SMELT WORKING GROUP

Monday, December 29, 2014

Meeting Summary:

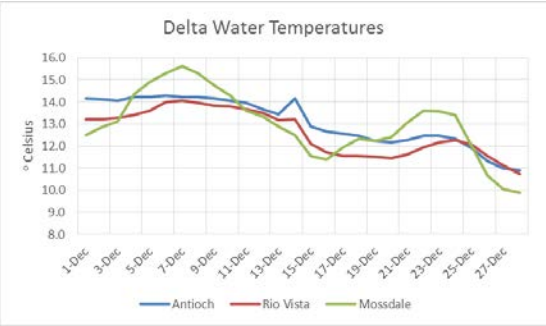
The SWG agreed that the conditions for, and potential benefit from, implementing Action 1 have passed, and is now following guidance in the BiOp for Action 2. Therefore, the SWG agreed to recommend that project exports should result in OMRs no more negative than -5000 cfs on a 14-day running average with a simultaneous 5-day running average no more negative than -6250 cfs. The SWG stated that OMR flows more negative than -5000 cfs would not be protective. Notwithstanding the recommendation, there was uncertainty expressed by some members as to whether OMR flows of no more negative than -5000 cfs would maintain the "low turbidity" region in the south Delta, currently believed to inhibit Delta Smelt movement to the export pumps. For this reason, the SWG recommends that should turbidities at interior stations, part of the "turbidity gap" as defined by Delta Conditions Team, reach or exceed 10 NTU, or should any salvage of Delta Smelt occur, OMR flows should not be more negative than -2000 cfs on a 14-day running average with a simultaneous 5-day running average no more negative than -2500 cfs.

The Working Group will continue to monitor Delta Smelt survey, and salvage data, and Delta conditions and will meet again Monday, January 5, 2015.

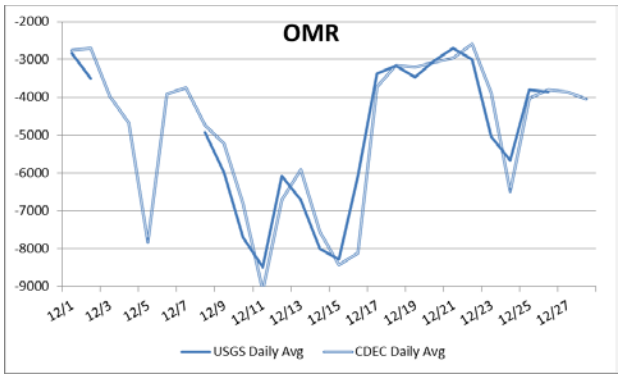
Reported Data:

1. **Current environmental data:**

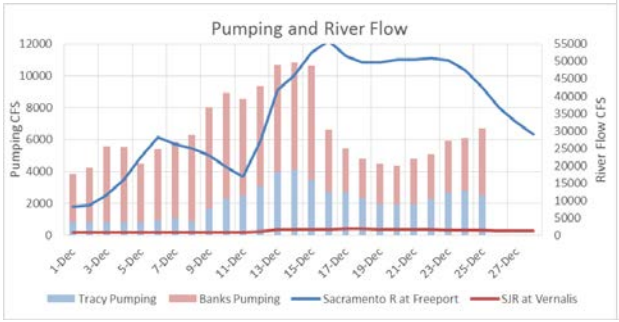
- Water Temperatures are as follows:

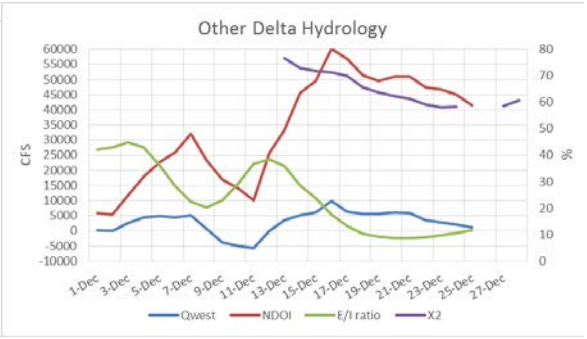


- OMR Flow: USGS tidally-averaged daily, 7 day average, and 14 day average OMR as of December 26 is -3860, -4276, and -4734 cfs. CDEC daily, 7 day average, and 14 day average OMR flow as of December 28 is –4047, -4446, and -4388 cfs

