

# State Water Project Incidental Take Permit Risk Assessment for Delta Smelt and Longfin Smelt

## Section 1: Overview

**Date: December 29, 2020**

### **Life Stages Present:**

Delta Smelt: Adult

Longfin Smelt: Adult, Larvae

### **Advice to WOMT:**

No advice is warranted for south Delta or Barker Slough operations.

### **Risk Assessment:**

Risk of entrainment into the central and south Delta or into the export facilities in the south Delta is low for Delta Smelt and low to moderate for Longfin Smelt across the range of expected OMR Index levels.

*Delta Smelt:* Based on distribution patterns over the past decade and no recent detection data, Delta Smelt are unlikely to be prevalent in the South Delta. Limited detection data support Delta Smelt being present in Suisun Marsh and west of the Sacramento-San Joaquin confluence. High X2 position could mean the distribution of Delta Smelt extends further upstream of the confluence. Precipitation is anticipated but change to Freeport flows and turbidity are not expected to reach “First Flush” conditions within the next seven days. The likelihood of Delta Smelt adult entrainment is slightly elevated relative to the previous seven days due to the range of potential OMR values being more negative during the next seven days and seasonal timing. The overall probability of Delta Smelt moving into the south Delta is low. The projected OMR Index limits are at a level that is sufficiently protective and low turbidity creates an overall low likelihood of entrainment.

*Longfin Smelt:* Evaluation of recent catch data indicates that Longfin Smelt (LFS) larvae are present in the lower San Joaquin River near Jersey Point and that adults and age 1 individuals are present in Suisun Marsh and Bay. Particle Tracking Model (PTM) runs have been requested to inform risk of entrainment, however, an OMR more positive than -5000 cfs is generally considered sufficiently protective for larvae and older individuals in the lower San Joaquin River under most conditions. December SLS collected 3 larval LFS (Total Length = 7 mm, yolk sac present) at station 809 near Jersey Point on the lower San Joaquin River on 12/28/2020. Chipps Island Survey collected one adult LFS (FL = 114 mm) on 12/27/2020. EDSM collected 16 LFS (FL = 65 – 115mm) in Suisun Marsh on 12/28/2020 and on LFS (FL = 74 mm) in Suisun Bay on 12/24/2020. December FMWT reported four LFS with one collected in San Pablo Bay, one in Suisun Bay, one near Chipps Island and one in the lower Sacramento River. See section 4-B below for catch details.

### **Section 1-A: Sacramento River and Confluence**

Risk of entrainment into central Delta and export facilities for Delta Smelt and Longfin Smelt in Sacramento River (8.1.5.2 C ii, iii, iv)

- Exposure Risk:
  - Delta Smelt: Low
  - Longfin Smelt: Low
- Routing Risk:
  - Delta Smelt: Low
  - Longfin Smelt: Low
- Overall Entrainment Risk
  - Delta Smelt: Low
  - Longfin Smelt: Low

## Section 1-B: Central Delta

Risk of entrainment into the export facilities for Delta Smelt and Longfin Smelt in the central Delta

- Exposure Risk:
  - Delta Smelt: Low
  - Longfin Smelt: Low
- Change in exposure from previous week:
  - Delta Smelt: No change
  - Longfin Smelt: Slight increase in exposure associated with onset of hatching in the lower San Joaquin River
- Reporting Old and Middle River Index (OMRI) (*Number and range of OMRI bins will vary based on anticipated hydrology and operations*)
  - OMRI is approximately -2,500 cfs and projected to remain between -1,500 cfs and -5,000 cfs.
  - OMRI (Export Scenario OMRI = -2,500 cfs)
    - Delta Smelt: Low Risk
    - Longfin Smelt: Low Risk
  - OMRI (Export Scenario OMRI = -5,000 cfs)
    - Delta Smelt: Low Risk
    - Longfin Smelt: Moderate for fish in OMR corridor (for adults in proximity to Bacon Island, the risk is moderate. If larvae were present in the OMR corridor risk of entrainment is high, however, no larvae have been detected upstream of Jersey Point. For fish of all life stages in the main-stem San Joaquin River near Jersey Point, an OMRI of -5,000 cfs is considered protective)

## Section 2: 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:

*List relevant Condition of Approval number and title based on species/life stage, time of year, etc.*

