

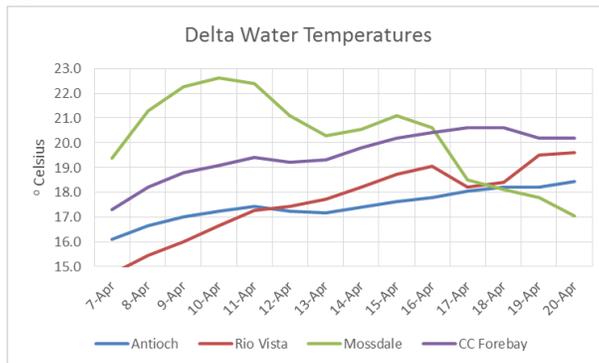
**Smelt Working Group
Monday, April 21, 2014**

Meeting Summary:

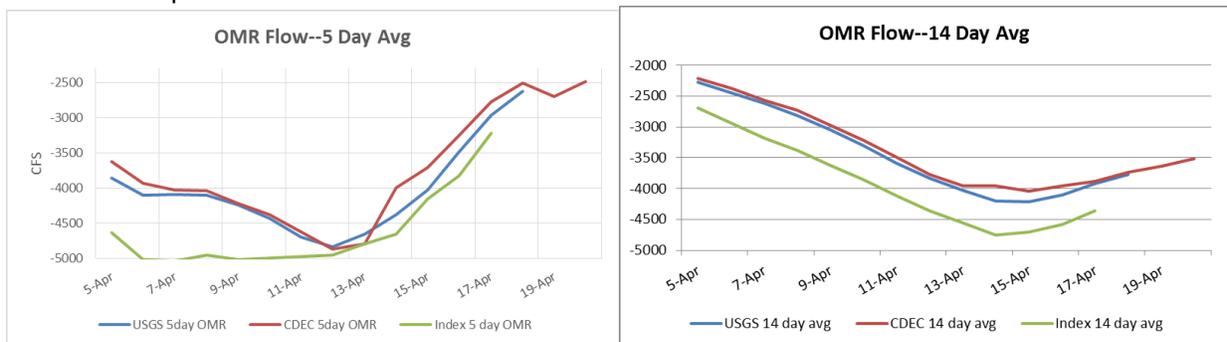
The Working Group agreed given their present distribution, current salvage, and Delta conditions, there was no indication that projected exports (potentially resulting in OMR flows as negative as approximately -3000 cfs daily average) need to be more restrictive for the protection of delta smelt adults and larvae. The Working Group also agreed that given their present distribution, existing constraining conditions were sufficient to protect longfin smelt from entrainment in the southern Delta. The next scheduled SWG meeting will be Monday, April 28.

Reported Data:

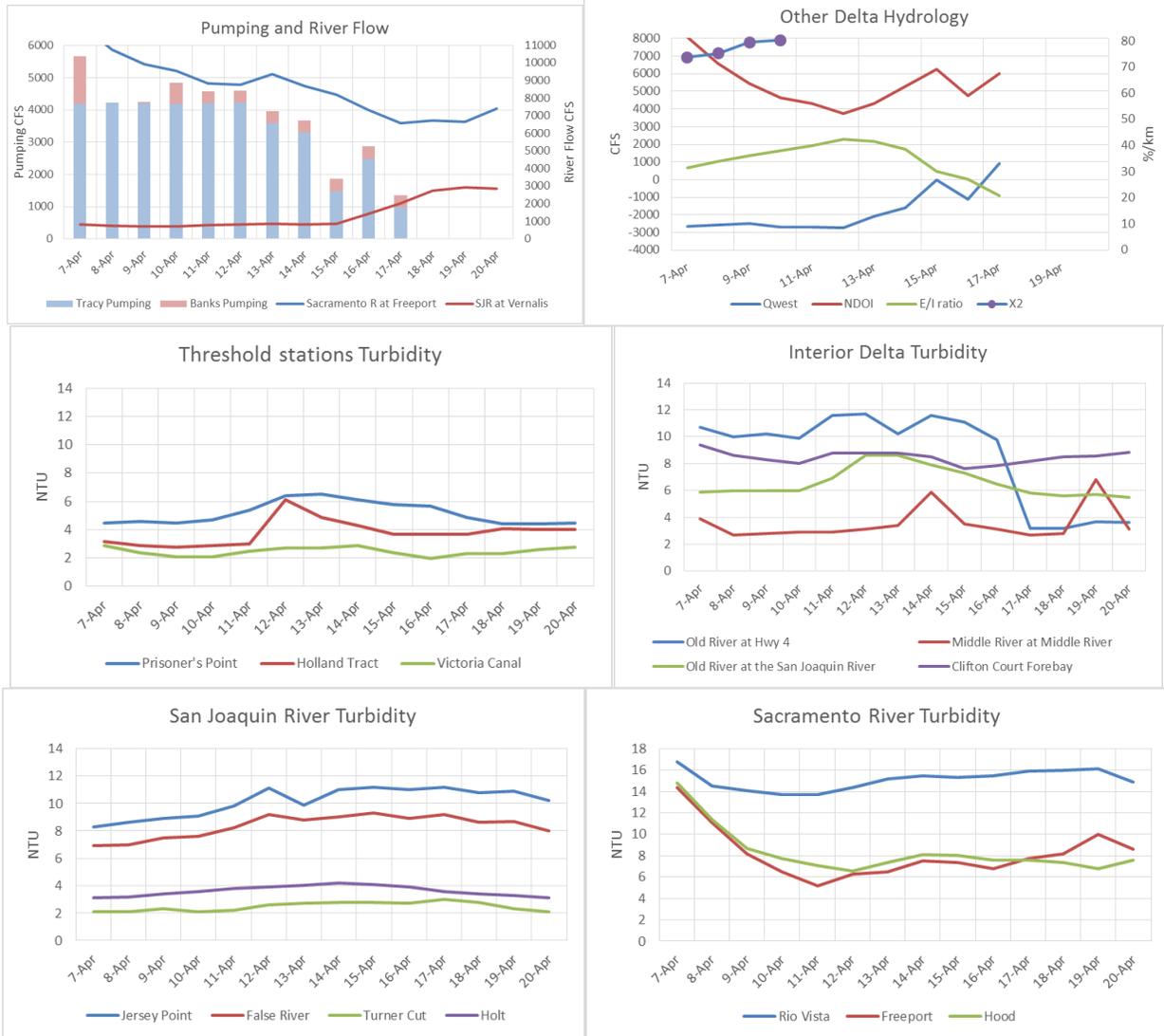
1. **Current environmental data:**
 - **Water temperatures:**



- **OMR flow:** USGS tidally averaged OMR flow 14-day and 5-day average for April 18 is listed as -3766 cfs and -2632 cfs. CDEC 14-day and 5-day average for April 20 is listed as -3520 cfs and -2486 cfs. OMR Index Method 14-day average was reported as -3900 cfs and the 5-day average was reported as -2800 cfs.



- **Flow:** Sacramento River average daily flow for April 20 was 7401 cfs and San Joaquin River average daily flow was 2866 cfs. X2 calculation from CDEC was upstream of Colinsville (81 km). The graphs below show the most recent trends in Delta hydrology and water quality that were evaluated by the Working Group.



2. Delta Fish Monitoring:

Spring Kodiak Trawl #4 was in the field the week of April 7. A total of 36 delta smelt were collected: 27 from station 719 in the Sacramento Deepwater Shipping Channel. The remaining catch of delta smelt were from stations in the Sacramento River, Montezuma Slough, and downstream. SKT #5 is in the field the week of May 8 (final SKT survey of the year).

20-mm Survey #3 was in the field the week of April 14. A total of 47 stations were sampled. Processing is 56% complete. A total of 21 delta smelt larvae have been process so far, sizes ranging from 7 to 20 mm. The majority of larvae were collected from stations in the Cache Slough/Sacramento Deepwater Shipping Channel and the confluence area and lower Sacramento River. One delta smelt larva was detected in the central Delta at the Jersey Point station (809) with a size of 7 mm. A total of 205 longfin smelt larvae have been collected so far, sizes range from 11 to 32 mm. 20-mm Survey #4 is in the field the week of April 28.

Jersey Point sampling concluded for the Service’s Early Warning Study on April 10.

The 2013 Annual FMWT surveys have concluded. The Annual FMWT Index (based on all four months) for delta smelt is 18, the second lowest on record, and statistically indistinguishable from the lowest, 17, from 2009.

The 2013 Delta Smelt Recovery Index (based on September and October) is 4. More information on the Recovery Index can be found on the Bay-Delta Office's web site at http://www.fws.gov/sfbaydelta/species/delta_smelt.cfm. Results from CDFG surveys are available online at: <http://www.dfg.ca.gov/delta/>.