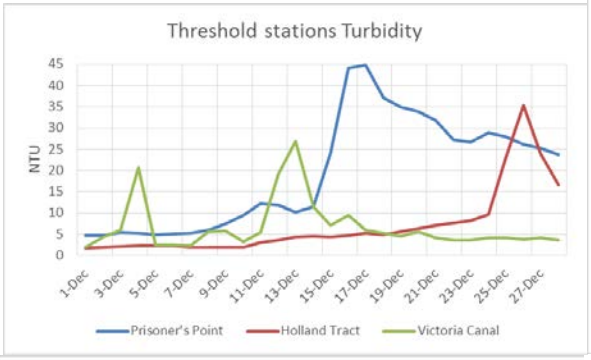


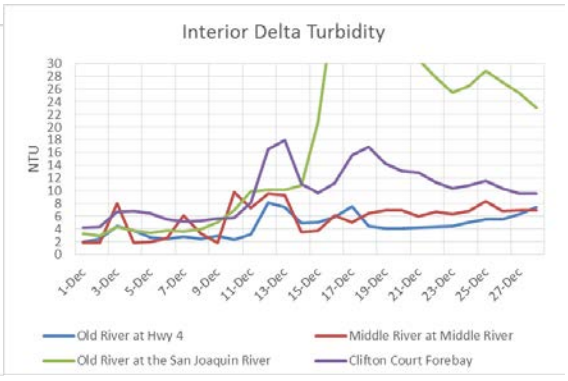
- River Flows: Sacramento River inflow is 28,969 cfs and San Joaquin River is 1252 cfs. X2 calculation from CDEC is 60.69km. The graphs below show the most recent trends in Delta hydrology and water quality that were evaluated by the Working Group

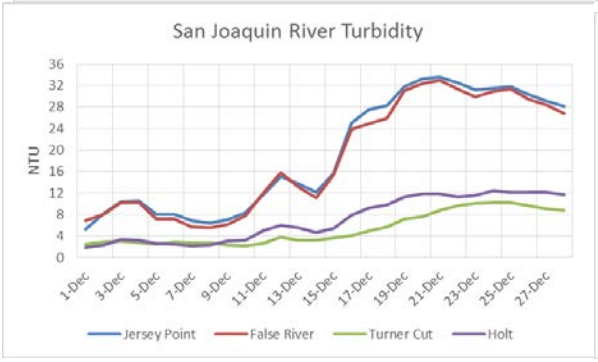


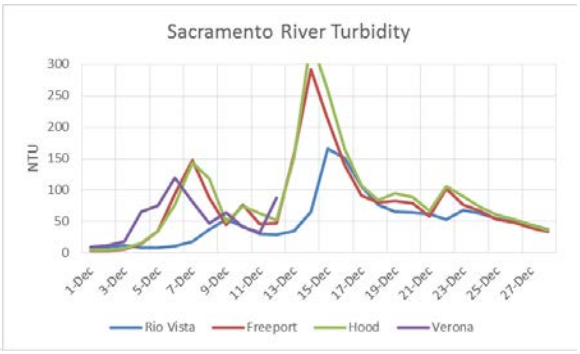


- Turbidity:









2. **Delta Fish Monitoring:**

The December Fall Midwater Trawl has completed sampling and data is being quality-checked. The preliminary reported Delta Smelt catch for the month of December is 3. One Delta Smelt was caught at the confluence, while the other two were caught in the North Delta and will not likely contribute to the FMWT Annual Index. The Spring Kodiak Trawl shadowed the FMWT on December 8 through 10. The shadow trawl captured 25 Delta Smelt mostly from 5 stations in the Lower Sacramento River (n=23), with a53-68 mm size range (average just under 60 mm). Three replicate tows were completed at stations 508 (n=1), 711 (n=1), and 809.

The December SKT #12 was in the field the week of December 15. A total of 28 Delta Smelt were collected. One Delta Smelt was collected at station 815 (Prisoner's Point), while the remainder of the catch was away from the central and south Delta (most from the lower Sacramento River stations). Delta Smelt ranged in size from 52 – 65 mm, with an average length of just larger than 60 mm.

