

Smelt Monitoring Team
Tuesday, April 21, 2020
11:00 AM – 12:00 PM

Executive Summary:

- A. OBI will not reach 12 ntu's
- B. One larval Delta Smelt (12 mm) was salvaged on April 13th at the Tracy Fish Collection Facility. This fish represents Delta Smelt in the entrainment zone.
- C. WY2020 has seen Delta Smelt in the north, and west Delta, Sacramento River, and the Sacramento Deep Water Ship Channel.
- D. No action needed to reduce entrainment, as OMR is projected to be less than the most protective levels identified in the ITP.

1. Introductions

2. Relevant Actions and Triggers:

Currently under larval and juvenile Delta Smelt protection of 2019 Biological Opinion:

“Reclamation and DWR to manage exports to limit entrainment to be protective of larval and juvenile Delta Smelt on or after March 15 of each year, if QWEST is negative, and larval or juvenile Delta Smelt are within the entrainment zone of the pumps based on real time sampling of spawning adults or young of life stages...

Reclamation coordinated with the Service on the Life Cycle Model entrainment module and proposes to operationalize results through the management of OMR reverse flows. When the secchi depth in the south Delta is less than one meter as determined by the weekly assessments based on EDSM and other available data, Reclamation will operate to OMR no more negative than 3,500 cfs. When the secchi depth in the south Delta is greater than 1 meter, Reclamation and DWR will operate to OMR no more negative than -5,000 cfs.”

Currently under the Incidental Take Permit for Long-Term Operation of the State Water Project in the Sacramento-San Joaquin Delta (2081-2019-066-00) (relevant actions and triggers below):

Onset of OMR management 8.3: From onset of OMR Management (initiated as described in 8.3.1 through 8.3.3) to the end (8.8) Permittee shall maintain a 14-day average OMR index no more negative than -5000 cfs, except during OMR Flex operations (8.7) or if a more positive OMR index is required.

Longfin Smelt larvae and juvenile protections 8.4.2:

- 1. Detections at 4 of the 12 SLS/20-mm stations in south and central Delta, or,
- 2. Catch per tow > 5 at 2 of the 12 SLS/20-mm stations

High flow off-ramp for Longfin Smelt 8.4.3: OMR management for LFS as described in 8.4.1 and 8.4.2 are not required, or would cease if previously required, when river flows are >55,000 cfs in the Sacramento River at Rio Vista or >8,000 cfs in the San Joaquin River at Vernalis. If flows subsequently drop <40,000 cfs in the Sacramento River at Rio Vista or <5,000 cfs in the San Joaquin River at Vernalis, the OMR limit previously required as a part of 8.4.1 and 8.4.2 shall resume.

Delta Smelt larvae and juvenile protection 8.5.2: Cumulative 5 day salvage ≥ 1 + average of 3 years' prior FMWT indices (rounded down), Permittee shall restrict south Delta exports for 7 consecutive days to maintain a 7 day average OMR index no more negative than -5,000 cfs. If 5 day cumulative salvage threshold is met or exceeded, SMT should immediately convene to conduct a risk assessment (8.1.5.2) and determine future risk of entrainment and take of larval and juvenile DS. SMT may provide advice to further restrict south Delta exports to maintain a more positive OMR than -5000 cfs.

End of OMR management 8.8: OMR Management season through June 30, or until the species-specific off-ramps occur. LFS and DS offramp- Daily mean water temperature at Clifton Court (CCF) > 25°C for three consecutive days.

