

**Footnotes**

[1] Maximum 3-day running average of combined export rate (cfs) which includes Tracy Pumping Plant and Clifton Court Forebay Inflow less Byron-Bethany pumping.

Year Type	All
Apr15 - May15*	The greater of 1,500 or 100% of 3-day avg. Vernalis flow

\* This time period may need to be adjusted to coincide with fish migration. Maximum export rate may be varied by CalFed Op's group.

[2] The maximum percentage of average Delta inflow (use 3-day average for balanced conditions with storage withdrawal, otherwise use 14-day average) diverted at Clifton Court Forebay (excluding Byron-Bethany pumping) and Tracy Pumping Plant using a 3-day average. (These percentages may be adjusted upward or downward depending on biological conditions, providing there is no net water cost.)

[3] The maximum percent Delta inflow diverted for Feb may vary depending on the January 8RI.

Jan 8RI	Feb exp. limit
≤ 1.0 MAF	45%
between 1.0 & 1.5 MAF	35%-45%
> 1.5 MAF	35%

[4] Minimum monthly average Delta outflow (cfs). If monthly standard ≤ 5,000 cfs, then the 7-day average must be within 1,000 cfs of standard; if monthly standard > 5,000 cfs, then the 7-day average must be ≥ 80% of standard.

Year Type	All	W	AN	BN	D	C
Jan	4,500*					
Jul		8,000	8,000	6,500	5,000	4,000
Aug		4,000	4,000	4,000	3,500	3,000
Sep	3,000					
Oct		4,000	4,000	4,000	4,000	3,000
Nov-Dec		4,500	4,500	4,500	4,500	3,500

\* Increase to 6,000 if the Dec 8RI is greater than 800 TAF

[5] Minimum 3-day running average of daily Delta outflow of 7,100 cfs OR: either the daily average or 14-day running average EC at Collinsville is less than 2.64 mmhos/cm (This standard for March may be relaxed if the Feb 8RI is less than 500 TAF. The standard does not apply in May and June if the May estimate of the SRIIS < 8.1 MAF at the 90% exceedence level in which case a minimum 14-day running average flow of 4,000 cfs is required.) For additional Delta outflow objectives, see TABLE A

[6] February starting salinity: If Jan 8RI > 900 TAF, then the daily or 14-day running average EC @ Collinsville must be ≤ 2.64 mmhos/cm for at least one day between Feb 1-14. If Jan 8RI is between 650 TAF and 900 TAF, then the CalFed Op's group will determine if this requirement must be met.

[7] Rio Vista minimum monthly average flow rate in cfs (the 7-day running average shall not be less than 1,000 below the monthly objective).

Year Type	All	W	AN	BN	D	C
Sep	3,000					
Oct		4,000	4,000	4,000	4,000	3,000
Nov-Dec		4,500	4,500	4,500	4,500	3,500

[8] BASE Vernalis minimum monthly average flow rate in cfs (the 7-day running average shall not be less than 20% below the objective). Take the higher objective if X2 is required to be west of Chipps Island.

Year Type	All	W	AN	BN	D	C
Feb-Apr14 and May16-Jun		2,130 or 3,420	2,130 or 3,420	1,420 or 2,280	1,420 or 2,280	710 or 1,140

[9] PULSE Vernalis minimum monthly average flow rate in cfs. Take the higher objective if X2 is required to be west of Chipps Island.

Year Type	All	W	AN	BN	D	C
Apr15 - May15		7,330 or 8,620	5,730 or 7,020	4,620 or 5,480	4,020 or 4,880	3,110 or 3,540
Oct	1,000*					

\* Up to an additional 28 TAF pulse/attraction flow to bring flows up to a monthly average of 2,000 cfs except for a critical year following a critical year. Time period based on real-time monitoring and determined by CalFed Op's group.

[10] For the Nov-Jan period, Delta Cross Channel gates may be closed for up to a total of 45 days.

[11] For the May 21-June 15 period, close Delta Cross Channel gates for a total of 14 days per CALFED Op's group. During the period the Delta cross channel gates may close 4 consecutive days each week, excluding weekends.

[12] Minimum # of days that the mean daily chlorides ≤ 150 mg/l must be provided in intervals of not less than 2 weeks duration. Standard applies at Contra Costa Canal Intake or Antioch Water Works Intake.

Year Type	W	AN	BN	D	C
# Days	240	190	175	165	155

*(Footnotes continued on next page)*

[13] The maximum 14-day running average of mean daily EC (mmhos/cm) depends on water year type.

Year Type	WESTERN DELTA				INTERIOR DELTA			
	Sac River @ Emmatton		SJR @ Jersey Point		Mokelumne R @ Terminous		SJR @ San Andreas	
	0.45 EC from April 1 to date shown	EC value from date shown to Aug15 *	0.45 EC from April 1 to date shown	EC value from date shown to Aug15 *	0.45 EC from April 1 to date shown	EC value from date shown to Aug15 *	0.45 EC from April 1 to date shown	EC value from date shown to Aug15 *
W	Aug 15		Aug 15		Aug 15		Aug 15	
AN	Jul 1	0.63	Aug 15		Aug 15		Aug 15	
BN	Jun 20	1.14	Jun 20	0.74	Aug 15		Aug 15	
D	Jun 15	1.67	Jun 15	1.35	Aug 15		Jun 25	0.58
C		2.78		2.20		0.54		0.87

\* When no date is shown, EC limit continues from April 1.

