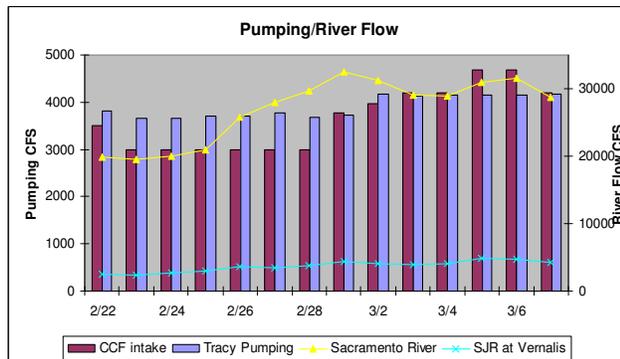
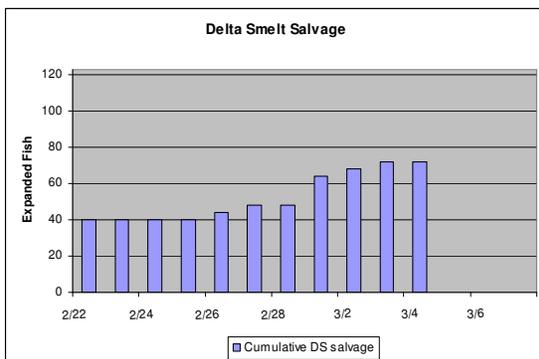


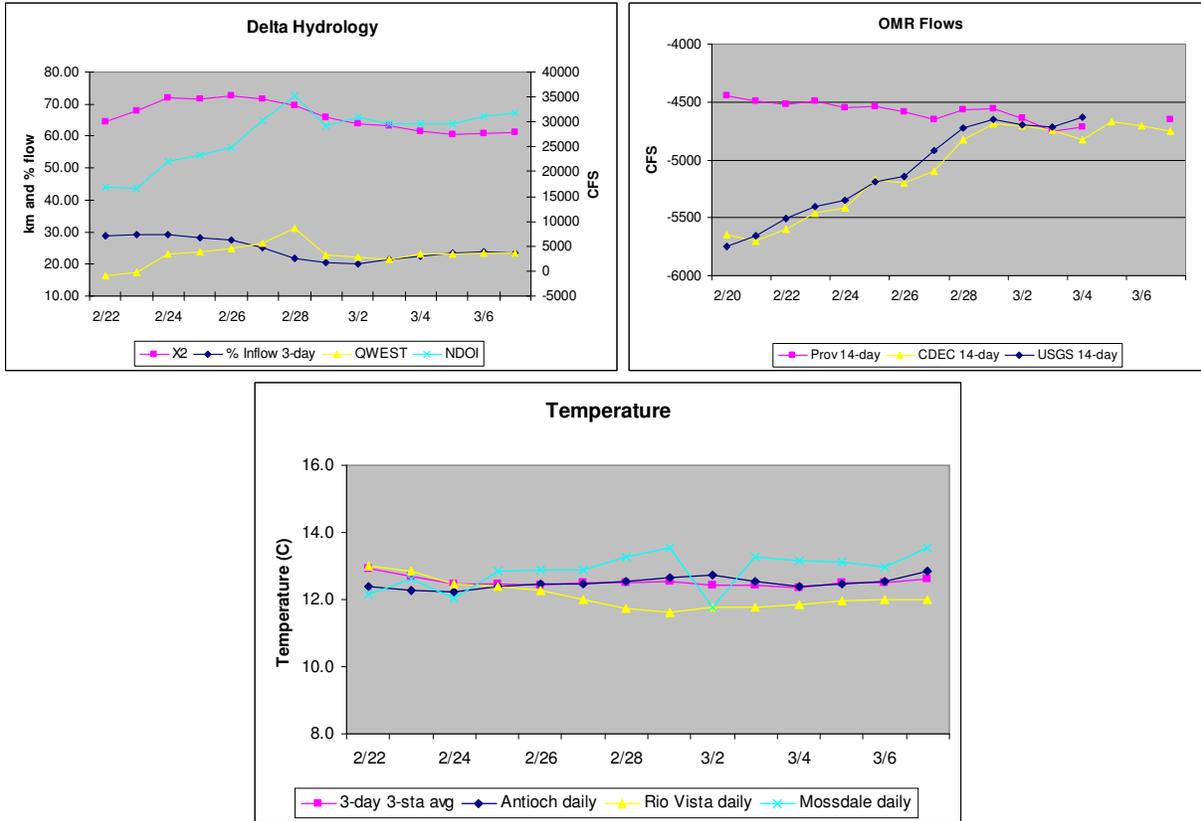
Recommendation for the week of March 8, 2010:

The SWG recommended OMR flows no more negative than -5000 cfs. The Working Group agreed that this level of OMR flow would be adequately protective of larval delta smelt for this week. The Working Group did not provide a recommendation of OMR flow that would provide protection for adult delta smelt. The Working Group cautioned the Service that at current expanded salvage rates (approximately 2 fish per day since Feb 1 and approximately 5 fish per day since Mar 1) that there is a high probability that salvage will exceed the concern level and the authorized take in the coming days or weeks. The Working Group will continue to monitor salvage, survey data, and hydrological conditions and reconvene March 15.

1) Current environmental data.

- **Water temperature** for the 3 station average is 12.6°C.
- **OMR** USGS 14-day tidally-averaged OMR as of March 4 is -4634 cfs. The 14-day OMR average estimate from CDEC as of March 7 is -4754 cfs.
- **Flow** Sacramento River inflow is 28,769 cfs and San Joaquin 4149 cfs. The E/I ratio is 23%, X_2 is 61 km, QWEST is 3732 cfs and NDOI is 31,723 cfs. The graphs below show the most recent trends in delta smelt salvage, Delta hydrology, and water quality that were evaluated by the Working Group.





2) Delta fish monitoring:

Smelt Larval Survey #5 was in the field March 1 and 2. Provisional results were provided by DFG for central and south Delta stations as well as the confluence and mainstem of the Sacramento River. Stations further westward are still being processed and QA/QC'd. Of those stations, the greatest concentration of longfin smelt larvae thus far occurs near the confluence. No delta smelt larvae have been collected. Spring Kodiak Trawl #3 is in the field this week. The 20mm Survey begins March 15. Results from larval surveys and the SKT are available online at: <http://www.delta.dfg.ca.gov/delta>.

3) Salvage

Cumulative salvage of adult delta smelt was 48 (expanded) on February 28. Since that time, salvage has occurred at both facilities and has nearly doubled. The provisional numbers, expanded, are:

	SWP	CVP
March 1	8	8
March 2	0	4
March 3	4	0
March 4	0	0
March 5	0	4
March 6	0	4
March 7	0	0

Total 12 20

This brought the cumulative total adult salvage to 80 as of the time of the call. The concern level is 92, and the total authorized take for adults under the Biological Opinion is 123, cumulative, for the season.

Larval sampling is ongoing at the CVP and SWP facilities. No longfin or delta smelt larvae have thus far been salvaged this season.

4) Expected Project Operations

The Projects expect to manage exports to maintain an OMR flow no more negative than -5000 cfs. Combined exports are expected to remain at approximately 8400 cfs until March 10, when they are anticipated to drop to 7800 cfs.

5) Particle Tracking Modeling

PTM was not requested or discussed for this week.

6) Discussion for Recommendation

The Working Group reviewed and discussed all relevant data from fish surveys, Delta monitoring, salvage, and planned Project operations.

Delta temperatures have exceeded 12⁰C since February 14 and egg size in salvage- and survey-collected females is approximately 1 mm in diameter. Therefore, the juvenile protective phase of the biological opinion (RPA Component 2; Action 3 in Attachment B) is in effect. This action will continue until June 30 or when the 3-day mean water temperature at Clifton Court Forebay reaches 25⁰C, whichever occurs earlier.

Component 2, Action 3 of the biological opinion, which is intended to protect larvae and juvenile delta smelt, includes a range of OMR flow from -1250 cfs to -5000 cfs. The BO provides guidance for the assessment of the risk of entrainment of larvae and juveniles and for determining the appropriately-protective OMR flows within that range for any given week. The BO (pp 353-354) specifies that if entrainment risk is low, OMR flows could be expected to remain as negative as -5000 cfs, but if entrainment risk is higher, OMR flows would be set so as to reduce that risk. The risk factors are (1) evidence (i.e., from survey data) that delta smelt are present in the South or Central Delta, and (2) evidence of ongoing entrainment. Because the Working Group believes hatching is just getting underway and that few larvae are present in the system, combined with the current hydrological conditions, it is appropriate to consider the low-entrainment risk scenario.

