled streams and facilities: i.e., Clear Creek, Sacramento River, American River, Stanislaus River, and the Tracy export facility.	Nineteen streams and rivers throughout the Central Valley that have the greatest biological benefit to anadromous fish populations.
Science	Scientific validity of program examined through external scientific review process managed by Science Program. Evaluation of overall program, rather than individual acquisitions. Compliance with environmental documentation for transfers.	Obligation to establish a sound scientific basis and to establish an experimental adaptive management framework for each acquisition.	Scientific basis for (b) (2) fish actions includes AFRP documents, published literature, DFG and IEP reports. (b)(2) fish actions are coordinated with an interagency team.	Acquisition priorities based on the biology, hydrology and economics decision support model which is part of the "Water Management Strategy and Water Acquisition Plan".
External Review Requirements	CEQA/NEPA compliance for most transfers, with SWRCB environmental review for any transfers exempt from CEQA.	Obligation to conduct scientific peer review and agency reviews similar to CBDA Ecosystem Restoration PSP process.	CVPIA mandates that (b)(2) shall be managed pursuant to conditions specified by USF&WS after consultation with USBR, DWR, and CDF&G.	NEPA compliance for all purchases, SWRCB approval for transfers and post-1914 water right purchases and superior court action for pre-1914 water right purchases.
Length of Acquisition	To date, all acquisitions have been short-term (1 year or less).	Program has a goal of purchasing water rights or long term leases.	Long-term. Authorized by CVPIA in 1992. Annual use of 800 TAF.	Short term and spot marked acquisitions have dominated with only one permanent water right purchase to date been limited by funding constraints.
Agency Support	Nearly all work, other than environmental documentation, has been completed by agency staff members from all five implementing agencies.	Primary agency support has been one USF&WS staff member. Preponderance of support has been provided by consultants.	FWS agency support is 3 USF&WS staff and two USBR staff. Additional support from DWR, DFG, and NMFS	Primary support has been one USBR staff and one USF&WS staff, NEPA documentation conducted by contractor.
Method of Acquisition	All acquisitions have been made by DWR staff and USBR staff.	Methods will be project specific and may be made by state agencies or USBR depending on the funding source.	CVPIA authorization of 800,000 AF annually.	All acquisitions have been made by WAP staff of USBR and the USF&WS.
Public Involvement	Public involvement through CALFED Ops, OFF, DAT and for environmental documentation, SWRCB approvals, and approvals by the boards of directors of willing sellers at public meetings.	Extensive public involvement required due to commitment to pursuing locally supported actions.	Public involvement through CALFED Ops, OFF, DAT and biannual stakeholder meetings.	Public involvement required for NEPA documentation, and development of the "Water Acquisition Strategy and Water Management Plan".