[14] As per D-1641, for San Joaquin River at Vernalis: however, the April through August maximum 30- day running average EC for San Joaquin River at Brandt Bridge, Old River near Middle River, and Old River at Tracy Road Bridge shall be 1.0 EC until April 1, 2005 when the value will be 0.7 EC.

[15] Compliance will be determined between Jersey Point & Prisoners Point. Does not apply in critical years or in May when the May 90% forecast of SRI  $\leq$  8.1 MAF.

[16] During deficiency period, the maximum monthly average mhtEC at Western Suisun Marsh stations as per SMPA is:

Month	mhtEC
Oct	19.0
Nov	16.5
Dec-Mar	15.6
Apr	14.0
May	12.5

[17] In November, maximum monthly average mhtEC = 16.5 for Western Marsh stations and maximum monthly average mhtEC = 15.5 for Eastern Marsh stations in all periods types.

**TABLE A**

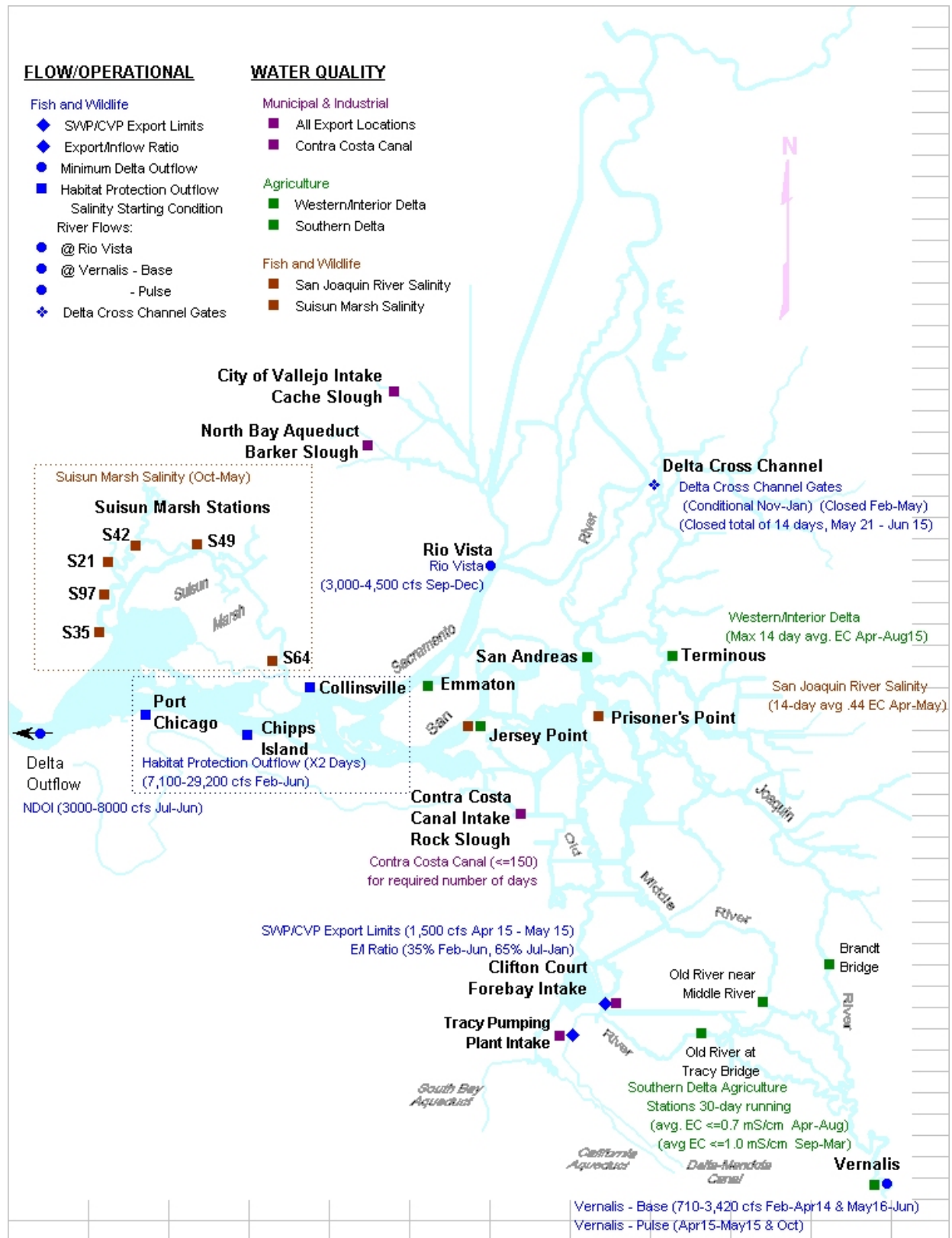
Number of Days When Max. Daily Average Electrical Conductivity of 2.64 mmhos/cm Must Be Maintained. (This can also be met with a maximum 14-day running average EC of 2.64 mmhos/cm, or 3-day running average Delta outflows of 11,400 cfs and 29,200 cfs, respectively.) Port Chicago Standard is triggered only when the 14-day average EC for the last day of the previous month is 2.64 mmhos/cm or less. PMI is previous month's 8RI. If salinity/flow objectives are met for a greater number of days than required for any month, the excess days shall be applied towards the following month's requirement. The number of day's for values of the PMI between those specified below shall be determined by linear interpolation.

