

SMELT WORKING GROUP

Monday, March 16, 2015

Meeting Summary:

The Working Group agreed that given present distribution, current salvage, and Delta conditions, there was no indication that the projected combined exports of 1500 cfs for the week (potentially resulting in OMR flows no more negative than approximately -1500 cfs daily average) need to be more restrictive for the protection of Delta Smelt adults and larvae. The Working Group is following guidance for entrainment protections from both Action 2 (adult Delta Smelt) and Action 3 (juvenile Delta Smelt).

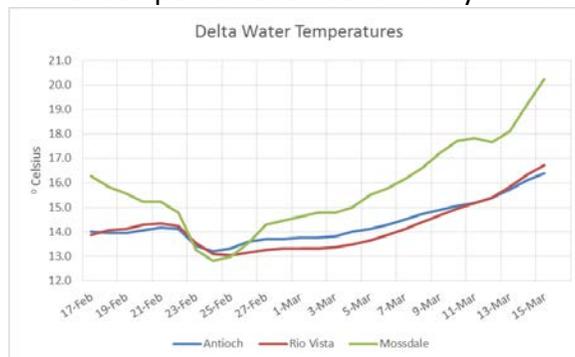
The Working Group also agreed that given their present distribution, existing constraining conditions were sufficient to protect longfin smelt from entrainment in the southern Delta.

The Working Group will continue to monitor Delta Smelt survey and salvage data and Delta conditions and will meet again Monday, March 23, 2015 at 10 am.

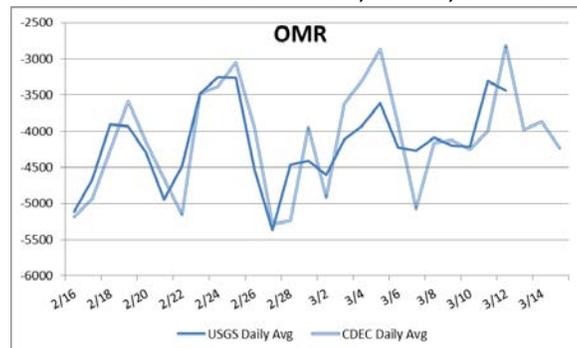
Reported Data:

1. Current environmental data:

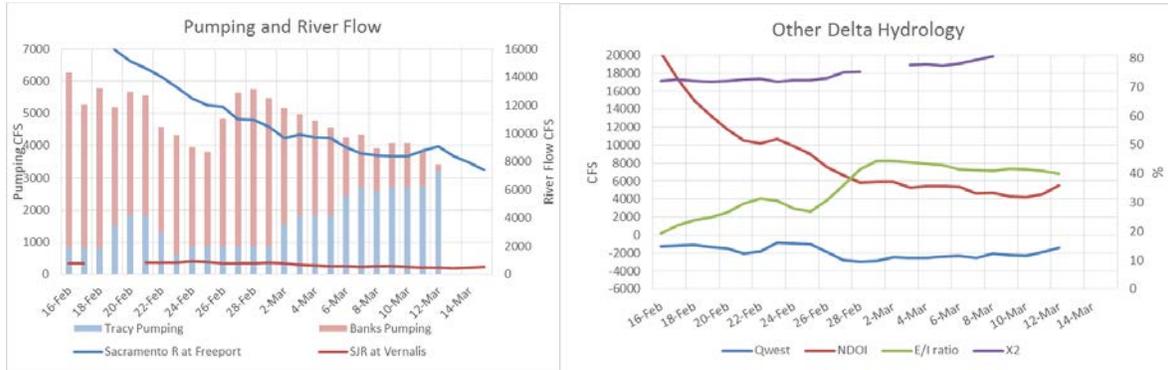
- Since February 3, it has been warm enough for Delta Smelt to spawn throughout much, or all of, the Delta. Water temperatures since February 17th are as follows:



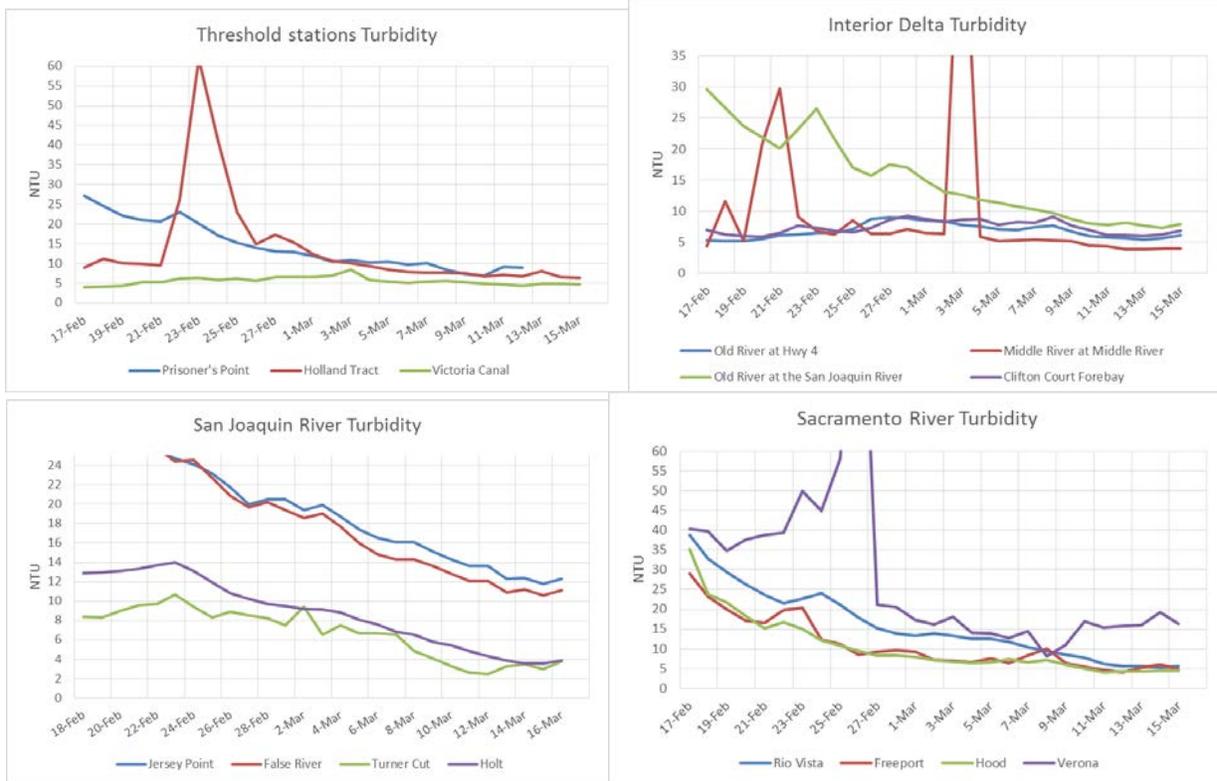
- OMR Flow: USGS tidally-averaged daily, 5-day, and 14-day average OMR flow for March 12 was -3440, -3852, and -4161 cfs, respectively. CDEC daily, 5-day average, and 14-day average OMR flow as of March 15 was -4232, -3779, and -3937 cfs, respectively.



- River Flows: Sacramento River inflow is 7420 cfs and San Joaquin River is 511 cfs. X2 calculation from CDEC has been upstream of Collinsville since March 9. The graphs below show the most recent trends in Delta hydrology and water quality that were evaluated by the Working Group



- Turbidity:



2. Delta Fish Monitoring:

The 2014 Fall Midwater Trawl Annual Index for Delta Smelt is 9. This is the lowest reported fall index since the beginning of this survey in 1967, and approximately one half of the previous lowest indices of 17 (2009) and 18 (2013).

SLS #5 was in the field March 2 through 4. Processing is ongoing. So far, 101 Longfin Smelt ranging in size from 5 to 14 mm have been reported. One Delta Smelt larva was collected from the Sacramento

Deepwater Shipping Channel. SLS #6 starts on March 23. Napa River samples from SLS Survey #4 and #5 will be processed at a later date because they are part of a special study.

