

Smelt Working Group
January 4, 2016

Meeting Summary

The Working Group reviewed current Delta Smelt distribution and salvage data, and current Delta conditions. The Working Group currently is following the guidance in the 2008 BiOp for Action 1 Part B and Action 2. The Working Group did not recommend a change in exports for the protection of Delta Smelt, due to the scheduled export levels and anticipated OMR flow over the next several days. However, the Working Group is concerned about current conditions, and is monitoring survey results and turbidity levels daily. The Working Group described the risk of entrainment under the Service-provided advice framework. Under this framework the relative risk of entrainment for OMR flow ranges is discussed and assessed. For the current week, the risk of entrainment for each of the flow ranges is characterized as follows, with a need to reassess risk levels should catch or turbidity levels increase:

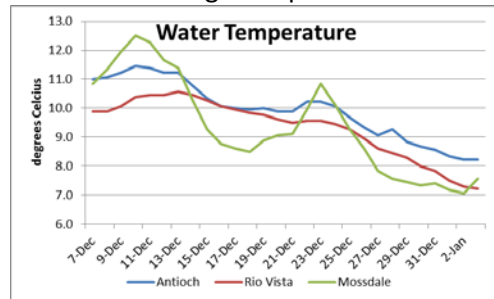
- -1250 to -2000 cfs has a low risk of entrainment,
- -2000 to -3500 cfs has a low risk of entrainment,
- -3500 to -5000 cfs has a medium risk of entrainment.

Reported Data

1. Current environmental data

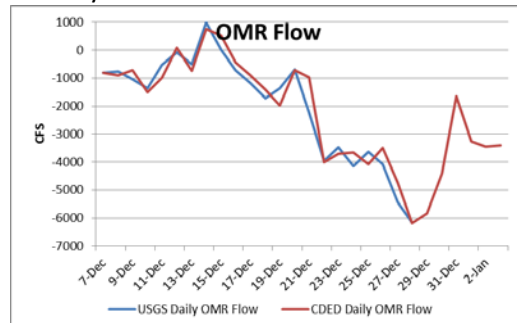
a. Temperature

Combined average temperatures for January 3 are 7.7°C



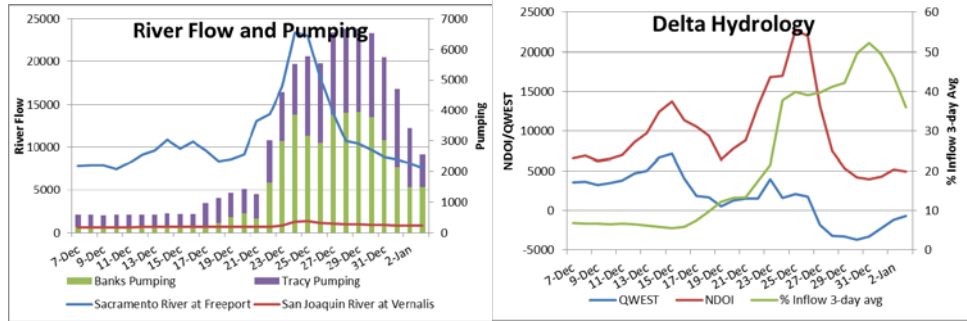
b. OMR flow

USGS OMR flow since December 28 is unavailable. CDEC OMR daily average flow for January 3 is -3412 cfs.