### 8.1.5.2 Smelt Monitoring Team Risk Assessment

#### 8.3.1 Integrated Early Winter Pulse Protection.

Between December 1 and January 31 each year Permittee shall reduce south Delta exports for 14 consecutive days to maintain a 14-day average OMR index no more negative than -2,000 cfs, and convene the Smelt Monitoring Team within one day of triggering the following criteria:

- Three day running average daily flows at Freeport greater than, or equal to, 25,000 cfs, AND
- Three day running average of daily turbidity at Freeport is greater than, or equal to, 50 Nephelometric Turbidity Units (NTU), OR

- The Smelt Monitoring Team determines that real-time monitoring of abiotic and biotic factors indicates a high risk of DS migration and dispersal into areas at high risk of future entrainment.

After maintaining a 14-day average OMR index no more negative than -2,000 cfs for 14 days, Permittee shall maintain a 14-day average OMR index no more negative than -5,000 cfs, initiating the OMR Management season, until the OMR Management Season ends (Condition of Approval 8.8).

The Integrated Early Winter Pulse Protection Action may only be initiated once during the December 1 through January 31 time period each year.

### **8.3.3 Adult Longfin Smelt Entrainment Protection.**

After December 1, if an Integrated Early Winter Pulse Protection (Condition of Approval 8.3.1) has not yet been initiated, Permittee shall reduce south Delta exports to maintain a 14-day average OMR index no more negative than -5,000 cfs and initiate OMR Management (Condition of Approval 8.3) if:

- Cumulative combined LFS expanded salvage (total estimated LFS counts at the CVP and SWP salvage facilities beginning December 1 through February 28 exceeds the most recent Fall Midwater Trawl (FMWT) LFS index<sup>1</sup> divided by 10, OR
- Real-time monitoring of abiotic and biotic factors indicates a high risk of LFS movement into areas at high risk of future entrainment, as determined by DWR and CDFW Smelt Monitoring Team staff.

When evaluating the possibility of LFS movement into areas that may be subject to an elevated risk of entrainment, the Smelt Monitoring Team shall evaluate catch of LFS with fork length  $\geq 60$  mm by the Chipps Island Trawl (conducted by USFWS) as an early warning indicator for LFS migration movement into the Delta, in addition to other available survey and abiotic data. The Smelt Monitoring Team shall communicate the results of these risk assessments and advice to the WOMT (Condition of Approval 8.1.3), and operational decisions shall be made as described in Condition of Approval 8.1.4 (Collaborative Approach to Real-Time Risk Assessment).

### **8.4.1 OMR Management for Adult Longfin Smelt.**

From the onset of OMR Management (Condition of Approval 8.3) through February 28, the Smelt Monitoring Team shall conduct weekly, or more often as needed, risk assessments (see Condition of Approval 8.1.5.2) and decide whether to recommend an OMR flow requirement between - 5,000 cfs and -1,250 cfs to minimize entrainment and take of adult LFS. The Smelt

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<sup>1</sup> The Fall Midwater Trawl (FMWT) Survey annual abundance index for LFS is calculated as the sum of September through December monthly abundance indices and is typically reported at about the same date as adult salvage begins in December. The FMWT Index available beginning on December 1 each year shall be used to establish this threshold.

Monitoring Team may provide advice to restrict south Delta exports for seven consecutive days to achieve a seven-day average OMR index within three risk categories:

Low risk: OMR between -4,000 cfs to -5,000 cfs

Medium risk: OMR between -2,500 cfs to -4,000 cfs

High risk: OMR between -1,250 cfs to -2,500 cfs

If a risk assessment conducted by the Smelt Monitoring Team determines that a more restrictive OMR flow requirement is needed to minimize take of adult LFS, the Smelt Monitoring Team shall provide its advice to WOMT (Condition of Approval 8.1.3) and operational decisions shall be made following the process described in Condition of Approval 8.1.4 (Collaborative Approach to Real-time Risk Assessment).

This Condition will terminate when a high-flow off-ramp occurs (Condition of Approval 8.4.3), or when LFS spawning has been detected in the system, as determined by the Smelt Monitoring Team, or, if there is disagreement and resolution is not reached within WOMT, as determined by CDFW. The Smelt Monitoring Team shall consider results from Additional LFS Larval Sampling (Condition of Approval 7.6.1) to inform its assessment of the start of LFS spawning. After LFS spawning has been observed, Permittee shall implement Condition of Approval 8.4.2 to minimize take of larval and juvenile LFS.

