SMELT WORKING GROUP

Monday, December 22, 2014

Meeting Summary:

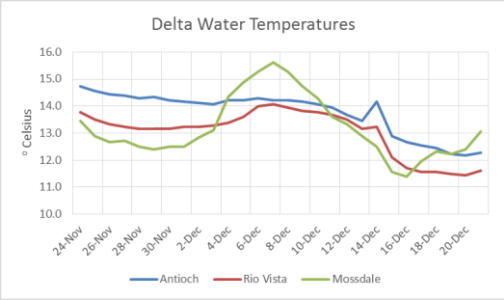
The SWG made no recommendation for a change in projected operations, which were reported to target an OMR of no more negative than -5000cfs for the week. The SWG also agreed that if OMR flows become more negative than -5000cfs, the SWG would need to reconvene to discuss Delta Smelt entrainment risk. The SWG agreed that the voluntary cutbacks in exports that occurred last week through this past weekend were successful in preventing turbidity from being drawn into the south Delta, and likely reduced overall Delta Smelt entrainment risk. The Service also posed a specific question to the SWG for consideration.

The Working Group will continue to monitor Delta Smelt survey and salvage data, and Delta conditions and will meet again Monday, December 29, 2014.

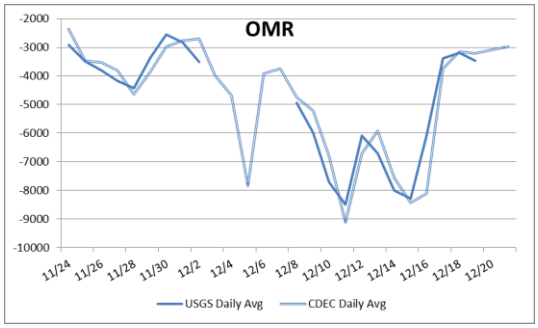
Reported Data:

1. **Current environmental data:**

- Water Temperatures are as follows:

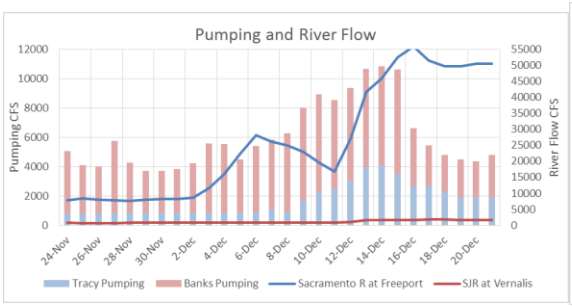


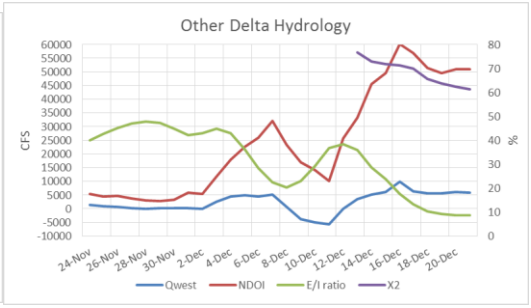
- OMR Flow: USGS tidally-averaged daily OMR as of December 19 is -3473 cfs. CDEC daily OMR flow as of December 21 is –2968 cfs



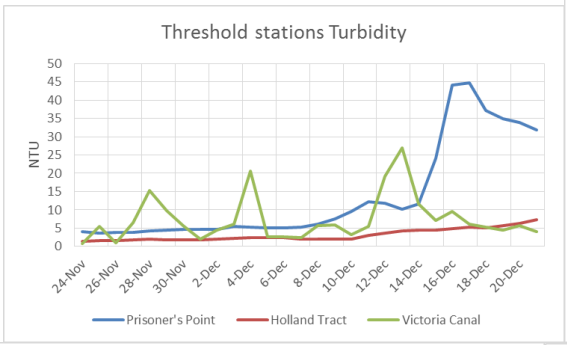
- River Flows: Sacramento River inflow is 50,514 cfs and San Joaquin River is 1619 cfs. X2 calculation from CDEC is 61.25km. The graphs below show the most recent trends in