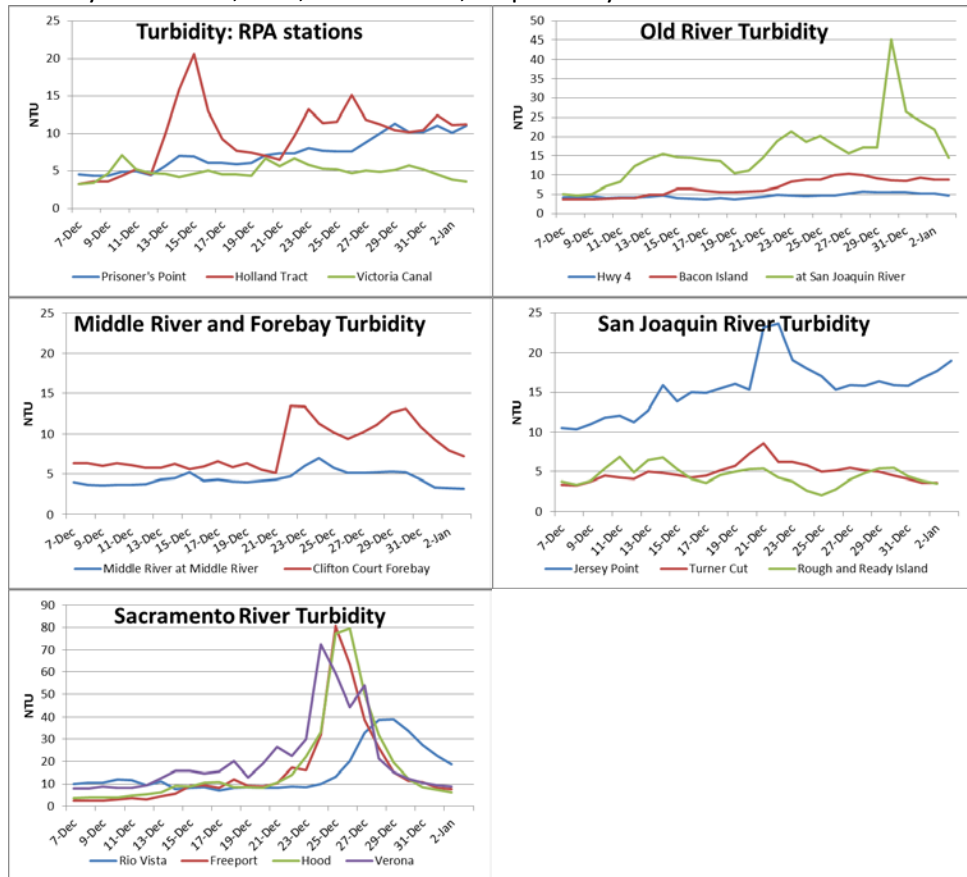
c. River Flows and pumping

Sacramento River at Freeport flow for January 3 was 7,526 cfs. San Joaquin River at Vernalis river flow for January 3 was 805 cfs. Combined exports are 2300 cfs today.



d. Turbidity

Three day average turbidity for Prisoner’s Point, Holland Tract, and Victoria Canal as of January 3 was 10.7, 11.6, and 3.9 NTU, respectively.



2. Delta fish monitoring

CDFW has released the 2015 FMWT indices:
 The 2015 Delta Smelt annual FMWT index is 7.
 The 2015 Longfin Smelt annual FMWT index is 4.
 Both indices are the lowest on record (i.e. since 1967).

The 2016 Spring Kodiak Trawl #1 survey will be in the field beginning January 11, 2016.

Smelt Larva Survey #1 is in the field this week.

The Early Warning Survey began November 30. Sampling has increased from last week and is alternating between Jersey and Prisoner’s Point daily. Sampling on the Sacramento River began December 18 at Sherwood Harbor, Sandy Beach, and station 707.

Early Warning Survey Results, December 24 through December 30

Date	Location	Delta Smelt Catch
12/28	Sherwood Harbor	0
12/28	Jersey Point	14
12/29	Prisoner’s Point	1
12/30	Jersey Point	10*
12/31	Prisoner’s Point	1
1/1	N/A	
1/2	N/A	
1/3	N/A	

*Only 3 of the 9 tows were completed in the north lane

3. Particle Tracking Modeling

No modeling runs were requested.

4. Salvage

There has been no salvage of Delta Smelt or Longfin Smelt at either the federal or state Delta pumping facilities during the current water year.

5. Expected Project Operations

Jones pumping plant is at 800 cfs. Clifton Court (CC) allotment is at 1500 cfs. Combined pumping is 2300 cfs. Pumping currently is being controlled by the SWRCB D-1641 Monthly Outflow Standard of 6000 cfs and 7 day average of 4800 cfs, with the chance that pumping may be further reduced later in the week to comply with NMFS Action IV.2.3, which results in OMR flows of no more negative than -3500 cfs for a five day period (beginning January 3). Operators indicated the projected OMR Index is expected to be approximately -2000 cfs today.