The Working Group determined that the risk of entrainment for newly emerged larvae hatching in the lower San Joaquin River (if this is occurring) at the current level of OMR flow was low, and that the risk to the overall population of delta smelt was low.

In the past, strongly negative OMR that corresponded in time with the primary upstream migration of adult delta smelt led to clearly discernable salvage peaks. The SWG observed that this year's adult salvage pattern differs from the typical historical pattern in that "spikes" in salvage have not been observed. The Working Group thinks the lack of a salvage peak is the result of managing OMR to limit the export influence north and west of Franks Tract and also partially as a result of record low abundance. The Working Group has remained concerned about the potential for a spike in salvage over the last few weeks, but thus far, such a spike has not materialized. Rather, the trend this season has been small numbers of fish in daily salvage (an average of 2.4 expanded fish per day over last 30 days, 4.6 expanded fish per day over last 7 days) over an extended period. The spawning behavior of delta smelt has not been described in the wild, but based on laboratory observations and studies of other smelts in other systems, it is likely that delta smelt make overnight forays into spawning habitats. This year's pattern of small numbers of ripe delta smelt salvaged over an extended period might reflect spawning forays rather than a "bulk" entrainment of delta smelt moving upstream.

The Working Group anticipates that the adult salvage concern level (92 fish, expanded) will be reached this week. The Working Group observed that if the salvage rates of the past 30 days continue, the authorized take level would also be reached before the end of March. Using the salvage rate of the previous 7 days, the authorized take level would be reached even sooner – possibly by next week. In other words, at the 30-day rate of salvage, the authorized take level would be reached in 19 days and at the March rate, in 8 days.

Historical data show that adult delta smelt often tapers off significantly by mid-March, but this pattern is highly variable, and salvage has often continued into early April. The present pattern of salvage (i.e., with no peaks or spikes in numbers) suggests that entrainment risk is relatively low. Nevertheless, if salvage continues as it has over the last week, the adult authorized take level will be met or exceeded sometime between the end of this week and the end of the month. However, there is also a possibility that take could tail off at any time if adult movements into the southern Delta cease.

The Working Group noted that at more positive OMR flows, it becomes less likely that the authorized take level will be exceeded during March or April. However, the Working Group does not have a means of quantifying salvage rates as functions of OMR in the -1250 to -5000 cfs range over a daily to weekly timescale. Therefore, the Working Group did not feel they could make an OMR recommendation that would assure that the authorized take level was not exceeded.

This high level of uncertainty, coupled with the lowest relative abundance (i.e., FMWT) and take limit of record, is problematic. Avoiding the take limit will probably require a significant adjustment of OMR flows. However, the Working Group was uncertain that substantial OMR restrictions were warranted at the present moment, given that salvage is occurring at low, intermittent numbers and may conclude within a few days. Distribution of adults is presently highly uncertain, as the SKT data are now a month old. Particle tracking modeling is not a suitable indicator of the risk of adult entrainment. The Working Group formulated a list of cautions for the Service to consider when making their determination of OMR flows:

- Salvage patterns for this year are atypical
- Take of adults typically stops mid-March, but can continue into early April
- Abundance index is at an historic low
- Authorized incidental take is at an historic low
- Once a salvage spike occurs, it is too late to take biologically meaningful action
- As OMR is made more positive, adult delta smelt salvage becomes less likely

The Working Group advises the Service that avoiding an exceedance of the authorized take level will likely require that exports be reduced significantly. The Working Group suggests that if the Service determines that this is necessary, then a reduction in negative OMR levels would be more effective earlier in March because it appears at this time that salvage totals will continue to accumulate.

Next Meeting: Monday, March 15, 2010 at 10 am

WEEKLY ADVICE FOR THE DEPARTMENT OF FISH AND GAME FOR LONGFIN SMELT

Advice for week of March 8:

The Smelt Working Group believes that OMR advice of -5000 cfs for delta smelt will provide protection for longfin smelt.