Spring Kodiak Survey #3 was in the field last week. A total of six Delta Smelt adults were collected, ranging in size from 65 to 71 mm. Three were collected in the lower Sacramento River near Threemile Slough at station 707, two were collected at station 719 in the Sacramento Deepwater Shipping Channel, and one was collected at station 609 in Montezuma Slough. Overall condition of fish caught was indicated to be relatively poor (e.g., 1-2 of the 6 individuals with small or resorbing ovaries).

20 mm Survey #1 begins today.

The Service's Early Warning Survey decreased sampling to once per week for each site beginning March 9. Results for last week are as follows:

3-9 (Jersey Point): no catch

3-10 (Prisoner's Point): no catch

3. Salvage:

Delta Smelt have not been observed in salvage counts since February 21. The estimated cumulative seasonal total (CVP and SWP combined) for adult Delta Smelt salvage is still 68. No adult Longfin Smelt have been observed in salvage counts during WY 2015. Both the SWP and CVP operated their fish facilities with normal 30 minute counts this past week. Both facilities have started larval fish monitoring although the frequency of larval fish samples at the CVP has been reduced to one or two per day due to heavy debris load in the salvage collections. No larval Delta Smelt have been reported.

4. Expected Project Operations:

Combined SWP/CVP exports today are approximately 1500 cfs. Operators indicated that they expect the OMR flow to be between -1400 and -1500 cfs for the week. It was reported that combined exports currently are restricted by the Temporary Urgency Change Petition, which restricts pumping to 1500 cfs when water quality standards have been exceeded.

5. Delta Conditions Team:

There was no official advice for the Working Group or Delta Operations for Salmonids and Sturgeon team.

6. Assessment of Risk:

Background:

RPA Component 1: "Beginning in December of each year, the Service shall review data on flow, turbidity, salvage, and other parameters that have historically predicted the timing of Delta Smelt migration into the Delta. On an ongoing basis, and consistent with the parameters outlined... [in the BO]...the SWG shall recommend to the Service OMR flows that are expected to minimize entrainment of adult Delta Smelt" (page 280).

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 Working Group 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 flow and water quality monitoring, salvage, field surveys, and planned Project operations.

The Service presented its updated WY2015 adult Delta Smelt ITL (196 fish) and early warning level (78 fish) at the January 12 SWG meeting. The January 9, 2015 reinitiation memo regarding these updated levels has been posted to the Bay-Delta FWO website (<http://www.fws.gov/sfbaydelta/>).

Three station average water temperature surpassed 12°C as of February 3, 2015. The Working Group is now looking to Action 3 of the Biological Opinion as well as Action 2 in framing their advice to the Service. The 3-station average water temperature as of March 15 was 17.8°C

Turbidity values have decreased across the system. Values in the southern Delta as of March 15 are well below the threshold values in the BiOp.

Early Warning Survey has reduced sampling to one day per week for each site. Last week there was no catch at either station.

The Working Group discussed the low catch of Delta Smelt from SKT #3. It was noted that the catch of six fish is the historical low for the month of March for the survey (confirmed in Table 1 below), and is one of the lowest single-month catches on record (other lowest catches were from May because most fish have died after spawning by then). In discussing possible reasons for the very low March SKT catch, it was pointed out that the SKT and FMWT abundance indices are generally well correlated and that the recent 2014 FMWT index was also the lowest on record. Some members indicated the increasing water temperatures could be contributing to the fish being located deeper in the water column and beyond

the reach of the nets. There was some doubt about this hypothesis, as surface water temperatures (although they have been high recently) are still within the range for spawning and larval hatching and thus, are not stressful. Some members indicated it was possible that most adults were located at the bottom of the water column to spawn, and therefore beyond the range of the nets. This vertical distribution effect has not been observed before in March, even though spawning has begun in March in years past, so the effect seems unlikely. Some members indicated that survival this spring has been poor because catches from SKT #2 (last month) were more than 10 times greater than SKT #3 (this month). Most members agreed that the most likely reason for such a decrease in survey results from SKT #2 to #3 is that the fish did not survive after their first spawn, which occurred early this year, and are now deceased. This hypothesis is partly supported by the poor condition of the few mature fish that were caught in SKT #3. Members expressed their concern for the well-being of this species given the historically low FMWT abundance index last fall, historically low March SKT catch, poor adult condition, possible shortened spawning window, and unfavorable environmental conditions. Low post-spawn survival would indicate even less resilience for a population that has decreased so dramatically during the past few years.