PMI (TAF)	Port Chicago (continuous recorder at Port Chicago)				
	FEB	MAR	APR	MAY	JUN
0	0	0	0	0	0
250	1	0	0	0	0
500	4	1	0	0	0
750	8	2	0	0	0
1000	12	4	0	0	0
1250	15	6	1	0	0
1500	18	9	1	0	0
1750	20	12	2	0	0
2000	21	15	4	0	0
2250	22	17	5	1	0
2500	23	19	8	1	0
2750	24	21	10	2	0
3000	25	23	12	4	0
3250	25	24	14	6	0
3500	25	25	16	9	0
3750	26	26	18	12	0
4000	26	27	20	15	0
4250	26	27	21	18	1
4500	26	28	23	21	2
4750	27	28	24	23	3
5000	27	28	25	25	4
5250	27	29	25	26	6
5500	27	29	26	28	9
5750	27	29	27	28	13
6000	27	29	27	29	16
6250	27	30	27	29	19
6500	27	30	28	30	22
6750	27	30	28	30	24
7000	27	30	28	30	26
7250	27	30	28	30	27
7500	27	30	29	30	28
7750	27	30	29	31	28
8000	27	30	29	31	29
8250	28	30	29	31	29
8500	28	30	29	31	29
8750	28	30	29	31	30
9000	28	30	29	31	30
9250	28	30	29	31	30
9500	28	31	29	31	30
9750	28	31	29	31	30
10000	28	31	30	31	30
> 10000	28	31	30	31	30

PMI (TAF)	Chippis Island (Chippis Island Station D10)				
	FEB	MAR	APR	MAY	JUN
$\leq$ 500	0	0	0	0	0
750	0	0	0	0	0
1000	28*	12	2	0	0
1250	28	31	6	0	0
1500	28	31	13	0	0
1750	28	31	20	0	0
2000	28	31	25	1	0
2250	28	31	27	3	0
2500	28	31	29	11	1
2750	28	31	29	20	2
3000	28	31	30	27	4
3250	28	31	30	29	8
3500	28	31	30	30	13
3750	28	31	30	31	18
4000	28	31	30	31	23
4250	28	31	30	31	25
4500	28	31	30	31	27
4750	28	31	30	31	28
5000	28	31	30	31	29
5250	28	31	30	31	29
$\geq$ 5500	28	31	30	31	30

\*When 800 TAF < PMI < 1000 TAF, the number of days is determined by linear interpolation between 0 and 28 days.

Figure 2-3 Footnotes for Summary Bay Delta Standards



**Figure 2–4 CVP/SWP Delta Map**

## Joint Point of Diversion

SWRCB D-1641 granted Reclamation and DWR the ability to utilize/exchange each Project's diversion capacity capabilities to enhance the beneficial uses of both Projects. The SWRCB conditioned the use of joint point of diversion (JPOD) capabilities based on a staged implementation and conditional requirements for each stage of implementation. The stages of JPOD in SWRCB D-1641 are:

- Stage 1 – for water service to Cross Valley Canal contractors and Musco Olive, and to recover export reductions taken to benefit fish.
- Stage 2 – for any purpose authorized under the current project water right permits.
- Stage 3 – for any purpose authorized up to the physical capacity of the diversion facilities.

Each stage of JPOD has regulatory terms and conditions which must be satisfied in order to implement JPOD.

All stages require a response plan to ensure water levels in the southern Delta will not be lowered to the injury of water users in the southern Delta (Water Level Response Plan). All stages require a response plan to ensure the water quality in the southern and central Delta will not be significantly degraded through operations of the JPOD to the injury of water users in the southern and central Delta.

All JPOD diversion under excess conditions in the Delta is junior to Contra Costa Water District (CCWD) water right permits for the Los Vaqueros Project, and must have an X2 location west of certain compliance locations consistent with the 1993 Los Vaqueros Biological Opinion (BO) for delta smelt.

Stage 2 has an additional requirement to complete an operations plan that will protect fish and wildlife and other legal users of water. This is commonly known as the Fisheries Response Plan.

Stage 3 has an additional requirement to protect water levels in the southern Delta under the operational conditions of the permanent South Delta Barrier program, along with an updated companion Fisheries Response Plan.

Reclamation and DWR intend to apply all response plan criteria consistently for JPOD uses as well as water transfer uses.

In general, JPOD capabilities will be used to accomplish four basic CVP-SWP objectives:

- When wintertime excess pumping capacity becomes available during Delta excess conditions and total CVP-SWP San Luis storage is not projected to fill before the spring pulse flow period, the project with the deficit in San Luis storage may elect to utilize JPOD capabilities. Concurrently, under the CALFED ROD, JPOD may be utilized to create additional water supplies for the EWA or reduce debt for previous EWA actions.
- When summertime pumping capacity is available at Banks Pumping Plant and CVP reservoir conditions can support additional releases, the CVP may elect to utilize JPOD capabilities to enhance annual CVP south of Delta water supplies.

- When summertime pumping capacity is available at Banks or Tracy Pumping Plant to facilitate water transfers, JPOD may be utilized to further facilitate the water transfer.
- During certain coordinated CVP-SWP operation scenarios for fishery entrainment management, JPOD may be utilized to maximize CVP-SWP exports at the facility with the least fishery entrainment impact while minimizing export at the facility with the most fishery entrainment impact.