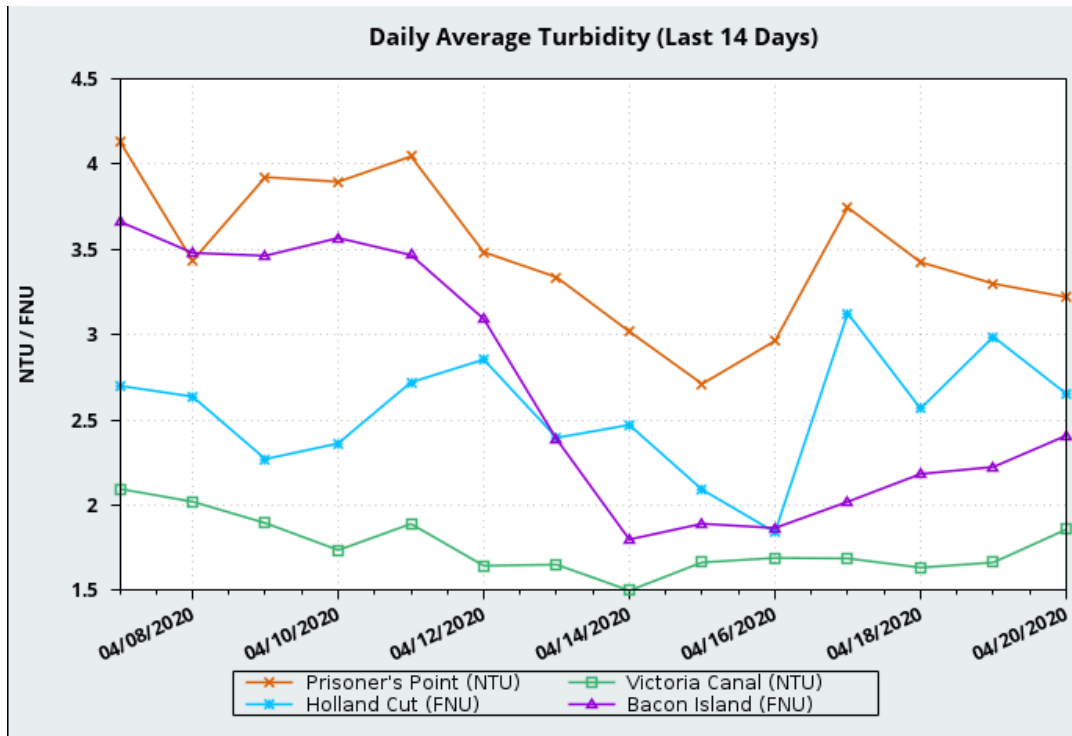
3. Operations

Tributary/Division	Projected Intended Operations and Ranges for week
Clear Creek	Whiskeytown Release: 200 cfs
Sacramento River	Shasta Storage: 3.75 MAF Total Release to Sacramento: 7,000 cfs to 10,000 cfs (Releases are made to support observed legal diversion demands on the Sacramento River in addition to Delta demands)
Feather River	Oroville Storage: 2.44 MAF Total Release to Feather: 1,550 cfs to 2,000 cfs

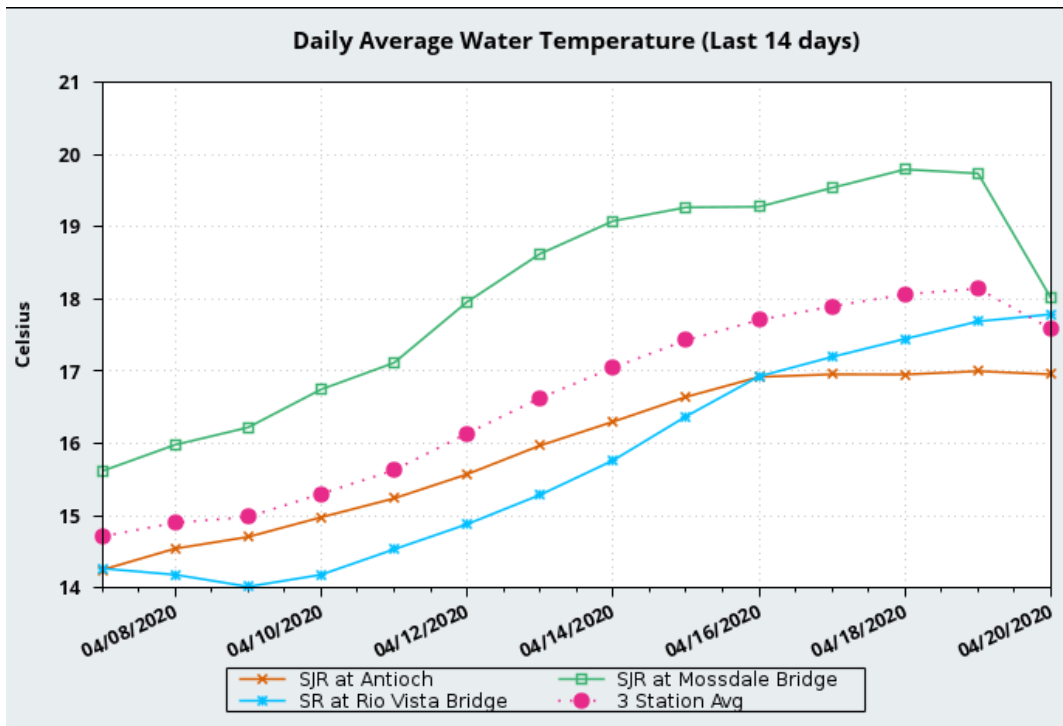
American River	Folsom Storage: .63 MAF Total Release to American: 1,000 to 1,500 cfs
Stanislaus River	New Melones Storage: 1.91 MAF Total Release to Stanislaus: 400 cfs to 1,500 cfs (Spring Pulse Flow)
Delta	Freeport: 9,000 to 11,000 cfs Vernalis: 1,500 to 3,000 cfs Delta Outflow index: 8,000 to 10,000 cfs Combined Exports: 1,500 to 3,000 cfs JPP: 800-2,700cfs CC: 200-1,500 cfs Expected OMR Index Values: -1,000 to -2,000 cfs (Max.: -5,000 cfs) X2 position: 74 to 81 km QWEST: +1,000 cfs to +2,000 cfs DCC: Closed