3. Salvage:

No adult delta smelt or longfin smelt have been observed in salvage in WY2014 thus far. Larval delta smelt (<20mm) were observed in the larval collection at the SWP on April 2, 12, 13, 14, and 16. Larval delta smelt (<20mm) were observed in the larval collection at the CVP on April 19. Eight juvenile longfin smelt ≥ 20 mm were observed in salvage on April 7. No longfin smelt < 20 mm were observed in salvage for the previous week.

Current longfin smelt and delta smelt salvage information can be downloaded from DFG's salvage FTP site at <ftp://ftp.dfg.ca.gov/salvage/Daily%20Smelt%20Summary/> or queried from DFG's salvage web page at <http://www.dfg.ca.gov/delta/apps/salvage/SalvageExportCalendar.aspx>

4. Expected Project Operations:

Combined SWP/CVP exports are at 2800 cfs as of today, and will increase to 2900 cfs tomorrow. Combined pumping is expected to be at this level for the remainder of the week, with small adjustments to comply with the export to inflow ratio of 1:1 for April 15-May 15 (NMFS RPA Stanislaus River/Vernalis pulse flows).

Operators estimated that daily OMR flow levels for this week to be approximately -3000 cfs.

The storm tomorrow is not expected to carry much rain. Another storm is expected for the upcoming weekend with more chance for rain. The DCC gate is closed.

The board's order from January 31, 2014 states that project operations must maintain a monthly net Delta outflow of no less than 3000 cfs and must not pump more than combined 1500 cfs. An addendum was submitted to the Board on February 7. This addendum allows the operators to revert to compliance with the monthly Outflow standard, and increase pumping above the 1500 cfs included in the TUC petition. A request to extend the board's January 31, 2014 order was approved through the end of March. An additional addendum was approved to modify the number of days required to meet an X2 at Chipps Island (11,400 cfs on a 3-day running average) for the remainder of March. The projects will continue to meet X2 at Collinsville (7,100 cfs on a 3-day running average) prescribed in the Board's Plan. An addendum was submitted and approved on April 9, 2014 to allow the projects to continue with their drought operations as approved by the board through the month of April. An addendum submitted and approved on April 18, 2014 allows the projects to match the 1:1 export pumping to Vernalis flow ratio (and exceed the 1500 cfs pumping restrictions as per earlier TUC orders) during the NMFS RPA Stanislaus River pulse flow from April 15 to May 15.

5. Particle Tracking Modeling:

No modeling runs were discussed.

6. Turbidity Modeling:

No modeling runs were discussed.

7. Assessment of Risk:

Background:

RPA Component 1, Action 2: “An action implemented using an adaptive process to tailor protection to changing environmental conditions after action 1. As in Action 1, the intent is to protect pre-spawning adults from entrainment and, to the extent possible, from adverse hydrodynamic conditions.”

“The range of net daily OMR flows will be no more negative than -1,250 to -5,000 cfs. Depending on extant conditions (and the general guidelines below) specific OMR flows within this range are recommended by the SWG from the onset of Action 2 through its termination...” (page 352).

RPA Component 2, Action 3: “The objective of this RPA component (which corresponds to Action 3 in Attachment B), is to improve flow conditions in the Central and South Delta so that larval and juvenile delta smelt can successfully rear in the Central Delta and move downstream when appropriate” (page 282).

“Upon completion of RPA Component 1 or when Delta water temperatures reach 12°C (based on a 3-station average of daily average water temperature at Mossdale, Antioch, and Rio Vista) or when a spent female delta smelt is detected in the trawls or at the salvage facilities, the projects shall operate to maintain OMR flows no more negative than -1,250 to -5000 cfs based on a 14-day running average with a simultaneous 5-day running average within 25 percent of the applicable 14-day OMR flow requirement. Depending on the extant conditions, the SWG shall make recommendations for the specific OMR flows within this range from the onset of implementing RPA Component 2 through its termination. The Service shall make the final determination regarding specific OMR flows. This action shall end June 30 or when the 3-day mean water temperature at Clifton Court Forebay reaches 25° C, whichever occurs earlier” (page 282).

Discussion:

The Working Group reviewed and discussed all relevant data from Delta monitoring, salvage, field surveys, and planned Project operations. Adult take limit is 155 with a concern level of 116 fish. Juvenile take limit is 1007 with a concern level of 671 fish. These numbers reflect the revised take estimate produced February 2013.