## Adaptive Management

Reclamation and DWR work closely with the U.S. Fish and Wildlife Service (FWS), the National Marine Fisheries Service (NOAA Fisheries), and the California Department of Fish and Game (DFG) to coordinate the operation of the CVP and SWP with fishery needs. This coordination is facilitated through several forums discussed below.

### CALFED Ops Group

The CALFED Ops Group consists of the Project Agencies, the Management Agencies, SWRCB staff, and the Federal Environmental Protection Agency (EPA). The CALFED Ops Group generally meets eleven times a year in a public setting to discuss the operation of the CVP and SWP, as well as implementation of the CVPIA and coordination with endangered species protection. The CALFED Ops Group held its first public meeting in January 1995, and during the next six years the group developed and refined its process. The CALFED Ops Group has been recognized within the SWRCB D-1641, and elsewhere, as a forum for consultation on decisions to exercise certain flexibility that has been incorporated into the Delta standards for protection of beneficial uses (e.g. E/I ratios, and some DCC Closures). Several teams were established through the Ops Group process. These teams are described below:

**Operations and Fishery Forum:** The Operations and Fishery Forum (OFF) was established as a stakeholder-driven process to disseminate information regarding recommendations and decisions about the operations of the CVP and SWP. OFF members are considered the contact person for their respective agency or interest group when information regarding take of listed species, or other factors and urgent issues need to be addressed by the CALFED Ops Group. Alternatively, the OFF may be directed by the CALFED Ops Group to develop recommendations on operational responses for issues of concern raised by member agencies.

**Data Assessment Team (DAT):** The DAT consists of technical staff members from the Project and Management agencies, as well as stakeholders. The DAT meets frequently<sup>2</sup> during the fall, winter, and spring to review and interpret data relating to fish movement, location, and behavior. Based upon its assessment and input concerning the CVP and SWP operations from the Project Agencies, the DAT makes recommendations regarding potential changes in operations to protect fish. These recommendations are a key element to the implementation of the EWA (discussed later).

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<sup>2</sup> The DAT holds weekly conference calls and may have additional discussions during other times as needed.

**B2 Interagency Team (B2IT):** The B2IT was established in 1999 and consists of technical staff members from the Project and Management agencies. The B2IT meets weekly to discuss implementation of section 3406 b(2) of the CVPIA, which defines the dedication of CVP water supply for environmental purposes. It communicates with EWAT and WOMT to ensure coordination with the other operational programs or resource related aspects of project operations.

**Environmental Water Account Team (EWAT):** The EWAT consists of members from the Project and Management agencies. The EWAT is responsible for implementation and reporting of actions to acquire water for the EWA. It also coordinates with the B2IT to develop strategies that maximize benefits derived from implementation of actions under CVPIA and the EWA.

## Fisheries Technical Teams

Several fisheries specific teams have been established to provide guidance on resource management issues. These teams include:

**The Sacramento River Temperature Task Group (SRTTG):** The SRTTG is a multi-agency group formed pursuant to SWRCB Water Rights Orders 90-5 and 91-1, to assist with improving and stabilizing Chinook population in the Sacramento River. Annually, Reclamation develops temperature operation plans for the Shasta and Trinity divisions of the CVP. These plans consider impacts on winter-run and other races of Chinook salmon, and associated project operations. The SRTTG meets initially in the spring to discuss biological and operational information, objectives, and alternative operations plans for temperature control. Once the SRTTG has recommended an operation plan for temperature control, Reclamation then submits a report to the SWRCB, generally on or before June 1 each year.

After implementation of the operation plan, the SRTTG may perform additional studies and holds meetings as needed to develop revisions based on updated biological data, reservoir temperature profiles and operations data. Updated plans may be needed for summer operations protecting winter-run, or in fall for fall-run spawning season. If there are any changes in the plan, Reclamation submits a supplemental report.

**The Salmon Decision Tree:** The Chinook Salmon Protection Decision Process is used by the fishery agencies and project operators to facilitate the often complex coordination issues surrounding DCC gate operations and the purposes of fishery protection closures, Delta water quality, and/or export reductions. Inputs such as fish lifestage and size development, current hydrologic events, fish indicators (such as the Knight's Landing Catch Index and Sacramento Catch Index), and salvage at the export facilities, as well as current and projected Delta water quality conditions, are used to determine potential DCC closures and/or export reductions. The coordination process has worked well during the recent fall and winter DCC operations and is expected to be used in the present or modified form in the future.

**Delta Smelt Working Group (DSWG):** The DSWG was established in 1995 to resolve biological and technical issues regarding delta smelt and to develop recommendations for consideration by the FWS. It is generally activated when Reclamation and DWR seek

consultation with FWS on delta smelt or when unusual salvage of delta smelt occurs. It can also be activated, and has been activated, to assist with the development of strategies to improve habitat conditions for delta smelt.

**Delta smelt decision tree:** The working group will employ a delta smelt decision tree (DSDT) to assist in formulating recommendations that will be forwarded to the water operations management team. The working group will not decide what actions will be taken, but will merely advise the WOMT. The working group will not supplant the DAT, but will provide an additional source of advice to the WOMT. The group may propose operations modifications that the group believes will protect delta smelt, either by reducing take at the export facilities or by preserving smelt habitat. The DSDT will be adapted by the working group as new knowledge becomes available. A more detailed description of the technical basis for the adoption of the DSDT, the way in which it will be used, and a copy of the current DSDT, is contained in the appendix.