Basis for advice:

The 2009 State Water Project 2081 for longfin smelt states that advice to the DFG Director shall be based on:

1. Adult Salvage – total adult (≥ 80 mm) longfin smelt expanded salvage (SWP+CVP) for December through February > 5 times the Fall Midwater Trawl longfin smelt annual abundance index.
2. Adult abundance, distribution or other information indicates that OMR flow advice is warranted.
3. Larva distribution in the Smelt Larva Survey or the 20mm Survey finds longfin smelt larvae present at 8 of 12 Central and South Delta sampling stations in 1 survey (809, 812, 815, 901, 902, 906, 910, 912, 914, 915, 918, 919).
4. Larva catch per tow exceeds 15 longfin smelt larvae or juveniles at 4 or more of the 12 survey stations listed.

Current Information

No adult longfin smelt were salvaged in the past week and none have been salvaged since the December 1, 2009 criterion period for salvage began. Adult longfin smelt have only rarely been salvaged after mid-February.

No adult longfin smelt were collected upstream of the confluence by Bay Study in March.

On March 1-2, longfin smelt larvae were found at only 6 of 12 south and central Delta criteria stations during the fifth Smelt Larva Survey, and catches at these stations declined from Survey 4 (Table 1). During Survey 4, total catch at the central/south Delta criteria stations represented about 1% of the longfin smelt larvae caught based on complete processing. Only 24 of 35 samples from Survey 5 were processed in time for this discussion making discussion of current distribution incomplete. Nonetheless, Survey 5 data suggests that outflows and positive Qwest continue to move longfin smelt larvae out of the Delta and away from risk of entrainment in Delta diversions.

Discussion

The distribution information above was used to develop OMR flow advice. Smelt Larva Survey #5 data indicate a continued reduction in longfin smelt larva numbers in the Delta (Table1) and neither the presence (8 of 12 stations) or density criteria were met for Survey 5, though the larva criteria trigger occurred as a result of SLS Survey 2 and outflow has been insufficient to reset triggers. Based on a larva/juvenile trigger, advice can restrict OMR flow levels to between -1,250 and -5000 cfs on a 14-day running average and the 5-day running average is within 25 percent of the required OMR flow. Outflows did not reach trigger re-set thresholds (55,000 cfs for Sacramento River at Rio Vista; 8,000 for San Joaquin River at Vernalis), but outflows were recently increasing in both rivers (see Figure 1 and 2 below). Qwest has been positive through February except for a few days from February 19 through the 23, and has been positive recently (Figure 3). A positive Qwest indicates net flow was likely to transport of longfin smelt larvae from the San Joaquin River and Franks Tract portion of the south Delta westward toward the confluence, reducing their risk of entrainment.

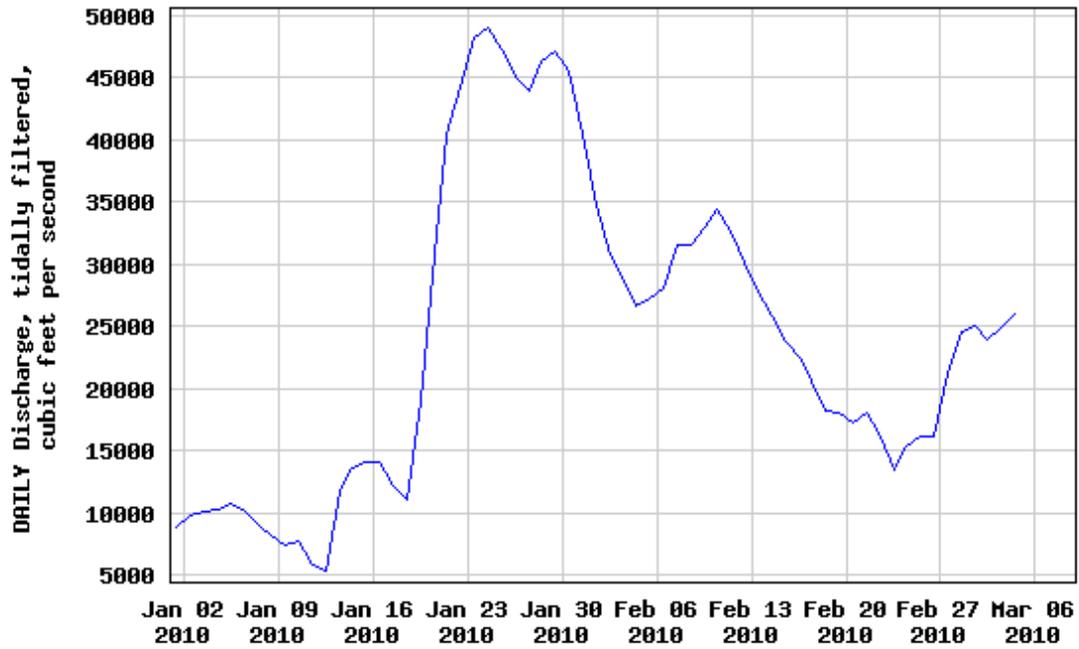
Only a small fraction of the longfin smelt larvae (ca 1% based on survey 4 results) was believed to be vulnerable to entrainment into the south Delta as long as OMR did not increase substantially. Larva numbers in the central and south Delta stations declined between surveys 4 and 5.