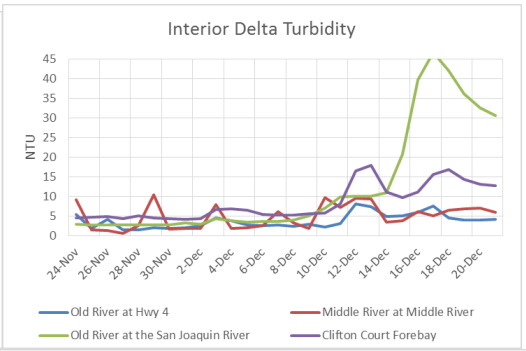
Delta hydrology and water quality that were evaluated by the Working Group

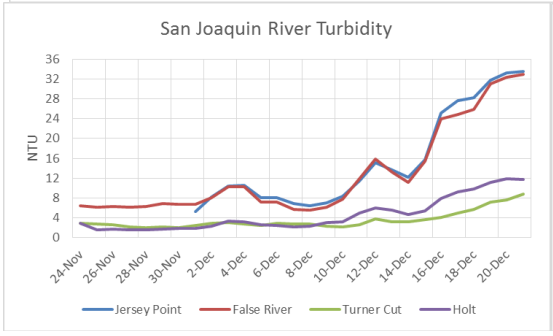


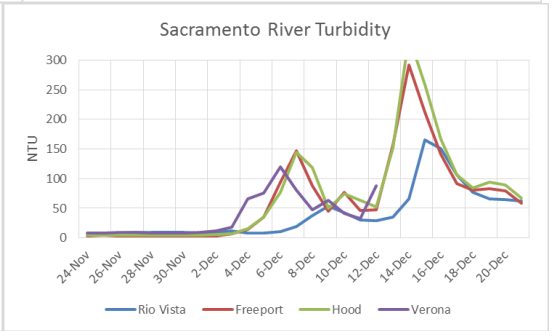


- Turbidity:









2. **Delta Fish Monitoring:**

The December Fall Midwater Trawl has completed sampling and data is being quality-checked. The preliminary 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), and sizes ranged from 53-68 mm (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 last week. 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. For the previous seven days, the Delta Smelt catch data from the Early Warning Study are as follows:

12/15 Jersey Point=17 Delta Smelt
12/16 Prisoner's Point=3 Delta Smelt
12/17 Jersey Point=13 Delta Smelt
12/18 Prisoner's Point=1 Delta Smelt
12/19 Jersey Point=13 Delta Smelt
12/20 Prisoner's Point=0 Delta Smelt
12/21 Jersey Point=1 Delta Smelt

3. **Salvage:**

No salvage has occurred for either Delta Smelt or Longfin Smelt for WY2015. Salvage has returned to normal protocols as of 12/16, with 30 minute counts every two hours. However, the TFCF operators have performed briefly some debris management procedures on the primary louver system that may also reduce the salvage efficiency.

4. **Expected Project Operations:**

Combined SWP/CVP exports today are 5000 cfs today and going to 5800 cfs by tomorrow. This level of pumping is anticipated through this week, with some slight adjustments possible to maintain an OMR flow of no more negative than -5000 cfs. Operators indicated they have voluntarily agreed to maintain OMR at no more negative than -5000 cfs for this week. Qwest is anticipated to become less positive, but will remain positive or approach zero in response to this pumping rate. Operators indicated that the Index OMR value could potentially be more negative than the observed value this week due to the tidal cycle of draining the Delta is beginning this week.

5. **Delta Conditions Team:**

The Delta Conditions Team (DCT) met on Friday, 12/19. The DCT charge has not been finalized. Turbidity forecast modeling and updated (12/22) turbidity map was provided to the Working Group, and is attached here. The turbidity forecast modeling results assumed exports through January 7th to target OMR flows at -4000 cfs.

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).

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, while stations in the south Delta remain at or below 7 NTU. From observed turbidity data, it appears that in the Old River corridor, higher turbidities remain north of the Frank's Tract area and lower turbidities are occurring south of Frank's Tract.

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.