Review of Environmental Conditions:

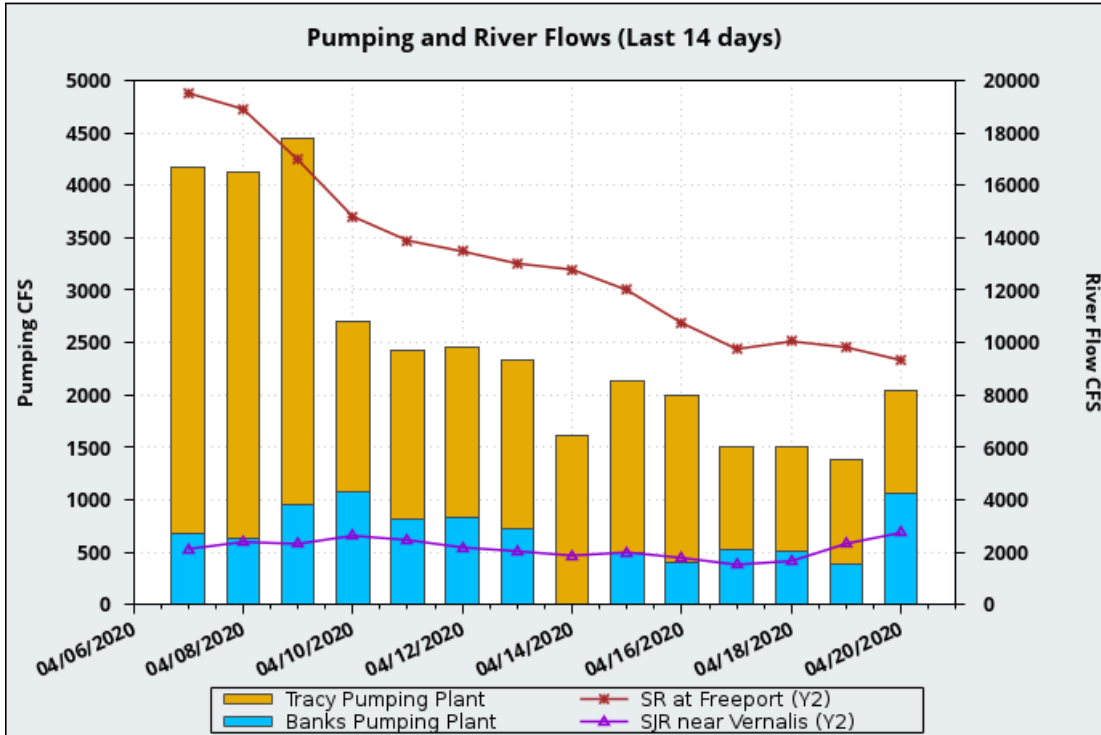
Turbidity:



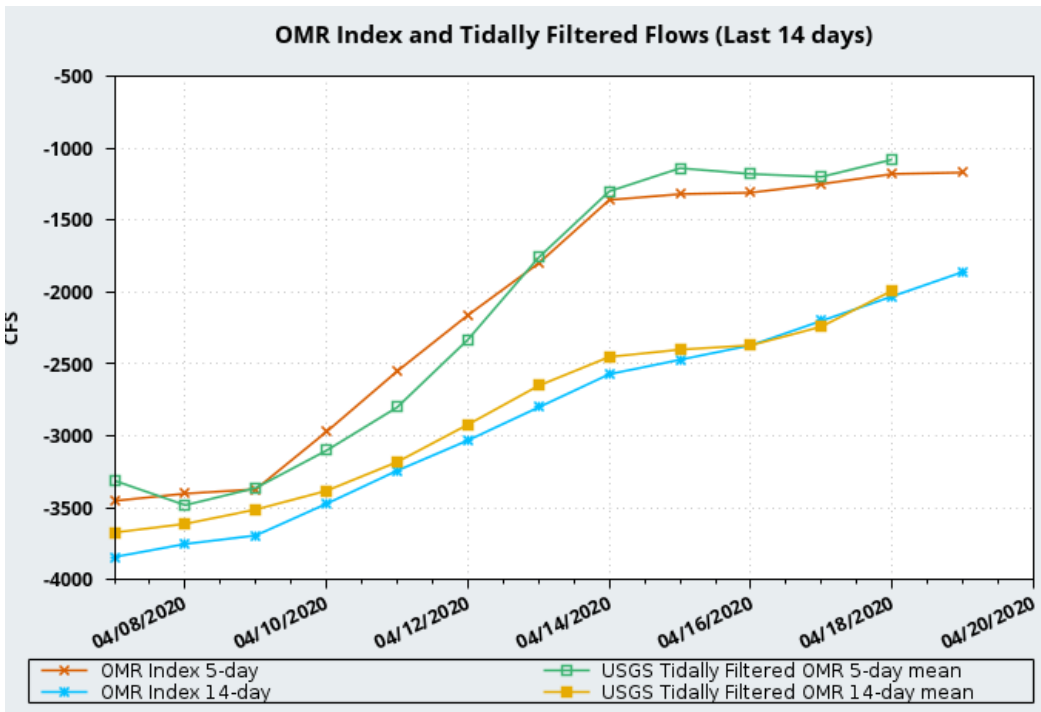
Temperature:

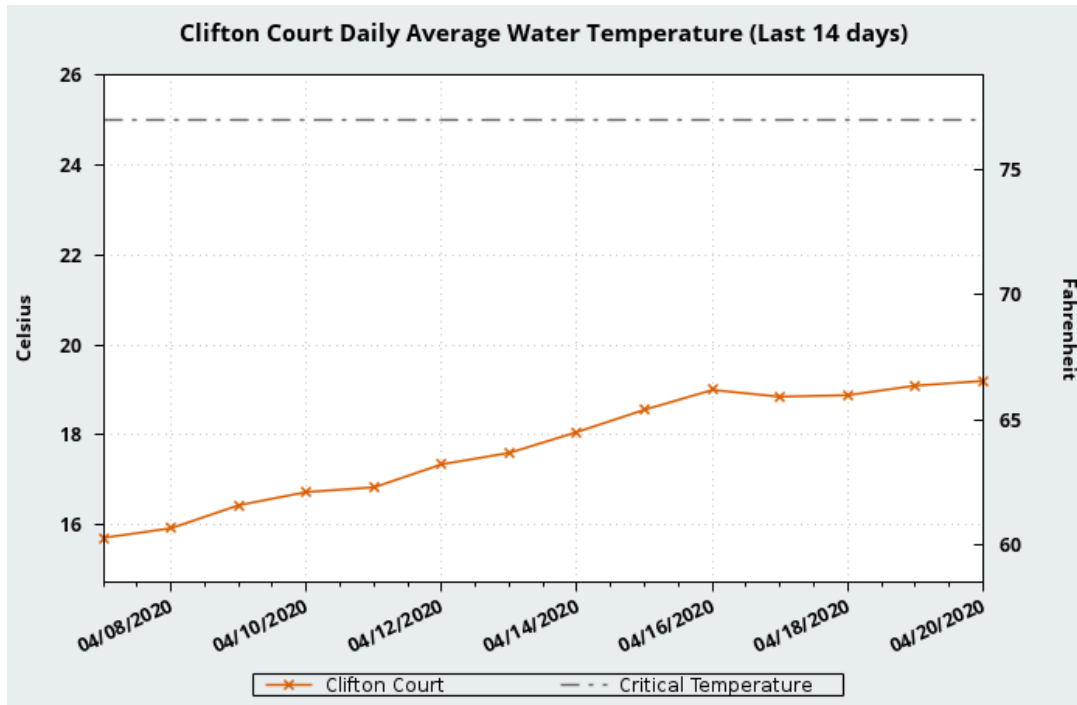


Pumping and Flows:



OMR Flows:





- As of April 13, the 3-station daily average temp: 17.59 °C
- Daily average Turbidity at OBI on April 5 = 2.41 NTU; Current turbidity = 1.80 NTU
- Clifton Court daily average: 19.20 °C; 66.56 °F (0 days over 77 °F, so not triggered)
- Forecast for Antioch: sunny to partly cloudy, no precipitation in next 7 days

The data presented for conditions was accessed via SacPAS:

http://www.cbr.washington.edu/sacramento/data/delta_smelt.html

4. Fish Abundance, distribution, and lifestage:

A. Survey Updates:

- **20 mm survey 1** (completed in Mid-March): processing almost complete; 18 samples from 7 stations remain to be identified
 1. No delta smelt
 2. 284 (6-29mm) Longfin -- 29 in Central and South Delta (10% of current ID'd catch)
- There was no **20 mm Survey 2**
- **20mm Survey #3** April in the field 13-15 sampled for -- only sampled 12 priority stations in south and central Delta and San Joaquin).
 1. No Delta Smelt; 1 longfin at Station 809 (15mm)
- April 27-29 will be in the field for **20mm Survey 4** – again will sample just south and central delta stations
- **-EDSM Week 18:**
- Finished 3rd week larval sampling last week

- 84,286 larval sampling abundance report estimate for week 2 (not specific to life stage; looking at all Delta Smelt)
- All samples prior to last Monday have been processed; still processing samples from after last Monday?
 1. 4/15, 1 Delta Smelt (15mm) in Upper Sac Shipping Channel (NOTE: Still defined as a larvae up to 20mm)
 2. 4/16, 6 Longfin Smelt in Suisun Marsh (8.3-22.6 mm)
- Note: the daily and weekly EDSM reports are found on the USFWS Lodi website: https://www.fws.gov/loidi/juvenile_fish_monitoring_program/jfmp_index.htm.

B. Salvage Monitoring:

- a. Reporting Salvage results from 4/13-4/19 + the results from yesterday
- b. Delta Smelt: one larvae last Monday (4/13) at CVP facility, none since then
- c. Longfin Smelt (seeing larval and juvenile)
 - i. SWP Facility: 42 salvage (on 4/13, 4/17, 4/18, 4/19)
 1. Encountered larvae on 4/13
 2. Cumulative for SWP: 42
 - ii. CVP Facility: 970 salvage
 1. Encountered larvae on every day in the period except 4/17, 4/19, 4/20
 2. Cumulative for CVP: 1170
 - iii. Cumulative salvage for SWP + CVP: 1,212?

5. Evaluation:

A. Is OBI turbidity likely to exceed 12NTU during the next week? What conditions are likely to create this turbidity event?

Group consensus: Turbidity at OBI is not expected to exceed 12NTU in the next week. Daily average turbidity at Old River Bacon Island (Station ID: OBI) on 4/20/2020 was 2.4 FNU. The weather forecast does not predict a precipitation events in the next seven days. North winds are forecast for Thursday and Friday but are not expected to have a major influence on turbidity.

Discussion:

- Group generally agrees with drafted response. Light north winds are forecasted for Thurs and Friday but should not be strong enough to generate much turbidity.
- *Discussion:*
 - Clifton Court station (CLC) has been detecting a lot of spikes since April 11 above 12 NTU; there could be some remnants of previously entrained delta smelt into the south Delta that could be detected
 - Q: Would turbidity decrease visibility and therefore increase amount of fish as salvage at state facility?

- a. Yes, that's what would be expected.
2. These levels of turbidity are not observed at other south Delta stations so CLC turbidity itself probably would not attract fish to Clifton Court from other areas but higher CLC turbidity could reduce predation for any fish already there or in the vicinity of Clifton Court.

B. After March 15 and if QWEST is negative, are larval or juvenile Delta Smelt within the entrainment zone of the CVP and SWP pumps based on surveys?

- *Group Consensus:* Larval Delta Smelt have been detected in the West Delta and Sacramento Deep Water Ship Channel. The West Delta and Deepwater Ship Channel are outside of the entrainment zone of the CVP and SWP pumps. However, the larval Delta Smelt observed at the CVP's Tracy Fish Collection Facility (TFCF) on 4/13/2020 implies larval delta smelt may be present in the entrainment zone. Since this detection, no other larval, juvenile, or adult Delta Smelt have been seen in the entrainment zone of the CVP and SWP pumps. In the Operations Outlook, QWEST continues to be predicted to be positive between 1,000 and 3,000, and OMR Index Values are predicted to be between -1,000 to -2,000 cfs.