DWR’s boat turbidity transect survey is in the field today and was not available for consideration.

6. Delta Conditions Team

No DCT recommendation.

7. Assessment of Risk:

WY 2016 adult Delta Smelt incidental take

The WY 2016 adult Delta Smelt incidental take (IT) is 56, as is stated in the Service’s December 23, 2015 memo to the Bureau of Reclamation. The method to calculate the IT is that which is described on p 386 of the 2008 BiOp, with the corrections described in both the February 22, 2013, and December 23, 2015 memos. The alternative approach that the Service presented to the 2015 independent review panel at the Long-term Operation Biological Opinions annual science review will be piloted this year.

BiOp Background:

RPA Component 1, Action 1, Part B states, “High-entrainment risk period: Delta Smelt have historically been entrained when first flush conditions occur in late December. In order to prevent or minimize such entrainment, Action 1 shall be initiated on or after December 20 if the 3 day average turbidity at Prisoner’s Point, Holland Cut, and Victoria Canal exceeds 12 NTU, or if there are three days of Delta Smelt salvage at either facility or if the cumulative daily salvage count is above the risk threshold based upon the ‘daily salvage index’ approach described in Attachment B. Action 1 shall require the Projects to maintain OMR flows no more negative than -2,000 cfs (14-day running average) with a simultaneous 5-day running average flow no more negative than -2,500 cfs to protect adult Delta Smelt for 14 days. However, the Working Group can recommend a delayed start or interruption based on other conditions such as delta inflow that may affect vulnerability to entrainment.” (BiOp page 281).

RPA Component 1, Action 2 states, “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...”

The timing of Action 2 is immediately after Action 1. Before this date (in time for operators to implement the flow requirement) the SWG will recommend specific requirement OMR flows based on salvage and on physical and biological data on an ongoing basis. If Action 1 is not implemented, the SWG may recommend a start date for the implementation of Action 2 to protect adult delta smelt. (BiOp page 352).

Discussion:

The Working Group reviewed Delta Smelt distribution data, salvage data, and current Delta conditions. The working group concluded that entrainment risk has remained at a similar level from last week. This is based on fish distribution and turbidity information, combined with water exports, but the group provided no recommendation for a change in water export reductions for either Delta Smelt or Longfin Smelt. This decision was based on the projected exports and corresponding OMR flows that were projected through Thursday of this week. The group will be monitoring conditions closely over the next several days, particularly turbidity distribution into the Old River from Prisoners Point, and catch at Prisoners Point in the Early Warning Survey.

Actions 1 through 3 of the RPA are designed to protect Delta Smelt from entrainment. RPA Action 1 and Action 2 are specifically designed for adult spawning stock in the San Joaquin River during December to March via real-time management of OMR flows. Members of the Working Group are currently evaluating conditions relative to the guidance in the BiOp for Action 1 Part B (BiOp p 329), and Action 2 (BiOp p352). The following details the discussion by the group:

2015 Delta Smelt abundance indices

The four primary 2015 annual abundance indices for all Delta Smelt life stages are the lowest on record.

	2014	2015
SKT	30.1	13.8
20-mm	1.1	0.3
TNS	0.5	0.0
FMWT	9	7

Early Warning Survey as an indicator of upstream movements and entrainment risk

Previously, members of the Working Group stated that elevated catch in the Jersey Point south lane trawl would indicate increased Delta Smelt movement and increased risk of entrainment into interior Delta channels, as this location is more hydrologically linked to tidal flow into these channels. Similarly, catch at Prisoners Point would serve as an indicator that movement upstream had commenced. The Working Group is particularly concerned about fish in the south lane at Jersey Point and at Prisoner’s Point, because these two locations are more closely linked hydrologically with tidal flows into interior south Delta channels than fish located in the middle and north lanes at Jersey Point, or at locations further downstream. Therefore, fish in these areas are considered at greater risk of entrainment.

Delta Smelt catch at Prisoner’s Point on December 29 and 31 was one each day. This, combined with the catch of fish in the Jersey Point south lane on December 30 indicate that fish currently are distributed in locations of increased probability of movement into interior Delta channels. The Early Warning Survey is scheduled to be at Prisoners Point tomorrow. Should catch of Delta Smelt at Prisoners Point exceed one fish tomorrow, the Working Group will reconvene to reassess the risk of entrainment.