Environmental Water Management Portfolio
Draft Conceptual Model

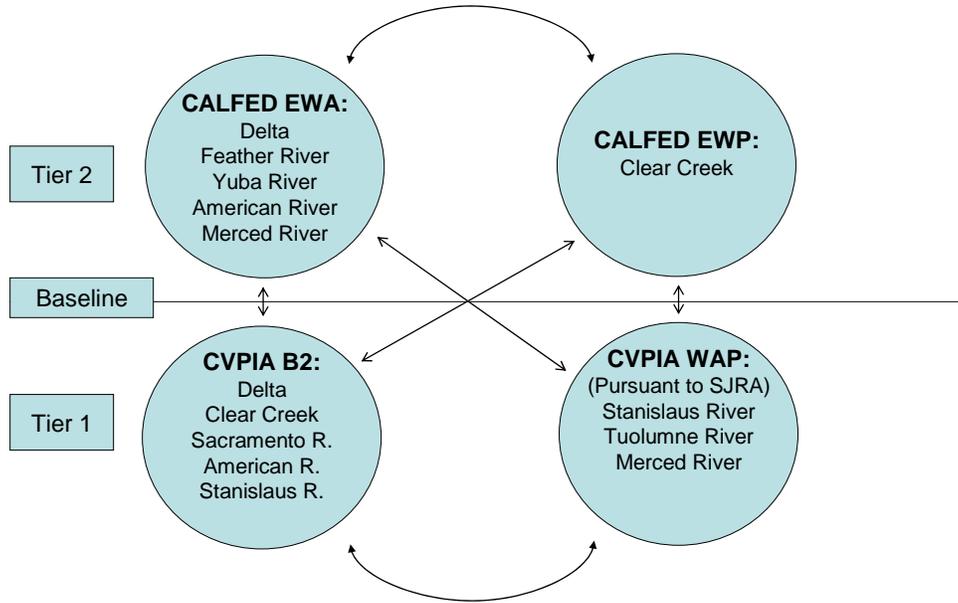


Figure 2. Conceptual Schematic of Habitat Restoration and Water Management Tools

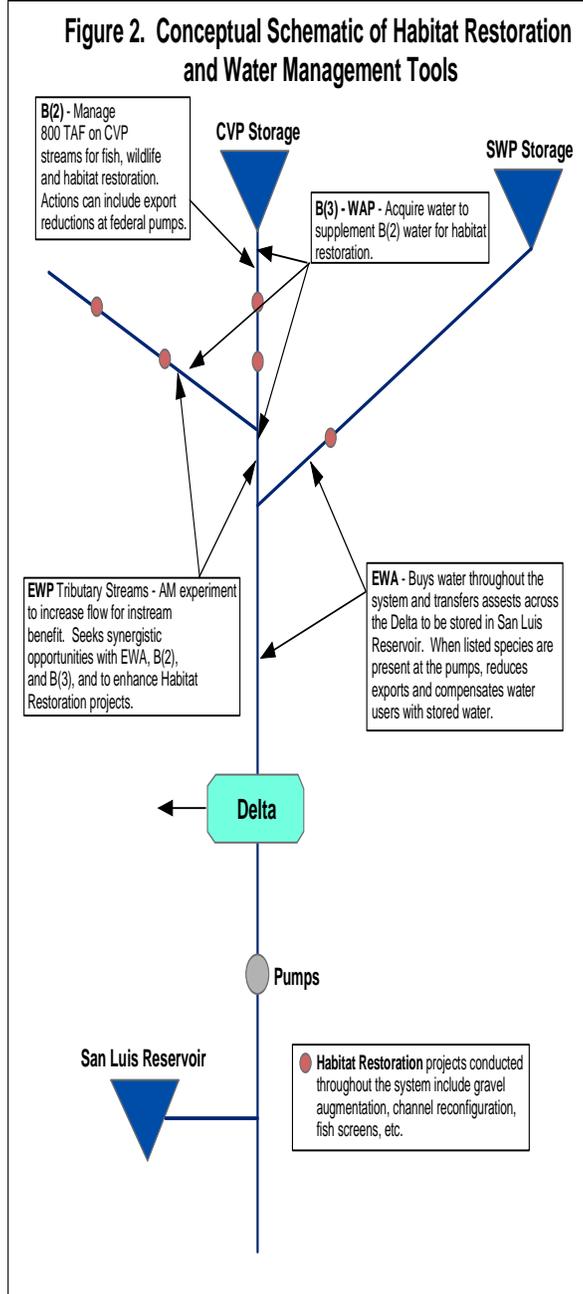
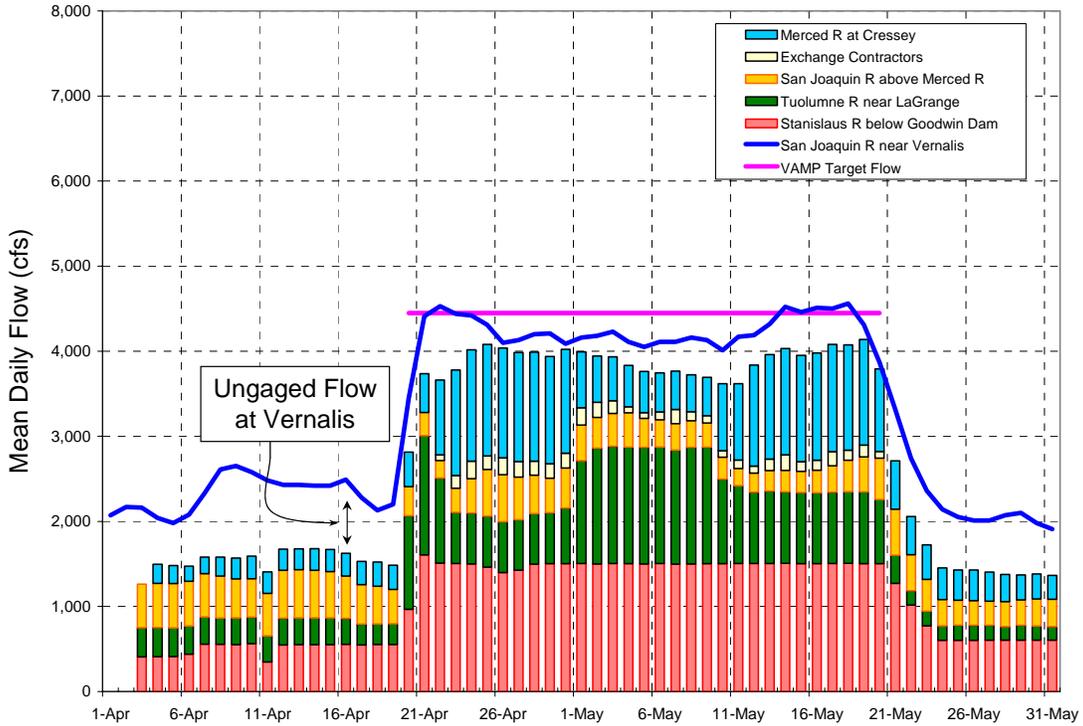