**American River Operations Work Group (AROG):** In 1996 Reclamation established an operational working group for the lower American River, known as AROG. Although open to anyone, the AROG meetings generally include representatives from several agencies and organizations with on-going concerns regarding management of the lower American River. The group includes Reclamation, FWS, NOAA Fisheries, DFG, Sacramento Area Flood Control Agency (SAFCA), Water Forum, City of Sacramento (City), County of Sacramento, Western Area Power Administration (Western), and Save the American River Association (SARA).

The AROG convenes monthly, or more frequently, with the purpose of providing fishery updates and reports for Reclamation to better manage Folsom Reservoir for fish resources in the lower American River.

**San Joaquin River Technical Committee (SJRTC):** The SJRTC meets for the purposes of planning and implementing the VAMP each year and oversees two subgroups: the Biology subgroup, and the Hydrology subgroup. These two groups are charged with certain responsibilities, and must also coordinate their activities within the San Joaquin River Agreement (SJRA) Technical Committee.

**DCC Project Work Team:** The DCC Project Work Team is a multi-agency group under CALFED. Its purpose is to determine and evaluate the affects of DCC gate operations on Delta hydrodynamics, water quality, and fish migration. The work team coordinates with the DAT and OFF groups to conduct gate experiments and members may be used as a resource to estimate impacts from real time gate operations.

## Water Operations Management Team

To facilitate timely decision-support and decision making at the appropriate level, a management-level team was established. The Water Operations Management Team (WOMT) first met in 1999, and consists of management level participants from the Project and

Management agencies. The WOMT meets frequently<sup>3</sup> in order to provide oversight and decision making that must routinely occur within the CALFED Ops Group process. The WOMT relies heavily upon the DAT and B2IT for recommendations on fishery actions. It also utilizes the CALFED Ops Group to communicate with stakeholders about its decisions. Although the goal of WOMT is to achieve consensus on decisions, the agencies retain their authorized roles and responsibilities.

## Process for Using Adaptive Management

Decisions regarding CVP and SWP operations must consider many factors that include public safety, water supply reliability, cost, as well as regulatory and environmental requirements. To facilitate such decisions, the Project and Management Agencies have developed and refined a process to collect data, disseminate information, develop recommendations, and make decisions.

1. **A workgroup makes a recommendation for a change in CVP and SWP operations.** Generally, operational adjustments to protect fish are initiated as the result of concern expressed over the interpretation of data that have been collected or as a part of an overarching strategic plan to improve habitat conditions. Examples of conditions that could signal concern include observance of large numbers of juvenile Chinook entering the Delta, high salvage of delta smelt at the export facilities, or unfavorable distribution of delta smelt throughout the Delta. Examples of strategic plans include maintaining higher releases for in stream needs or closing the Delta Cross-channel gates to keep emigrating juvenile Chinook from entering the central Delta.
2. **The Project Agencies consider the recommendation and seek consensus with the Management Agencies.** Decisions regarding changes to the CVP and SWP operations must be made quickly to be effective. To accomplish this, recommendations are vetted with the management-level staff of the Project and Management Agencies. This provides for appropriate consideration of the many factors that must be taken into consideration.
3. **The recommendations and decisions are disseminated.** Numerous stakeholders have a keen interest in CVP and SWP operations. In fact, workgroups established through the Ops Group process (DAT and OFF are two prime examples) have significant stakeholder involvement. In addition, decisions regarding the projects can have significant policy-related implications that must be presented to the State and Federal administrations. To facilitate adequate feedback to stakeholders, Reclamation and DWR disseminate recommendations and the resulting decisions to agencies and stakeholders through the OFF and DAT.
4. **Annual reporting is performed to summarize when decision trees are used and results are updated.**

Example: The DAT determines adult delta smelt are migrating upstream to spawn in sufficient numbers to warrant a change in pumping levels. After careful consideration of

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<sup>3</sup> As with the DAT, WOMT holds weekly meetings during the critical fish periods. In addition, it will hold impromptu meetings or conference calls to consider recommendations for changes in the operations of the CVP and SWP.



the water supply costs to the EWA and CVPIA b(2) water assets, DAT recommends a five-day reduction in exports.

The WOMT meets and considers the recommendation of the DAT, and after careful consideration of the recommendation, WOMT agrees that EWA and CVPIA b(2) assets may be used to implement the export reduction. Reclamation and DWR then implement the export reduction as prescribed.

In addition, South Delta barrier operations will be further studied and refined by WOMT/DAT representatives, including Reclamation, DWR, DFG, NOAA Fisheries, delta stakeholders and representatives of the delta smelt working group. Representatives from these groups will meet to determine how best to operate south delta barriers in order to balance fish needs with water levels and water quality needs. Forecast modeling as well as monitoring of real-time barrier operations will be used to modify operations as needed.

## Central Valley Project

### Project Management Objectives

The CVP is the Mid-Pacific Region's largest project. Facilities are operated and maintained by local Reclamation area offices, with operations overseen by the CVOO at the Joint Operations Center in Sacramento, California. The CVOO is responsible for recommending CVP operating policy, developing annual operating plans, coordinating CVP operations with the SWP and other entities, establishing CVP-wide standards and procedures, and making day-to-day operating decisions. Figure 1-4 shows the relationship between the CVOO and Reclamation area offices in the Mid-Pacific Region.