The Working Group agreed that the voluntary reductions in pumping, resulting in a less negative OMR flow appears to have been successful in maintaining low turbidity in the south Delta.

Some members pointed out that hydrology will degrade if we do not experience significant rainfall this week (the forecast calls for dry conditions), and could result in a hydrology that would not be as protective of Delta Smelt as experienced last week.

The Working Group agreed that Delta Smelt likely are early in the spawning migration. Historically, mid-December is early for spawning migration, with a peak in movement occurring later in the month. Therefore, the Working Group anticipates that a substantial number of Delta Smelt have yet to begin migration.

The Working Group agreed that OMR flow should not be allowed to become more negative than -5000 cfs. Some members indicated a more positive OMR would provide more suitable protection for the species, with some members indicating the Service should still consider implementing Action 1 of the BiOp. There was agreement that OMR flow should be monitored closely for this week. Members indicated that the goal of pumping should be to maintain a level that limits higher turbidity to the lower San Joaquin River and not south of Frank's Tract on the Old River corridor in order to keep fish in the lower San Joaquin River in the mainstem.

The Working Group agreed that the current Qwest would assist in lowering the risk of entrainment, but as Qwest approaches zero, which is expected this week, that benefit will be less effective. Members stressed the importance of maintaining a positive Qwest.

Members stated that with increasingly negative OMR flows, fish that may have been entrained into the south Delta during the period of high exports a couple weeks ago may now be drawn into clear water conditions and those fish would be subject to a high risk of predation. In addition to the increased predation risk, the impacts of debris load on salvage efficiency last week and so far this week likely reduced 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 Service requested that the Working Group discuss and respond to one question designed to inform the Service in its decision-making process with regard to Delta Smelt entrainment risk:

> Given that the water projects have voluntarily reduced operations to result in OMRs of -4000 cfs last week and -5000 cfs this week, how do you think this is working?

The SWG agreed that it is early to discuss how protective the voluntary cutback was, or what the overall effect on Delta Smelt will be. However, the SWG also agreed that the voluntary cutbacks, which coincided with the increases in Delta Smelt catches in the Early Warning survey, were successful in maintaining turbidity out of the interior Delta, and reduced the overall Delta Smelt entrainment risk.

The Working Group stressed the importance of having data from the Early Warning Study so far this year. Members indicated this data has proved highly useful in our discussion of risk of entrainment. The Working Group would like this survey to continue for the near future.

The Working Group indicated that should either the observed OMR flow or Index value OMR become more negative than -5000 cfs, they would need to meet again to discuss risk of entrainment. Thursday and Friday of this week are federal holidays, which could complicate matters if a meeting is warranted on either of those days.

The Working Group will continue to monitor conditions and smelt distribution and will meet again on Monday, December 29, 2015.

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

Advice for week of December 22, 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 21, 2014, no Longfin Smelt has 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. It will be revised up when November and December indices are calculated and included. 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. Catches from the Chipps Island trawl suggested that spawning movement is currently ongoing. 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 5th.

5. Too early for water year classification.

Current conditions: Sacramento River flow increased to over 45,000 cfs at Freeport on December 14 – exceeding 55,000 on the 16th then declining to 50,000 on the 18th, and then remaining at that that approximate level until the 21st. X2 has continued to decline and was about 61 km today. Combined State and federal exports have decreased since December 15, but are scheduled to increase starting today and will target -5,000 OMR. Qwest was positive on December 14th at +5,146, but is expected to decrease this week, and approach zero by the end of the week. Daily OMR reached levels more negative than -8,000 about December 15, but rapidly became less negative until December 18 when levels approached -3,000.

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 declines as X2 moves downstream, 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. Current 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. The current location of X2 down to 61 km likely reduced the number of Longfin Smelt migrating into the central Delta. Enhanced "early warning sampling" comprised of Kodiak trawling daily with sampling (15 tows) alternating between Jersey Point and Prisoners Point may detect Longfin Smelt migrating upstream, particularly if they are "tidally surfing" and relatively high in the water column on flood tides (i.e., susceptible to Kodiak trawling).