Discussion:

- Based on detection of larval delta smelt on 13th, delta smelt are in entrainment zone.
- As discussed before, absence of detection doesn't mean they are not in the region, especially given the lack of EDSM sampling in the south Delta and general lack of surveys in this area.
- Delta smelt have been detected in south, west Delta and Sacramento Deep Water Ship Channel.

C. What is the OMR level to manage the annual larval entrainment based on DSM recruitment level from the FWS LCM? How does this information from the real-time spatial distribution of DSM operationalize the LCM?

-*Group Consensus:* Based on the life cycle model, low South Delta turbidity, and the limited observations of larval and adult Delta smelt, Reclamation identified an OMR more positive than -5,000 should be used for export management. Based on surveys, larval and adult Delta Smelt have been observed in the TFCF, west Delta, north Delta, and Sacramento Deepwater Ship Channel, suggesting the spatial distribution of Delta Smelt extends into the larval entrainment zone of the CVP and SWP pumps, which extends into Franks Tract under the OMR conditions in the Operations Outlook. OMR levels are projected to be more protective than the levels identified in the LTO Action and USFWS BiOp.

Discussion:

- If there are issues with this question, we'd like to solicit feedback on how to change it.
- Regarding response:
 - Recruitment prediction is highly uncertain and difficult to estimate from the field (surveys targeting larval/juvenile delta smelt began just in the last few weeks). s a precise answer based on the fact that .
 - The LCM was not designed to be used for real time decision-making and the above question implies otherwise.
 -
 - An OMR of - 5000 is too negative given detection of smelt and all the longfin salvaged at much less negative OMRs; -5000 would not be protective at all.
 - -5000 comes from BiOp; -5000 with clear water is assumed protective; if trigger some of turbidity conditions, -3500. But not making any recommendation here because OMR levels are more positive than that lower.
 - Current regulations are not written in a way that allows the SMT to recommend an OMR level deemed protective by the SMT.
- Re question:
 - The question does not capture the real concern the group has.
 - Concern is that the model is based on 2 month average for larvae; can't take a smaller subset of that time and apply it; the model does not operate on the time scale we are trying to use it on
 - The 20 mm index, if computed this year, will not be available until after the SMT meetings are completed for this water year. Need to consider more carefully what the LCM can tell us.
 - Got clear direction from people who created it that it is not supposed to be used for real time decision-making which OMR management is
 - Still need to address the concern but maybe not using this LCM. Perhaps a LCM could be refined to more directly address SMT needs.

D. What do hydrodynamic models, informed by EDSM or other relevant data, suggest the estimated percentage of larval and juvenile DSM that could be entrained may be?

Group Consensus: Larval Delta smelt in the south Delta are at high risk of entrainment into the water export facilities. The expected OMR Index values are -1,000 to -2,000 cfs for the next week. PTM results suggest the <5% particles injected into the Central Delta could arrive at the CVP and SWP after 21 days and the modeled entrainment zone extends into Franks Tract under the OMR conditions in the Operations Outlook.

Discussion:

- Looking at station 815 – looks like less than 10 percent of particles have been resolved; high probability of them being stuck in the South Delta.
 - Would like to include the particles that are in the Old Middle River; they may not get to the pumps but they are still lost to the system.
 - Site 901 in Franks Tract – shows more particles could be entrained into the south Delta compared to sites 815 and 809.s. This suggest it is important to consider the path by which the fish enter the system. This is a cumulative process – accumulation of larval fish through combination of avenues and over time. Once the fish enter the south delta, they will not likely survive due to either poor abiotic conditions and/or predation.
- Earlier, mentioned Barker Slough operations; we don't have 20mm survey results to inform operations there; looked at historic and recent operations and they look similar – the 7 day average had just hit 60 cfs which is very close to the level we would require under the ITP if Delta Smelt were present at 716. Going to continue to monitor conditions there; if they change, will need to figure out another approach.
- larval survey completed 2 weeks ago, any sampling near Barker Slough?
 1. No did not sample on the Sacramento River.
 2. Maybe just monitor temperature and turbidity there? If we see conditions conducive to delta smelt being present, bring it back to the group for further discussion.