### ***Central Valley Project Improvement Act***

On October 30, 1992, Public Law 102-575, (Reclamation Projects Authorization and Adjustment Act of 1992) was passed. Included in the law was Title 34, the CVPIA. The CVPIA amended previous authorizations of the CVP to include fish and wildlife protection, restoration, and mitigation as project purposes having equal priority with irrigation and domestic water supply uses, and fish and wildlife enhancement having an equal priority with power generation. Among the changes mandated by the CVPIA are:

- Dedicating 800,000 af to fish and wildlife annually
- Authorizing water transfers outside the CVP service area
- Restoring anadromous fish populations by 2002
- Creating a restoration fund financed by water and power users
- Providing for the Shasta Temperature Control Device
- Implementing fish passage measures at Red Bluff Diversion Dam
- Calling for planning to increase the CVP yield
- Mandating firm water supplies for Central Valley wildlife refuges
- Improving the Tracy Fish Collection Facility (TFCF)

- Meeting Federal trust responsibility to protect fishery resources(Trinity River)

The CVPIA is being implemented on a broad front. The Final Programmatic Environmental Impact Statement (PEIS) for the CVPIA analyzes projected conditions in 2022, 30 years from the CVPIA's adoption in 1992. The Final PEIS was released in October 1999 and the CVPIA ROD was signed on January 9, 2001. The BOs were issued on November 21, 2000.

Operations of the CVP reflect provisions of the CVPIA, particularly sections 3406(b)(1), (b)(2), and (b)(3). On May 9, 2003, the Department of the Interior issued its Decision on Implementation of Section 3406 (b)(2) of the Central Valley Project Improvement Act. The B2IT provides the basis for implementing upstream and Delta actions with CVP delivery capability.

## **Water Service Contracts and Deliveries**

### ***Water Needs Assessment***

Water needs assessments have been performed for each CVP water contractor eligible to participate in the CVP long-term contract renewal process. Water needs assessments confirm a contractor's past beneficial use and determine future CVP water supplies needed to meet the contractor's anticipated future demands. The assessments are based on a common methodology used to determine the amount of CVP water needed to balance a contractor's water demands with available surface and groundwater supplies.

As of December 2003, most of the contractor assessments have been finalized. However, a couple of assessments remain under analysis and require either additional information from the contractor or do not fit into the assumptions incorporated into the methodology used for the rest of the CVP. The contractors are located primarily in the American River and San Felipe Divisions of the CVP. It is anticipated that all the assessments will be concluded by March 1, 2004. Because of the remaining assessments, the total supply required to meet the all the demands for the CVP cannot be determined at this time.

For modeling purposes, assumptions for future conditions have been made, even though the water assessments continue. The 2020 level of development's demands include higher amounts than the 2001 level of development's demands on the American River.

## **Future American River Operations - Water Service Contracts and Deliveries**

Surface water deliveries from the American River are made by various water rights entities and CVP contractors. Total annual demands are estimated to increase from 217,185 af in 2001 to 475,250 af in 2020, including the FRWP. Reclamation is negotiating the renewal of 13 long-term water service contracts, four Warren Act contracts, and has a role in six infrastructure or Folsom Reservoir operations actions influencing the management of American River Division facilities and water use.

## **CVP M&I Water Shortage Policy**

The CVP has 253 water service contracts (including Sacramento River Settlement Contracts). These water service contracts have had varying water shortage provisions (e.g., in some contracts, M&I and agricultural uses have shared shortages equally; in most of the larger M&I

contracts, agricultural water has been shorted 25 percent of its contract entitlement before M&I water was shorted, and then both shared shortages equally). Since 1991, Reclamation has been attempting to develop an M&I Water shortage policy applicable to as many CVP M&I contractors as appropriate.

For a contractor to receive the M&I minimum shortage allocation by means of the proposed policy, its water service contract must reference the proposed policy. For various reasons, Reclamation expects the proposed policy will not be referenced in contracts for the (1) Friant Division, (2) New Melones interim supply, (3) Hidden and Buchanan Units, (4) Cross Valley contractors, (5) Sugar Pine Units (subjects of title transfer legislation), (6) San Joaquin settlement contractors, and (7) Sacramento River settlement contractors. Any separate shortage-related contractual provisions will prevail.

The proposed policy provides a minimum shortage allocation for M&I water supplies of 75 percent of a contractor's historical use (i.e., the last three years of water deliveries unconstrained by the availability of CVP water). Historical use can be adjusted for growth, extraordinary water conservation measures, and use of non-CVP water as those terms are defined in the proposed policy. Before the M&I water allocation is reduced, the irrigation water allocation would be reduced below 75 percent of contract entitlement.

The proposed policy also provides that when the allocation of irrigation water is reduced below 25 percent of contract entitlement, Reclamation will reassess the availability of CVP water and CVP water demand; however, due to limited water supplies during these times, M&I water allocation may be reduced below 75 percent of adjusted historical use. Shortages for South of Delta and North of Delta irrigation allocations and M&I allocations are the same.