#### **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 stations 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 -5,000 cfs. Permittee shall also immediately convene the Smelt Monitoring Team to conduct a risk assessment (see Condition of Approval 8.5.1.2) to assess the risk of larval and juvenile LFS entrainment into the South Delta Export Facilities, determine if an OMR flow restriction is warranted, and recommend an OMR flow limit between -1,250 and -5,000 cfs. The Smelt Monitoring Team risk assessment and operational advice shall be reviewed by the 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 Smelt Monitoring Team shall convene to conduct a new risk assessment and determine whether to maintain, or off ramp 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 Smelt Monitoring Team 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 a part of the risk assessment the Smelt Monitoring Team shall provide advice on the appropriate OMR flow targets to minimize LFS entrainment or entrainment risk, or both. The Smelt Monitoring Team 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 an OMR flow restriction is warranted and determine OMR flow limit between -1,250 and -5,000 cfs. The OMR flow limit shall be in place until the next risk assessment conducted by the Smelt Monitoring Team 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 Condition of Approval 8.8 (End of OMR Management).

#### **Discussion of Conditions of approval**

*Provide sentence or two addressing criteria for each Condition of Approval listed in “Basis for Advice” section. Refer to data below where appropriate.*

SMT will conduct weekly risk assessments as described in Condition of Approval 8.1.5.2.

8.3.1 Environmental conditions have not exceeded the thresholds identified in this condition. The SMT examined abiotic conditions and determined that risk is low for Delta Smelt.

8.3.3 No LFS have been salvaged this water year. The cumulative expanded salvage threshold is 2 based on the most recently available FMWT Index. The November Index, which was reported to the SMT via email on 11/25/2020, will be used until the annual index is finalized in late December or early January. The SMT examined abiotic conditions and determined that risk is low for Longfin Smelt. See section 4-B for the discussion of the FMWT Index.

8.4.1 This Condition of Approval begins with the onset of OMR management, which has not been triggered, and this condition terminates when spawning is detected in the system. The second December SLS survey detected larval LFS in the lower San Joaquin River on 12/28/2020 which terminates this Condition of Approval.

8.4.2 This Condition of Approval begins on January 1<sup>st</sup>, prior to the next SMT meeting. Data collected during the SLS survey 1, scheduled to start 1/11/2021, will inform this condition of approval.

## Section 3: Hydrology and Operations

Assessment of hydrologic, operational, and meteorological information. 8.1.5.2 A.

### Section 3-A: Water operations conditions. 8.1.5.2.A. i

- Antecedent Actions: (e.g. DCC gate closure and actions such as integrated early winter pulse protection, etc.)
  - DCC gates will remain closed for the remainder of the season (through May 20, 2021 per the PA description for DCC gate operations) but may be opened to maintain water quality during drought conditions for up to 5 days and for up to 2 events as per the PA in December and January.
  - Grantline Canal agricultural barrier was breached on 11/11/2020. The OMRI equation was adjusted accordingly to accommodate the change in barrier status.
- Controlling Factors: Water quality
- Water Temperature:
  - CCF = Not discussed (*Condition of Approval 8.8: Daily average temperature at CCF exceeds 25°C for 3 consecutive days*)
  - 3 Station Average = 9.99°C
- Tidal Cycle: Transitioning to a period of reduced tidal magnitude which may result in the Delta freshening slightly.
- Turbidity:
  - 8.3.1 Freeport 3-day average = 4.81 FNU
  - 8.5.1 Turbidity at OBI Feb 1 to April 1
- Salinity: X2 is upstream of Collinsville, estimated to be 95.7 km on the Sacramento River and 97.8 km on the San Joaquin River
- Hydrologic Footprint:
  - CDFW requested PTM models to inform risk of entrainment for larval Longfin Smelt present in the lower San Joaquin River near Jersey Point. The request includes two additional insertion points, one at Prisoner's Point (station 815) and one south of Franks Tract (station 902), to inform potential entrainment risk if SLS 1 detects larvae at these stations. Larvae have only been detected at SLS station 809 (Jersey Point) and the inclusion of additional insertion points does not imply the presence of larvae. CDFW SMT staff are awaiting confirmation that request has been received and that staff are available to complete the analysis.

