

Smelt Working Group
December 28, 2015

Meeting Summary

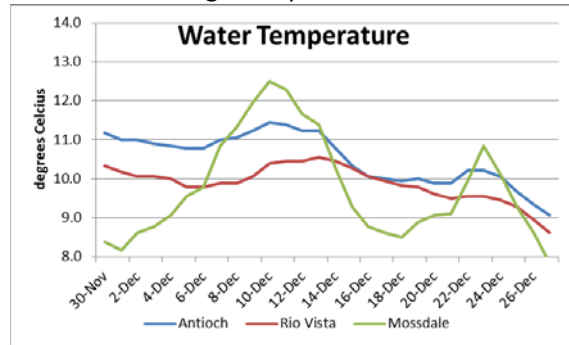
The Working Group reviewed current Delta Smelt distribution and salvage data, and current Delta conditions. The Working Group did not recommend a change in exports for the protection of Delta Smelt. However, the Working Group agrees that entrainment risk has increased since last week. The Working Group will meet again this Wednesday, December 30 to reassess Delta Smelt entrainment risk in light of the additional data being collected at the beginning of this week (Early Warning Survey data, boat turbidity transect survey data, and PTM runs). The Working Group is monitoring conditions in light of part B of Action 1 using the real-time information listed above.

Reported Data

1. Current environmental data

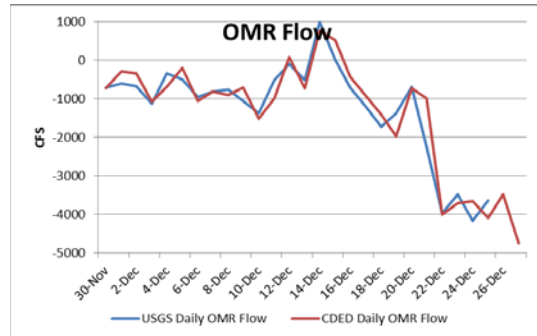
a. Temperature

Combined average temperatures for December 27 are 8.5°C



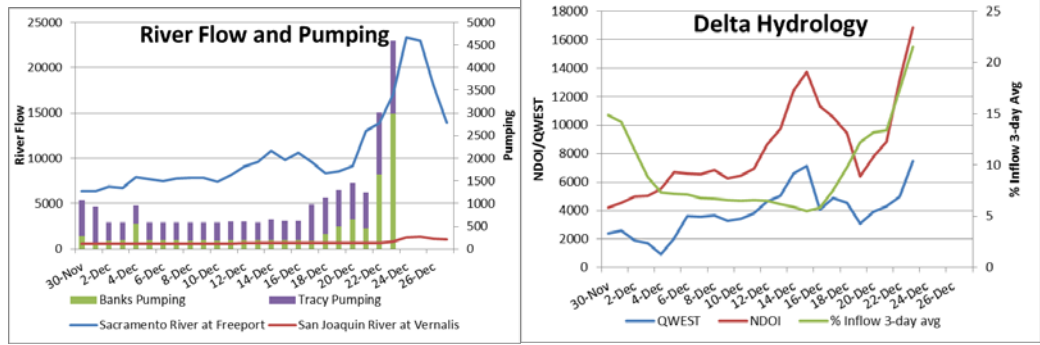
b. OMR flow

USGS OMR daily average flow for December 25 is -3640 cfs. CDEC OMR daily average flow for December 27 is -4742 cfs.