Particle tracking model output was not reviewed for this advice.

Figure 1. Tidally averaged discharge for Sacramento River at Rio Vista, posted as of March 8, 2010.



USGS 11455420 SACRAMENTO R A RIO VISTA CA



----- Provisional Data Subject to Revision -----

Figure 2. Clifton court intake, Tracy export pumping and daily river flows for the Sacramento River and San Joaquin River at Vernalis presented to the SWG March 8, 2010.

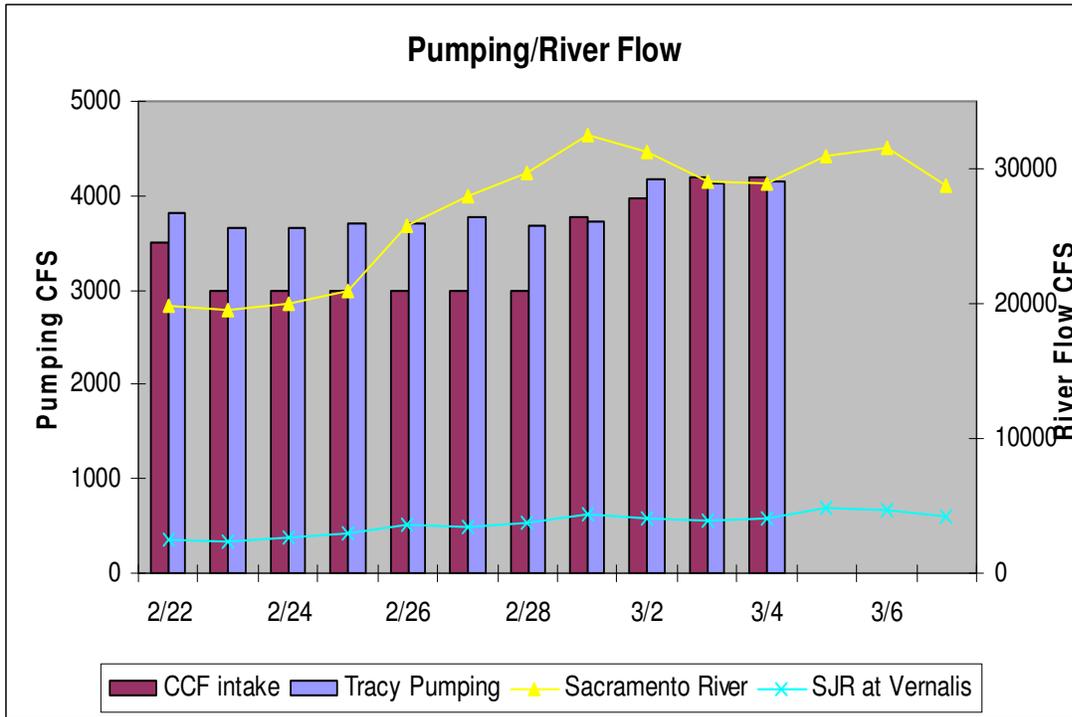


Figure 3. Location of X2, mean 3-day percent inflow diverted, Qwest and Net Delta Outflow Index presented to the SWG March 8, 2010.