TABLE 2

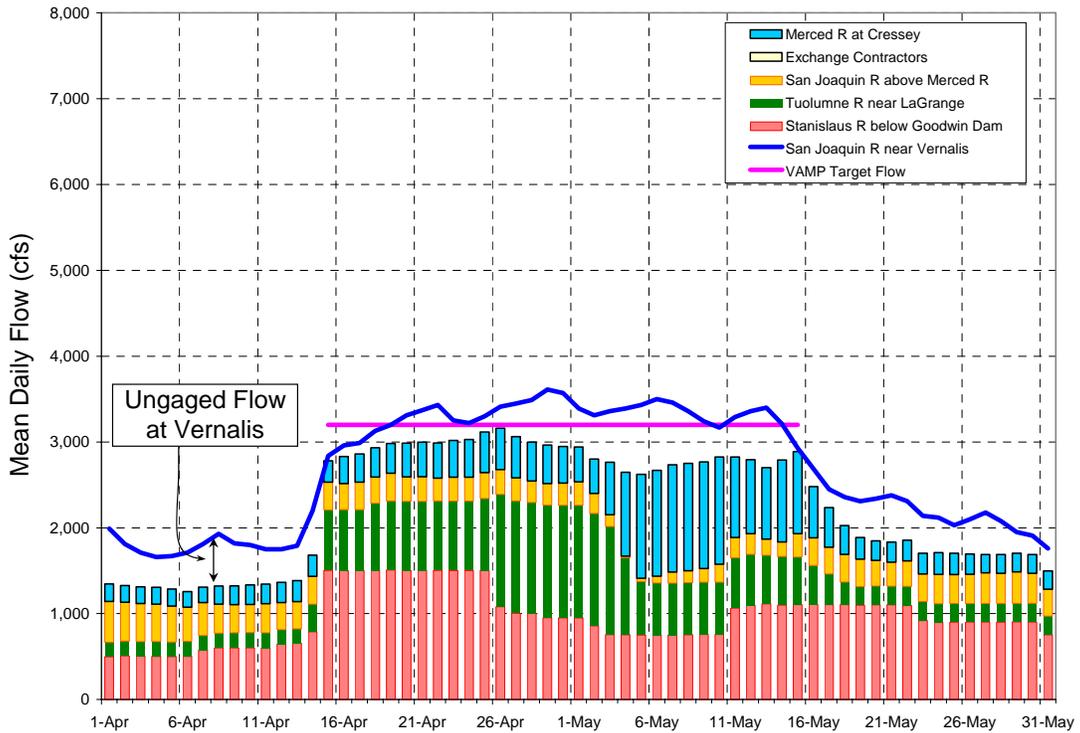
VAMP Vernalis Flow and Delta Export Targets

Existing Flow (cfs)	VAMP Flow Target (cfs)	Delta Export Target Rates (cfs)
0 - 1,999	2,000	
2,000 - 3,199	3,200	1,500
3,200 - 4,449	4,450	1,500
4,450 - 5,699	5,700	2,250
5,700 - 7,000	7,000	1500 or 3,000
Greater than 7,000	Provide stable flow to extent possible	

