

SMELT WORKING GROUP
Monday, February 2, 2015

Meeting Summary:

The Working Group described the risk of entrainment under the Service-provided advice framework. Under this framework the relative risk of entrainment for each of the three flow ranges is ranked and discussed:

- -1250 to -2000 cfs has a low risk of entrainment,
- -2000 to -3500 cfs has a low risk of entrainment, and
- -3500 to -5000 cfs has a medium risk of entrainment.

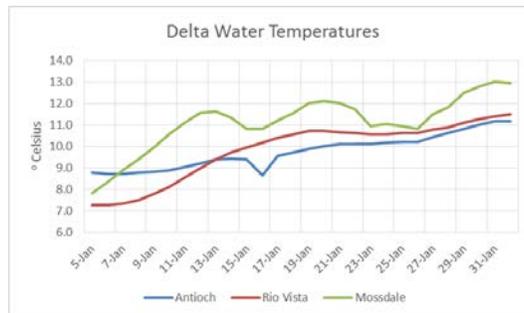
These relative risk levels are based upon a review of Delta Smelt relative abundance and distribution data, Delta Smelt salvage data, and Delta conditions data, including turbidity. With increased Delta water temperatures (11.9°C, 3 station average), the Working Group has begun to refer to Action 3 (protection of juvenile Delta Smelt); however, the risk values provided refer only to adult fish.

The Working Group will continue to monitor Delta Smelt survey and salvage data and Delta conditions and will meet again Monday, February 9, 2015 at 10am.

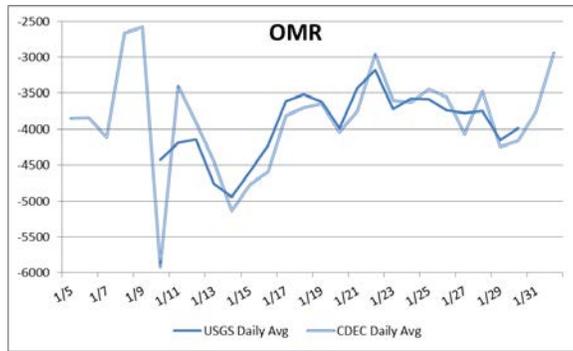
Reported Data:

1. **Current environmental data:**

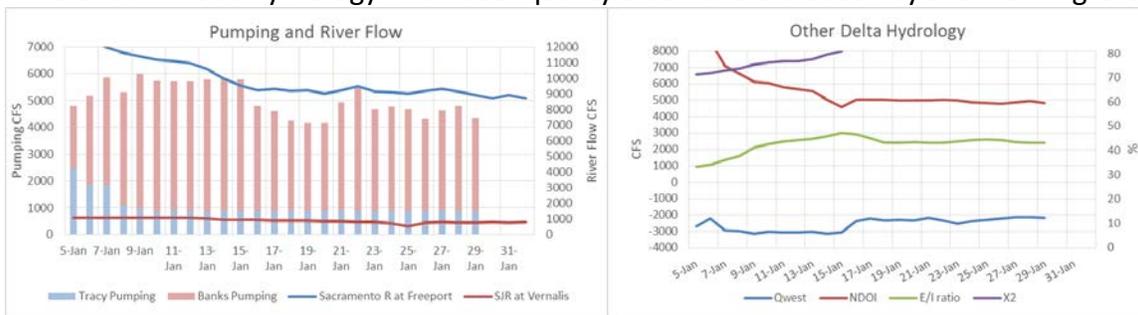
- Water Temperatures are as follows:



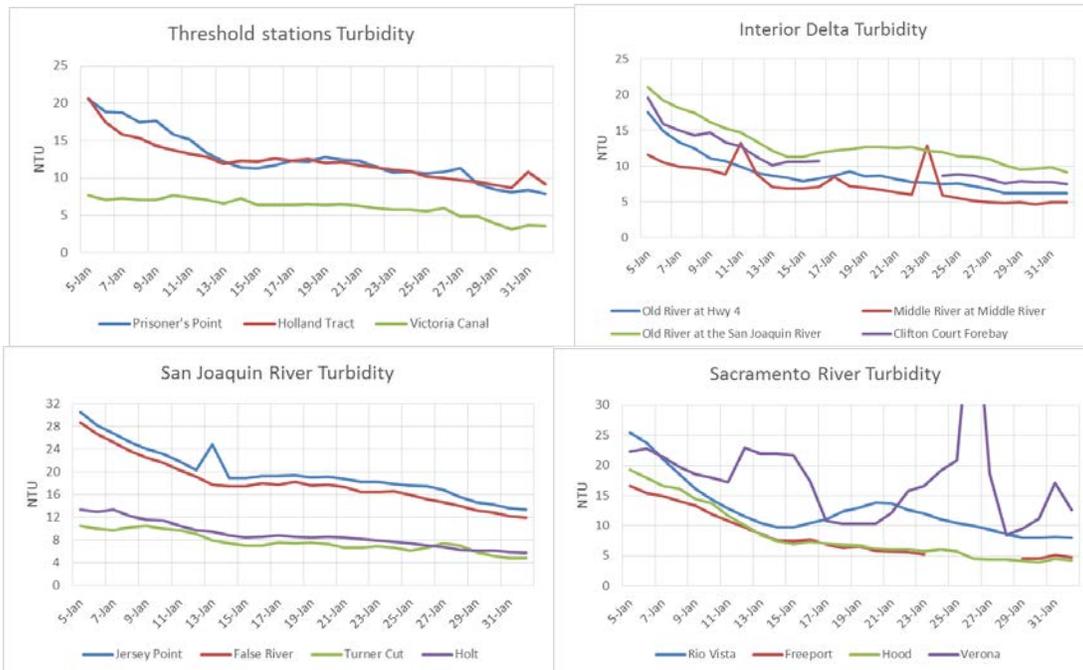
- OMR Flow: USGS tidally-averaged daily, 5 day, and 14 day average OMR flow for January 30 is -3990, -3882, and -3688 cfs, respectively. CDEC daily, 5 day average, and 14 day average OMR flow as of February 1 is -2940, -3718, and -3664 cfs, respectively.



- River Flows: Sacramento River inflow is 8724 cfs and San Joaquin River is 794 cfs. X2 calculation from CDEC is upstream of 81 km. 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 2014 is 9. This is the lowest fall index, and

approximately one half of the previous lowest indices of 17 (2009) and 18 (2013).

Smelt Larva Survey #2 was in the field January 19 through 26. Processing is now complete except for the Napa river stations. A total of 191 Longfin Smelt ranging in size from 5-10mm were observed in samples taken from stations generally from the confluence and downstream. No Delta Smelt have been observed in the samples processed so far. SLS #3 will start February 2nd.

Spring Kodiak Survey 2 will be in the field beginning February 9th.

The Service's Early Warning Survey has reduced sampling to one day per week at each location. A total of 3 delta smelt was collected on January 26 at Jersey Point, and none were collected at Prisoner's Point on January 27. Additional data will be available later this week.

3. Salvage:

No Delta Smelt salvage has occurred since January 7. The estimated cumulative seasonal total for adult Delta Smelt salvage remains at 56. No Longfin Smelt has been observed in salvage counts during WY2015. Salvage counts have returned to 30 minutes per 2 hours at the SWP, with the exception of two survey periods on January 27. High debris loads at the CVP have caused the number of 10 minute salvage counts to be increased in frequency over last week.

4. Expected Project Operations:

Combined SWP/CVP exports today are approximately 3500 cfs. Operators indicated that the Index OMR value was anticipated to be approximately -3000 cfs. Export pumping is currently controlled by the 3-day temporary Temporary Urgency Change petition, as issued by the SWRCB. The Board is expected to make a final decision on the TUC petition soon, as the 3-day temporary orders expire by the end of the day tomorrow. All letters and memos regarding this TUC petition have been posted to the Board's website.