Salvage

Any level of salvage observed at either facility will be of concern to the Working Group, considering the low abundance and associated low detection probability (BiOp page 338) of Delta Smelt in salvage under RPA compliant operations. Our concern is for both direct mortality and indirect mortality of the spawning stock, which are 2 of the 3 factors affecting Delta Smelt as presented on in the BiOp (page 325):

“1) direct mortality associated with entrainment of pre-spawning adult delta smelt by CVP/SWP operations; 2) direct mortality of larval and early juvenile delta smelt associated with entrainment by CVP/SWP operations; and 3) indirect mortality and reduced fitness through reductions to and degradation of Delta habitats by CVP/SWP operations.”

Turbidity and Delta Smelt Distribution

The four primary Delta Smelt abundance indices and the December SKT all indicate that abundance has been at a record low all year, and as a result, the Working Group expects that detection ability in salvage and trawl surveys has been reduced. As members of the Working Group have stressed in previous meetings, sporadic, low catch in surveys from record low abundance makes using those survey results for assessing the species’ distribution and risk of entrainment very challenging. The Working Group has suggested monitoring turbidity as a proxy for location of Delta Smelt, based on a documented migration response to turbidity (BiOp pages 146 and 347) and last water year’s salvage events which once again followed a turbidity plume that extended from the San Joaquin River into the South Delta to the export facilities.

Turbidity

The DWR Turbidity Transect data distributed on December 31 indicated that elevated turbidity (approximately 10 ntu or greater) had encroached further upstream in Old River than the previous survey indicated. However, an area of lower turbidity currently remains between Hwy 4 and the export facilities on the Old River corridor, which may discourage Delta Smelt activity in the higher velocity areas of the channel where they are subject to more rapid advection toward the export facilities. Given the weather system moving through the area presently, high winds and elevated inflow are anticipated to further increase turbidities in the Delta. Should turbidity greater than 10 NTU extend upstream in the Old River past Bacon Island, the Working Group will need to reassess the risk of entrainment. Turbidity stations and boat transects will be monitored daily for any changes.

Extension of turbid water from the San Joaquin River further upstream into Old and Middle rivers in conjunction with a heightened proportion of San Joaquin EWS catch at Prisoner's Point and the Jersey Point south lane would be considered a clear indicator of high risk of entrainment into Old and Middle rivers, and from there, into the SWP and CVP intake facilities.

Comparison to last winter

The first salvage of Delta Smelt last season occurred on January 2., after a period of OMR flows ranged from around -6000 to -4000 (see SWG notes, 01/05/2015). The start of the salvage season began one to two weeks after increased inflow and turbidity was observed in the Delta. Although some hydrological conditions are presently different than this time last season, recent higher flows, elevated turbidity, and presence of Delta Smelt at Prisoner's Point suggest the migration "season" has started this year. Given the exceedingly low abundance and sporadic catch in surveys, the Working Group is concerned there will be little, if any, catch in the early warning survey to indicate the fish are moving into the south Delta.

OMR Flow

Anticipated OMR flow for the week is not anticipated to increase the risk of entrainment to fish in the lower San Joaquin River. However, should fish have moved upstream in the Old River corridor (following the turbidity plume) the OMR flow levels could pose a risk for increased entrainment and the Working Group would need to reconvene to reassess risk.

The above discussion points influenced and contributed 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 indices on record, confirmed Delta Smelt presence in central Delta based upon Jersey Point and Prisoner's Point catch data.
 - Salvage: Zero salvage this water year, geographic influence of the pumps does not extend to central Delta under this flow range
 - Unknowns: detection ability in salvage and trawl surveys has been severely reduced, given the record low abundance indexes; unknown Sacramento River catch (unable to assess percentage of population in the lower San Joaquin River)
 - Persistence of risk: unlikely to change prior to January 11