The Service's Early Warning Study reported Delta Smelt catches at Jersey Point and Prisoner's Point. Delta Smelt catch data from the Early Warning Study is as follows:

12/23 Old River 1 (4 tows) = 0 Delta Smelt
12/24 Prisoner's Point (15 tows) = 1 Delta Smelt
12/25 Jersey Point (11 tows) = 23 Delta Smelt
12/26 Prisoner's Point (15 tows) = 3 Delta Smelt
12/27 Jersey Point (15 tows) = 12 Delta Smelt
12/28 Prisoner's Point (15 tows) = 2 Delta Smelt

3. **Salvage:**

No Delta Smelt or Longfin Smelt have been observed in salvage counts during WY2015. Salvage counts have been reduced to 10 minutes per 2 hours as of 12/23 (normal protocol is 30 minute counts every two hours), due to high debris loads coming into the facility.

4. **Expected Project Operations:**

Combined SWP/CVP exports today are 5750 cfs today and going to 6150-6250 cfs by tomorrow. The CVP is anticipated to remain steady for the week; however the SWP could increase pumping again as early as December 31. Operators indicated they have voluntarily agreed to maintain OMR flows to keep turbidity out of the south Delta. Qwest is anticipated to become more negative as the week moves forward. Operators indicated that the Index OMR value was anticipated to be -5000 to -5500 cfs in response to today and tomorrow's pumping level, and could potentially be more negative in response to any potential increases in pumping on or after December 31.

5. **Delta Conditions Team:**

The Delta Conditions Team (DCT) did not meet on Friday, 12/26. The DCT charge has not been finalized. A turbidity map was provided to the Working Group on 12/29, and is attached here.

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 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 SWG can recommend a delayed start or interruption based on other conditions such as delta inflow that may affect vulnerability to entrainment." (page 281).

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).

Discussion:
The Working Group reviewed and discussed all relevant data from Delta monitoring, salvage, field surveys, and planned Project operations, with specific focus on the updated Early Warning Survey catch data from Jersey Point and Prisoner's Point, spring Kodiak trawl (SKT) data, and current Delta conditions, including south and central Delta turbidity.

Turbidity in the central Delta remains relatively high, especially in the mainstem San Joaquin River. A few stations in the downstream portions of Old and Middle Rivers indicate that higher turbidities have encroached into portions of the south Delta (OBI and HLT). Stations well into the south end of the south Delta remain relatively clear (OH4 and MDM). From observed turbidity data, it appears that in the Old River corridor, higher turbidities have encroached into the Bacon Island area, with lower turbidities occurring further upstream at Hwy 4. High winds are anticipated later this week, which could potentially increase turbidity in the Old and Middle River corridors. Members are concerned about the elevated levels at Bacon Island, indicating that the further into the south Delta turbidity is pulled, the more likely that Delta Smelt will be entrained. Members agreed that recent Delta Smelt distribution and turbidity data indicate that Delta Smelt are likely in the northern end of Old and Middle River corridors (associated with the higher turbidity field); therefore, the probability for entrainment has increased. If

these fish spawn in these corridors, the group was concerned over what this will mean for entrainment farther into the season.

The Special Survey results were discussed. In particular, the high levels of catch at Jersey Point over the last week as well as the sustained low levels of catch at Prisoner's Point. The Working Group agreed that the results indicated both a robust presence of Delta Smelt in the central Delta (although members were unsure what proportion of the population these fish represent) and that fish are continuing to migrate causing an increased vulnerability of entrainment. Additionally, members indicated the challenge of using these results to compare with other studies and with only one year of previous catch for Jersey Point, and no previous year's record for Prisoner's Point.

January 2013 SKT results were briefly discussed. Jersey Point catch in 2013 averaged approximately 9 fish per tow. So far in WY2015 catch rates at Jersey Point have been lower. Also, recent WY2015 Jersey Point SKT catch rates have been generally lower than those observed in the lower Sacramento River.

Overall length frequency of Delta Smelt from this season's field surveys indicate that this year's Delta Smelt are relatively small and in poor condition, likely due to stressors in the system, including drought. The final 2014 FMWT Index is not final, however the FMWT catch suggests very low annual FMWT index of relative abundance, and thus a very low incidental take level.