5. Delta Conditions Team:

Turbidity in the Delta was reported to have decreased from last week with Delta operations being controlled by the 7-day average outflow requirement under D1641. 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 monitoring, salvage, field surveys, and planned Project operations. On January 13, 2014, the Service introduced a proposed "Framework for Providing Advice to the Service" (advice framework). This proposed framework was updated based on specific SWG feedback and has been in use by SWG since January 12, 2015. Under the advice framework, the Working Group is to evaluate the risk of entrainment relative to three ranges of OMR flow (-1250 to -2000 cfs, -2000 to -3500 cfs, and -3500 to -5000 cfs). Specific guidelines were provided to the Working Group in how to discuss the risk of entrainment under each flow range. Refer to the January 12, 2015 notes to view the draft advice framework.

The Service presented its updated WY2015 adult Delta Smelt ITL (196 fish) at the January 12 meeting. The January 9, 2015 reinitiation memo regarding this new limit has been posted to the Bay-Delta FWO website (<http://www.fws.gov/sfbaydelta/>).

As Delta temperatures have reached 11.9°C as of February 1, 2015, the Working Group noted that they are looking to Action 3 of the Biological Opinion as well as Action 2 in framing their advice to the Service. Members were undecided as to the status of spawning for the species. Some members indicated some individuals have probably begun spawning, with the majority of the population likely not ready to spawn.

Turbidity has dropped below 10 NTU at stations in the southern Delta, while Prisoner's Point and Holland Tract turbidity remains slightly above 10 NTU. The weather forecast indicates rain for Northern California starting this Thursday and continuing through the weekend. Members indicated some concern that when the rains from the anticipated storm enter the Delta, we could begin to see more Delta Smelt in the trawls at Jersey Point and Prisoner's Point. However, the Working Group did not see an immediate need to increase sampling, as the next scheduled sampling days are February 9 and 10, which are expected to be the best days to detect early movement with the additional flows.

High debris loads continue to negatively impacted fish salvage efficiency at the CVP. Fish counts (for the most part) are at the full 30 minutes per two hours at the SWP facility and counts at the CVP facility have been reduced to 10 minutes per 2 hours due to high debris load for an increasing percentage of the time. The reduced counts sporadically reduce the already low probability of detecting Delta Smelt. Larval fish sampling was discussed. The Biological Opinion indicates larval sampling should begin at the time of year when the Service begins looking to Action 3 for guidance in providing protections for juvenile delta smelt. Some members of Working Group indicated that it is early in the season to begin sampling; however, some members indicated that larval Delta Smelt presence at the fish facilities has been confirmed prior to detection in the field. It was also noted that when larval sampling begins, we expect debris to be a problem and could require operators to change sampling protocols.

The entrainment risk advice provided below is based on current conditions. The Working Group agreed that there is potential for Delta Smelt to move with the storm that is predicted to occur at the end of this week. This storm could result in increased central and south Delta turbidities, and occur coincident with warmer Delta temperatures at a time when some Delta Smelt are approaching spawning stage. The above discussion points influenced and contribute to all three flow ranges described below:

Advice Framework OMR Level Risk Ranking and Discussion

- OMR flow of -1250 to -2000 cfs: There is a low risk of entrainment under this flow range. This is the most protective range for Delta Smelt.
 - Risk factors: lowest annual index on record, turbidity levels below threshold levels for fish movement, confirmed Delta Smelt presence in central Delta based upon earlier Jersey Point and Prisoner's Point catch data, reduction in salvage efficiency due to debris loads at the CVP, comparable catch results for January SKT for Sac River stations and Jersey Point
 - Salvage: geographic influence of the pumps is reduced to southern Delta under this flow range
 - Unknowns: Would expect Qwest to become more positive under this flow scenario.
 - Persistence of risk: N/A
- OMR flow of -2000 to -3500 cfs: There is a low risk of entrainment under this flow range, although some members indicated a medium risk of entrainment also was appropriate for this flow range.
 - Risk factors: lowest annual index on record, turbidity levels below threshold levels for fish movement, confirmed Delta Smelt presence in central Delta based upon persistent Jersey Point and Prisoner's Point catches from the Early Warning Survey and partially from the January SKT survey, reduction in salvage efficiency due to debris loads at the CVP, comparable catch results for January SKT for Sac River stations and Jersey Point
 - Salvage: Observed salvage has been zero since January 8
 - Unknowns: anticipated rain over the northern part of the state could result in increased risk of entrainment under this flow range.
 - Persistence of risk: level of risk for this flow range would be anticipated to remain until the rain from the anticipated storm hits the Delta, or the coming weekend, whichever is sooner.
- OMR flow of -3500 to -5000 cfs: There is a medium risk of entrainment under this flow range.
 - Risk factors: lowest annual index on record, turbidity levels below threshold levels for fish movement, persistent Delta Smelt presence in central Delta based upon earlier Jersey Point and Prisoner's Point catch data, reduction in salvage efficiency due to debris loads at the CVP, comparable catch results for SKT for Sac River stations and

Jersey Point. Some members did indicate this flow range carries a high risk of entrainment for the species.

- Salvage: Observed salvage has been zero since January 8
- Unknowns: anticipated rain over the northern part of the state could result in increased risk of entrainment under this flow range.
- Persistence of risk: level of risk for this flow range would be anticipated to remain until the rain from the anticipated storm hits the Delta, or the coming weekend, whichever is sooner.

The Working Group will continue to monitor conditions and smelt distribution and will meet again on Monday, February 9, 2015.

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

Advice for week of February 2, 2015:

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

Barker Slough operations advice was not provided by the Smelt Work Group, because water year 2015 is currently classified as “below normal” (see Basis of advice #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 February 1, 2015, no Longfin Smelt have been salvaged for the water year. The interim 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. No advice is warranted based on this criterion.

2. No new survey information for adults has been received. Early January sampling (USFWS) detected two adult Longfin Smelt at Jersey Point; otherwise, none have been caught at Jersey Point or Prisoner's Point. No other detections have been made in the San Joaquin River or south Delta in January to date. 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 December. Previously, Fall Midwater Trawl sampled the Bay-Delta region during the first half of the month and the supplemental Spring Kodiak Trawl survey during last week, and neither detected any Longfin Smelt in the central or south Delta. Late December catches by the Chipps Island trawl suggested that spawning movement into the western Delta happened. Current distribution information does not indicate advice is warranted based on this criterion.

3 & 4. The second Smelt Larva Survey (SLS) completed sampling at all stations; sampling concluded with Napa River on Monday January 26. Survey 2 sample processing has yet to be completed. During survey 2, larvae were detected at only two stations in the central and south Delta: a single larvae at station 906 on the San Joaquin River at Medford Island and three larvae at station 809, Jersey Point (Table 1, Figure 1). SLS 3 is scheduled for February 2-5. In SLS 1, most larvae were distributed from the confluence downstream. Hatching for the season is only just beginning. Catches are not yet sufficient to reach concern levels based on density or distribution.

5. Based on the January 1, 2015 California Cooperative Snow Surveys Forecast and as of February 2, the California Hydrological Conditions report listed the water year type as below normal. No advice is warranted based on this criterion.

Current conditions: Sacramento River flow remained at about 9,100 cfs at Freeport on February 1. X2 remains above 81 km after a low of 61 km on December 28. Combined State and federal exports have been between 4,500 and 5,000 cfs for the past week, but dropped to about 3,500 February 1. Qwest has been about -2,200 cfs, but dropped to -1,000 on February 1. Projected OMR index of less negative than -3,000 cfs is expected.

Summary of Risk:

Risk of entrainment remains low, but this could change at any time with an influx of adult Longfin Smelt into the central or south Delta, or with substantial hatching in the region.

The risk of adult entrainment increases as X2 increases. X2 exceeded 81 km recently.