- OMR flow of -2000 to -3500 cfs: There is a low risk of entrainment under this flow range, given conditions listed below:
 - Risk factors: lowest annual index on record, confirmed Delta Smelt presence in locations of elevated risk of movement into interior Delta channels based upon Jersey Point and Prisoner's Point catches from the Early Warning Survey.
 - Salvage: Zero salvage this water year, influence of pump not likely to extend to the lower San Joaquin River under this OMR flow range.
 - Unknowns: detection ability in salvage and trawl surveys has been severely reduced, given the record low abundance indexes, unknown Sacramento River catch (unable to assess percentage of population in the lower San Joaquin River), turbidity trend is uncertain.
 - Persistence of risk: Should elevated turbidity extend south of Bacon Island or catch increase at Prisoner's Point, risk of entrainment for this flow range will be reassessed.
- 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, confirmed Delta Smelt presence in Jersey Point south lane and Prisoner's Point catch data, elevated turbidity in the San Joaquin River extending into Old River.
 - Risk factors: lowest annual index on record, confirmed Delta Smelt presence in central Delta based upon Jersey Point and Prisoner's Point catch data.
 - Salvage: Zero salvage this water year, geographic influence of the pumps could extend to the lower San Joaquin River at the more negative end of this flow range, especially affecting the southern bank near Jersey Point.
 - Unknowns: detection ability in salvage and trawl surveys has been severely reduced, given the record low abundance indexes; unknown Sacramento River catch (unable to assess percentage of population in the lower San Joaquin River), turbidity trend is uncertain, although likely that should flows increase to this range, higher turbidities could be drawn closer to the export facilities.
 - Persistence of risk: Should elevated turbidity extend south of Bacon Island or catch increase at Prisoner's Point, risk of entrainment for this flow range will be reassessed.

The Working Group will continue to monitor conditions and smelt distribution and will meet again on Monday, January 11, 2016.

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

Advice for week of January 4, 2016:

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

Barker Slough operations advice was not provided by the Smelt Work Group, because the meeting occurred prior to concern period beginning January 15 (see #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 January 3, 2016, no Longfin Smelt have been salvaged for the water year. The **Longfin Smelt adult salvage threshold for advice is 20** based on a Fall Midwater Trawl abundance index of 4 for 2015 (see criterion in #1 above). No advice is warranted based on this criterion.
2. December Bay Study sampling collected no Longfin Smelt in the San Joaquin River, suggesting no recent proximity to the export pumps. The December Fall Midwater Trawl sampled the region and did not detect Longfin Smelt in the San Joaquin River or the south Delta. Distribution information does not indicate advice is warranted based on this criterion.
- 3 & 4. The first Smelt Larva Survey (SLS) of 2016 will be conducted beginning January 4th.
5. Criteria does not begin until January 15th.

Current conditions: As of January 3rd, the Sacramento River flow continued to decline to 7,526 cfs, and the San Joaquin 805 cfs. X2 has been >81 . Qwest was -655 on January 3rd. Combined State and federal exports are expected to be about 2,300 cfs for today and are limited by outflow constraints. Potential increases in outflow later this week may lead to increased exports. Exports will be constrained to -3,500 cfs OMR or less negative based on NMFS criteria, which will remain in place through Thursday this week (export operations remain under a target of -5,000 cfs OMR based on the NMFS RPA).

In December, a few Longfin Smelt were collected by the Fall Midwater Trawl, one each in Carquinez Strait, Grizzly Bay and just upstream of Chipps Island. These were the first and only collections of Longfin Smelt by the Fall Midwater Trawl this year. A single Longfin Smelt was collected by the Bay Study in December in Carquinez Strait. No Longfin Smelt were collected in the San Joaquin River or south Delta by either survey. As of December 26, only three Longfin Smelt had been collected by Chipps Island Trawl sampling, two adults on December 18 and the third adult on December 23.

No Longfin Smelt have been salvaged this water year.

Summary of Risk: Risk of entrainment is low due to a weakly negative Qwest and the apparent absence of Longfin Smelt in the lower San Joaquin River or south Delta.

The collection of no adult Longfin Smelt in the San Joaquin River or central Delta (Bay Study and FMWT sampling) to date suggests few fish have moved into the central or south Delta for spawning. Predicted conditions, particularly the combined exports of 2,300 for the start of this week, indicate only a low risk of entrainment even if adult fish do move into or larvae hatch into the central Delta.