High debris load has negatively impacted salvage efficiency. The reduced salvage counts at the CVP reduce the already low probability of detecting in salvage operations any Delta Smelt entrained in the south Delta. The Working Group therefore indicated that pumping operations may have entrained Delta Smelt into the south Delta and into the pumps, even though fish have not yet been detected in salvage. The Working Group agreed that should any Delta Smelt be detected in salvage operations, OMR flow should be made significantly more positive as quickly as possible to avoid a larger salvage event, bearing in mind that this year's take allowance is likely to be among the lowest on record.

The Working Group discussed RPA Component 1, Actions 1 and 2. Members generally agreed that the greatest value for implementing Action 1 has passed. The Working Group agreed that although Action 1 was not formally implemented, the voluntary reduction in water operations designed to manage turbidity partially satisfied the intent of Action 1. The group agreed that adult Delta Smelt currently are at an elevated risk for entrainment and that the Service should begin implementing Action 2 immediately. The Working Group agreed that OMR flow should not be allowed to become more negative than -5000 cfs, although some members indicated -5000 cfs was not sufficiently protective (OMR flow should be more positive than -5000 cfs). Members indicated that the goal of pumping should be to maintain a level that minimizes turbidity in the Old River and Middle River corridors in order to keep fish in the mainstem lower San Joaquin River from migrating out of the mainstem and into the south Delta. Members indicated should turbidity rise to 10 NTU at the OH4 or MDM stations, OMR flows would need to become significantly more positive to avoid drawing that turbidity to the export pumps and likely triggering a salvage event. Members indicated waiting until these stations reach 12 NTU would not adequately protect Delta Smelt from entrainment, as by that time, the probability for a salvage event would be increased. This reasoning is based on the entrainment scenario that occurred in December 2012, which occurred prior to south Delta turbidities reaching 12 NTU.

The Working Group additionally agreed that should turbidity levels increase at OH4 or MDM to 10 NTU

or if any salvage of Delta Smelt occurs, OMR flows should be limited to no more negative than -2000 cfs. The group noted that as we are early in the Delta Smelt season, any actions taken now can greatly impact the species (and entrainment) later in the year.

The Working Group will continue to monitor conditions and smelt distribution and will meet again on Monday, January 5, 2015.

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

Advice for week of December 29, 2014:
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 the meeting occurred prior to the concern period, which begins 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 (>=80mm) 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 28, 2014, no Longfin Smelt have been salvaged for the water year. The interim Longfin Smelt adult salvage threshold for advice is > 45 (see criterion in #1 above), which is based on a combined September and October Fall Midwater Trawl Longfin Smelt index of 9. This advice criterion will be revised up when November and December indices are calculated and included in the annual index. No advice is warranted based on this criterion.

2. December 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. Recent catches from the Chipps Island trawl suggested that spawning movement into the western Delta is currently ongoing. Distribution information does not indicate advice is warranted based on this criterion.

3 & 4. No larval distribution information is available yet. The first Smelt Larva Survey (SLS) of 2015 will be conducted beginning January 5th.

5. The criterion does not take effect until January 15, and the water year classification as of January 1 2015 will be a determining factor.

Current conditions: Sacramento River flow decreased below 29,000 cfs at Freeport on December 28 and will continue to decline. X2 declined to about 58 km and has started back upstream, reaching about 61 km on December 28. Combined State and federal exports have been steady at 5,750 cfs, but are scheduled to increase starting today and will target -5,000 to -5,500 OMR. Qwest has been low but positive recently; however, it is expected to go slightly negative this week as river flows decline and exports increase.

Summary of Risk:
Risk of entrainment is very low, but this could change at any time with an influx of Longfin Smelt into the central and south Delta. The risk of entrainment is low when X2 remains low (<70 km), which has recently been the case.

The absence of adult Longfin Smelt in salvage samples, and in the San Joaquin River or central Delta fish surveys (FMWT sampling; SKT trawls) to date suggests few fish have moved into the central or south Delta for spawning. Recent past conditions, particularly the less negative OMR and the positive Qwest values, represent a much-reduced risk for fish that do move into the central Delta. However, Qwest will turn negative this week and OMR is likely to remain near -5,000, posing some risk to fish entering the south Delta. Yet overall risk remains very low because the recent past and current location of X2 down to 61 km likely reduced the number of Longfin Smelt migrating into the central Delta.