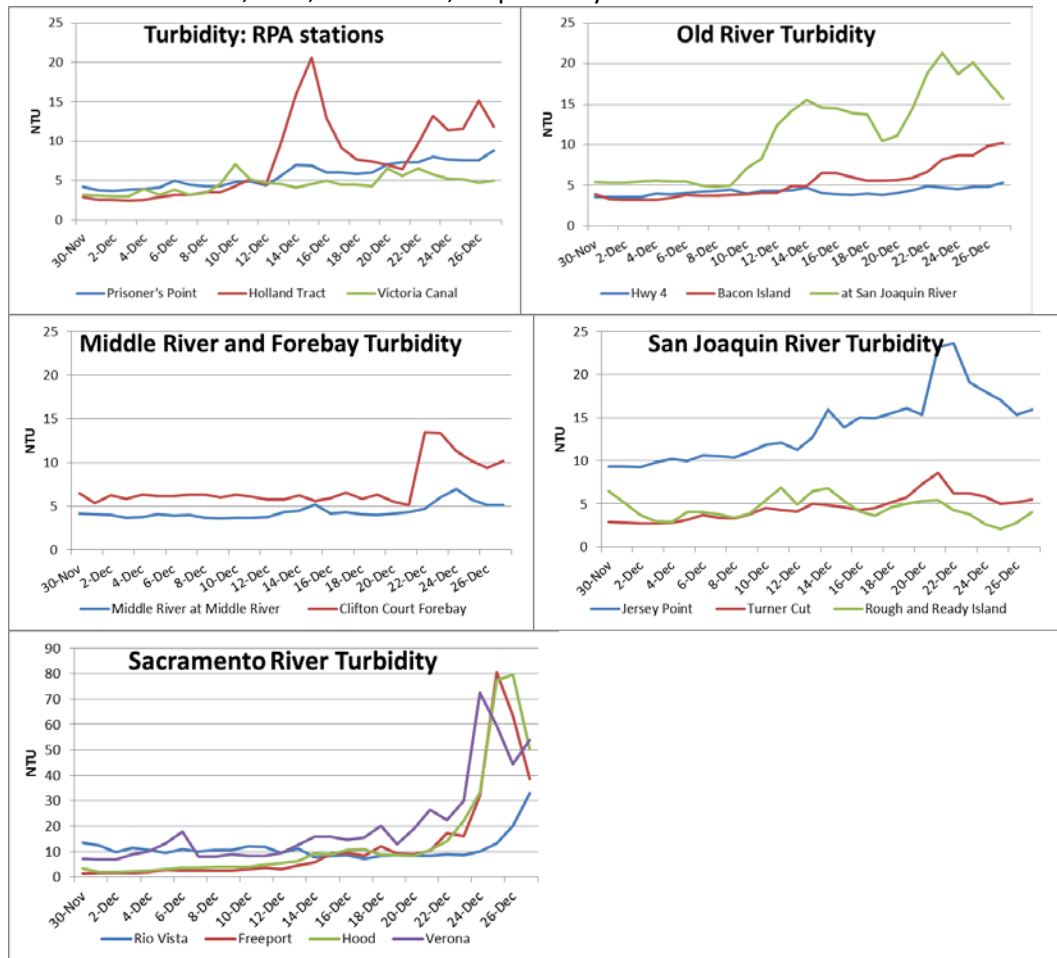
c. River Flows and pumping

Sacramento River at Freeport flow for December 27 was 13,918 cfs. San Joaquin River at Vernalis river flow for December 27 was 1,047 cfs. Combined exports are expected to be at 6700 cfs as of December 29 and are expected to remain at that level until January 1.



d. Turbidity

Three day average turbidity for Prisoner’s Point, Holland Tract, and Victoria Canal as of December 27 was 8, 12.8, and 5 NTU, respectively.



2. Delta fish monitoring

Fall Midwater Trawl (FMWT): The December FMWT was in the field the weeks of November 30 and December 7. Two Delta Smelt were detected.

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 December Kodiak trawl survey was conducted the week of December 14. Two Delta Smelt were caught at station 606 (both 64mm, undetermined sex), but none at any other station; all 40 stations were sampled. The 2016 SKT #1 survey will be in the field beginning January 11, 2016.

Smelt Larva Survey begins January 4, 2016.

The Early Warning Survey began November 30. Sampling is alternating between Jersey and Prisoner's Point, with each being sampled once per week. Sampling on the Sacramento River began December 18 at Sherwood Harbor, Sandy Beach, and station 707.

Early Warning Survey Results, December 19 through December 24

Date	Location	Delta Smelt Catch
12/19	N/A	
12/20	N/A	
12/21	Sherwood Harbor	0
12/22	N/A	
12/23	Sherwood Harbor	0
12/23	Jersey Point	5
12/24	Sherwood Harbor	0
12/24	Jersey Point	0

3. 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.

4. Expected Project Operations

Jones pumping plant is pumping 2800 cfs. Clifton Court (CC) allotment is at 3900 cfs. Combined pumping is anticipated to be 6700 cfs by tomorrow. Pumping may be adjusted later in the week to comply with NMFS Biological Opinion maximum OMR flow of -5000 cfs. Project operations currently are being controlled by water quality, which has improved from last week. Operators indicated the projected OMR Index for the week (based on a combined pumping of 6700 cfs) is expected to be approximately -6000 cfs.

DWR's boat turbidity transect survey was in the field December 22, but data from that survey are not available as yet.

5. Delta Conditions Team

DCT did not meet last week and is not anticipated to meet this week.

6. Assessment of Risk/Discussion

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 a correction (as discussed in the memo). 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.

RPA Component 1, Action 1, Part B: “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).

The Working Group reviewed Delta Smelt distribution and salvage data, and current Delta conditions and provided no recommendation as yet for a change in water operations for either Delta Smelt or Longfin Smelt. However, members of the Working Group did conclude that entrainment risk is increasing and the group will meet again December 30 to further discuss a potential recommendation to the Service.