Delta smelt larvae are just becoming large enough to be efficiently detected in the 20-mm Survey equipment. 20-mm Survey #3 catch to date indicates the majority of larvae are in the Cache Slough/Sacramento Deepwater Shipping Channel as well as the confluence and lower Sacramento River. There has been zero adult salvage so far this season. Larval delta smelt (<20-mm) were collected on April 12, 13, 14, 16, and 19. Members expressed concern over the increased detection of <20-mm delta smelt. The Working Group believes these larvae were likely hatched in the central or southern Delta and are being drawn into the facilities with the current level of OMR flow. Members suggested that additional larval delta smelt are expected at

the facilities for the rest of the week as additional larvae in the south Delta are pulled into the facilities. The Working Group expects that once these larvae are pulled into the facilities, detections of delta smelt larvae in the larval fish sampling will decrease. Qwest was reported as 1150 cfs, which also assists larvae in the lower San Joaquin River to move toward the confluence area and further away from the influence of the pumps. Based on the current information the Working Group concluded there was insufficient evidence to recommend a change in expected operations for this week.

8. Framework for providing advice to the Service:

No update was provided.

The SWG will have the next meeting on April 28.

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

Advice for week of April 21, 2014:

The Smelt Working Group believes that current and planned export rates are protective of Longfin Smelt at this time.

Barker Slough operations advice terminated for the year as of March 31.

Basis for advice:

The 2009 State Water Project 2081 for Longfin Smelt states that advice to WOMT and the DFW Director shall be based on:

1. Adult Salvage – total adult (≥ 80 mm) Longfin Smelt 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; see Figure 1).
4. Larva catch per tow exceeds 15 Longfin Smelt larvae or juveniles in 4 or more of the 12 survey stations listed.
5. During the period January 15 through March 31 of a dry or critically dry water year only, advice for Barker Slough pumping plant operations may be warranted if larval Longfin Smelt are detected at station 716 and other information indicates risk of entrainment.

Discussion of Criteria

1. As of April 20, 2014, no age-1 or adult Longfin Smelt have been salvaged for the water year. The Fall Midwater Trawl Longfin Smelt annual abundance index was 164. The total salvage level threshold for advice is > 820 (see criterion in #1). No advice is warranted based on this criterion.

On February 24, the first Longfin Smelt larva was detected at the SWP and larvae were detected almost daily for about a week before declining (CVP started sampling for larvae as of March 13 on a day-time work-week schedule). On February 28, the first juvenile (age-0) Longfin Smelt was detected at the SWP. From April 14 and through April 20, no juvenile Longfin Smelt were collected at either facility. Only a single Longfin Smelt larvae was collected at the CVP on April 13; that's been the only Longfin Smelt larvae detected at either facility in the 2 weeks ending April 17. This information is not related to a criterion and does not have a direct effect on advice.

2. December Fall Midwater Trawl and Bay Study sampling in December through March collected no Longfin Smelt in the central or south Delta, suggesting limited or no recent proximity to the export pumps. Distribution information does not indicate advice is warranted based on this criterion.

3 & 4. The third 20mm Survey of 2014 was conducted April 14-17. Longfin Smelt larvae were detected at only 2 central and south Delta stations and 1 of 2 detections involved only a single larvae (Table 1). Larva density at station 809 declined compared to survey 3. Together these data indicate low risk of entrainment.

5. The Barker Slough concern period ended for the water year on March 31. No additional advice will be given for this water year.

Current conditions: Outflow fluctuated between 4,700 and 6260 cfs from April 14-20. Combined State and federal exports declined to 2,500 cfs by April 20. Qwest shifted from -1,616 on April 14 to +1,142 cfs on April 20. CDEC 5-day OMR has been trending more positive since April 14, and was about -2,500 to -2,800 cfs April 18-20. A pulse flow began on the Stanislaus River April 13, and once it reaches Vernalis will begin a 31 day pulse flow period. Reservoir releases will target a pulse flow of 3,300 cfs for the first 15 days and 1,500 cfs thereafter. Currently, Vernalis flows are a little over 2,800 cfs, and combined exports are at 2,800 cfs as of April 20; export level during this week will match Vernalis flows.