### **Section 3-B: Water operations outlook. 8.1.5.2.A. ii**

- Outages
  - SWP: No export or salvage outages reported for the period of 12/22/2020 to 12/28/2020
  - CVP: No export or salvage outages reported for the period of 12/22/2020 to 12/28/2020.Exports
  - CCF: 2500 as of 12/29/2020 and is projected to decrease to 2000 cfs on 12/30/2020.
  - CVP: 800 cfs
  - Barker Slough: Not reported. Will begin reporting when Barker Slough Condition of Approval go into effect January 15<sup>th</sup>.
- Meteorological Forecast: Mostly Sunny with winds up to 9 mph. 30% chance of precipitation 12/30/2020 and slight chance of precipitation over the weekend.
- Storm Event Projection: Long term forecast shows increased chance of precipitation next week; however, the magnitude of the effects is unknown, and runoff is not expected to reach the Delta prior to the next SMT meeting.

### **Section 3-C: Projected conditions. 8.1.5.2.A. iii**

- DCC Gates position: Closed for season (through May 20, 2021)
- Sacramento River flow at Freeport: Approximately 8,200 cfs and may decrease prior to the arrival of precipitation next week.
- San Joaquin River flow at Vernalis: 900 - 1200 cfs
- Qwest: -2000 cfs as of 12/29/2020 and will become less negative as SWP exports decrease.
- Old River at Bacon Island Turbidity: Not reported
- Freeport Turbidity (3-day average): 4.81 FNU.
- Expected changes in South Delta Exports: Exports may increase if water quality permits.
- NDOI: 5,000 as of 12/28/2020.



Table 1: Comparison of OMR and OMR Index (5-day and 14-day averages reported on [SacPAS website](#), accessed Dec 29, 2020)

Date	Averaging Period	USGS gauges (cfs)	Index (cfs)
12/29/2020	Daily	Not Reported	-2,500 cfs
12/27/2020	5-day	Not Reported	-3,660cfs
12/27/2020	14-day	Not Reported	-2,420 cfs
NA	Daily	Not Reported	Not Reported
12/26/2020	5-day	-3,590 cfs	-3,480 cfs
12/26/2020	14-day	-2,120 cfs	-2,120 cfs

## Section 4: Distribution and Biology.

### 8.1.5.2.B. Assessment of biological information for Delta Smelt and Longfin Smelt

#### **Section 4-A: Delta Smelt population status 8.1.5.2.B. i**

- EDSM did not collect any Delta Smelt during recent sampling (12/21/2020 – 12/24/2020 and 12/28/2020)
- Delta Smelt LCM discussion. Not Discussed.
- Biological Conditions: None reported.
- % in Delta zones: SMT did not discuss distribution in terms of percentage in Delta zones.
- Other Surveys: No Delta Smelt detections were reported in recent sampling including FMWT, Chipps Island Trawl and December SLS. FCCL brood stock collection has not detected any Delta Smelt in the lower Sacramento River after 5 days of sampling conducted earlier in December. Two December SLS surveys were conducted on 12/14/2020 through 12/15/2020 (SLS 12) and on 12/28/2020 (SLS 13). They sampled 12 south and central Delta stations. No Delta Smelt were detected. The standard SLS survey is scheduled to begin 1/11/2021 and will sample the full set of stations. The last Delta Smelt detection occurred on 11/09/2020 in Suisun Marsh.
- Salvage: No Delta Smelt have been detected at either salvage facility this season.