Table 1*

Year	Number of Delta Smelt collected in March SKT
2002	239
2003	373
2004	196
2005	27
2006	70
2007	60
2008	64
2009	64
2010	78
2011	52
2012	296
2013	75
2014	88
2015	6

*Numbers contained in this table were not specifically discussed during the SWG call.

The Working Group does not expect detections of larval Delta Smelt in this week's 20 mm survey (net mesh is smaller than SKT, but not small enough to reliably retain early larval stages). The next most likely opportunity for survey data that can provide comprehensive spatial information on the distribution of larval delta smelt may be SLS #6, which starts March 23 and will not have samples fully processed until April.

The Working Group discussed the potential for PTM runs to be generated for future discussion of larval entrainment risk. No modeling runs were requested at this time.

The Working Group will continue to monitor conditions and smelt distribution and will meet again on Monday, March 16, 2015.

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

Advice for week of March 16, 2015:

The Smelt Working Group does not have any Longfin Smelt-related advice based on recent information.

Barker Slough operations advice is not warranted at this time. No Longfin Smelt larvae were detected at the criteria station and Barker Slough exports have been well below the potential limit of 50 cfs (see Basis for advice and Discussion of Criteria for #5 below).

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 March 15, 2015, no age-1 or adult Longfin Smelt have been salvaged for the water year. The Longfin Smelt adult salvage threshold for advice is > 80 (see criterion in #1 above), which is based on a combined September through December Fall Midwater Trawl Longfin Smelt index of 16. The first larvae of the season were collected at each of the facilities: 1 larva at the CVP on February 27 and 1 larva SWP on March 3. There is no criterion for larvae in salvage. No advice is warranted based on this criterion.

2. Early March sampling by Bay Study detected no age-1 or adult Longfin Smelt in the San Joaquin River and very few in the Sacramento River ($n= 2$). Kodiak Trawl sampling tends to be inefficient for Longfin Smelt, but in February the USFWS detected four adult Longfin Smelt at Jersey Point, compared to two adult Longfin Smelt at that location in January; none have been caught at Prisoner's Point. No other detections were made in the San Joaquin River or south Delta in January. In early January Bay Study detected Longfin Smelt adults in the Sacramento River at Rio Vista (station 761), a juvenile and adult in the Sacramento River at Sherman Lake (station 736), none in the San Joaquin River, and juveniles (< 80 mm) and adults throughout

Suisun Bay. During mid- to late February, Chipps Island trawling caught modest numbers of Longfin Smelt (19 and 16 for Feb 15-21 and 22-28), indicating the spawning run continues. Current distribution information does not indicate advice is warranted based on this criterion.

3 & 4. The fifth Smelt Larva Survey (SLS) completed sampling at all stations, but some sample processing remains for Napa River stations. Catch per station remains low and Longfin Smelt larvae were detected at 3 of the 12 criteria stations at densities of 3 larvae or less per tow; thus, neither criterion was met for concern (Table 1, Figure 1). Catches are not sufficient to reach concern levels based on density or distribution.

5. SLS 5 did not detect larvae at station 716, the criterion station. At station 723 a single larvae was detected. The lack of larvae at 716 removes the trigger criterion for North Bay Aqueduct operations and the single larva at 723 suggests the risk to larvae in the vicinity is low. The water year remains critical, based on the February 1, 2015 Bulletin 120 Water Supply Forecast of the water year type for the Sacramento River. In addition to a Dry or Critical water year type, concern also requires the presence of Longfin Smelt larvae at the criteria, station 716. During SLS 4, a single larva was detected at station 716 and none at 723, so criteria remain in effect. SLS 3 sampling collected four larvae at station 716 and two more at 723 indicating presence but not substantial numbers. NBA has been exporting less than 30 cfs daily through February, except for a 3-day period near the end of the month; exports ceased entirely March 4 and 5. This level is well below the 50 cfs ceiling established for this component of the Longfin Smelt Incidental Take Permit. Based on no larvae collected at 716, few collected nearby and current export levels well below the potential limit of 50 cfs, no change in current operations is warranted based on this criterion.