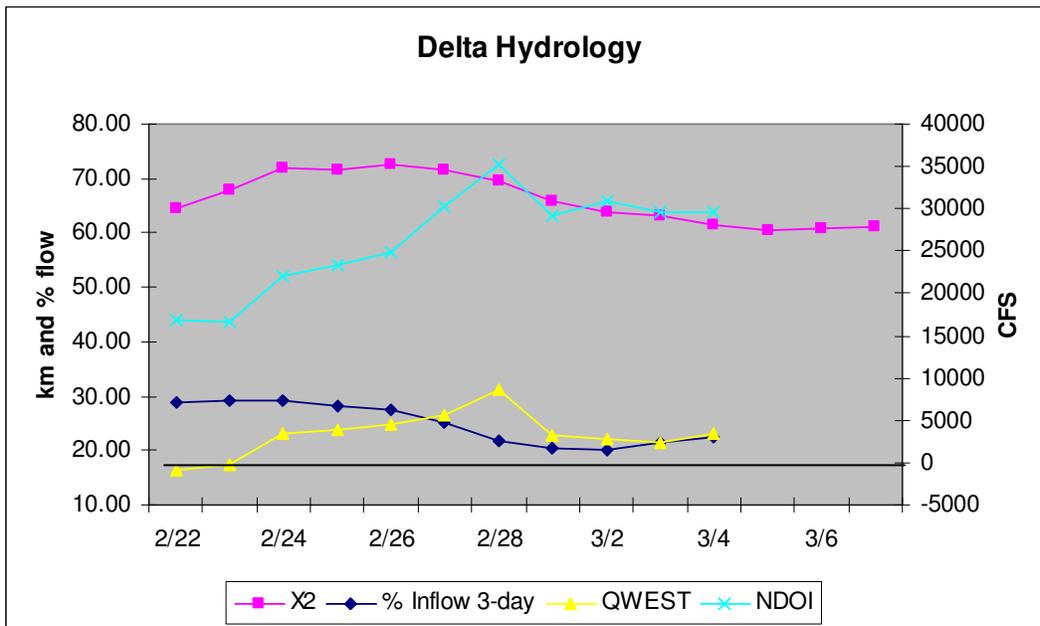


Table 1. Longfin smelt total catch by station for Smelt Larva Survey #5, March 1-2, 2010; samples processed through Wednesday March 3 only. Criteria stations for the State Water Project ITP are shaded.

Year	Survey	SLS Station	Sample Status	Species	Smelt Catch
2010	5	405	Not yet processed		
2010	5	411	Not yet processed		
2010	5	418	Not yet processed		
2010	5	501	Not yet processed		
2010	5	504	Not yet processed		
2010	5	508	Processed	Longfin Smelt	20
2010	5	513	Processed	Longfin Smelt	12
2010	5	519	Not yet processed		
2010	5	520	Processed	Longfin Smelt	27
2010	5	602	Not yet processed		
2010	5	606	Not yet processed		
2010	5	609	Not yet processed		
2010	5	610	Not yet processed		
2010	5	703	Processed	Longfin Smelt	25
2010	5	704	Processed	Longfin Smelt	16
2010	5	705	Processed	Longfin Smelt	15
2010	5	706	Not yet processed		
2010	5	707	Processed	Longfin Smelt	15
2010	5	711	Processed	Longfin Smelt	3
2010	5	716	Processed	Longfin Smelt	7
2010	5	723	Processed	Longfin Smelt	16
2010	5	801	Processed	Longfin Smelt	26
2010	5	804	Processed	Longfin Smelt	27
2010	5	809	Processed	Longfin Smelt	19
2010	5	812	Processed	Longfin Smelt	6
2010	5	815	Processed	Longfin Smelt	1
2010	5	901	Processed	Longfin Smelt	5
2010	5	902	Processed	Longfin Smelt	1
2010	5	906	Processed		No Smelt Catch
2010	5	910	Processed		No Smelt Catch
2010	5	912	Processed		No Smelt Catch
2010	5	914	Processed		No Smelt Catch
2010	5	915	Processed		No Smelt Catch
2010	5	918	Processed	Longfin Smelt	1
2010	5	919	Processed		No Smelt Catch

SWP ITP Criteria Stations

Processing as of 3/3/10.