Summary of Risk: Qwest trended from slightly negative to positive through the past week. OMR flows were trending less negative throughout the period (CDEC 5-day OMR: -5,000 to -2,500 cfs); this OMR level should remain the same this week. Exports will match Vernalis flow for the coming weeks. These hydrodynamics though improved will continue to put larvae in central and south Delta at some risk of entrainment; however, few Longfin Smelt larvae have been detected in the region (Table 1) and no additional larvae are expected to hatch this season, so the overall risk is low.

The concern period for Barker Slough exports ended for the water year on March 31.

Table 1. Longfin Smelt catch per station from 2014 20mm Survey, Survey 3. These data are preliminary and subject to change.

Year	Survey	Station	Date	# Tows Processed	Species_	Total Catch	Min Length	Max Length	Avg Length	
2014	3	323		0	Not Yet Processed	0				Suisun Bay & West
2014	3	340		0	Not Yet Processed	0				
2014	3	342		0	Not Yet Processed	0				
2014	3	343		0	Not Yet Processed	0				
2014	3	344		0	Not Yet Processed	0				
2014	3	345		0	Not Yet Processed	0				
2014	3	346		0	Not Yet Processed	0				
2014	3	405		0	Not Yet Processed	0				
2014	3	411		0	Not Yet Processed	0				
2014	3	418		0	Not Yet Processed	0				
2014	3	501	15-Apr-14	1	Longfin Smelt	5	21	32	25.60	
2014	3	504	15-Apr-14	1	No Longfin Catch	0				
2014	3	519	15-Apr-14	1	No Longfin Catch	0				
2014	3	602	15-Apr-14	1	Longfin Smelt	6	13	32	24.50	
2014	3	606	15-Apr-14	1	Longfin Smelt	26	17	28	22.19	
2014	3	609	15-Apr-14	1	Longfin Smelt	4	20	27	22.00	
2014	3	610		0	Not Yet Processed	0				
2014	3	508	16-Apr-14	1	Longfin Smelt	7	17	32	26.00	Confluence
2014	3	513	16-Apr-14	1	Longfin Smelt	6	16	22	19.83	
2014	3	520	16-Apr-14	1	Longfin Smelt	32	11	28	20.94	
2014	3	801	16-Apr-14	3	Longfin Smelt	84	11	32	21.89	
2014	3	804	16-Apr-14	3	No Longfin Catch	0				
2014	3	703	16-Apr-14	1	Longfin Smelt	1	17	17	17.00	Sac. River System
2014	3	704	16-Apr-14	1	Longfin Smelt	5	15	28	23.00	
2014	3	705	15-Apr-14	3	No Longfin Catch	0				
2014	3	706	15-Apr-14	1	Longfin Smelt	2	20	26	23.00	
2014	3	707	15-Apr-14	1	Longfin Smelt	1	16	16	16.00	
2014	3	711	14-Apr-14	3	No Longfin Catch	0				
2014	3	716	14-Apr-14	3	No Longfin Catch	0				
2014	3	718	14-Apr-14	3	No Longfin Catch	0				
2014	3	719	14-Apr-14	3	Longfin Smelt	4	17	21	18.25	
2014	3	720	14-Apr-14	3	Longfin Smelt	1	16	16	16.00	
2014	3	723	14-Apr-14	3	Longfin Smelt	1	15	15	15.00	
2014	3	724	14-Apr-14	2*	No Longfin Catch	0				
2014	3	726	14-Apr-14	2*	No Longfin Catch	0				
2014	3	809	14-Apr-14	3	Longfin Smelt	19	11	27	18.58	Central & South Delta
2014	3	812	15-Apr-14	1	No Longfin Catch	0				
2014	3	815	15-Apr-14	3	No Longfin Catch	0				
2014	3	901	14-Apr-14	3	Longfin Smelt	1	12	12	12.00	
2014	3	902	14-Apr-14	3	No Longfin Catch	0				
2014	3	906	15-Apr-14	3	No Longfin Catch	0				
2014	3	910	14-Apr-14	3	No Longfin Catch	0				
2014	3	912	14-Apr-14	3	No Longfin Catch	0				
2014	3	914	14-Apr-14	3	No Longfin Catch	0				
2014	3	915	14-Apr-14	3	No Longfin Catch	0				
2014	3	918	14-Apr-14	3	No Longfin Catch	0				
2014	3	919	15-Apr-14	3	No Longfin Catch	0				

Processing complete through 04/17/2014

*Only 2 tows done at station

Figure 1. DFW's Smelt Larva Survey/20-mm Survey station locations.