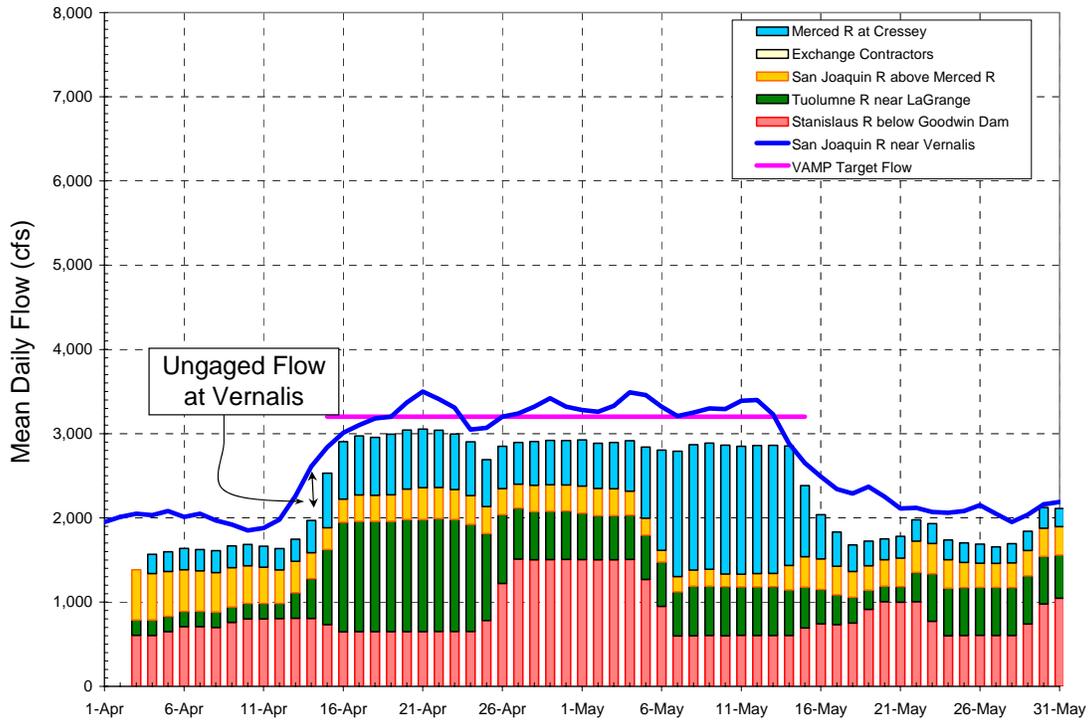
**Figure 3. VAMP 2001 --- San Joaquin River near Vernalis
With Lagged Contributions from Primary Sources**



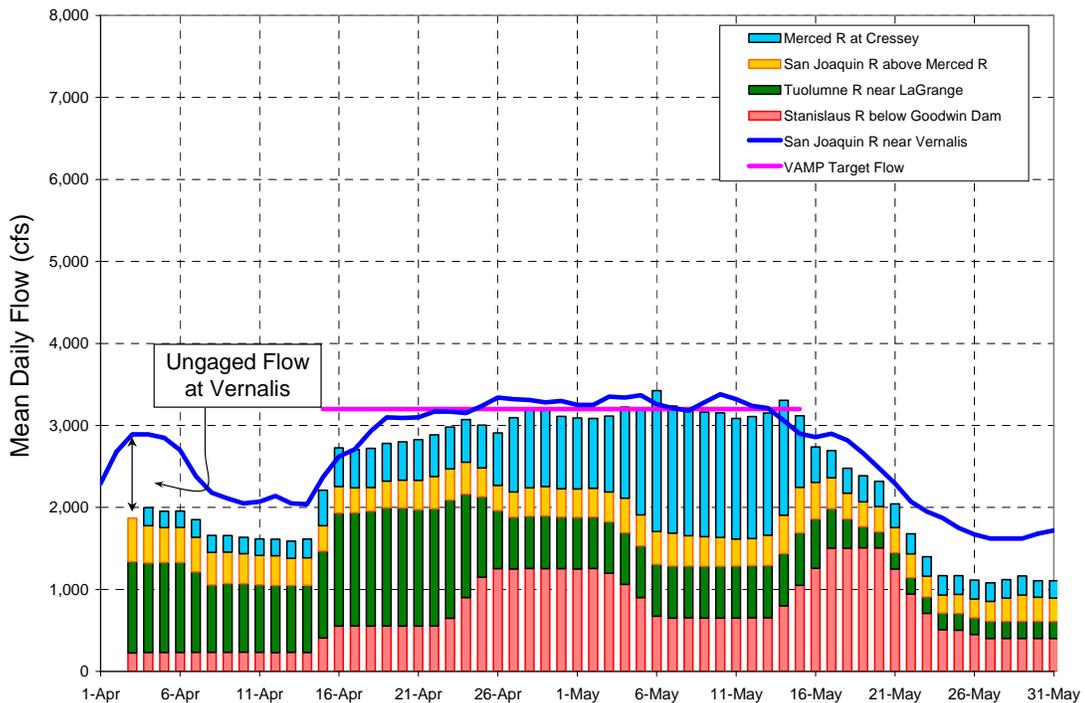
**Figure 4. VAMP 2002 --- San Joaquin River near Vernalis
With Lagged Contributions from Primary Sources**