8. Additional Considerations

9. Next Meeting:

April 28, 2020 at 11:00am

Weekly Advice for Longfin Smelt

21 April 2020

Summary of Risk

Current Lifestage(s) in the Delta: Larvae and Juveniles

South Delta Entrainment Risk: High

Advice: Substantial entrainment of Longfin Smelt larvae and juveniles is currently occurring at the south Delta export facilities. Because of this, the Smelt Monitoring Team has determined that juveniles and larvae within the south and central Delta are at a high risk of entrainment. However, the State Water Project exports are currently limited due to Condition of Approval 8.17 (Export Curtailments for Spring Outflow). As a result, OMR is projected to be between -1000 cfs and -1600 cfs, which is roughly equivalent to the most protective levels identified in the ITP. Therefore, advice for this week will defer to the implementation of CoA 8.17.

Basis for Advice

The 2020 [Incidental Take Permit for Long-Term Operation of the State Water Project in the Sacramento-San Joaquin Delta 2081-2019-066-00](#) (ITP) states that advice to Water Operations Management Team (WOMT) shall be based the following Conditions of Approval.

Larvae and Juveniles

8.4.2 Larval and Juvenile Longfin Smelt Entrainment Protection. From January 1 through June 30, when a single Smelt Larva Survey (SLS) or 20 mm Survey (20 mm) sampling period exceeds one of the following thresholds:

- LFS larvae or juveniles found in four or more of the 12 SLS or 20 mm station in the central Delta and south Delta (Stations 809, 812, 815, 901, 902, 906, 910, 912, 914, 915, 918, 919), or
- LFS catch per tow exceeds five LFS larvae or juveniles in two or more of the 12 stations in the central Delta and south Delta (Stations 809, 812, 815, 901, 902, 906, 910, 912, 914, 915, 918, 919).

Permittee shall restrict south Delta exports for seven consecutive days to maintain a seven-day average OMR index no more negative than -5000 cfs. Permittee shall also immediately convene the SMT to conduct a risk assessment (see Condition of Approval 8.5.1.2) to assess the risk of larval and juvenile LFS entrainment into south Delta export facilities, determine if an OMR flow restriction is warranted, and recommend an OMR flow limit between -1250 cfs and -5000 cfs. The SMT risk assessment and operational advice shall be reviewed by WOMT (Condition of Approval 8.1.3) via the Collaborative Real-time Decision-making process (Condition of Approval 8.1.4). Permittee shall operate to the export restriction and OMR flow target approved through Conditions of Approval 8.1.3 and 8.1.4. Each week the SMT shall convene to conduct a new risk assessment and determine whether to maintain, or

offramp from, export restrictions based on the risk to LFS, or until the DS and LFS off-ramp has been met as described in Condition of Approval 8.8 (End of OMR Management).

From January 1 through June 30, DWR and CDFW SMT staff shall conduct weekly, or more often as needed, risk assessments (see Condition of Approval 8.5.1.2) to assess the risk of larval and juvenile LFS entrainment into the South Delta Export Facilities. As part of the risk assessment the SMT shall provide advice on the appropriate OMR flow targets to minimize LFS entrainment or risk of entrainment, or both. The SMT shall provide its advice to WOMT (Condition of Approval 8.1.3) and use the Collaborative Approach to Real-time Risk Assessment process described in Condition of Approval 8.1.4 to determine if OMR flow restriction is warranted and determine the OMR flow limit between -1250 and -5000 cfs. The OMR flow limit shall be in place until the next risk assessment conducted by the SMT determines that it is no longer necessary to minimize take or related impacts to LFS, or until the DS and LFS off-ramp has been met as described in the Condition of Approval 8.8 (End of OMR Management).

8.8 End of OMR management

Conditions of Approval in place to minimize take of Delta and Longfin Smelt shall remain in effect until June 30th or until daily mean water temperature at Clifton Court Forebay (CCF) is greater than 25°C for 3 consecutive days.

Discussion of Criteria

Larvae and Juveniles

8.4.2 Larval and Juvenile Longfin Smelt Entrainment Protection

Note: Regular field sampling has been disrupted due to precautions in place to prevent the spread of COVID-19. Distribution data is limited. 20 mm Survey 2 was canceled. 20 mm Survey 3 sampled the 12 south and central Delta stations listed in CoA 8.4.2.