Current conditions: Sacramento River flow peaked at a little over 36,000 cfs on February 13, declined to 10,444 on the March 1st, and dropped below 7,719 cfs on March 15. X2 has been slowly moving upstream and is above 85 currently. Combined State and federal exports are currently 1,500 cfs and expected to remain at that level into the foreseeable future; exports are targeting an E:I ratio of 35%. The current OMR index is projected to be in the range of -1,400 to -1,500 cfs. Qwest was -1,477 on March 15 and is to be +810 today. Barker Slough exports dropped to zero March 4-12 and have recently ramped up to 36 cfs.

Summary of Risk:

Risk of entrainment is very low in both the south Delta and Barker Slough. This results from both low densities of larvae and low exports. Risks of additional adult influx continue to diminish. Larva densities appeared to decrease through mid-March resulting in lower risk of entrainment to those close to export facilities.

The limited number of Longfin Smelt larvae detected in the central and south Delta in SLSs 3-5, the few adults collected in the San Joaquin River or central Delta fish surveys and the absence of adult Longfin Smelt in salvage samples to date suggests few fish have moved into the central or south Delta for spawning. Current conditions, particularly OMR targeted at -1,400 to -1,500 cfs and positive Qwest, indicate very little risk for fish that do move into or hatch into the central Delta. The overall risk of entrainment remains very low.

Table 1. Longfin Smelt catches by station in Smelt Larva Survey 5, 2015. Sample processing is incomplete.

Year	Survey #	SLS Station	Sample Status	Species	Smelt Catch
2015		340	Not yet processed		
2015		342	Not yet processed		
2015		343	Not yet processed		
2015		344	Not yet processed		
2015		345	Not yet processed		
2015		346	Not yet processed		
2015		347	Not yet processed		
2015		348	Not yet processed		
2015		349	Not yet processed		
2015	5	405	Processed	Longfin Smelt	2
2015	5	411	Processed	Longfin Smelt	7
2015	5	418	Processed		No Smelt Catch
2015	5	501	Processed	Longfin Smelt	15
2015	5	504	Processed	Longfin Smelt	2
2015	5	508	Processed	Longfin Smelt	5
2015	5	513	Processed	Longfin Smelt	1
2015	5	519	Processed	Longfin Smelt	4
2015	5	520	Processed	Longfin Smelt	6
2015	5	602	Processed	Longfin Smelt	7
2015	5	606	Processed	Longfin Smelt	13
2015	5	609	Processed		No Smelt Catch
2015	5	610	Processed	Longfin Smelt	5
2015	5	703	Processed	Longfin Smelt	6
2015	5	704	Processed	Longfin Smelt	3
2015	5	705	Processed	Longfin Smelt	5
2015	5	706	Processed	Longfin Smelt	3
2015	5	707	Processed	Longfin Smelt	4
2015	5	711	Processed		No Smelt Catch
2015	5	716	Processed		No Smelt Catch
2015	5	723	Processed	Longfin Smelt	1
2015	5	801	Processed	Longfin Smelt	2
2015	5	804	Processed	Longfin Smelt	5
2015	5	809	Processed	Longfin Smelt	1
2015	5	812	Processed	Longfin Smelt	3
2015	5	815	Processed		No Smelt Catch
2015	5	901	Processed		No Smelt Catch
2015	5	902	Processed		No Smelt Catch
2015	5	906	Processed		No Smelt Catch
2015	5	910	Processed		No Smelt Catch
2015	5	912	Processed		No Smelt Catch
2015	5	914	Processed	Longfin Smelt	1
2015	5	915	Processed		No Smelt Catch
2015	5	918	Processed		No Smelt Catch
2015	5	919	Processed		No Smelt Catch

SWP ITP Criteria Stations

Processing is complete through 3/18/15.

Figure 1. CDFW's Smelt Larva Survey station locations.