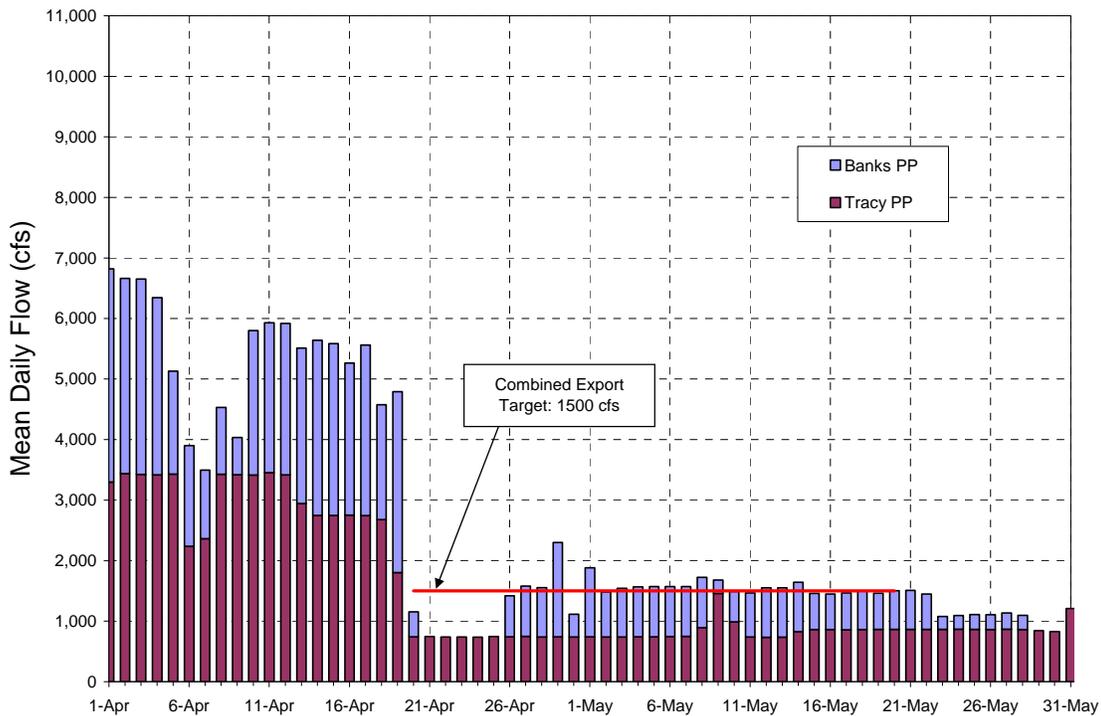
**Figure 5. VAMP 2003 --- San Joaquin River near Vernalis
With Lagged Contributions from Primary Sources**