The proposed policy provides that Reclamation will deliver CVP water to all M&I contractors at not less than a public health and safety level if CVP water is available, if an emergency situation exists, (taking into consideration water supplies available to the M&I contractors from other sources), and in recognition that the M&I allocation may, nevertheless, fall to 50 percent when the irrigation allocation drops below 25 percent due to limited CVP supplies.

It should be noted the minimum shortage allocation of 75 percent, as proposed in the September 11, 2001, draft (which was made available for public review and comment) would apply only to that portion of CVP water identified as of September 30, 1994, as shown on Schedule A-12 of the 1996 M&I Water Rates book, and for those contract quantities specified in section 206 of Public Law 101-514. However, under the proposed policy a contractor may request an M&I minimum shortage allocation for post-1994 identified water that is transferred or assigned, converted, provided significant impacts upon irrigation supplies, or upon irrigation and M&I supplies, respectively, are mitigated.

Due to the development of policy alternatives generated by Reclamation after consideration of public comment, that portion of CVP water to which the minimum shortage allocation would apply could change prior to policy finalization. Prior to such finalization, Reclamation will meet the requirements of the National Environmental Policy Act (NEPA) and the Federal ESA.

Ag 100% to 75% then M&I is at 100%

Ag 70%                      M&I is 95%

Ag 65%                      M&I 90%

Ag 60%                      M&I 85%

Ag 55%                      M&I 80%

Ag 50% to 25%              M&I 75%

Dry and critical years has a modeling assumption

Ag 20%                      M&I 70%

Ag 15%                      M&I 65%

Ag 10%                      M&I 60%

Ag 5%                        M&I 55%

Ag 0                         M&I 50%

## Trinity River Division Operations

The Trinity River Division, completed in 1964, includes facilities to store and regulate water in the Trinity River, as well as facilities to divert water to the Sacramento River Basin. Trinity Dam is located on the Trinity River and regulates the flow from a drainage area of approximately 720 square miles. The dam was completed in 1962, forming Trinity Lake, which has a maximum storage capacity of approximately 2.4 million af.

The mean annual inflow to Trinity Lake from the Trinity River is about 1.2 million af per year. Historically, an average of about two-thirds of the annual inflow has been diverted to the Sacramento River Basin (1991-2003). Trinity Lake stores water for release to the Trinity River and for diversion to the Sacramento River via Lewiston Reservoir, Carr Tunnel, Whiskeytown Reservoir, and Spring Creek Tunnel where it commingles in Keswick Reservoir with Sacramento River water released from both the Shasta Dam and Spring Creek Debris Dam.

### Safety of Dams at Trinity Reservoir

Periodically, increased water releases are made from Trinity Dam consistent with Reclamation safety of dams (SOD) criteria intended to prevent overtopping of Trinity Dam. Although flood control is not an authorized purpose of the Trinity River Division, flood control benefits are provided through normal operations.

Trinity Dam has limited release capacity below the spillway crest elevation. Studies completed by the Army Corps of Engineers (Corps) in 1974 and Reclamation in 1975 showed the spillway and outlet works at Trinity Dam are not sufficient to safely pass the anticipated design flood inflow. Therefore, Reclamation implemented SOD criteria stipulating flood season release and storage criteria at Trinity Dam to reduce the potential for overtopping during large flood events. The SOD criteria attempt to prevent storage from exceeding 2.1 million af from November

through March. The SOD criteria begin to prescribe reservoir releases when storage in Trinity Dam is forecast to exceed 2.0 million af during November through March.

The SOD release criteria specifies that Carr Powerplant capacity should be used as a first preference destination for SOD releases made at Trinity Dam. Trinity River releases are made as a second preference destination. During significant Northern California high water flood events, the Sacramento River water stages are also at concern levels. Under such high water conditions, the water that would otherwise move through Carr Powerplant is routed to the Trinity River. Total river release is limited to 6,000 cfs below Lewiston Dam (under SOD criteria) due to local high water concerns and local bridge flow capacities; until local inflows to Lewiston Lake and Trinity Dam spillway flows exceed 6,000 cfs; and also the Carr Powerplant discharge.

### **Fish and Wildlife Requirements on Trinity River**

Based on the December 19, 2000, Trinity River Main stem ROD, 369,000 to 815,000 af is allocated annually for Trinity River flows. Due to ongoing litigation on the ROSD, the Federal District Court for the Eastern District of California issued a December 10, 2002, Order that directed the CVP to release 368,600 af during critical Trinity River inflow years and 452,000 af during all other conditions. This amount is scheduled in coordination with the FWS to best meet habitat, temperature, and sediment transport objectives in the Trinity Basin.

Temperature objectives for the Trinity River are set forth in SWRCB WR 90-5. These vary by reach and by season. Between Lewiston Dam and Douglas City Bridge, the daily average temperature should not exceed 60° F from July 1 to September 14 and 56° F from September 15 to October 1. From October 1 to December 31, the daily average temperature should not exceed 56° F between Lewiston Dam and the confluence of the North Fork Trinity River. Reclamation consults with FWS in establishing a schedule of releases from Lewiston Dam that can best achieve these objectives.

Operationally, the water year type is forecasted on April 1, based on a 90 percent forecast. Annual runoff upstream of Lewiston Dam is based on actual unimpaired runoff between October 1 and March 31, and the April 1 runoff is from a 90 percent forecast. In the modeling, actual historic Trinity inflows were used rather than a forecast on April 1. There is a temperature curtain in Lewiston Reservoir.