The limited number of Longfin Smelt larvae detected in the central and south Delta in SLSs 1 & 2, 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 of about -3,000 cfs and slightly negative Qwest (about -1,000 cfs), add limited risk for fish that do move into the central

Delta. The overall risk of entrainment remains low, but could increase if adult fish migrate into the central or south Delta or if larvae hatch in the region. Roughly half the spawning season remains and as X2 moves upstream subsequent spawners may move upstream as well, potentially placing them and their progeny closer to the export facilities.

Table 1. Longfin Smelt catches by station in Smelt Larva Survey 2, 2015. Sample processing is incomplete.

| Year | Survey # | SLS Station | Sample Status | Species | Smelt Catch |
|------|----------|-------------|-------------------|---------------|----------------|
| 2015 | 2 | 340 | Processed | | No Smelt Catch |
| 2015 | 2 | 342 | Not yet processed | | |
| 2015 | 2 | 343 | Not yet processed | | |
| 2015 | 2 | 344 | Not yet processed | | |
| 2015 | 2 | 345 | Not yet processed | | |
| 2015 | 2 | 346 | Not yet processed | | |
| 2015 | 2 | 347 | Not yet processed | | |
| 2015 | 2 | 348 | Not yet processed | | |
| 2015 | 2 | 349 | Processed | Longfin Smelt | 1 |
| 2015 | 2 | 405 | Processed | Longfin Smelt | 2 |
| 2015 | 2 | 411 | Processed | Longfin Smelt | 16 |
| 2015 | 2 | 418 | Processed | Longfin Smelt | 20 |
| 2015 | 2 | 501 | Processed | Longfin Smelt | 8 |
| 2015 | 2 | 504 | Processed | Longfin Smelt | 9 |
| 2015 | 2 | 508 | Processed | Longfin Smelt | 36 |
| 2015 | 2 | 513 | Processed | Longfin Smelt | 11 |
| 2015 | 2 | 519 | Processed | Longfin Smelt | 21 |
| 2015 | 2 | 520 | Processed | Longfin Smelt | 12 |
| 2015 | 2 | 602 | Processed | Longfin Smelt | 9 |
| 2015 | 2 | 606 | Processed | Longfin Smelt | 3 |
| 2015 | 2 | 609 | Processed | Longfin Smelt | 4 |
| 2015 | 2 | 610 | Processed | | No Smelt Catch |
| 2015 | 2 | 703 | Processed | Longfin Smelt | 2 |
| 2015 | 2 | 704 | Processed | Longfin Smelt | 9 |
| 2015 | 2 | 705 | Processed | Longfin Smelt | 7 |
| 2015 | 2 | 706 | Processed | Longfin Smelt | 1 |
| 2015 | 2 | 707 | Processed | | No Smelt Catch |
| 2015 | 2 | 711 | Processed | | No Smelt Catch |
| 2015 | 2 | 716 | Processed | | No Smelt Catch |
| 2015 | 2 | 723 | Processed | Longfin Smelt | 1 |
| 2015 | 2 | 801 | Processed | Longfin Smelt | 14 |
| 2015 | 2 | 804 | Processed | Longfin Smelt | 1 |
| 2015 | 2 | 809 | Processed | Longfin Smelt | 3 |
| 2015 | 2 | 812 | Processed | | No Smelt Catch |
| 2015 | 2 | 815 | Processed | | No Smelt Catch |
| 2015 | 2 | 901 | Processed | | No Smelt Catch |
| 2015 | 2 | 902 | Processed | | No Smelt Catch |
| 2015 | 2 | 906 | Processed | Longfin Smelt | 1 |
| 2015 | 2 | 910 | Processed | | No Smelt Catch |
| 2015 | 2 | 912 | Processed | | No Smelt Catch |
| 2015 | 2 | 914 | Processed | | No Smelt Catch |
| 2015 | 2 | 915 | Processed | | No Smelt Catch |
| 2015 | 2 | 918 | Processed | | No Smelt Catch |
| 2015 | 2 | 919 | Processed | | No Smelt Catch |

SWP ITP Criteria Stations

Processing is complete through 1/30/15.

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

