

1988 Critical Year

Concern	Tools	System Status		Priority	
		Historic	1A Baseline WQCP)	Action	Evaluation
Yearling salmon migrants Oct-Jan	• Increase inflow	Pulse of 25kcf	Pulse of 25kcf	A	<ul style="list-style-type: none"> <li>• A -2<sup>nd</sup> and 3<sup>rd</sup> weeks in Dec during high exports (100-1000/TAF)</li> <li>• B Jan-Feb</li> </ul>
	• Reduce export	10,000-12,000	12000		
	• Close DCC	Open	Closed		
Winter run survival Dec-Mar	• Increase inflow	13,000		A/C	<ul style="list-style-type: none"> <li>• A Mar-Apr relatively high numbers</li> <li>• C - Feb lower numbers</li> </ul>
	• Reduce export	8-10kcf/Dec	12kcf Dec, 1500 Feb Mar		
	• Close DCC	Open	Closed		
Delta Smelt Adults Jan-Mar	• Reduce export	10,000	12000	A	<ul style="list-style-type: none"> <li>• Two weeks at end of Dec and early Jan. 100/TAF</li> </ul>
	• Increase outflow	>1200			
Steelhead Feb-May	• Reduce export	8000-10000		B	<ul style="list-style-type: none"> <li>• Feb-Apr 10-50/TAF</li> </ul>
X2 Feb - June	• Increase inflow	Outflow <2000		OK?	
	• Reduce export	<ul style="list-style-type: none"> <li>• 8000-10000 through late May then 4000-6000</li> </ul>			
Salmon Fry Feb-Mar				OK	Few fry
DS Young Apr-Jul	• X2 placement			A	<ul style="list-style-type: none"> <li>• Mid May to Mid June 1000/TAF</li> </ul>
	• Reduce exports	10000>>4000			
San Joaquin smolts Apr-Jun	• Reduce exports	10000>>4000		A/B	<ul style="list-style-type: none"> <li>• A - Mid April to end May</li> <li>• B -Two week in June 500-1000/TAF</li> <li>• C - early April 100/TAF</li> </ul>
	• Increase SJ flow				
	• Close HOR				
Striped Bass Young	• X2 placement			B	<ul style="list-style-type: none"> <li>• Mid May to Mid July 1000-10000/TAF</li> </ul>
	• Increase Sac flow				
	• Reduce exports	4000>>>10000			
Splittail May-Jul				B	<ul style="list-style-type: none"> <li>• Mid April through June 100-500/TAF</li> </ul>

## Gaming 1988

### Old Game 1A

- Critical Year - Shasta Criteria - inflow less than 3.2.
- DI485 Baseline - 5.1 MAF of exports versus DWRSIM total 4.8 MAF of deliveries
- WQCP Baseline - 5.6
- Carry over 50 TAF of b(2) in San Luis.
- 1 MAF impact of the Accord - 450 TAF credited to b(2).
- Upstream b(2) cost - Shasta 124 TAF for Feb AFRP 5000 cfs target. Outflow requirements would override probably so some would be needed for WQCP. Thus not charge Shasta b(2) cost.
- Folsom b(2) cost 150 TAF by end of January. 250 balance for EWA b(2) for gaming.

Conservative Pattern for fish protection because of low balance.

**Action 1:** cut exports to 7000 in middle December weeks. Cost to b(2) 85 TAF

**Action 2:** close DCC.

**Action 3:** March 5000 export limit to protect winter run.

**Action 4:** First two weeks of April set exports to 3000.

**Action 5:** Full 1500 VAMP export restriction. Cost of Actions 3-5 = 90 TAF in April. But backed up into Shasta.

**Action 6:** Extend VAMP through May = Cost of 50 TAF. Back up into Shasta.

**Action 7:** Move 25 TAF of b(2) to San Luis

**Note:** Cut CVP deliveries from Folsom was needed to protect Folsom storage.

Total hit beyond WQCP of 85 TAF.

**Work Action:** detailed accounting of DWRSIM and Daily models by month to QC mass balance and reservoir levels (Art, Paul, and Russ)

### New 1B-1988

- Initial conditions: Storage is high after wet year.
- Upstream b(2): cost of 45 TAF
- WQCP cost to b(2) was 411 TAF.
- 345 TAF left for Delta export actions – all used.
- Purchased 100 TAF from Kern (allowed first two years of drought purchases – this is second year) and 60 TAF demand shifting with MWD. (Feb-Mar) – not in the model case for this or last.
- 300 TAF lower exports under DAILY OPS than DWRSIM.
- Delta Island storage added 200 TAF to exports and reduced outflow by 200 TAF.
- 5% reduction in deliveries

October	<b>B(2) Actions:</b> Raise American River flows from 1200 to AFRP 1500 cfs
November	<b>B(2) Actions:</b> Raise American River flows from 1200 to AFRP 1500 cfs
December	<b>B(2) Actions:</b> 1. Raise American River flows from 1200 to AFRP 1500 cfs. 2. export restriction to 7500 cfs for last three weeks of the month – 180 TAF b(2) cost.
January	<b>Supply Actions:</b> filled Delta Island storage <b>B(2) Actions:</b> First week of January reduce exports to 7500 cfs. 50 TAF b(2) cost
February	No Action.
March	<b>B(2) Actions:</b> export restriction to 1500 cfs in first week in March - 275 TAF cost to b(2).
April	<b>B(2) Actions:</b> VAMP export restriction to 1500 cfs from 1 <sup>st</sup> through 30 <sup>th</sup> .
May	<b>B(2) Actions:</b> VAMP export restriction to 1500 cfs.
June	<b>B(2) Actions:</b> export restriction to 3000 cfs for first two weeks.
July	No Actions.
August	No Actions.
September	No Actions.

#### Summary of Year:

- Exports: 4.3 MAF (Historic 5.6 MAF)
- Deliveries: 4.5 MAF (Historic 6.3 MAF)
- Outflow: 5.7 MAF (Historic 4.4 MAF)
- Storage: Folsom down 45 TAF. No upstream change; San Luis up 80 TAF.

#### Performance of Assets:

- Expanded Banks used sparingly in winter (Jan) – essential in maintaining San Luis
- Shasta expansion 290 TAF had no benefit.
- Delta Island storage – refilled and emptied for 200 TAF of water supply benefit.
- Groundwater storage recharged in fall and winter, then discharged to benefit San Luis in spring-summer.

#### EWA suggestions:

- More delta smelt young protection needed in spring.
- High exports in last three weeks in Jan are a concern for salmon and smelt.