Actions 1 through 3 of the RPA are designed to protect Delta Smelt from entrainment. RPA Action 1 and Action 2 are specifically designed to protect spawners in the San Joaquin River by limiting the entrainment of adult delta smelt during December to March via real-time management of OMR flows. The Working Group currently is evaluating conditions relative to the guidance in the BiOp for Action 1 Part B (BiOp p 329). 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

The Working Group has previously submitted comments regarding the Early Warning Survey. It is recommended that the Early Warning Survey be continued only on the San Joaquin River side as this area provides helpful information for water operations management with regard to assessing the risk of entrainment. In particular, members of the Working Group considers elevated catch in the Jersey Point south lane trawl an indicator of 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 Early Warning Survey is scheduled to be in the field at Jersey Point today (12/28) and Prisoner's Point tomorrow (12/29). Results from these days could provide important information in the assessment of risk, and will be part of the group discussion December 30. Additionally, the Working Group would like to review any turbidity or water clarity data that is collected by the survey.

To date, the Early Warning Survey has been maintaining a baseline sampling protocol, where Jersey and Prisoner's points are each sampled once per week. After reviewing the survey data on Wednesday, the group discussed the appropriateness of transitioning from the baseline sampling protocol to the "first flush" sampling protocol which has Jersey and Prisoner's points visited on alternating days until hydrology changes.

Salvage

Considering the low abundance and associated low detection probability of Delta Smelt in salvage under RPA compliant operations, any level of salvage observed at either facility will be of concern to the Working Group.

Low Salinity Zone

The Working Group discussed the LSZ last week, and those concerns related to low Delta outflow remain; however, updated position on both the San Joaquin River and Sacramento River was not available. Should the LSZ have shifted downstream of last week's position, it could result in a decrease in risk of entrainment.

Turbidity

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 to the export facilities into the South Delta. The Working Group will be watching changes in turbidity closely at stations throughout the system, but particularly at lower San Joaquin River stations and those in the Old River corridor. The Working Group also requests that turbidity transect monitoring conducted by DWR in the South Delta be conducted tomorrow. The Working Group is concerned that the turbidity levels in the main part of the channel of Old River and/or Middle River could be significantly higher than those reported at the turbidity stations, and some Old River stations are reporting turbidities greater than 12 NTU.

Extension of turbid water from the San Joaquin River into Old and Middle rivers in conjunction with indicators of elevated Delta Smelt activity or upstream movement would be considered a clear indicator of heightened risk of entrainment into Old and Middle rivers and from there, into the SWP and CVP intake facilities. These parameters will be reevaluated on December 30.

Comparison to last winter

The first salvage of Delta Smelt last season occurred on January 2. The start of the salvage season began one to two weeks after increased flow and turbidity was observed in the Delta. Although some hydrological conditions are presently different than this time last season, higher flows and elevated turbidity suggest the migration “season” has started. 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. Also, weather conditions have been dynamic suggesting that higher entrainment risk conditions could develop quickly.

OMR Flow

The last week’s changes in flow and turbidity, combined with the increasingly negative OMR flow is concerning to the Working Group. Members stressed that the previous few days’ conditions appear to be setting up a situation where elevated turbidity will occur continuously from the lower San Joaquin River through the export facilities in the south Delta. Such a “turbidity bridge” has been associated with increased Delta Smelt salvage in the past (BiOp pages 146 and 347). To address their concern, the SWG made requests listed below and planned to review requested information and more recent early warning data on December 30.

Data to be reviewed on Wed, Dec 30

In preparation for Wednesday’s meeting, the Working Group has requested:

1. PTM model runs given the following conditions:
 - 30-day run
 - OMRs of -1250, -3500, -5000 and current planned ops
 - Insertion of particles at Jersey Point on 12/23
 - Flux past Prisoner's Point, Chipps and export facilities.
2. Turbidity forecast modeling

In addition, the Working Group will review today’s (12/28) Early Warning Survey data collected at Jersey Point and tomorrow’s (12/29) Prisoner’s Point data. The Working Group will also review DWR’s boat transect turbidity survey data, which is in the field today (12/28).

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

Advice for week of December 28, 2015:

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 December 27, 2015, 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 2015 will be conducted beginning January 4th.
5. Criteria does not begin until January 15th.

Current conditions: As of December 27th, the Sacramento River flow was 13,918 cfs, and the San Joaquin 1,047 cfs. X2 has been >81 . Combined State and federal exports are expected to be about 6,700 cfs for today through Thursday December 31 and are being controlled by water quality. On Friday January 1, export operations will target an OMR of -5,000 cfs, controlled by the NMFS RPA. The projected OMR is -6,000 cfs through Thursday, then -5,000 cfs. Qwest was +6,770 on December 26 and +2,316 on December 27. The storms last week produced only a small spike in outflow that arrived last week.

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 19, only a couple Longfin Smelt had been collected by Chipps Island Trawl sampling, both on December 18.

No Longfin Smelt have been salvaged this water year.

Summary of Risk: Risk of entrainment is low due to a positive 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 -6,000 OMR for this week, indicate a sizable risk of entrainment if fish do move into the central Delta.