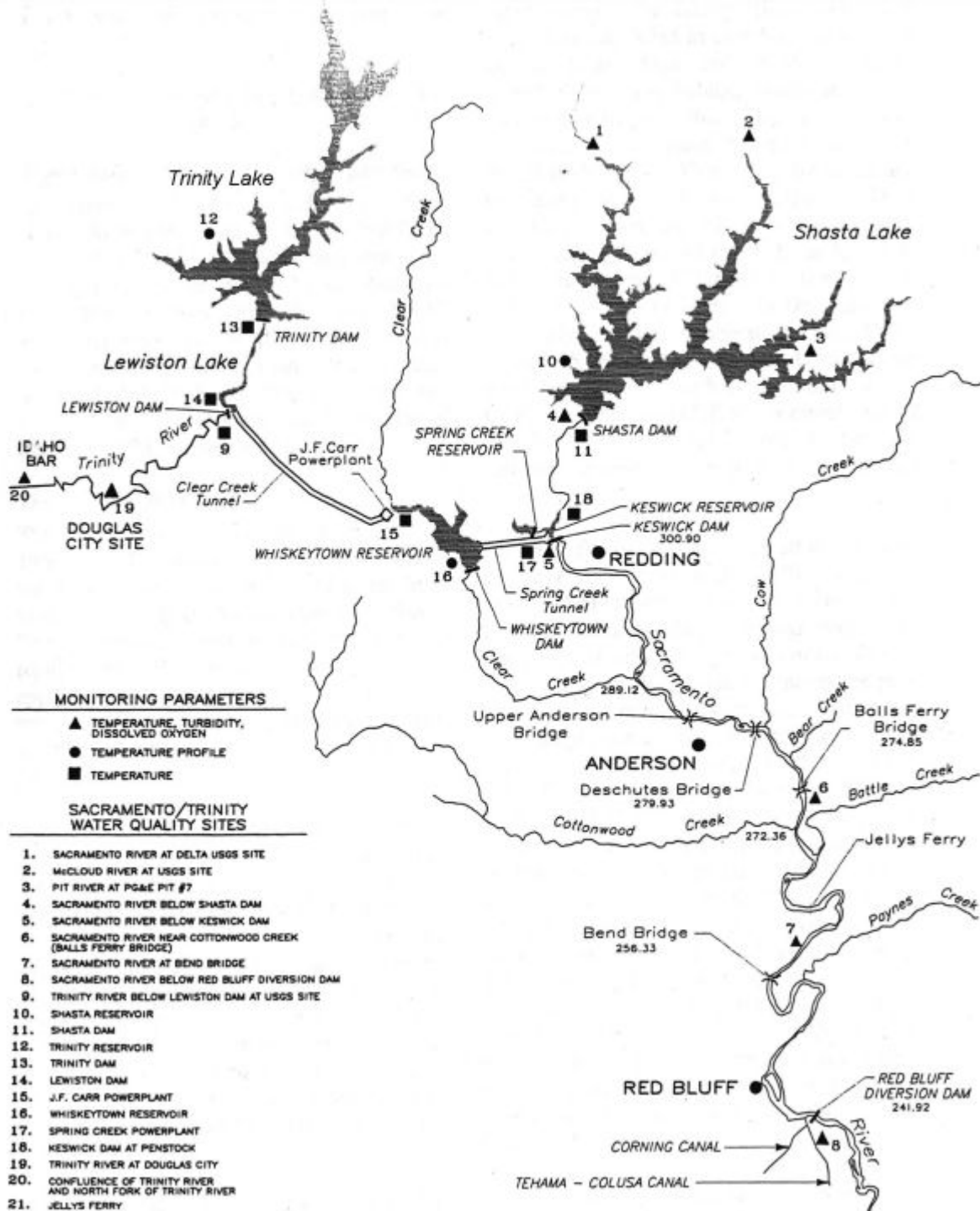
### **Transbasin Exports**

Export of Trinity water to the Sacramento Basin provides water supply and hydroelectric power generation for the CVP and assists in water temperature control in the Trinity River and upper Sacramento River. The amounts and timing of the Trinity exports are determined by subtracting Trinity River scheduled flow and targeted carryover storage from the forecasted Trinity water supply.

The seasonal timing of Trinity exports is a result of determining how to make best use of a limited volume of Trinity export (in concert with releases from Shasta) to help conserve cold water pools and meet temperature objectives on the upper Sacramento and Trinity rivers, as well as power production economics. A key consideration in the export timing determination is the thermal degradation which occurs in Whiskeytown Lake due to the long residence time of trans-basin exports in the lake.

In order to minimize the thermal degradation effects, transbasin export patterns are typically scheduled by an operator to provide an approximate 120,000 af volume to occur in late spring to create a thermal connection to the Spring Creek Powerhouse before larger trans-basin volumes are scheduled to occur during the hot summer months. Typically, to avoid warming and function most efficiently for temperature control, the water flowing from the Trinity Basin through Whiskeytown must be sustained at fairly high rates. When the total volume of Trinity water available for export is limited, that may, in turn, compress the time period for which effective temperature control releases can be made from Whiskeytown Lake.

To increase CVP water supply, export volumes from Trinity are made in coordination with the operation of other CVP water supply reservoirs generally based on reservoir refill potential and CVP Delta export water demand. Other important considerations affecting the timing of Trinity



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