SLS 6: (March 16 through 18) LFS larvae or juveniles were collected at 6 of the 12 relevant stations (809, 812, 815, 901, 902, 906). Catch per tow was greater than 5 at 3 of the 12 relevant stations (809, 812 and 901).

20 mm 1: (March 16 through 18) LFS larvae or juveniles were collected at 4 of the 12 relevant stations (809, 812, 815, 901). Average catch per tow was greater than 5 at 2 of the 12 relevant stations (809 and 812).

20 mm 3: (April 13 through 15) One LFS larvae (15 mm) was collected at station 809 in in the lower San Joaquin River. See attachment "2020_20mm_Sur3_SmeltCatch_041620.pdf" and the [20-mm webpage](#) for reported catch and more information.

Salvage: As of April 20, estimated juvenile Longfin Smelt salvage for WY 2020 was 1170 for CVP and 42 for SWP. LFS larvae were detected at the federal facility on the March 27, 28, 29, 30 and April 3, 5, 6, April 9 through 16 and April 18. One larval LFS was detected at the state salvage facility on April 1, three on April 10, and two on April 13. See the table below for a summary of salvage and larval detections

Estimated salvage and larval detections at SWP and CVP for Water Year 2020. Note: Larval detections are reported as presence only.

DATE	State Daily Salvage	State Season Total	SWP Larvae Y or N	Federal Daily Salvage	Federal Season Total	CVP Larvae Y or N
3/17/2020	0	0	NC	4	4	N
3/24/2020	0	0	N	12	16	N
3/25/2020	0	0	N	8	24	N
3/27/2020	0	0	N	0	24	Y
3/28/2020	0	0	N	4	28	Y
3/29/2020	0	0	N	0	28	Y
3/30/2020	0	0	N	0	28	Y
4/1/2020	0	0	Y	8	36	N
4/3/2020	0	0	N	0	36	Y
4/5/2020	0	0	N	0	36	Y
4/6/2020	0	0	N	4	40	Y
4/9/2020	4	4	N	4	44	Y
4/10/2020	0	0	Y	8	52	Y
4/11/2020	0	0	N	48	100	Y
4/12/2020	2	6	N	100	200	Y
4/13/2020	6	12	Y	311.8	511.8	Y
4/14/2020	0	12	N	118.6	630.4	Y
4/15/2020	0	12	N	156.0	786.3	Y
4/16/2020	0	12	N	208.0	994.3	Y
4/17/2020	8	20	N	84.0	1078.3	N
4/18/2020	14	34	N	80.0	1158.3	Y
4/19/2020	8	42	W	0.0	1158.3	N
4/20/2020	0	42	W	12.0	1170.3	N

8.8 End of OMR management. Daily average water temperature at CCF has not exceeded 25°C.

Current Conditions

As of April 20, 2020

Sacramento River flow at Freeport = 9500 cfs. San Joaquin River flow at Vernalis = 2740 cfs. X2 = 73 km. Qwest was approximately + 2200 cfs. Daily average OMR Index = -1400 cfs. Daily average water temperature at Clifton Court Forebay was 19.2°C.

Attachments

2020_20mm_Sur3_SmeltCatch_041620.pdf

Table 1. Delta Smelt and Longfin Smelt catch per station from 2020 20-mm Survey 3, which was in the field 4/13/2020 – 4/15/2020. Only the 12 priority stations in the south and central delta were sampled due to COVID 19. These data are preliminary and subject to change.

Year	Survey	Station	Date	# Tows Processes	Species	Total Catch	Min Length	Max Length	Avg Length
2020	3	809	15-Apr-20	3	Longfin Smelt	1	15	15	15.00
2020	3	812*	15-Apr-20	3	No Smelt Catch	0			
2020	3	815	15-Apr-20	3	No Smelt Catch	0			
2020	3	901	13-Apr-20	3	No Smelt Catch	0			
2020	3	902	13-Apr-20	3	No Smelt Catch	0			
2020	3	906	14-Apr-20	3	No Smelt Catch	0			
2020	3	910	14-Apr-20	3	No Smelt Catch	0			
2020	3	912	14-Apr-20	3	No Smelt Catch	0			
2020	3	914	14-Apr-20	3	No Smelt Catch	0			
2020	3	915	13-Apr-20	3	No Smelt Catch	0			
2020	3	918	13-Apr-20	3	No Smelt Catch	0			
2020	3	919	15-Apr-20	3	No Smelt Catch	0			

Central & South Delta

* Indicates reduced tow time