#### **Section 4-B: Longfin Smelt population status 8.1.5.2.B. ii.**

- FMWT Index: The November FMWT Index is 21.7. Indices for September and October were zero. Preliminary December FMWT catch reported 4 Longfin Smelt, with one collected in San Pablo Bay, Suisun Bay, the lower Sacramento River and one near Chipps Island. Fork lengths and station numbers were not available at the time of the call. The annual index is typically distributed in late December or early January.
- Bay Study: The most recent Bay Study data was collected in early November and is not likely to reflect current distribution. During November sampling, 42 Longfin Smelt were collected. One was collected in Carquinez Strait. The rest were collected in San Pablo and San Francisco Bays. December Bay Study began 12/01/2020 but was interrupted after two days of sampling. No Longfin Smelt were detected by Bay Study in December.
- Other Surveys: Chipps Island Survey collected one adult LFS (FL = 114 mm) on 12/27/2020. EDSM collected 16 LFS (FL = 65 – 115mm) in Suisun Marsh on 12/28/2020 and one LFS (FL = 74 mm) in Suisun Bay on 12/24/2020. Two December SLS surveys were conducted on 12/14/2020 through 12/15/2020 (SLS 12) and on 12/28/2020 (SLS 13). They sampled 12 south and central Delta stations. No Longfin Smelt were detected during SLS 12. SLS 13 collected 3 larvae (Total Length = 7 mm) with yolk sacks intact at station 809 near Jersey Point in the lower San Joaquin River. The standard SLS survey is scheduled to begin 1/11/2021 and will sample the full set of stations.
- UC Davis Otolith Lab collected Longfin Smelt in south San Francisco Bay including spent and ripe adults on 12/12/2020.
- Salvage: No Longfin Smelt have been detected at either salvage facility.

**Section 4-C:** Additional data sources to assess sensitivity to entrainment Delta. 8.1.5.2.C & D. i

- SMT estimated X2 using a tool developed by DWR staff that applies the same methodology used to calculate X2 reported on CDEC. There is interest in validating the results of this tool.

**Notes:** The SMT ITP Risk Assessments can be accessed on the CDFW [Water Branch website](#).

The Onset of OMR management is expected to be begin 1/1/2021 based on salmonid presence. Upon initiation of the OMR Management season, Permittee shall reduce exports to achieve and maintain a 14-day average OMR index no more negative than -5,000 cfs, until the OMR Management season ends

The deadline for SMT members to provide comments and edits for draft documents has been extended to 1/04/2020 to accommodate the New Year holiday.

EDSM temporarily reduced the number of sampling crews from 3 to 2 due to limitations associated with COVID-19. This will reduce the number of sites sampled in some strata for sampling conducted this week (12/28/2020 through 12/31/2020). Bay Study is expected to resume sampling in January.

## Attachments:

Insert catch reports, PTM results, Salvage tables, etc.

Table 1. Longfin Smelt catch per station from 2020 Smelt Larva Survey, Survey 13, which was in the field on 12/28/2020. Longfin Smelt incidental take permit criteria stations are highlighted in blue (Barker Slough Pumping Plant) and yellow (South Delta exports).

Study Year	Survey #	SLS Station	Turbidity	Sample Status	Species	Smelt Catch	MinOfL length	MaxOfL length	AvgOfLen gth	
2020		405		Not Sampled						
2020		411		Not Sampled						
2020		418		Not Sampled						
2020		501		Not Sampled						
2020		504		Not Sampled						
2020		508		Not Sampled						
2020		513		Not Sampled						
2020		519		Not Sampled						
2020		520		Not Sampled						
2020		602		Not Sampled						
2020		606		Not Sampled						
2020		609		Not Sampled						
2020		610		Not Sampled						
2020		703		Not Sampled						
2020		704		Not Sampled						
2020		705		Not Sampled						
2020		706		Not Sampled						
2020		707		Not Sampled						
2020		711		Not Sampled						
2020		716		Not Sampled						Barker ITP
2020		723		Not Sampled						
2020		801		Not Sampled						
2020		804		Not Sampled						
2020	13	809	7.3	Processed	Longfin Smelt	3	7	7	7.0	SWP ITP Criteria Stations
2020	13	812	5	Processed		No Smelt Catch				
2020	13	815	3.5	Processed		No Smelt Catch				
2020	13	901	5.7	Processed		No Smelt Catch				
2020	13	902	2.4	Processed		No Smelt Catch				
2020	13	906	2.4	Processed		No Smelt Catch				
2020	13	910	4.7	Processed		No Smelt Catch				
2020	13	912	8.9	Processed		No Smelt Catch				
2020	13	914	1.8	Processed		No Smelt Catch				
2020	13	915	2.3	Processed		No Smelt Catch				
2020	13	918	2.1	Processed		No Smelt Catch				
2020	13	919	3.3	Processed		No Smelt Catch				

\*Processing complete