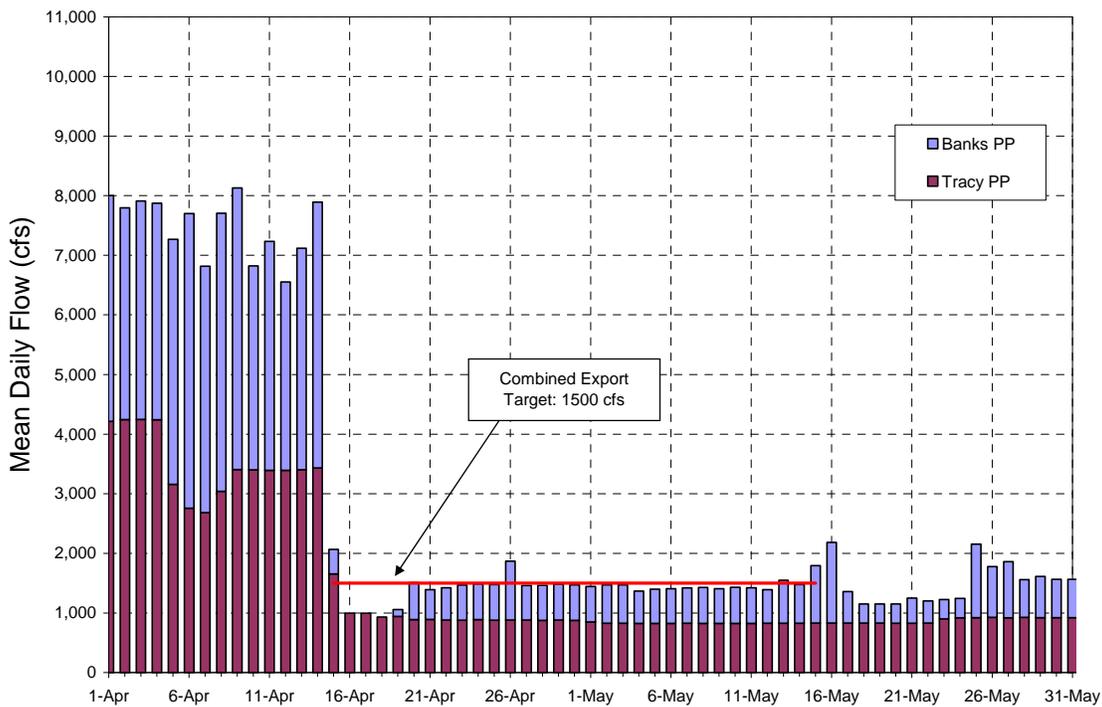
**Figure 6. VAMP 2004 --- San Joaquin River near Vernalis
With Lagged Contributions from Primary Sources**



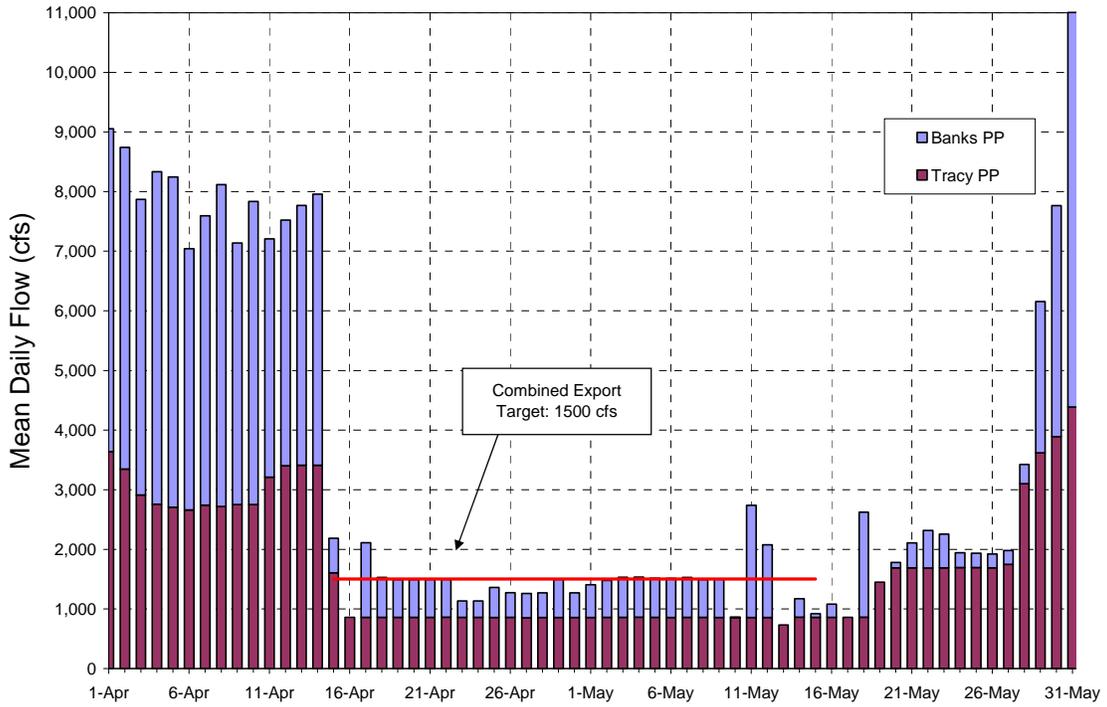
**Figure 7. VAMP 2001
Federal and State Exports**



**Figure 8. VAMP 2002
Federal and State Exports**



**Figure 9. VAMP 2003
Federal and State Exports**



**Figure 10. 2004 VAMP
Federal and State Exports**

